Role of the *Arabidopsis thaliana* transcription factor BBX14 in retrograde and stress acclimation signaling pathways

Dissertation

zur Erlangung des Doktorgrades der Naturwissenschaften (Dr. rer. nat.)



an der Fakultät für Biologie der Ludwig-Maximilians-Universität München vorgelegt von

Vasil Atanasov

München, 2024

Diese Dissertation wurde angefertigt unter der Leitung von PD Dr. Tatjana Kleine im Bereich "Molekulare Pflanzenwissenschaften" an der Fakultät für Biologie der Ludwig-Maximilians-Universität München

Datum der Abgabe: 04.07.2024 Datum der mündlichen Prüfung: 01.10.2024 Erstgutachter: PD Dr. Tatjana Kleine Zweitgutachter: Prof. Thomas Nägele

Statutory declaration

Eidesstattliche Erklärung

Ich versichere hiermit an Eides statt, dass die vorgelegte Dissertation von mir selbstständig und ohne unerlaubte Hilfe angefertigt wurde. Des Weiteren erkläre ich, dass ich nicht anderweitig ohne Erfolg versucht habe, eine Dissertation einzureichen oder mich der Doktorprüfung zu unterziehen. Die folgende Dissertation liegt weder ganz noch in wesentlichen Teilen einer anderen Prüfungskommission vor.

Vasil Atanasov München, den 04.07.2024

Statutory declaration

I declare that I have authored this thesis independently and that I have not used other than the declared (re)sources. As well I declare that I have not submitted a dissertation without success and not passed the oral exam. The present dissertation (neither the entire dissertation nor parts) has not been presented to another examination board.

Vasil Atanasov München, 04.07.2024

Contents

S	tatutory declaration	2
С	ontents	3
A	bbreviations	5
A	bstract	6
K	urzfassung	7
1.	Introduction	9
	 1.1. General elements of retrograde signaling 1.1.1. GUN-type retrograde signaling 1.1.2. <i>gun</i> mutants and beyond 	9 .12 .14
	 1.2.1. Classification, phylogeny, and structural complexities among BBX proteins 1.2.2. BBX proteins are involved in both cooperative and antagonistic interactions during various physiological processes	.19 .21
	1.3. Abiotic stress regulation 1.3.1. BBX proteins in the context of abiotic stress	28 .29
2.	Scientific aims of the thesis	31
3.	Materials and Methods	32
	3.1. Materials. 3.1.1. Chemicals and enzymes. 3.1.2. Oligonucleotides. 3.1.3. Vectors	32 .32 .32 .33 .33 .33 .34 .34 .35 .35
	 3.2. Methods 3.2.1. Plant growth conditions 3.2.2. Plant phenotypical measurements and data analysis 3.2.3. Molecular methods 3.2.4. Gene expression analysis 3.2.5. Measurements of physiological and biochemical parameters 	35 .35 .36 .37 .39 .40
4.	Results	43
	4.1. BBX14 is involved in chlorophyll biosynthesis during early stages of light exposure	43
	4.2. BBX14 participates in the regulation of genes associated with the circadian clock.	49
	4.3. The elongated hypocotyl of the <i>bbx14</i> mutant depends on a retrograde signal	53
	4.4. Repression of <i>BBX14</i> expression during biogenic signaling depends on GUN1	56

	4.5. Overexpression of BBX14 potentially affects seedling growth	. 59
	4.6. Role of BBX14 and BBX15 in GUN1-mediated retrograde signaling	. 62
	4.7. BBX14 is required for high light stress acclimation	. 66
5.	Discussion	. 70
	5.1. BBX14 is part of the GLK1/GUN1-dependent retrograde signaling mechanism regulating seedling development	. 72
	5.2. Involvement of BBX14 in circadian rhythm dynamics	. 76
	5.3. BBX14 promotes chlorophyll accumulation and seedling establishment	. 78
	5.4. The role of BBX14 in acclimation to light stress	. 79
6.	References	. 83
7.	Supplemental information 1	102
8.	Acknowledgement1	121
9.	Permission for republishing1	122

Abbreviations

BBX	B-box protein
bp	base pairs
ССТ	CONSTANS, CO-like and TOC1
Chl	Chlorophyll
Col-0	Arabidopsis ecotype Columbia-0
COP1	Constitutively Photomorphogenic 1
CRY	Cryptochrome
DNA	Deoxyribonucleic acid
F_v/F_m	Maximum quantum yield of PSII
GFP	Green fluorescent protein
GLK	GOLDEN2-LIKE transcription factor
gun	genomes uncoupled mutant
HL	High Light
HY5	Elongated Hypocotyl 5
НҮН	HY5 Homolog
LHC	Light-harvesting complex
LHCB	Light-harvesting chlorophyll a/b-binding
LIN	Lincomycin
mRNA	messenger ribonucleic acid
MS	Murashige and Skoog medium
NF	Norflurazon
NGE	Nuclear gene expression
OGE	Organellar gene expression
PAM	Pulse-Amplitude-Modulation
PGE	Plastid gene expression
PhANGs	Photosynthesis-associated nuclear-encoded genes
РНҮ	Phytochrome
PIF	Phytochrome Interacting Factor
PSII	Photosystem II
ROS	Reactive oxygen species
RS	Retrograde signaling
TF	Transcription factor
WT	Wild-type

Abstract

Light signaling plays an essential role in controlling higher plants' early developmental process termed as photomorphogenesis. The development of seedlings capable of photosynthesis necessitates the orchestration of both light and retrograde biogenic signaling pathways. Transcriptional regulation stands as a pivotal mechanism, orchestrated by a dynamic interplay of transcription factors and regulatory proteins, meticulously modulating gene expression. Despite considerable characterization of transcription factors and regulators within the lightsignaling pathway, their intricate interactions largely remain elusive. Notably, a plethora of transcription factors in plants have garnered attention for their pivotal roles in orchestrating light-regulated development. Among these, the B-box (BBX) family of transcription factors, distinguished by the presence of zinc-finger BBX domains in their N-terminal region, holds prominence. BBX proteins emerge as central players in regulatory networks governing various growth and developmental processes, spanning seedling photomorphogenesis, photoperiodic regulation of flowering, shade avoidance, and responses to diverse biotic and abiotic stresses. In a previous study exploring the response to high light (HL) and biogenic signals, BBX14, alongside GLK1, was identified within a core module. Utilizing inhibitors targeting chloroplast development, in this thesis it was uncovered that BBX14 is directly targeted by GLK1, as evidenced by chromatin immunoprecipitation-Seq experiments. Furthermore, RNA-Seq analysis hinted at a potential role for BBX14 in regulating the circadian clock. Additionally, BBX14 was found to contribute to chlorophyll biosynthesis upon the early onset of light, promote photomorphogenesis and influence the accumulation of the chlorophyll precursor, Pchlide, in the dark. Conversely, a knockout of BBX14 resulted in a long hypocotyl phenotype dependent on retrograde signaling, similar to the glk1 mutant. Notably, the expression of BBX14 and BBX15 during biogenic signaling was contingent upon GUN1. Investigating their role in GUN-type biogenic signaling, it was observed that overexpression of BBX14 or BBX15 led to the de-repression of CA1 mRNA levels under norflurazon conditions, while transcripts levels of the LHCB1.2 marker remained unaffected. Finally, BBX14 was identified to be crucial for plants to acclimate to HL stress.

In summary, BBX14 emerges as a pivotal component in the integration of biogenic signals and as a nuclear target downstream of the GUN1/GLK1 module. Its established significance in seedling development and its central role in plastid-to-nucleus signaling render BBX14 a promising candidate for further characterization and exploration.

Kurzfassung

Lichtsignale spielen eine wesentliche Rolle bei der Steuerung des frühen Entwicklungsprozesses höherer Pflanzen, der als Photomorphogenese bezeichnet wird. Die Entwicklung von Keimlingen, die Photosynthese betreiben können, erfordert die Integration sowohl von Licht als auch von retrograden biogenen Signalwegen. Die Transkriptionsregulation ist ein zentraler Mechanismus, der durch ein dynamisches Zusammenspiel von Transkriptionsfaktoren und regulatorischen Proteinen gesteuert wird, die die Genexpression akkurat modulieren. Trotz der umfangreichen Charakterisierung von Transkriptionsfaktoren und Regulatoren innerhalb des Lichtsignalwegs sind ihre komplizierten Interaktionen noch weitgehend unbekannt. Mittlerweile hat eine Vielzahl von noch nicht eingehend erforschten pflanzlichen Transkriptionsfaktoren aufgrund ihrer zentralen Rolle bei der Orchestrierung der lichtgesteuerten Entwicklung Aufmerksamkeit erregt. Unter diesen ist die B-Box-Familie (BBX) von Transkriptionsfaktoren, die sich durch das Vorhandensein von Zink-Finger-BBX-Domänen in ihrer N-terminalen Region auszeichnen, besonders hervorzuheben. BBX-Proteine spielen eine zentrale Rolle in regulatorischen Netzwerken, die verschiedene Wachstumsund Entwicklungsprozesse steuern, darunter die Photomorphogenese der Keimlinge, die photoperiodische Regulation der Blüte, die Vermeidung von Schatten und die Reaktion auf verschiedene biotische und abiotische Stressfaktoren.

In einer früheren Studie, in der die Reaktion auf hohe Lichtintensität (HL) und biogene Signale untersucht wurde, wurde BBX14 neben GLK1 in einem Kernmodul identifiziert. Unter Verwendung von Inhibitoren, die die Chloroplastenentwicklung hemmen, wurde in dieser Dissertation aufgedeckt, dass GLK1 den Promotor von *BBX14* direkt bindet, was durch Chromatin-Immunpräzipitations-Sequenzierung belegt wurde. Darüber hinaus deutete eine RNA-Sequenz-Analyse auf eine mögliche Rolle von BBX14 bei der Regulierung der zirkadianen Uhr hin. Weiterhin wurde festgestellt, dass BBX14 bei frühem Lichteinfall zur Chlorophyllbiosynthese beiträgt, die Photomorphogenese fördert und die Akkumulation des Chlorophyllvorläufers Pchlide im Dunkeln beeinflusst. Außerdem führte ein Knockout von *BBX14* zu einem langen Hypokotyl-Phänotyp, der von retrograder Signalübertragung abhängig ist, ähnlich wie bei der *glk1* Mutante. Bemerkenswert war auch, dass die Expression von BBX14 und BBX15 während der biogenen Signalübertragung von GUN1 abhängig war. Bei der Untersuchung der Rolle von BBX14 und BBX15 bei der biogenen Signalübertragung vom GUN-Typ wurde festgestellt, dass die Überexpression von BBX14 oder BBX15 unter Norflurazon-Bedingungen zu einer De-Reprimierung der *CA1* Expression führte, während die Expression vom *LHCB1.2*-Markergen unbeeinflusst blieb. Schließlich wurde festgestellt, dass BBX14 für die Anpassung der Pflanzen an HL-Stress entscheidend ist.

Zusammenfassend lässt sich sagen, dass sich BBX14 als eine zentrale Komponente in der Integration biogener Signale downstream vom GUN1/GLK1-Moduls etabliert hat. Eine etablierte Bedeutung in der Keimlingsentwicklung und ein aufkeimendes Potenzial in der Plastiden-zu-Kern-Signalübertragung machen BBX14 zu einem vielversprechenden Kandidaten für die weitere Charakterisierung und Erforschung pflanzlicher Transkriptionsfaktoren.

1. Introduction

1.1. General elements of retrograde signaling

In higher plants, the plastid genome contains fewer than 100 open reading frames. The majority of the over 3000 polypeptides found in the photosynthetically active plastids called chloroplast are transcribed from nuclear-localized genes and imported post-translationally into the chloroplast. The nucleus, on the other hand, harbors genes crucial for chloroplast gene expression, such as components of the transcription and translation machinery, proteins constituting the protein import apparatus as well as the photosynthetic machinery (Kleine et al., 2009; Richter et al., 2023). Therefore, effective organelle biogenesis and metabolism require coordinated gene expression across eukaryotic cell compartments (Archibald, 2015). Proper assembly of multiprotein complexes of mixed genetic origin relies on the coordination of organellar gene expression (OGE) and nuclear gene expression (NGE) at multiple levels (Zhang et al., 2023). Given the limited number of chloroplast-encoded proteins, mainly involved in OGE and photosynthesis, precise coordination of gene expression between the plastid and the nucleus is pivotal for the efficient assembly of protein complexes (Gollan et al., 2015). This coordination is a multifaceted two-way process involving both anterograde signaling, in which nuclear genes directly control OGE, and retrograde signaling (RS), where information about the chloroplast's development and metabolic state is transmitted to the nucleus to modulate NGE of chloroplast-localized proteins appropriately (Chi et al., 2013; Terry & Smith, 201).

The control of NGE via retrograde signals plays a pivotal role in establishing the photoautotrophic lifestyle and efficient allocation of resources under conditions of reduced organelle metabolic function (Nott et al., 2006). In later stages of development, RS may adjust NGE in response to changes in chlorophyll biosynthetic flux or modulate expression in response to alterations in photosynthetic flux or damage to chloroplasts caused by high irradiance (Koussevitzky et al., 2007; Martin et al., 2016). Consequently, intracellular communication between organelles is of paramount importance for maintaining the appropriate balance of gene expression in a dynamic environment, particularly in consideration of the effects of abiotic stress factors. (Leister et al., 2014; Leister et al., 2017). The close interplay between plastids and nucleus, and thus the interdependence between chloroplast and NGE, is further highlighted by the fact that expression of several nuclear-encoded photosynthetic genes is significantly reduced in the absence of functional chloroplasts (Nott et al., 2006). Similar effects are observed when inducing carotenoid deficiency with the herbicide norflurazon.

Furthermore, inhibiting chloroplast development by arresting plastid gene expression (PGE) through chloramphenicol treatment in turn inhibits nuclear photosynthetic gene expression (Oemuller et al., 1986). Together, these findings suggest a significant interdependence between chloroplast and nuclear gene expression.

Almost over three decades ago, the idea of a plastid-generated factors triggering retrograde signaling was proposed. Subsequent genetic and biochemical studies in a variety of organisms have established multiple communication pathways between chloroplasts and the nucleus. However, the components of these pathways remain incompletely understood up to date. (Richter et al., 2023). Retrograde signals are thought to originate from four main sources: (i) the tetrapyrrole pathway, (ii) OGE, (iii) reactive oxygen species (ROS), or (iv) the redox state of the organelle (Leister et al., 2014). Indeed, while the conventional understanding of plastid signaling implicated minute amounts of signaling molecules, recent years have seen a shift in this perspective. It's now suggested that alterations in the concentrations of chloroplast metabolites could also influence NGE regulation. Over the past five years, five chloroplast metabolites have emerged as potential retrograde signals: (i) heme; (ii) phosphonucleotide PAP (3'-phosphoadenosine 5'-phosphate); (iii) β -cyclocitral (β -CC), an oxidation byproduct of β carotene; (iv) methylerythritol cyclodiphosphate (MEcPP), a precursor of carotenoids, and consequently, of β -carotene; and (v) cleavage product(s) of ζ -carotene and/or phytofluene (Kleine & Leister, 2016). Metabolites are strong candidates for RS mediators due to their reflection of organelle metabolic states, although nucleic acids, ROS, and transcription factors have also been implicated (Sun et al., 2011). Thus, alternations in the metabolic profile of the cytosol triggered by the organelles could well be used by the cell to adjust NGE, either by using a metabolite directly as a signaling molecule or by converting an appropriate metabolite into an active signaling molecule in the cytosol (Leister et al., 2012). Two principal modes of RS molecule transfer - passive diffusion and active transport - add complexity to the signaling cascade. While the classical scenario proposes that signaling factors are generated within organelles, exported, traverse the cytosol, and act in the nucleus, recent research challenges this view (Leister, 2012). Although several such putative messenger molecules have been identified, their role and function often intertwine with other pathways outside of RS, making them difficult to study independently of one another (Kleine & Leister, 2013).

Changes in the developmental or metabolic state of chloroplasts or mitochondria can have profound effects on NGE, resulting in significant changes in transcript profiles and cell development. Moreover, it's intriguing that nuclear genes encoding chloroplast proteins generally exhibit a degree of co-regulation, regardless of their specific biochemical functions (Leister, 2012), such as those encoding photosystem subunits, thereby underscoring the dual role of photosynthesis as both a stimulus and a target of retrograde regulation (Kleine et al., 2021). Furthermore, a comprehensive analysis of transcript profiles in the model organism *Arabidopsis thaliana* (hereafter Arabidopsis) revealed that genes relevant to chloroplasts and mitochondria are coordinated in their activity (Leister et al., 2011). This coordination extends to gene sets involved in organellar energy production or OGE within each organelle and in the nucleus. Additionally, this highlights the presence of dynamic transcriptional networks, both between and within organelles (Leister et al., 2011). These networks dynamically adjust organelle activity in response to changes in cellular energy levels and environmental stresses (Barkan, A., & Goldschmidt-Clermont, M., 2000; Chi et al., 2013).

As mentioned above, retrograde signaling plays a critical role in coordinating chlorophyll biosynthesis with the expression of nuclear-encoded chlorophyll-binding proteins, such as LHCA and LHCB proteins. Moreover, over the years, compiling evidence have suggested that precursors of the chlorophyll biosynthesis, namely Mg-protoporphyrinIX (Mg-protoIX), and Mg-protoporphyrinIX-methylesters (Mg-protoIXme), could act as regulators of NGE (Kleine et al., 2009). Studies on C. reinhardtii and higher plants have shown that the accumulation of porphyrin intermediates between protoIX and Mg-protoIXme is crucial for repressing LHCB transcripts. In addition, treatments inhibiting protochlorophyllide (Pchlide) synthesis in higher plants lead to the accumulation of Mg-protoIX and Mg-protoIXme, which affects LHCB mRNA levels (Nott et al., 2006). It's believed that impaired chloroplast function causes increase in Mg-protoIX accumulation, which may diffuse or be actively transported to the cytoplasm, where it binds to unidentified proteins, initiating regulation of nuclear-encoded photosynthetic genes (Strand et al., 2003). However, further investigation is required to determine the exact integration point between Mg-ProtoIX and PGE signals, as well as the identity of yet unknown cytosolic components involved in this signaling transduction pathway. Contrary to earlier assumptions by Strand et al., (2003), however, Mg-protoIX is no longer believed to function directly as a signaling molecule (Mochizuki et al., 2008; Moulin et al., 2008). Instead, perturbations in the tetrapyrrole synthesis due to mutations in key enzymes are believed to induce localized ROS production or alter plastid redox states, potentially mediating RS (Kleine et al., 2009). Thus, suggesting that reduction in protein synthesis rates or the synthesis of specific plastid proteins during early plastid development generate retrograde signals (Leister et al., 2014). However, OGE-dependent signaling was shown to persist in mature leaf tissues, as observed in mutants with defective components of the OGE machinery, for example the Arabidopsis lines lacking the plastid- and mitochondria-localized prolyl-tRNA

synthetase PRORS1 (Pesaresi et al., 2006; Leister and Kleine et al., 2016). When OGE is perturbed simultaneously in both mitochondria and chloroplasts, there is a more pronounced down-regulation of nuclear photosynthetic genes compared to treatments affecting OGE in only one organelle. For instance, the double mutant *prpl11mrpl11*, characterized by impaired ribosomal function in both plastids and mitochondria, consistently exhibited lower transcript levels than either the single mutants *prpl11* or *mrpl11* (Pesaresi et al., 2006). This indicates that both plastid OGE and mitochondrial OGE play roles in stimulating NGE under the specific growth conditions examined in the study (Leister et al., 2011). In addition to that, the regulation of NGE was found to involve synergistic contributions from both chloroplast and mitochondrial translation rates, as evidenced in studies on the plastid and mitochondrial ribosome deficient mutants *prpl11* and *mrpl11*, respectively (Leister et al., 2014).

1.1.1. GUN-type retrograde signaling

The genomes <u>un</u>coupled (gun) mutants, identified through genetic screens involving chemical inhibitors, have played a crucial role in deciphering RS (Susek et a., 1993). Initially five mutants (gun1-gun5) were identified by their sustained expression of photosynthesisassociated nuclear genes (*PhANGs*), such as the marker gene *LHCB* coding for light-harvesting chlorophyll a/b-binding proteins of photosystem (PS) II despite impaired plastid development due to stressors such as norflurazon (NF) and lincomycin (LIN), which inhibit carotenoid biosynthesis and protein synthesis in the plastid, respectively (Susek et al., 1993). Over the years other mutants that display such distinctive molecular phenotype have been identified, like for instance the gun6-1D mutant overexpressing the plastid ferrochelatase 1 (FC1), however its behavior under LIN requires further investigation (Richter et al., 2023). Among these mutants, however, gun1 exhibits distinctive PhANG expression under both LIN and NF treatment, whereas gun2-gun5 respond only to NF treatment (Leister & Kleine, 2016). Since GUN2–GUN6 genes encode for proteins involved in the regulation of tetrapyrrole biosynthesis, it is feasible that disruptions in those pathways could result in the accumulation of intermediates that, when exported out of the chloroplast, alternate the expression of nuclearencoded genes. The gun mutants, thereby reveal the indirect or intermediate role of Mg-protoIX in RS, as mutations in GUN2, GUN3, GUN4, and GUN5 (all linked to porphyrin biosynthesis), lead to decreased Mg-protoIX accumulation and consequently to impaired plastid control of NGE (Mochizuki et al., 2001; Larkin et al., 2003).

As mentioned above, the *gun1* mutant stands out as a unique case among the classical *gun* mutants due to its LIN-specific phenotype. GUN1's exact molecular function remains enigmatic (S. Honkanen & I. Small, 2022), although its pentatricopeptide repeat (PPR) domain suggests an RNA-binding role (A. Barkan & I. Small, 2014), GUN1 has been associated with potential retrograde signals involving tetrapyrrole biosynthesis, specifically heme, as it seems to directly bind tetrapyrroles (Colombo et al., 2016; Wu et al., 2018; Shimizu et al. 2019). The involvement of heme in GUN1-mediated RS still requiring further experimental proof, as its role in RS currently appears controversial (Richter et al., 2023). What makes it even more interesting is that absence of GUN1 evokes a specific response under LIN treatments, which is not the case in the other initially identified *gun* mutants, and GUN1 itself is not connected to the tetrapyrrole biosynthesis pathways as a PRR protein in any way (Koussevitzky et al., 2007). Instead, its RNA-binding function is thought to manifest itself in RNA editing during chloroplast-to-nucleus signaling as shown in NF-treated *gun1* mutants that exhibit altered efficiency of plastid-RNA editing (Zhao et al., 2019).

GUN1's crucial role in the retrograde signaling cascade is further highlighted by its ability to directly interact with heme and other metal-porphyrins (Shimizu et al., 2019), which affects the tetrapyrrole biosynthesis pathway and enhances FC1 chelatase activity (Woodson et al., 2011). This observation supports the hypothesis that GUN1's signaling role may manifest through changes in tetrapyrrole metabolism (Shimizu et al., 2019), proposing tetrapyrroles as crucial mediators of a singular biogenic chloroplast-to-nucleus signaling pathway (Terry et al., 2013). It has been proposed that a specific heme pool generated by flux through FC1 functions as a positive signal in the *gun1* mutant, with GUN1 acting as a bottleneck for heme signal generation (Shimizu et al., 2019). More recently, the identification of the dominant *gun6* mutant, characterized by increased FC1 activity, suggests a central role for heme synthesized by FC1 as a retrograde signal or its precursor (Woodson et al., 2011).

Although there has been significant progress in this direction, it remains challenging to elucidate the detailed signaling mechanism and confirm the exclusivity of the tetrapyrrolemediated GUN signaling pathway. The *gun1* mutant has been suggested to operate independently from tetrapyrrole-mediated GUN signaling, which complicates the pathway's comprehensive understanding. Experimental evidence shows that changes in GUN1 levels affect tetrapyrrole metabolism, leading to alterations in NGE, with GUN1 overexpression restricting the flow through both branches of the tetrapyrrole pathway thereby affecting the accumulation of Pchlide and heme (Shimizu et al., 2019).

1.1.2. gun mutants and beyond

The GUN1 protein is a unique candidate for examining retrograde signaling in the context of chloroplast development. The name-giving gun phenotype that arises when inhibitors of OGE like LIN are applied, however, also holds true for mutants that are not lacking any of the GUN proteins involved in tetrapyrrole biosynthesis (GUN2-GUN5). For instance, the glk1glk2 (golden2-like 1 golden2-like 2) double mutant also displays a subtle gun phenotype (Waters et al., 2009). The GLK1 and GLK2 genes, which are essential for nuclear photosynthetic gene expression and chloroplast development, encode a pair of partially redundant nuclear-localized transcription factors in land plants. Notably, GLK1 and GLK2 play crucial roles in the expression of nuclear genes encoding proteins involved in photosynthesis (Waters et al., 2009). It has been observed that the glk1glk2 double mutant accumulates abnormal levels of tetrapyrroles, suggesting a potential link between tetrapyrrole intermediates and the phenotype associated with mutants in the GUN pathway (Waters et al., 2009). Interestingly, among the original five gun mutants, gun1-gun4 are known to exhibit disruptions in tetrapyrrole synthesis, suggesting that changes in the levels of tetrapyrrole intermediates could contribute to the gun phenotype. This has been investigated by examining the response of the pale green glk1glk2 mutant to treatment with NF or LIN, which are known to induce the gun phenotype indicating its partial derepression of nucleus-encoded photosynthesis genes in response to NF or LIN treatment (Fitter et al., 2002; Waters et al., 2009). In the glk1glk2 double mutant, genes encoding proteins associated with light-harvesting and chlorophyll biosynthesis are notably downregulated, resulting in a pale green phenotype (Waters et al., 2009). This also hints at the idea that perturbations in the tetrapyrrole pool may influence the GUN pathway. Interestingly, overexpression of either GLK1 or GLK2 effectively complements this defect, leading to LHCB transcript levels approximately 2-fold higher than those observed in wild-type adult plants (Kleine and Leister, 2016).

Moreover, perturbations in OGE, induced either by inhibitors or mutations such as *mterf6-1* or *prors1-2*, have been found to downregulate *GLK1* and *GLK2* transcripts, further emphasizing the intricate regulatory network involving these transcription factors and their role in coordinating organellar gene expression (Kleine & Leister, 2013). This notion is further supported by the finding that overexpression of GLK1 and GLK2 following either NF or LIN treatment evokes a strong *gun* phenotype (Leister & Kleine, 2016). This, together with the finding that disturbances in OGE cause down-regulation of *GLK* transcripts hints that this repression is required for an operational signaling event under disadvantageous conditions. So

far, the overexpression of both GLK1 and GLK2 has been independently shown to result in gun phenotype both under NF and LIN treatment with oeGLK2 displaying a weaker one than oeGLK1 (Leister & Kleine, 2016; Kleine, 2016). Thereby setting them apart from the other *gun* mutants, which display *gun* phenotypes only under NF conditions and not under LIN conditions, but rather akin to the phenotype of the *gun1* mutant (Leister & Kleine, 2016). In Arabidopsis lines overexpressing GLK1 or GLK2, transcript levels of genes encoding key enzymes in the tetrapyrrole pathway, such as *GUN4*, *GUN5*, and *PORA-C*, are notably induced, suggesting a potential increase in flux through this pathway. This increased flux is reflected in elevated chlorophyll levels observed in GLK overexpression lines (Waters et al., 2009). Consequently, two distinct scenarios may explain the *gun* phenotype observed in lines overexpressing GLKs: first, alterations in tetrapyrrole pools; and second, chloroplast signals received by GLK transcription factors, that prompt the activation of their down-stream target

genes, which include *LHCB* and tetrapyrrole genes. Conversely, in unfavorable conditions where GLKs are downregulated, their target genes are consequently downregulated as well (Martin et al., 2016).



Figure 1. The regulation of photomorphogenesis involves antagonistic interactions between PIF-mediated light signaling and GUN1-mediated retrograde signaling (modified after Martin et al., 2016).

PIFs bind to the GLK1 promoter via a PBE motif (CACATG), leading to direct repression of GLK1 expression in dark conditions. However, there are unidentified transcriptional activators, represented by A, which are poised on the promoter and constitutively activate GLK1 expression. Upon receiving informational light signals, activated phytochromes induce the degradation of PIFs (red lines), thereby derepressing GLK1 expression through the action of A. Subsequently, GLK1 directly promotes the expression of photosynthesis-associated nuclear genes (PhANGs) and potentially other genes (referred to as 'Gene(s) X') involved in seedling development. Disruption of chloroplast integrity by factors like lincomycin or high light triggers the emission of a negative retrograde signal (purple line) from dysfunctional chloroplasts. This negative RS induces GUN1-mediated repression of GLK1 expression by diminishing the effectiveness of A. Conversely, functional chloroplasts may produce a positive retrograde signal (green line) essential for the expression and/or activity of A. However, when chloroplast function is compromised, GUN1 facilitates the disruption of this positive RS.

It is widely speculated that other transcription factors may also play significant roles in plastid signaling pathways, with GLK1 and GLK2 being proposed as strong candidates for such involvement. Notably, GUN-type retrograde signaling influences nuclear transcription factors such as ELONGATED HYPOCOTYL 5 (HY5) and the GLKs, as well by the photoreceptor CRYPTOCHROME 1 (CRY1) impacting the expression of genes involved in seedling and chloroplast development, thereby establishing a link between light signaling and RS as means

to regulate NGE (Li et al., 2022). The most prominently studied is the relationship between GUN1-mediated RS and GLK1, whose expression is inhibited in response to PHYTOCHROME-INTERACTING FACTOR (PIF)-mediated light signals (Martin et al., 2016). Upon exposure to light, the degradation of PIFs - induced by phytochromes - alleviates the repression of GLK1 expression, thereby initiating the transition from skotomorphogenesis to photomorphogenesis, provided that the plastid remains functionally intact. This allows GLK1 to regulate the expression of photosynthetic genes (i.e. LHCB gene family) and potentially other down-stream target genes involved in various aspects of photomorphogenesis (i.e. cotyledon unfolding and hypocotyl elongation). However, in instances of plastid damage (i.e. lincomycin and/or high light), RS is activated and counteracts the light-induced derepression of GLK1. This occurs through a GUN1-facilitated, PIF-independent pathway, effectively dampening normal photomorphogenesis to protect the seedling under unfavorable conditions. Concurrently, the chloroplast acts as a sensor of excessive light levels (when the phytochrome/PIF system becomes saturated), preventing potential irreversible damage (Martin et al., 2016; Leivar et al., 2009). Therefore, the coordination of external light cues together with internal chloroplast integrity is essential for promoting photomorphogenesis. The phytochrome/PIF light signaling system monitors transitions between darkness and light, as well as the quality and periodicity of light, to optimize light-regulated development. This mechanism serves to protect the plant from photo-oxidative damage by minimizing the exposure of tissues to harmful radiation. Specifically, the GUN1/GLK1-mediated RS antagonizes phytochrome/PIF signaling, leading to the inhibition of cotyledon separation and expansion when chloroplast integrity is compromised. This effectively reduces the surface area exposed to potentially harmful irradiance levels. Although the exact mechanism remains unclear, it does not involve the re-accumulation of PIF proteins under these conditions, suggesting the involvement of undefined components (Martin et al., 2016). Overall, the GUN1mediated RS and the PIF-light signaling system converge together establishing a molecular framework that integrates phytochrome and retrograde signals at a central node to regulate NGE, thus providing new insight into how plants coordinate light responses with the status of the chloroplasts for optimal growth development and photosynthetic capacity (Figure 1).

Finally, recent evidence suggests that GUN1 may exert even greater influence on GLK1 protein by regulating its stability through ubiquitin-mediated proteolysis, a mechanism possibly more crucial than transcriptional regulation described above. Recent studies indicate that GLK1 participates in GUN1 signaling following chloroplast damage, together with BBX16, a BBXtype zinc-finger transcription factor, playing a role in this process. Mutations in *BBX16* significantly alleviate the *gun1* phenotype induced by LIN treatment and suppress the *gun1*-like phenotype observed in GLK1 overexpressing lines (Veciana et al., 2022).

1.2. The BBX transcription factor family

Transcriptional regulation is a crucial mechanism that governs gene expression in plants. Mutations in transcription factors (TFs) often underlie informative phenotypes and many TFs have been identified that act as central regulators of various plant processes. TFs are proteins that initiate gene expression and typically harbor a DNA-binding domain (DBD) for specific DNA sequence recognition. Proteins that lack a DBD but interact with DNA-binding counterparts to form transcriptional complexes, are also categorized as TFs.

The genome of Arabidopsis contains approximately 25.498 protein-coding genes (Arabidopsis Genome Initiative 2000), including a significant number of TFs, with analyses suggesting a count exceeding 2000 that encode TF (Riechmann et al., 2000). Compared to organisms such as *Drosophila melanogaster* and *Caenorhabditis elegans*, which have similar genome sizes to Arabidopsis, the model land plant has a significantly higher number of TF genes, accounting for 5-10% of the total genes. This exceeds the TF ratios in *D. melanogaster* (4.7%) and *C. elegans* (3.6%), although it remains comparable to that of humans (6.0%) (Duvuluri et al., 2003; Guo et al., 2005; Mitsuda & Ohme-Takagi, 2009).

Arabidopsis TFs are also characterized by a greater quantity and diversity of DBDs, hinting at a significant role in plant transcriptional regulation greater than that of other species. Their complexity arises from a diverse range of gene families with varying DNA-binding specificities. Although significant efforts have been made to identify TF functions, many of their roles remain unclear.

Transcription factors in Arabidopsis are abundant and diverse, comprising numerous gene families. For example, zinc-finger TFs make up approximately 20% of all. Many are specific to plants (ca. 45 %) and possess DBDs unique to this group. Plant-specific families include AP2-ERF, NAC, Dof, YABBY, WRKY, GARP, TCP, SBP, ABI3-VP1 (B3), EIL, and LFY. Additionally, Arabidopsis TFs are often organized into gene families with shared DBDs, such as AP2-ERF and NAC, resulting in large loci counts (Riechmann et al., 2000). Evolutionary processes have led to significant diversification in each eukaryotic lineage, resulting in the emergence of new proteins that regulate lineage-specific activities (Riechmann et al., 2000). The plant zinc finger family is a prime example of such diversification. It is a large group of proteins that can be further categorized into distinct subfamilies.

1.2.1. Classification, phylogeny, and structural complexities among BBX proteins

Zinc-finger proteins have finger-like protrusions that can bind metals such as zinc, and they exhibit diversified functionalities. These proteins often have specialized interaction domains and are known for their ability to bind DNA, RNA, or other proteins (Khanna et al., 2009). Additionally, certain Zinc-finger proteins, exemplified by the B-box (BBX) proteins, are presumed to facilitate protein-protein interactions (Borden et al., 1995; Rushton et al., 1995; Yanagisawa, 1995; de Pater et al., 1996; Torok and Etkin, 2001). The BBX family is a subset of zinc-finger proteins that includes one or more B-box domains. These domains are characterized by specific tertiary structures that are stabilized through zinc ion binding (Klug and Schwabe, 1995). Although the precise biochemical functions of BBX proteins are still unknown, on molecular level they are believed to play a role in modulating protein-protein interactions, particularly within transcriptional complexes (Khanna et al., 2009).

The B-box domain is present in over 1500 proteins across multicellular and certain unicellular eukaryotes (Meroni and Diez-Roux, 2005). In plant systems it appears in the N-terminus either as a single B-box or in tandem repeats designated as B-box1 (B1) and B-box2 (B2), respectively (Massiah et al., 2006, 2007; Short and Cox, 2006), and with some having a CCT (CONSTANS, CO-like, and TOC1) domain in the C-terminus (Griffiths et al., 2003; Robson et al., 2001). The classification of BBX proteins into structural groups has shed light on their diversity. A recent phylogenetic analysis in Arabidopsis identified a gene family of 32 members encoding BBX proteins, named from BBX1 to BBX32 (Khanna et al., 2009). This study classified AtBBX proteins into five structural groups (I-V). The AtBBX members of structure group I (BBX1 to BBX6) contain two B-boxes in tandem (B1 and B2) along with a CCT domain. In these proteins, the B1 domain is located N-terminal to the B2 domain and is separated by 5 to 20 residues. Similarly, the AtBBX members of structure group II (BBX7 to BBX13) also contain B1, B2, and CCT domains, with slight differences in the consensus sequences of the B2 domain compared to structure group I (Chang et al., 2008). Structure group III (BBX14-BBX17) consists of AtBBX members with a single B-box domain associated with a CCT domain. On the other hand, structure group IV (BBX18 to BBX25) comprises BBX proteins with B1 and B2 domains but lacking the CCT domain. Lastly, members of structure group V (BBX26-BBX32) carry a single B-box domain without a CCT domain (Khanna et al., 2009). This classification framework aids in understanding the structural nuances and functional implications within the BBX protein family (Riechmann et al., 2000; Klug and Schwabe, 1995). This clustering of BBX proteins into five structural groups was also confirmed by a recent study in rice (Huang et al., 2012). In Arabidopsis, 21 out of the 32 BBX proteins

possess tandem B-boxes (BBX1–13 and BBX18–25), while the remaining 11 (BBX14–BBX17 and BBX26–BBX32) contain a single B-box. Similarly, in rice (*Oryza sativa*), 17 out of the 30 BBX proteins feature tandem B-boxes at their N termini (Crocco & Botto, 2013). This shared structural feature between Arabidopsis and rice underscores the conservation of the B-box domain in plants (Huang et al., 2012).

The structural analysis of BBX proteins revealed notable similarities and differences among the various structure groups. For instance, there is a high sequence similarity between the B1 domains of structure groups I, II, and IV, which have double B-boxes, and the single B-box domains of structure groups III and V. However, the B1 consensus domain of structure group V has one fewer amino acid in the 7th position compared to the other structure groups. Despite this difference, the number of cysteine residues in the B1 consensus domains remains conserved across all structure groups, indicating a retained topology among BBX proteins (Crocco & Botto, 2013; Torok et al., 2001). Similarly, while the topology of the B2 domain is conserved across all structure groups, there is a low percent sequence identity between structure groups I, II, and IV (Tamura et al., 2011). This suggests an early evolutionary origin of the B2 domain compared to the B1 domain, with the B2 domain of structure group I likely arising independently from those of structure groups II and IV likely originating from segmental duplications and internal deletion events in plant genomes. Despite these variations, the conservation of topology between the B1 and B2 consensus sequences underscores the essential role of this domain in molecular function.

Amino acid alterations in the consensus sequences of B1 and B2 domains have been linked to dysfunctional proteins with implications for plant development. This highlights the importance of maintaining the conservation of B-box domains across green plants, suggesting that BBX proteins' functional diversification may be driven by conserved sequences outside of the B-box domain. Additionally, seven novel motifs (M1 to M7) were identified, each shared by BBX members within the same structure group. For instance, the M1 motif found in BBX members of structure group I contains a conserved valine next to a proline (VP pair), known to be critical for BBX protein-protein interaction. Interestingly, this VP pair was also conserved at the C-terminus in a significant proportion of BBX members across other structure groups (Gangappa & Botto, 2014). These findings suggest that while some BBX proteins may have undergone domain loss in recent evolutionary events, they still retain other common characteristics specific to their structure group. Furthermore, phylogenetic analysis revealed that BBX proteins within the same structure group were primarily classified based on amino acid similarity, with secondary classification based on the organization of B-box and CCT domains.

The five BBX structure groups are thought to have evolved constrained by the conservation of amino acid sequences in the two B-boxes but radiating variation into nuclear-localization signal motif (NLS) and the novel motifs (M1–M7) of each structural group, suggesting that these features serve as the functional basis for the BBX protein diversity in green plants (Khanna et al., 2009; Crocco & Botto, 2013).

1.2.2. BBX proteins are involved in both cooperative and antagonistic interactions during various physiological processes

BBX proteins are encoded by highly conserved genes found in multicellular species, including blue-green algae and mosses, implying an ancient origin of approximately one billion years ago, that predates land plant colonization by over 450 million years. The widespread presence of BBX genes across various species, spanning from algae to monocots and dicots, indicates an ancient origin of these genes. While most green algae typically possess a single B-box motif, the identification of two B-box motifs in the unicellular green alga *C. reinhardtii* implies that the duplication event of the B-box likely occurred prior to the colonization of land plants (Kenrick and Crane, 1997; Peers and Niyogi, 2008). The significant expansion of BBX proteins throughout evolution, coupled with their high conservation across the plant kingdom, suggests that BBX proteins may have played essential roles in the adaptation of land plants. This evolutionary trajectory underscores the fundamental importance of BBX proteins in the evolutionary history and diversification of plant species, especially regarding interaction with other TFs to regulate gene transcription.

As mentioned previously BBX-containing protein are hypothesized to play a role in modulating protein-protein interactions, particularly within transcriptional complexes (Brandao et al., 2009). Indeed, BBX proteins play a central role in transcriptional regulation, as evidenced by their physical interactions with the transcription factor ELONGATED HYPOCOTYL 5 (HY5) and HOMOLOG of HY5 (HYH), as the case with BBX22, 24 and 25 (Datta et al., 2008; Gangappa et al., 201; 2015). Site-directed mutations in B-box motifs, disrupt these interactions, emphasizing the significance of the B-box motif in mediating BBX-HY5 interactions. Functional divergence is exemplified by BBX proteins, which act both as transcriptional coactivators (e.g. BBX21 and BBX22) and corepressors (e.g. BBX24 and BBX25) of HY5-mediated transcriptional activity (Chang et al., 2008; Gangappa et al., 2015). Furthermore, epistatic analyses have revealed complex relationships between BBX proteins and another key regulator of seedling development CONSTITUTIVE PHOTOMORPHOGENIC1 (COP1) and

influence its activity (Gangappa & Botto, 2014). Some BBX proteins repress COP1 function, while others enhance it. For examples, BBX4, BBX20, BBX21, and BBX22 repress COP1 function (Yan et al., 2011; Chang et al., 2013), whereas BBX24 and BBX25 are known to enhance its function (Gangappa, Crocco, et al., 2013; Gangappa, Holm, et al., 2013). On the other hand, COP1 interacts with and facilitates the degradation of various BBX proteins, including CO (CONSTANS)/BBX1, BBX22, BBX24, and BBX25 (Datta et al, 2008a; Datta et al., 2008b; Crocco et al., 2010). This intricate regulatory network is contributed to by direct interactions between BBX proteins and COP1, or by the recruitment of BBX proteins by COP1 into nuclear speckles. The critical VP pair located at the C-terminus of BBX proteins is essential for their interaction with COP1. In plants, COP1 functions as an E3 ubiquitin ligase, suppressing light signaling by ubiquitylating and subsequently degrading target photoreceptors and downstream TFs. Since plants lack TRIM/RBCC proteins, which are found in animals and possess E3 ubiquitin ligase activity (Lorick et al., 1999), it has been proposed that the BBX-COP1 protein complex serves as the functional equivalent of E3 ubiquitin ligase activity in green plants (Meroni and Diez-Roux, 2005). Phylogenetic analysis suggests that 45% of the BBX proteins analyzed possess the VP pair, making them potential candidates to participate in BBX-COP1 protein complexes. In addition to the B-box domain, the CCT domain and the VP pair in BBX proteins also have important roles in protein-protein interactions. For instance, BBX1, BBX16, and other BBX proteins containing the CCT domain interact with DNA binding proteins such as NUCLEAR FACTOR-Y (NF-Y) through the CCT domain (Cao et al., 2014). This interaction facilitates nuclear localization, and the CO/NF-Y complex binds to conserved CCAAT cis-elements in promoter regions (Vaishak et al., 2019).

The diverse roles of BBX proteins in seedling (de)-etiolation, hypocotyl growth, anthocyanin production, chlorophyll accumulation, lateral root growth, cotyledon unfolding and other developmental processes are underscored by their interplay, which is evidenced by mutual enhancement or inhibition (Gangappa & Botto, 2014). On physiological levels, BBX proteins have diverse functions in regulating the transition from skotomorphogenesis (or etiolation) to photomorphogenesis (or de-etiolation), with the former occurring in the dark and the latter in the light (Sullivan and Deng, 2003). In their natural environment, seeds germinating in soil experience complete darkness or very low light intensity, prompting them to undergo skotomorphogenesis as they emerge through the soil to reach light. Subsequently, exposure to light triggers the transition to photomorphogenic development (Frankhauser and Chory, 1997). Dark-grown seedlings exhibit elongated hypocotyls, unexpanded cotyledons with nonphotosynthetic etioplasts and apical hook that protects the apical meristem from damage

(Han et al., 2020). Conversely, exposure to light initiates photomorphogenic development, characterized by dampening of hypocotyl elongation, hook unfolding, and expansion of green cotyledons containing functional photosynthesis-driving chloroplasts to maximize light absorption. The ability to switch from etiolated/skotomorphogenic deto etiolated/photomorphogenic state is essential for seedling survival. The process is initiated upon light perception and involves massive transcriptome changes, especially genes involved in photosynthesis, and is under tight temporal regulation (Ma et al., 2001; Shi et al., 2018; Tripathi et al., 2019; Jing & Lin, 2020).

Some members of the BBX protein family oppose each other in the context of skotomorphogenesis and photomorphogenesis, which distinguishes them from other TF families (Figure 2). For instance, it has been shown that BBX4, BBX11, BBX20, BBX21, BBX22 and BBX23 promote photomorphogenesis, whereas BBX18, BBX19, BBX24, BBX25, BBX28, BBX29 and BBX30-32 suppress photomorphogenesis (Datta et al., 2008; Chang et al., 2011; Holtan et al., 2011; Yan et al., 2011; Fan et al., 2012; Gangappa, Crocco, et al., 2013; Gangappa, Holm, et al., 2013; Gangappa & Botto, 2014; Wei et al., 2016; Xu et al., 2016; Zhang et al., 2017; Job et al., 2018; Lin et al., 2018 Xu et al., 2018; Heng et al., 2019; Wang et al., 2019; Song et al., 2020; Singh & Datta, 2022). This is supported by studies on mutants lacking BBX proteins resulting in various light-dependent phenotypes reflected in hypocotyl shortening or elongation. For instance, mutant seedlings lacking BBX24, BBX25, or BBX32 exhibit short hypocotyls in response to red, far-red, and blue light, indicating that these proteins suppress photomorphogenesis regardless of the photoreceptor type involved (Gangappa & Botto, 2014). Conversely, overexpression of BBX18 and BBX19 leads to longer hypocotyls compared to wild-type plants under continuous red and far-red light, which is not the case in seedlings devoid of BBX18 and BBX19, suggesting that these proteins may have redundant functions during de-etiolation (Indorf et al., 2007). BBX21 has been found to enhance the functions of both BBX20 and BBX22 while suppressing the function of BBX32. BBX32, on the other hand, physically interacts with BBX21 and diminishes HY5-mediated transcriptional activity (Tripathi et al., 2017). Intriguingly, both BBX21 and BBX22 directly interact with HY5, boosting its activity. Moreover, the epistatic interaction observed between BBX24 and BBX25 indicates that they enhance each other's function but can also independently regulate seedling photomorphogenesis. BBX24 and BBX25 act as transcriptional corepressors of HY5, forming inactive heterodimers with it and consequently reducing its transcriptional activity on target genes like CHI and CHS, which are involved in

anthocyanin biosynthesis (Gangappa, Crocco, et al., 2013; Gangappa, Holm, et al., 2013; Job et al., 2018; Yadukrishnan et al., 2018).

Light receptor cells are instrumental in perceiving and transmitting light signals to key light regulatory proteins, including HY5, HYH, COP1, and PHYTOCHROME INTERACTING FACTORS (PIFs), which collectively orchestrate the regulation of skoto- and photomorphogenesis (Vaishak et al., 2019). At the core of the light-dependent signal transduction network governing this transition from skoto- to photomorphogenesis lies the E3 ubiquitin ligase COP1. COP1 acts as a central integrator of signals from photoreceptors and orchestrates the activity of various downstream components like HY5 (Podolec & Ulm, 2018; Han et al., 2020), GLK1 and GLK2 (Waters et al., 2009). In general, HY5 and HYH function as positive regulators of photomorphogenesis, while COP1 and PIFs act as negative regulators in this intricate process (Osterlund et al, 2000; Jiao et al., 2007; Kami et al., 2010). Under light conditions, HY5 and HYH operate effectively, but in darkness, the COP1/SUPPRESSOR OF phyA-105 (SPA) complex orchestrates their targeted degradation, concomitant with the cytosolic partitioning of COP1 in light and its nuclear relocation in darkness (Osterlund et al, 2000). PIFs (PIF1, PIF3-8) accumulate predominantly in the dark and undergo light-induced degradation in a phytochrome-dependent manner (Jiao et al., 2007; Kami et al., 2010), exerting either inhibitory or activating effects on the expression of light-induced or light-repressed genes, respectively (Leivar et al., 2009; Zhang et al., 2013). The quadruple mutant *pifq*, lacking PIF1, PIF3, PIF4, and PIF5, exhibits a partially constitutively photomorphogenic phenotype in the dark, suggesting that PIFs promote skotomorphogenesis (Leivar et al., 2008; Shin et al., 2009). Upon exposure to light, active phytochromes induce the inactivation and degradation of PIFs via the 26S proteasome-mediated pathway. This process enables seedlings to initiate lightregulated gene expression and embark on a photomorphogenic developmental program (Leivar et al., 2008, 2009). The functional association of BBX proteins with PIFs in seedling photomorphogenesis is an emerging area of study. For instance, BBX23, regulated by PIF3, participates in the repression of hook unfolding during the dark-to-light transition. PIF1 and PIF3 directly regulate the transcription of BBX23 and HY5 by binding to their promoters (Zhang et al., 2017). BBX19, a negative regulator, facilitates the derepression of PIF4 and PIF5 by recruiting ELF3 to COP1 for degradation, revealing the complex interplay between BBX proteins and PIFs in seedling photomorphogenesis (Xu et al., 2013).

The HY5-COP1 regulatory module is pivotal for the regulation of BBX proteins in photomorphogenesis (Xu, 2020). Almost all BBX genes possess light-regulated *cis*-elements on their promoters, crucial for their light-responsive expression, which directly respond to

photoreceptors, especially phytochromes. Additionally, G-box and its variants, binding sites for HY5 and PIFs, are commonly found on BBX promoters (Lee et al., 2007; Yilmaz et al., 2011). This collective regulation forms a central hub integrating complex signaling networks of light and hormonal pathways, finely tuning early developmental events like seedling photomorphogenesis through modulation of downstream factors (Gray, 2004; de Wit et al., 2016). BBX proteins, like BBX21 and BBX22, interact with HY5, influencing its transcriptional and post-transcriptional regulation and promoting photomorphogenesis. BBX23, acting redundantly with BBX22, cooperates with HY5 to positively regulate photomorphogenesis (Figure 2). Conversely, negative regulators such as BBX24, BBX25, and BBX32 rely on HY5 for their function. BBX24 hinders HY5 from binding to its target promoters, while BBX25 inhibits the transcriptional regulation of BBX22 by HY5. BBX28, another negative regulator, interacts with HY5 and impedes its binding on downstream targets, akin to BBX24's mechanism. The intricate relationship between COP1 and BBX proteins, further highlights the involvement of the HY5-COP1 module in BBX regulation (Holm et al., 2001; Holtan et al., 2011; Jiang et al., 2012; Gangappa, Crocco, et al., 2013; Job et al., 2018, Lin et al., 2018).



Figure 2. BBX transcription factors on the interface between light perception and photomorphogenesis (adapted after Gangappa & Brotto, 2014).

BBX proteins play crucial roles in seedling photomorphogenesis by integrating light signals perceived by phytochrome (PHYs) and cryptochrome (CRYs) photoreceptors through the COP1 and HY5 signaling pathway. Specifically, BBX4 is involved in integrating red light signals, while BBX20 integrates both red and blue light signals. The remaining BBX proteins integrate signals from red, far-red, and blue light. BBX4, BBX20, BBX21, and BBX22 promote photomorphogenesis by inhibiting COP1 function. BBX4 and BBX20 interact directly with COP1, whereas BBX21 and BBX22 colocalize with COP1. Additionally, BBX21 and BBX22 directly interact with HY5, enhancing its functions, which leads to the inhibition of hypocotyl growth and increased pigment accumulation. Concurrently, HY5 enhances the functions of BBX21 and BBX22. Moreover, BBX21 enhances the functions of both BBX20 and BBX22 to further inhibit hypocotyl growth. In contrast, BBX18, BBX19, BBX24, BBX25, and BBX32 act as inhibitors of seedling photomorphogenesis. BBX24 and BBX25 directly interact with HY5 and COP1, thereby suppressing HY5 function and enhancing COP1 action. Through a negative feedback mechanism, COP1 degrades both BBX24 and BBX25. On the other hand, BBX32 directly interacts with BBX21, forming inactive heterodimers and reducing HY5 transcriptional activity, thus exhibiting antagonistic functions with HY5.

The intersection of BBX proteins with hormonal pathways further complicates the regulatory network governing seedling photomorphogenesis. Hormonal signaling pathways involving BBX proteins are not well understood, with limited evidence supporting their roles in brassinosteroid (BR) and gibberellin (GA) signaling. Members like BBX18 and BBX24 are known to be involved in GA signaling, influencing hypocotyl length, while BBX20 integrates

signals from both BR and light pathways, connecting them with photomorphogenesis. Additionally, BBX21 modulates ABA signaling and gibberellin catabolism, highlighting the intricate crosstalk between hormonal pathways and BBX-mediated photomorphogenic responses (Chen et al., 2008; Sun et al., 2010; Wang et al., 2011; Fan et al., 2012). On the other hand, BBX18 promotes hypocotyl growth by influencing bioactive GA levels, suggesting a role in GA signaling pathways (Chang et al., 2008). Furthermore, BBX proteins play a role in various hormonal signaling pathways, with interactions implicated in responses to abiotic and biotic stresses. Differential expression of several BBX genes (e.g. *BBX14, BBX28* and *BBX29*), among other members of group III and IV, are induced by ABA, cADPR, and low temperatures, as they are predicted to contain putative ARABIDOPSIS RESPONSE REGULATOR 10 (ARR10) binding sites on their promoters, indicating their potential involvement in stress signaling (Sanchez et al., 2004; Cutler et al., 2010).

1.3. Abiotic stress regulation

Abiotic stresses, such as extreme temperatures, salinity, and limited water availability, are environmental conditions that can significantly impede plant growth and productivity. These stresses can alter plant morphology and physiology, inhibiting cell division and affecting crucial processes like photosynthesis (Foyer et al., 2016).

Plants have developed rapid response mechanisms to adverse conditions, which involve interconnected molecular networks governed by signal cascades (Fowler et al., 2002). Stress response components include signal perception, transduction, and expression of stressresponsive genes (Hrmova & Lopato, 2014). When stress signals are perceived, plant cells activate receptors or sensors, triggering rapid responses that transmit external signals to intracellular counterparts. Upon exposure to stress, major signal cascades, such as MAPK and CDPK pathways are activated, leading to the upregulation or downregulation of specific genes (Erpen et al., 2018). The response of plants to abiotic stress involves complex physiological and biochemical changes, often associated with modified gene expression patterns (Nuruzzaman et al., 2013). Stress initiation activates initial sensors, which activate cytoplasmic Ca2⁺ and protein signaling pathways, resulting in altered gene expression and physiological adjustments. Abiotic stresses cause significant changes in gene expression and protein turnover, highlighting the importance of transcriptional and post-transcriptional regulation in adapting cellular functions to environmental changes (Pfannschmidt et al., 1999; Leister et al., 2017). Photosynthesis, as a fundamental process, is particularly vulnerable to abiotic stress at various stages, affecting factors such as CO₂ diffusion, PSII efficiency, electron transport, and enzyme activities (Saibo et al., 2009).

As abiotic stresses can affect photosynthesis in both the short and long term, gene expression regulation becomes crucial. Transcription factors are important in stress acclimation as they regulate the expression of stress-responsive genes, influencing essential aspects of plant function such as environmental responses, hormone signaling, and developmental processes (Foyer et al., 2016; Hoang et al., 2017; Inukai et al., 2017). They are modulated by stress signals such as ABA, redox state, and ATP/NADPH content, and play a crucial role in coordinating adaptive responses to abiotic stress (Suzuki et al., 2013). Distinct regulons, such as the CBF/DREB, NAC/ZF-HD, AREB/ABF, and MYC/MYB regulons, are identified in the context of photosynthesis-related responses to stress (Erpen et al., 2018). Under abiotic stress, the MYB TF family, traditionally associated with single MYB repeats, is involved in regulating photosynthesis-related genes (Dubos et al., 201). Additionally, MYB-related TFs, such as

CCA1, GLK1, and GLK2 (Fitter et al., 2002), have been implicated in the stress-induced regulation of photosynthesis-related genes (Baillo et al., 2019).

Other transcription factors, such as HY5, which is known for its involvement in light-mediated CAB gene expression, may also play a role in the response to abiotic stress. HY5, which is a bZIP-type TF, regulates several genes related to photosynthesis, indicating a possible function in stress conditions (Chattopadhyay et al., 1998; Wang et al., 2011; Sornaraj et al., 2016). While there is no direct evidence of HY5's involvement in regulating photosynthesis-related genes under abiotic stress, its upregulation in response to extreme temperatures suggests a possible connection (Li et al., 2021). Additionally, the transcriptional regulation of plastid-encoded photosynthesis genes by environmental stimuli adds complexity to the issue. A comprehensive understanding of chloroplast-encoded gene regulation under abiotic stress is necessary due to the intricate control exerted by nuclear-encoded transcription regulators, such as AtSig5 and AtSig6 (Leister et al., 2017). Moreover, functional studies have shown that NAC genes are induced by various abiotic stresses, resulting in improved drought tolerance when overexpressed. WRKY transcription factors are involved in various processes and control gene expression through positive and negative regulation (Bakshi et al., 2014). Regulatory small RNAs play a crucial role in biotic stress responses by modulating the expression of TFs, guiding the proper progression of biological events. However, the responses of TFs to stress conditions are complex, as a single transcription factor gene may regulate multiple downstream genes, be regulated by different TFs, or respond to various stresses (Baillo et al., 2019).

1.3.1. BBX proteins in the context of abiotic stress

Evidence for the role of BBX proteins in abiotic stress acclimation and signaling pathways is scarce. BBX proteins are involved in abiotic stress responses, such as low temperature, high salinity, drought, heat, and HL. Although abiotic stress tolerance is a polygenic trait, single genes encoding crucial transcriptional regulators can improve plant adaptation to various stresses by regulating gene networks. The significance of BBX proteins in stress tolerance has been revealed by manipulating their genes in transgenic economically essential plants to obtain desirable agronomic characteristics and stress resistance (Shahzad et al., 2021). Some studies propose that BBX proteins, known for their roles in growth and development, also participate in signaling pathways activated by both abiotic and biotic stresses. Many BBX genes show changes in transcript levels under different stress conditions, indicating their involvement in stress responses (Huang et al., 2019). On a broad scale, overexpressing certain BBX genes has been shown to enhance stress tolerance in different plant species, including Arabidopsis,

apples, and rice, improving their resilience to salt and drought stresses, as well as cold tolerance. Their role in stress response is often mediated through their interaction with phytohormones and participation in hormonal signaling pathways that are crucial for the plant's acclimation and adaptation to abiotic stresses.

For instance, it has been revealed that in Arabidopsis BBX18 plays a role in thermotolerance. In experiments, lines with reduced BBX18 expression exhibited enhanced thermotolerance, while overexpression of BBX18 led to reduced thermotolerance. Furthermore, BBX18 was found to negatively regulate the expression of heat-responsive genes like DGD1, Hsp70, Hsp101, and APX2, consequently impacting germination and seedling survival after heat treatment (Wang et al., 2013). Another BBX protein, BBX24, has been implicated in salt stress signaling. BBX24 was discovered to confer increased salt tolerance in yeast. Further studies revealed that BBX24 complements the salt-sensitive phenotype of yeast mutants deficient in calcineurin and enhances salt tolerance in wild-type yeast (Lippuner et al., 1996). Overexpression of BBX24 in Arabidopsis also resulted in enhanced salt tolerance compared to wild-type plants, as evidenced by increased root length in transgenic plants exposed to salt stress (Gangappa, Holm et al., 2013). Interestingly, BBX24 does not appear to be directly inducible by salt, suggesting its effects may be mediated through indirect mechanisms (Indorf et al., 2007; Yan et al., 2011). Genome-wide expression analyses indicate potential involvement of BBX proteins in various stress signaling responses. For instance, studies have shown differential expression of BBX genes in response to ABA, cyclic ADP-ribose, and low temperatures. While previous research suggests a role for cADPR in early ABA signaling, direct involvement of BBXs in abiotic stress signaling pathways requires further investigation (Sanchez et al., 2004; Chen et al., 2008).

In the context of HL stress, genes such as *BBX14*, *BBX15*, *BBX16*, and *BBX17* are mentioned as being downregulated in response to HL stress in Arabidopsis. These genes, which were consistently repressed at all time points during the HL stress and are part of clade III in the BBX phylogenetic tree may have a role in the HL response through light signaling pathways (Huang et al., 2019). The downregulation of these BBX genes under HL conditions suggests that they might function in modulating the plant stress response mechanisms, potentially by influencing light-dependent pathways that affect gene expression during HL intensity exposure.

2. Scientific aims of the thesis

The overall aim of this thesis was to provide further insights into the regulatory mechanisms underlying the light-regulated plant development in the context of retrograde signaling. In particular, the molecular role of the Arabidopsis BBX transcription factor, BBX14, in the crosstalk between light and RS during photomorphogenesis was genetically investigated und critically discussed in a comprehensive manner. Furthermore, the study aimed to understand the molecular function of BBX14 in Arabidopsis, particularly focusing on its involvement in the acclimation to HL conditions and its role in seedling establishment. Moreover, the research further aimed to assess the impact of BBX14 on chlorophyll accumulation during early light exposure and to analyze transcriptome changes to identify BBX14 targets and its potential regulatory role in photomorphogenesis.

BBX14, a clade III member of the BBX transcription factor family, was selected for study due to its association with GLK1 and GLK2 in a core module essential for the nuclear retrograde response to changes in organellar gene expression (Leister & Kleine, 2016). This module, identified through database analyses, revealed gene expression alterations similar to those induced by RS-triggering treatments like LIN, NF, or HL in mutants with defective PGE. Additionally, *BBX14* was among the top upregulated genes in transcriptional regulation following GLK1 and GLK2 overexpression, indicating a regulatory link between BBX14 and GLKs (Waters et al., 2009).

Taking all this into account, it was reasoned that BBX14 represents a solid basis for further characterization due to its limited knowledge as important player in seedling development but also as emerging candidate in plastid-to-nucleus signaling.

3. Materials and Methods

3.1. Materials

3.1.1. Chemicals and enzymes

All chemicals utilized in this work were obtained from Invitrogen, Roche Diagnostics, Roth, Sigma-Aldrich, AppliChem, Serva, Merck, Biozym, and GE Healthcare with a purity grade for analysis (p.A.). The enzymes employed in this work were acquired from New England Biolabs and Invitrogen. The work included the use of the following kits: FastGene Gel/PCR Extraction Kit (Nippon Genetics), Direct-zolTM RNA MiniPrep Kit (Zymo Research in Irvine, USA), iScriptTM cDNA synthesis kit (Bio-Rad, Munich, Germany) and plasmid DNA extraction kit EasyPure Plasmid MiniPrep Kit (Transgene Biotech, Beijing, China).

3.1.2. Oligonucleotides

All oligonucleotides utilized in this study were synthesized by Metabion (Planegg, Germany) in DST quality (desalt). BioScience Grade water (Roth) was used to prepare a 100 μ M stock and a 10 μ M working solution which were stored at -20°C. See Table S4. in supplemental information for a list of the oligonucleotides used in this research.

Name	Description	Features	Origin/Reference	Use
pAUL1	C-terminal in- frame fusion of protein to HA- tag	3x HA-tag, nosT, Basta ^r , 2x p35S CaMV, <i>ccdB</i> , <i>att</i> R1, <i>att</i> R2, Cm ^r , Kan ^r	Lyska et al., 2013	Overexpression of tag-fused protein
pB7FWG2	C-terminal in- frame fusion of protein to GFP- tag	eGFP-tag, nosT, Basta ^r , p35S CaMV, <i>ccd</i> B, <i>att</i> R1, <i>att</i> R2, Cm ^r , Sp ^r	Karimi et al., 2002	Overexpression of tag-fused protein + subcellular localization
pDONR207	Generation of entry clones for GATEWAY cloning	rrnB T2, rrnB T1, <i>att</i> P1, <i>ccd</i> B, <i>att</i> P2, Kan ^r	Invitrogen	Gateway cloning
pHEE401E	Egg cell- specific promoter- controlled expression of 3x FLAG-NLS- zCas9-NLS	3x FLAG-tag, nosT, Cas9, 2x U6-26p U6 promoter, Sm ^r , Hyg ^r , Kan ^r	Addgene #71286; Wang et al., 2015	CRISPR

3.1.3. Vectors

3.1.4. Antibodies

Name	Use	Dilution	Origin
anti-GFP	primary	1:5000	A6455; Life
			Technologies
anti-HA	primary	1:1000	G1546; Sigma-
			Aldrich
anti-BBX14	primary	1:500	BioGenes
anti-mouse	secondary	1:5000	Agrisera
anti-rabbit	secondary	1:10 000	Agrisera

3.1.5. Bacterial strains

Organism	Strain	Features	Origin
<i>E.coli</i> DH5-alpha H		F-80dlacZ M15	Woodstock et al.,
		(lacZYA-argF)	1989
		U169 recA1	
		endA1hsdR17(rk-,	
		mk+) phoAsupE44 -	
		thi-1 gyrA96 relA1	
A. tumefaciens	GV3101	Gent ^r , Rif ^r , pMP90	Koncz und Schell
, , , , , , , , , , , , , , , , , , ,		(pTiC58∆T-DNA)	(1986)

3.1.6. Solutions and media

Purified water of aqua bidest quality (ddH₂O was used to prepare all media, buffers, and solutions via the Milli-Q Plus Water System (Millipore, Bradford, USA). Unless otherwise specified, this is referred to as ddH₂O. Sterilization was accomplished through autoclaving for 20 min at 121°C and 2×10^5 Pa or by employing sterile filters with exclusion limits of 0.22 or 0.45 µm.

Solutions		
50x TAE	2 mM	Tris-acetate
	100 mM	EDTA pH 8.0
TBS-(T)	10 mM	Tris pH 8.0
	150 mM	NaCl
	(0,1 %	Tween-20)
1x Running buffer	25 mM	Tris base pH 8.3
2	190 mM	glycine
	0,1 %	SDS
Semi-dry transfer buffer	10 %	1x Running buffer
5	20 %	Methanol
De-staining solution	10 % (v/v)	Methanol
<u> </u>	10 % (v/v)	Acetic acid

Coomassie staining solution	40 % (v/v) 10 % (v/v) 0,1 % (w/v)	Ethanol Acetic acid Coomassie Brilliant Blue R- 250
2x Laemli buffer	120 mM 4% SDS 20% glycerol 2.5% 0.01%	Tris pH 6.8 SDS glycerol ß-mercaptoethanol bromophenol blue
DNA extraction buffer	200 mM 25 mM 20 mM 0,5 % (w/v)	Tris base pH 7.5 NaCl EDTA pH 8.0 SDS
Media		
LB (<i>E.coli</i> and Agrobacteria)	10 g 5 g 5 g to 1 1 with	tryptone NaCl yeast extract H ₂ O
LB (liquid) (<i>E.coli</i> and Agrobacteria)	10 g 5 g 5 g 15 g to 1 l with	tryptone NaCl yeast extract agar H ₂ O
0.5x MS pH 5.8 (Arabidopsis thaliana)	2,2 g 8 g (10 g to 1 l with	Murashige & Skoog medium + vitamins agar sucrose) H ₂ O

The following antibiotics were used to select bacteria: Ampicillin (Amp¹⁰⁰), Kanamycin (Kan⁵⁰) Spectinomycin (Spec¹⁰⁰) Gentamycin (Gent³⁰), Rifampicin (Rif¹⁰⁰)

3.1.7. Plant material

All the Arabidopsis lines used in this work were in the Col-0 background unless stated otherwise.

3.1.8. T-DNA lines

Mutant lines *bbx14-1* (SAIL_1221_D02; N878600) and *pifq* (N2107737) were obtained from the North American Arabidopsis Stock Center (https://arabidopsis.info) and Arabidopsis Biological Resource Center (https://abrc.osu.edu/), respectively. Oligonucleotides confirming

the T-DNA insertion in *bbx14-1* line are listed in Table S4. Previous studies have described the *gun1-102* mutant (Tadini et al., 2016), *gun4-2* mutant (Peter and Grimm, 2009), *gun5-1* mutant (Mochizuki et al., 2001), and *glk1* mutant (Waters et al., 2009).

3.1.9. CRISPR lines

The pHEE401-E vector, which provides an egg-cell-specific promoter, was used to generate the CRISPR-Cas lines bbx14-2 and bbx14-3 (Wang et al., 2015). The specific guide RNA (gRNA) was designed utilizing the web tool CHOPCHOP (https://chopchop.cbu.uib.no/#). The annealed oligos were inserted into the pHEE401-E vector via a one-step cut and ligate reaction, as detailed by Wang et al. (2015; 2022). Col-0 plants were transformed with the construct via floral dipping using Agrobacterium tumefaciens GV3101 (Clough and Bent, 1998). Positive transformants were selected in the T1 generation on plates supplemented with 50 µg mL–1 hygromycin and 1% (w/v) sucrose in 0.5x MS medium. To identify homozygous bbx14 mutants, the BBX14 gene was sequenced in the surviving plants with the help of oligonucleotides mentioned in Table S4.

3.1.10. Other transgenic lines

The inducible overexpression line TPT14 (N2101635), TPT15-1 (N2101503) and TPT15-2 (N2101504) expressing the BBX14 transcription factor under the control of a beta-estradiol inducible promote (Coego et al., 2014) was obtained from the Arabidopsis Biological Resource Center (<u>https://abrc.osu.edu/stocks/38</u>). The lines were verified to be homozygous for the transgene and contain a hygromycin resistance marker, used to select positive plants in the first generation.

3.2. Methods

3.2.1. Plant growth conditions

Arabidopsis thaliana plants were cultivated on potting soil (Stender, Schermbeck, Germany) under controlled conditions in a growth-chamber with at approx. 100 µmol photons m⁻² sec⁻¹ with 16h/8h light/dark cycles.

For *in vitro* cultivation Arabidopsis seeds were surface-sterilized in a 10 % bleach solution containing 0.01% Triton-X-100 for 10 min under vigorous shaking. Afterward seeds were plated on sucrose-free agar plates (Sigma-Aldrich/Merck, Darmstadt, Germany) containing 0.5x MS medium (except for experiments performed on plates containing 1 % sucrose) under sterile conditions followed by stratification in dark for 3 days at 4°C before growth at 22°C
under 100 µmol photons m⁻² sec⁻¹ provided by white fluorescent lamps. For experiments involving dark treatment, seeds were exposed to 2 h of white light (100 µmol photons m⁻² sec⁻¹) following stratification, before allowing to germinate in the dark. For experiments that involved lincomycin (LIN) or norflurazon (NF) treatment, the medium was supplemented with 0.5 mM lincomycin (Sigma-Aldrich) or 5 µM norflurazon (Sigma-Aldrich). Consistent temperature (22°C/20°C during the 16h/8h day/night cycle) and relative humidity (60%) were meticulously maintained under all conditions. For high-light experiments, plants were initially grown for one week in an LED chamber at 80 µmol photons m⁻² s⁻¹ (16-h light/8-h dark cycle) before increasing the irradiance to 1000 µmol photons m⁻² s⁻¹ under precisely controlled temperature conditions.

In experiments conducted using inducible overexpression lines, overexpression was induced by supplementing 0.5x MS medium with 2.5 μ M β -estradiol or by spraying 4-days-old seedlings with a solution containing 20 μ M β -estradiol (Sigma-Aldrich), 0.01 % Silwet L-77 and 0.2% DMSO. For the experiments illustrated in Figure X, the induction was carried out right after three days of dark treatment. This was then followed by two hours of dark incubation and subsequent growth for at least 16 hours under 100 μ mol photons m⁻² sec⁻¹ continuous white light.

3.2.2. Plant phenotypical measurements and data analysis

For hypocotyl and root measurements at least 50 seedlings were recorded using Image J software (<u>http://imagej.en.softonic.com/</u>) and the mean of the 15 longest was calculated unless stated otherwise in the figure description. Experiments were performed twice with consistent results.

Statistically significant differences in relative mRNA expression levels were assessed by applying one-way ANOVA with Tukey's post-hoc HSD test (https://astatsa.com; version August 2021). The significance of differences in chlorophyll accumulation, hypocotyl lengths, F_v/F_m and Y(II) was tested by two-way ANOVA, followed by Tukey's multiple comparison test (as indicated in the Figure legends) using GraphPad Prism version 9.4.1 for Windows (GraphPad Software, <u>www.graphpad.com</u>). All comparisons were made exclusively to the corresponding wild-type (Col-0) sample within the same condition. Only statistically significant differences are presented, as specified in the legends for each figure.

3.2.3. Molecular methods

Standard molecular techniques, as well as media and buffer preparation, were conducted following the protocols described in Sambrook & Russell (2001). Enzymes and kits were utilized in accordance with the manufacturer's instructions, unless stated otherwise.

3.2.3.1. Nucleic acid extraction

Plant tissue was ground into a fine powder using a MM300 Retsch mill (Haan, Germany) for the isolation of genomic DNA (gDNA). To achieve this, freshly harvested plant tissue was shock-frozen in a 2 ml reaction tube containing two steel balls (\emptyset 5 mm) submerged in liquid nitrogen and grinded for 3 min at 30 Hz/sec. Subsequently, the ground leaf tissue was homogenized with 1 ml of DNA extraction buffer. Following centrifugation, DNA was precipitated from the supernatant with the addition of 700 µl of isopropyl alcohol. After washing the DNA pellet with 1 mL of 70% (v/v) ethanol, it was dissolved in distilled water and stored at 4°C.

To isolate RNA, frozen plant tissue was ground in liquid nitrogen, as described previously, for 30 seconds at 30 Hz/sec. Total RNA from plants was then extracted using Trizol (Invitrogen, Carlsbad, CA) and purified through Direct-zol[™] RNA MiniPrep Plus columns (Zymo Research, Irvine, CA) according to the manufacturer's instructions. RNA quality, concentration, and the A260/A280 ratio were evaluated using agarose gel electrophoresis and spectrophotometry, respectively. Subsequently, RNA was isolated and stored at -80°C prior to use.

3.2.3.2. Plasmid DNA isolation

Plasmid DNA was extracted from E. coli cells using plasmid DNA extraction kit EasyPure Plasmid MiniPrep Kit (Transgene Biotech, Beijing, China) from 5 ml overnight liquid cultures that underwent antibiotic selection. The resulting plasmid DNA was then stored at -20°C.

3.2.3.3. Plasmid construction and transformation

To generate stable overexpression lines of BBX14 in the Col-0 background, the coding region of the AT1G68520 gene was amplified from wild-type cDNA using VeriFi™ polymerase from PCR Biosystems (London, UK) with specific oligonucleotides listed in Table S4. Consecutively the attB-flanked PCR product was then cloned into an entry vector and finally into both the pB7FWG2 and pAUL1 expression vectors using the GATEWAY technology (Invitrogen, Netherlands) in accordance with the manufacturer's protocol. The fusions

generated with the enhanced eGFP- and HA-tag, respectively, were expressed under the control of the Cauliflower Mosaic Virus 35S promoter and transformed into Agrobacterium cells. Both constructs were introduced into Col-0 plants through floral dipping (Clough and Bent, 1998). Restriction analysis and sequencing verified all cloned DNA fragments post plasmid isolation.

3.2.3.4. Standard polymerase chain reaction (PCR)

To amplify specific DNA sections, a standard PCR was conducted utilizing either homemade Taq polymerase or VeriFi [™] polymerase. Plasmid DNA, cDNA, or gDNA was used as template. The reaction sets were formulated as follows:

Taq polymerase reaction	VeriFi polymerase reaction
Template DNA (0.2 µg – 100 ng)	Template DNA ($0.2 \ \mu g - 100 \ ng$)
Taq reaction buffer (10x)	VeriFi reaction buffer (5x)
Fw-Primer (100 nM)	Fw-Primer (100 nM)
Rev-Primer (100 nM)	Rev-Primer (100 nM)
dNTPs (10 mM per dNTP)	VeriFi polymerase (2 U/µl)
Taq polymerase (0.5 U/µl)	add H_2O to 50 μl
add H_2O to 10-50 µl	

Reactions were performed in a Dyad Thermocycler (Bio-Rad, Munich, Germany) using the program outlined below with 20-35 cycles ranging from step 2 to 4:

1.Initial denaturation	95°C	5 min	1.Initial denaturation	95°C	1 min
2.Denaturation	95°C	30 sec	2.Denaturation	95°C	15 sec
3.Primer annealing	55-60°C	30 sec	3.Primer annealing	60-75°C	15 sec
4.Elongation	72°C	1 min/kb	4.Elongation	72°C	30 sec/kb
5.Final Elongation	72°C	5 min	6.Hold	16°C	∞
6.Hold	16°C	∞			

The annealing temperature was set to 1-4°C below the oligonucleotide's melting temperature, typically between 55°C and 60°C. Elongation time was determined by the size of the DNA

fragment being amplified and set to 1 minute per kilobase (for Taq polymerase) or 30 seconds per kilobase (for VeriFi polymerase). PCR conditions were optimized by varying the annealing temperature, template concentration, and number of cycles used.

PCR reactions were mixed with 0.5 µl of 6x loading dye and separated on a 1% agarose gel supplemented with Midori-Green DNA dye (Nippon Genetics) for 20-30 minutes at 120 V. A FastGene 1 kb plus DNA ladder (Nippon Genetics) served as the size marker.

3.2.3.5 Sequencing

DNA sequencing was performed by the LMU Sequencing Service Unit in Munich, Germany, utilizing the "Cycle, Clean & Run (BigDye v3.1)" protocol. Each reaction consisted of 3.8 µl purified DNA template and 3.2 µl of either the forward or reverse primer.

3.2.4. Gene expression analysis

3.2.4.1 cDNA synthesis and quantitative real-time PCR

First-strand cDNA synthesis was conducted with the iScript[™] cDNA synthesis kit (Bio-Rad, Munich, Germany), following the manufacturer's instructions. For reverse transcription, 250 ng total RNA was used as standard, unless otherwise specified. After reverse transcription, the cDNA was diluted at a 1:20 ratio using DNase-/RNase-free water. 2 µl of the diluted cDNA was utilized for quantitative real-time PCR analysis on the CFX Connect Real-Time System. The assay was conducted using Universal SYBR Green Supermix (Bio-Rad, Munich, Germany). The experimental protocol was previously described by Wang et al. (2022), and oligonucleotides are listed in Table S4. Whenever possible, oligonucleotides were designed to flank intron sites as to avoid amplification of gDNA. Gene expression data represents values from three independent biological replicates, each with three technical replicates per measurement. The graphs show the mean expression of the biological replicates, with SEM denoted by error bars. Data evaluation was performed using Bio-Rad's CFX Maestro® software. Gene expression was normalized to the AT4G36800 gene that encodes an RUB1-conjugating enzyme (RCE1).

3.2.4.2. RNA-seq analysis

Total RNA from plants was extracted utilizing Trizol (Invitrogen, Carlsbad, USA) and subsequently purified using Direct-zolTM RNA MiniPrep Plus columns (Zymo Research, Irvine, USA) following the manufacturer's protocol. The quality and integrity of RNA were analyzed using the Agilent 2100 Bioanalyzer (Agilent, Santa Clara, CA). RNA-Seq libraries were generated and sequenced in paired-end mode with 150-bp reads using standard Illumina protocols on either an Illumina HiSeq 2500 (Illumina, San Diego, USA) or Novaseq6000 system by Novogene Biotech (Beijing, China) or Biomarker Technologies GmbH (Münster, Germany), respectively. Every genotype consisted of either three independent biological replicates for Col-0 and *bbx14* seedlings or two independent biological replicates for Col-0, *gun1*, and TPT14 seedlings grown on NF. RNA-Seq reads were analyzed using the Galaxy platform (Afgan et al., 2016) as essentially described before (Xu et al., 2013). In the TPT14 NF experiment, differentially expressed genes were identified using a 2-fold cut-off without adjusting for p-values due to poor read quality in one TPT14 NF replicate. This study aimed to obtain an initial understanding of potential BBX14 targets in RS and was not replicated.

3.2.5. Measurements of physiological and biochemical parameters

3.2.5.1. Chlorophyll and protochlorophyllide content determination

For chlorophyll extraction, approximately 100 mg of leaf tissue from three-week-old plants was ground in liquid nitrogen with 1 ml of ice-cold 80% (v/v) acetone. After removing cell debris by centrifugation chlorophyll absorption was measured spectrophotometrically. Pigment concentrations were calculated following Lichtenthaler's method (1987) and normalized to fresh weight.

To determine protochlorophyllide content in etiolated seedlings, the procedure described by Terry and Kacprzak (2019) was followed. In brief, approximately 100 mg of 4-day-old etiolated seedlings were harvested and stored in liquid nitrogen in under safe green light. The resulting material was homogenized in 400 μ l of ice-cold alkaline acetone solution (acetone: 0.1 M NH₄OH; 9:1; (v/v)). Following removal of cell debris by centrifugation for 5 min at full speed and repeated extraction, supernatants were combined, and Pchlide absorption was measured spectrophotometrically after excitation at 440 nm. Pigment concentrations were calculated as relative fluorescence on a per milligram fresh weight basis. All steps were carrier at 4°C, and samples were covered with foil to protect them from light.

3.2.5.2. Chlorophyll fluorescence analysis

In vivo chlorophyll *a* fluorescence of Arabidopsis seedlings was measured using an ImagingPAM chlorophyll fluorometer (Walz GmbH, Effeltrich, Germany) as described previously (Garcia-Molina et al., 2020). In essence, plants were adapted to darkness for at least 30 min before exposure to a to pulsed saturating light flash (8000 µmol photons m⁻² sec⁻¹) to obtain the maximum PS II quantum yield value ($F_v/F_m = (F_m - F_0)/F_m$). F₀ was measured at a low frequency of pulse-modulated measuring light (4 Hz, intensity 3), while Fm was quantified following saturation pulses of approximately 2700 µmol photons m⁻² s⁻¹ for 0.8 s. The calculations and plotting of the parameters were performed using the ImagingWinGigE software.

3.2.5.3. SDS polyacrylamide gel electrophoresis and immunoblot analysis

The plant tissue was rapidly frozen in liquid nitrogen and ground into a fine powder in a 1.5 mL reaction tube. The ground tissue was mixed with an equal volume of 2x Laemmli sample buffer and incubated for 10 min at 95°C, followed by centrifugation for 5 min. The protein concentration of the resulting supernatant was assessed using the BioRad Protein Assay Dye Reagent Concentrate (BioRad, Munich) according to the Bradford method (1976).

Total proteins were separated based on their molecular weight using 10% (w/v) SDSpolyacrylamide gels in a Mini-PROTEAN Tetra Cell system (BioRad, Munich). Electrophoresis was carried out using 1x Running buffer at 30-50 mM per gel (constant 80 V). Subsequently, a semi-dry western transfer protocol was used to transfer the proteins from the polyacrylamide gel onto a polymeric, protein-binding membrane, allowing for further applications such as immunodetection. To accomplish this, a polyvinylidene fluoride (PVDF) membrane (Millipore in Billerica, Massachusetts) of the same dimensions as the SDS gel was treated with methanol for 30 sec. The SDS gel was subsequently equilibrated in 1x TBS for 5 min. A bubble-free sandwich comprising of three filter paper layers, the membrane, the SDS gel, and another three filter paper layers was constructed on the lower electrode of the Bio-Rad Trans-Blot Turbo electroblot (Munich, Germany), and the device was sealed by placing the second electrode on top. The semi-dry transfer buffer pre-soaked all parts of the sandwich. A constant current of 30 mA per gel (approximately 2 mA/cm²) was used for transfer. The electrophoresis duration relied on the size of the proteins intended for blotting and ranged from 30 to 50 minutes. Subsequently, the membrane underwent staining for 10 minutes with Coomassie staining solution and was destained with Coomassie destaining solution to certify protein transfer onto the membrane and elucidate the background. The membrane with the blotted proteins was used immediately for immunodetection.

After western transfer, the membrane was incubated for one hour in a blocking solution consisting of 5% skimmed milk powder in 1x TBS at room temperature while gently shaking. Following this, the membrane was moved to a 2.5 % skimmed milk blocking solution that contained an appropriate concentration of primary antibody (see 3.1.4) and shaken for at least 60 minutes at room temperature or overnight at 4°C. The membrane was washed three times for five minutes in 1x TBST-T before being incubated with the HRP-conjugated secondary antibody in a 2.5 % skimmed milk blocking solution for two hours (see 3.1.4). Following this, the membrane was washed three times again for five minutes with 1x TBST-T. Visualizing the signals was accomplished by using the enhanced chemiluminescence PierceTM ECL Western-Blotting substrate reagent (ThermoFisher Scientific, Waltham, MA, USA) and an ECL reader system (Fusion FX7, PeqLab). Signals were quantified via ImageJ software (http://rsbweb.nih.gov/ij).

4. Results

4.1. BBX14 is involved in chlorophyll biosynthesis during early stages of light exposure

Seedling development hinges on successful chloroplast biogenesis, which facilitates the transition from heterotrophic to autotrophic growth. Since most seeds germinate underground, seedling development typically commences in darkness, following a skotomorphogenic program known as etiolation. Conversely, light triggers seedling de-etiolation, marked by morphological changes like cotyledon expansion, hypocotyl growth inhibition and greening (Pipitone et al., 2021). On a molecular level, the de-etiolation process is initiated via the PHY-PIF-GLK1 signaling cascade in the nucleus, whereby light exposure via phytochromes triggers the degradation of PIFs, which relieves the repression of GLK1 expression (Martin et al., 2016). GLK1 then regulates the expression of photosynthetic genes as well as potentially other downstream target genes involved in various aspects of seedling development and chlorophyll accumulation (Waters et al., 2009; Martin et al., 2016). Alongside with this, BBX proteins are well-established factors which play various roles in facilitating seedling development (see 1.2.2). To determine the involvement of BBX14, a member of clade III of the BBX TF family, in seedling development, mutant lines lacking BBX14 were utilized. Specifically, the mutant *bbx14-1* (SAIL 1221 D02) was identified from the SIGnAL database (Alonso et al., 2003) (Figure 3 A, B). It was observed that *bbx14-1* expresses *BBX14* transcripts at levels equivalent to 10% of Col-0 levels (Figure 3 C). As *bbx14-1* was the only available T-DNA mutant line, two additional CRISPR/Cas9-mediated lines, bbx14-2, and bbx14-3, were generated. In bbx14-2, a premature stop codon was introduced after nucleotide (nt) 924 relative to the start codon due to an insertion, whereas in the *bbx14-3* mutant, a Trp residue was replaced by a Gly residue due to a T-to-G change at nt 925. In bbx14-2, BBX14 transcript levels were reduced to 10%, and in *bbx14-3*, transcript levels were reduced to 25% compared to Col-0 (Figure 3 C).





(A) Schematic representation of the Arabidopsis BBX14 coding sequence (AT1G68520). Exons (black boxes), introns (black lines) and the 5' and 3' UTRs (grey boxes) are shown. Locations and orientation of T-DNA insertion (bbx14-1) is indicated, as deduced from LB + RP PCR products shown in (B), which were subsequently sequenced. Note that the insertions are not drawn to scale. Furthermore, the locations of the primers used in the RT-qPCR analysis of BBX14 expression shown (C) are indicated as thick black lines. The LP primer is an exonexon primer spanning intron 1 of BBX14, which avoids amplification of genomic DNA. Also indicated is the target sequence of the gRNA used to generate CRSPR-Cas mutant lines. The position of the nucleotide insertion in the bbx14-2 mutant line (red arrow), as well as the nucleotide substitution T/G in bbx14-3 (blue) are shown.

(B) Confirmation and identification of homozygous T-DNA insertions in the different *bbx14* T-DNA line. The gene-specific left and right border primers (LP and RP) were used for amplification of sequences around the T-DNA insertion, and the RP was used together with the T-DNA left border primer (SAIL-LB) for verification of the T-DNA insertion.

(C) RT-qPCR of *BBX14* expression in 7-day-old wild-type Col-0 and *bbx14* mutant seedlings grown under at 16h light/8-h dark, 100 μ mol photons m⁻² s⁻¹. The results were normalized to AT4G36800, encoding a RUB1conjugating enzyme (RCE1). Expression values are reported relative to the corresponding transcript levels in Col-0 which were set to 1. Mean values \pm SE were derived from two independent experiments (n=2), each performed with three technical replicates per sample. Statistically significant differences (Tukey's test; **P < 0.01, *P < 0.05) between Col-0 and mutant samples are indicated by an asterisk.

The role of BBX14 in seedling development was assessed by examining chlorophyll contents in bbx14 mutant seedlings grown for 3 days in darkness and then transferred into continuous white light for 2, 4, and 8 hours. The seedlings were grown in the absence of exogenous sucrose before exposed to constant white light as to avoid effects of exogenous sucrose on seedling development and variations due to circadian rhythm. GUN4 is known to stimulate chlorophyll biosynthesis (Peter & Grimm, 2009) making the gun4-2 mutant, which lacks the activator of the GUN5 subunit of the Mg-chelatase required for chlorophyll biosynthesis a suitable control. As depicted in Figure 4 A, the gun4-2 line exhibited reduced chlorophyll levels compared to Col-0 throughout all three time points. In angiosperms, chlorophyll synthesis stops in the absence of light but resumes immediately upon exposure to light (von Wettstein et al., 1995). Chlorophyll levels in the whole seedlings of the tested genotypes increased during the first 4 hours of illumination and continued to increase linearly as the seedlings grew under subsequent illumination for up to 8 hours. Conversely, chlorophyll accumulation in *bbx14* mutant seedlings was significantly reduced when transferred to light for 2 and 4 hours only but remained higher than those of the gun4-2 mutant throughout the time course experiment. Interestingly, after 8 hours of light chlorophyll levels of the bbx14 mutants rose back to wild-type levels, thus indicating that BBX14 participates in chlorophyll accumulation during the early onset of light.





(A) Determination of total chlorophyll (Chl a + b) content of seedlings grown in darkness for three days and then transferred to at 100 µmol m⁻² s⁻¹ white light for the indicated time. Chlorophyll was acetone-extracted and measured spectrophotometrically, and concentrations were determined as described (see 3.2.5.1). Data are shown as mean values ± SD from 3 different plant pools. Each pool contained more than 100 seedlings. Statistically significant differences between the wild-type and each mutant line at each time point are highlighted by letters above the plots (t-test; a, no significant difference; b, P < 0.05).

(B) Phenotypical representation of wild-type (Col-0) and mutant (*bbx14-1*, *bbx14-2*, and *gun4-2*) seedling grown as in (A). Scale bar corresponds to 0,5 cm for all images.

(C) Measurement of protochlorophyllide (Pchlide) by fluorescence spectroscopy in 4-old-old dark-grown wildtype (Col-0) seedlings and mutant lines *bbx14-1*, *bbx14-2*, *pifq*, *glk1glk2* and *bbx14-1×glk1glk2*. Fluorescence spectra were recorded following excitation at 440 nm. The relative fluorescence (RFU) at the 636 nm peak was used as proxy for the quantification of the Pchlide amount and normalized to fresh weight. Data represents mean values of three independent biological replicates \pm SD. Statistically significant differences between the wild-type and each mutant line at each time point are highlighted by letters above the plots (t-test; a, no significant difference; b, *P* < 0.05).

Cotyledon expansion and greening are hallmarks for chloroplast biogenesis and initiation of photosynthesis. The delayed chlorophyll accumulation observed in the *bbx14* mutants in the initial 2-4 hours of illumination suggested that photomorphogenesis was impeded when BBX14 is absent (**Figure 4 A**). Indeed, when comparing the same genotypes on a phenotypical level, it was observed that within the first 2 hours of light exposure *bbx14* mutants retained tightly closed cotyledon compared to both WT seedlings and the *gun4-2* line. This phenotype was later abolished by further exposure to light for 2 hours resulting in completely open cotyledons like Col-0 (**Figure 4 B**). This finding, together with the reduced chlorophyll amounts in the *bbx14* mutants, supports the notion that a lack of BBX14 leads to retarded initiation of photomorphogenesis.

Chlorophyll is indispensable for plants due to its essential role in light harvesting and energy transduction in photosynthesis. The Chl biosynthesis pathway in higher plants is complex and is mediated by more than 17 enzymes (Tripathy & Pattanayak, 2012). Plants carrying mutants in this pathway, such as *gun4* and *gun5*, are easily distinguishable by pale green appearance when grown under normal light conditions. This also holds true for the *glk1glk2* double mutant, in which genes required for light-harvesting and chlorophyll biosynthesis are notably downregulated (Waters et al., 2009). While a pale green phenotype was not observed in *bbx14* mutants under normal light conditions, it is not known if BBX14 plays role in chlorophyll in absence of light. Although etiolated seedlings do not synthesize chlorophyll, they prepare for eventual light exposure by accumulating large quantities of Pchlide in developmentally arrested plastids called etioplasts. In higher plants, the strictly light-dependent reduction of Pchlide to chlorophyll biosynthesis pathway. The Arabidopsis genome encodes three structurally related but differentially regulated and expressed *POR* genes, *PORA*, *PORB* and *PORC* with *PORA* being expressed primarily early on during etiolation (Paddock et al., 2010).

To establish whether chlorophyll biosynthesis is perturbed in bbx14 mutants, levels of Pchlide in dark-grown seedling were measured by fluorescence spectroscopy and compared to mutant of higher order namely *pifq*, *glk1glk2* and *bbx14-1×glk1glk2*. The relative fluorescence at 663 nm was used as proxy to determine relative Pchlide levels. As depicted in **Figure 4 C**, levels of Pchlide were slightly elevated in the *bbx14* mutant in comparison to the WT as well as to mutants lacking GLK1 and GLK2. In contrast, the *pifq* mutant, which exhibits a constantly photomorphogenic phenotype even in absence of light, displayed abnormal amount of Pchlide fluorescence. The double *glk1glk2* mutant showed the lowest fluorescence peak, approximately 25 % less than Col-0. Interestingly, in the triple mutant *bbx14-1×glk1glk2* the Pchlide levels increased back close to WT levels, indicating that absence of BBX14 can rescue the compromised flux through the chlorophyll pathway in the *glk1glk2* mutant. Moreover, this suggests that BBX14 exerts a certain degree of influence on Pchlide biosynthesis in the dark and due to its role in promoting photomorphogenesis could represent an additional regulatory node during de-etiolation, that is already initiated in the dark.

Recently, another BBX protein also part of clade III, BBX16, was reported to be involved in the positive regulation of seedling development downstream of the above mentioned PHY-PIF-GLK1 module as direct target of GLK1 (Veciana et al., 2022). Additionally, the finding that all four BBX proteins belonging to clade III (BBX14-BBX17), are significantly enriched (pvalue: 2.46 e-05) upon overexpression of GLKs among all 119 genes identified by Waters et al. (2009), implies that BBX14 too could be a direct target of GLK1. To shine light on this notion, a chromatin immunoprecipitation experiment followed by sequencing (ChIP-seq) on 14-day-old seedlings of a plant line expressing GLK1 from its endogenous promoter in the Col-0 background was carried out (cooperation with HU, Berlin). The ChIP-seq analysis confirmed GLK1 binding to the BBX16 promoter (Veciana et al., 2022) and identified a GLK1-bound genomic region upstream of the BBX14 transcription start site (TSS). Within this region, four GLK1 binding sites were identified (Figure S1 A), all matching the CCAATC consensus found in co-expressed photosynthesis-related genes (Kobayashi et al., 2012). Notably, one motif located 70 bp upstream of the TSS closely resembled a GLK1-binding motif identified by protein-binding microarrays (GATTCTGATTGG; Franco-Zorrilla et al., 2014), suggesting strong potential for GLK1 binding. This finding indicated that BBX14 was indeed a direct target of GLK1, with additional BBX genes detected among the top 10 most enriched potential targets (Figure S1 B). Furthermore, TIME FOR COFFEE (TIC), a component of the circadian clock, emerged as a top target, suggesting coordinated control of target gene activities. Analysis

revealed enrichment of motifs resembling various TF binding motifs, including bZIP, LOB, C2H2, and GATA (Figure S1 C), in GLK1-bound genomic regions, indicating a complex regulatory network involving GLK1. This is further supported by the fact that other TFs such as PIF4, HY5, and PSEUDO-RESPONSE REGULATOR5 (PRR5), involved in light/circadian and cytokinin signaling pathways bind to the BBX14 core promoter in combination with GLK1 (Fu et al., 2022). In addition to that, the GLK1 binding site was submitted to enrichment analysis using the Shiny GO gene set enrichment tool (Ge et al., 2020). A total of 761 and 1365 genes located within 1 kb and 3kb of the GLK1 binding site were analyzed, respectively When classified according to Gene Ontology (GO) terms relating to biological process, cellular compartment, and molecular function, terms related to photosynthesis and light-harvesting appeared to be the most highly represented and significantly enriched terms (Figure S1 D). The biological processes that are most enriched, namely photosynthesis, light harvesting, and chlorophyll biosynthesis, suggested that the genes targeted by GLK1 are involved in the expression of nuclear genes related to both LHCB and chlorophyll biosynthesis. This is in accordance with the previous finding suggesting BBX14 to play a role in chlorophyll accumulation during the early stages of light exposure (Figure 4 A).

4.2. BBX14 participates in the regulation of genes associated with the circadian clock

During the transition from etiolation to de-etiolation, there is a significant demand for protein synthesis to assemble the abundant photosynthetic complexes within thylakoid membranes. This process, known as the photomorphogenic program, is intricately regulated at multiple levels (Wu, 2014). Transcriptome analyses have demonstrated that upon exposure to light, a substantial portion of Arabidopsis genes undergo differential expression, with approximately three-fifths being upregulated and two-fifths being downregulated (Ma et al., 2001). Emerging from darkness requires a delicate balance, where repressive mechanisms at both the transcriptional and post-transcriptional levels play a crucial role (Hernandez-Verdeja et al., 2022). De-etiolation in Arabidopsis is closely linked to the circadian rhythm, with the circadian clock regulating the timing and extent of light-induced responses during this transition. The clock controls the expression of key genes involved in photomorphogenesis, chloroplast development, and photosynthesis to synchronize these processes with the diurnal cycle. Additionally, the circadian clock influences the sensitivity of plants to light signals, ensuring a coordinated and optimized response to environmental changes (Kato et al., 2007).

To better understand the molecular function of BBX14 during the transition from dark to light, transcriptome analysis was carried out, focusing on targets affected in both light-independent and light-dependent conditions, as well as those common to both. For this purpose, RNAs obtained from 3-day-old etiolated WT and bbx14-1 seedlings, as well as from 3-day-old etiolated seedlings exposed to 16 hours of light followed by 8 hours of darkness, were subjected to RNA sequencing (RNA-Seq). In dark-grown bbx14-1 seedlings, the analysis revealed alterations in only a handful of protein-coding transcripts. Specifically, four transcripts were reduced (ACTIN-RELATED PROTEIN 9 [ARP9], ARABIDOPSIS RESPONSE REGULATOR 7 [ARR7], MEMBRANE-ANCHORED UBIQUITIN-FOLD PROTEIN 5 PRECURSOR [MUB5], and AT5G26270), while two were elevated (QUA-QUINE STARCH [QQS] and AT3G29633) compared to the WT control, all showing fold changes greater than two-fold with a statistical significance of p < 0.05 (Figure 5 A, B; Table S2). In contrast to this, *bbx14-1* seedlings exposed to 16 hours of light followed by 8 hours of darkness, 147 protein-coding transcripts showed significant changes compared to WT (>2-fold, p < 0.5; Figure 5 A, B; Table S3), with 63 being reduced and 84 elevated. Most notably, transcript levels of clade II members BBX7 and BBX8 were reduced, alongside lower levels of PHOTOPERIODIC CONTROL OF *HYPOCOTYL* 1 levels of **XYLOGLUCAN** (PCH1) and higher ENDOTRANSGLUCOSYLASE/HYDROLASE 9 (XTH9) and XTH16 transcripts, encoding proteins implicated in cell wall rearrangement. Gene ontology (GO) analysis (DAVID; Sherman et al., 2022) revealed a remarkable 180-fold enrichment of the "rhythmic process" category and almost 50-fold of the "circadian rhythm" among genes with reduced transcript levels (Figure 5 C), including genes encoding PSEUDO-RESPONSE REGULATOR5 (PRR5), and the CCT motif-containing response regulator protein TIMING OF CAB EXPRESSION 1 (TOC1), suggestive of potential involvement of BBX14 in circadian regulation, similarly to BBX19 as demonstrated before (Yuan et al., 2021). Moreover, the binding of circadian clock-associated TFs to the BBX14 promoter implies feedback regulatory mechanisms, despite BBX14 not being strongly rhythmically active according to the Arabidopsis eFP Browser (Figure S8; Winter et al., 2007) in comparison to other BBX proteins, such as BBX1 and BBX32 (Talar & Kielbowicz-Matuk, 2021). What's more, the anticipated target transcripts of GLKs associated with photosynthetic proteins or chlorophyll biosynthesis (Waters et al., 2009) were not identified in the GO analysis.





(A, B) Analysis of transcriptome changes in bbx14 mutant seedlings. Venn diagrams depicting the degree of overlap between the sets of genes whose expression levels were reduced (A) or elevated (B) by at least two-fold in bbx14-1 seedlings that had been exposed to LD (16 h light, 8 h dark) conditions or were grown in darkness compared with the respective WT (Col-0) control.

(C) GO analysis of genes whose expression is down-regulated in light-shifted *bbx14-1* seedlings. GO annotations for the biological process category were extracted from DAVID.

(**D**) Yeast two-hybrid system to screen for potential interacting partners of BBX14 among known circadian clock proteins. AD, activating domain; BD, binding domain; -LW, synthetic dropout medium without leucine and tryptophan; -LWH, selective medium without leucine, tryptophan, histidine, supplemented with X-alpha-Gal for visualization of interaction and \pm 3-AT to avoid background noise from growth at histidine-lacking media. An internal control PP7L with MAIL1 was used as positive control. The empty pGBKT7 plasmid (pDEST-BD) was utilized as a negative control. A representative picture from two independent repetitions with similar results is shown.

(E) RT-qPCR PRR579 time-series mRNA expression patterns in bbx14 vs Col-0. Levels of *PRR5*, *PRR7* and *PRR9* mRNAs in seedlings grown for three days under standard growth conditions at 100 μ mol m⁻² s⁻¹ and harvested at the indicated time points. White or gray bars represent subjective day or subjective night, respectively. The results were normalized to *RCE1*. Expression values are reported relative to the corresponding transcript levels in Col-0, which were set to 1. Data are shown as mean values ± SEM from three independent biological replicates, each with three technical replicates.

The participation of BBX proteins as transcriptional regulators in fine-tuning of the circadian clock has been reported on scarcely, with few examples including BBX18 and BBX19, which interact with PRR9, PRR7, and PRR5 in the nucleus from early morning onward to regulate circadian periodicity (Yuan et al., 2021). To test whether BBX14 could also be involved in circadian regulation, a yest-two-hybrid system was utilized to screen for potential interaction partners of BBX14 (**Figure 5 D**). The results demonstrated that BBX14 strongly interacted with PIF4, but not with any PRR member (PRR5, 7, 9) or PIF1-3 tested here. PIFs are known to be involved a wide range of processes, including light signaling, circadian regulation, hormonal signaling, developmental and (a)biotic responses, due to their high diversification (Paik et al., 2017). In the context of BBX proteins, it has been previously shown that PIFs can regulate expression of *BBX* genes (Zhang et al., 2017; Buelbuel et al., 2023), but no reports for interaction on protein levels have emerged.

Strikingly, in addition to complexing with PIF4, BBX14 also interacts with GLK2, whereas it exhibited no interaction with GLK1. This also held true for BBX15, BBX14's closest homolog within clade III (74 % protein homology; Khanna et al., 2009; **Figure S7**), which also displayed strong interaction with GLK2 and none with GLK1. Moreover, interactions were also confirmed to some extend by the prediction aligned error (PAE) plots generated via AlphaFold2, whereby BBX14 was predicted to be an interaction partner of GLK2, not of GLK1, but also surprisingly of PRR5, PPR7 and PRR9, which was not confirmed in the yest-two-hybrid analysis (**Figure S2**).

Although no interaction was observable for BBX14 and the PRRs, the influence of BBX14 on transcript accumulation of PRR5, PRR7 and PRR9 was compared in WT and the *bbx14-1* mutant over a full long-day of normal light condition (**Figure 5 E**). The results showed that absence of BBX14 caused expression of both *PRR5* and *PRR7* to peak 6 hours after onset of light and then to sharply decrease during the day reaching WT levels before night evening, whereas expression in the WT remained steady with almost no fluctuations. On the other hand, expression of *PRR9* in the *bbx14-1* mutant was completely misregulated throughout the whole time period of the measurement, exhibiting opposing expression pattern compared to the WT.

In Arabidopsis, PRRs are essential components of circadian clock that play pivotal roles in coordinating many daily cycling physiological processes by timing the expression of numerous down-stream TFs (Nakamichi et al., 2010). As part of a tightly modulated network with comprising of multiple interconnected regulators, often absence or misregulation of one can cause drastic changes in the expression of other, it is therefore feasible that based on the results here BBX14 is required for the endogenous circadian rhythm by modulating the expression of clock components such as PRRs.

4.3. The elongated hypocotyl of the *bbx14* mutant depends on a retrograde signal

Based on the finding that *BBX14* represents a target of GLK1, their correlation was examined further. Gene expression analysis revealed that mRNA levels of *BBX14* in light-grown *glk1* seedlings (**Figure 6 A**) are dependent on GLK1, which is corroborative with a previous finding by Veciana et al., (2022), suggesting that BBX14 might share function with BBX15 and BBX16. Additionally, *glk1* seedlings were observed to develop longer hypocotyls in the light. Strikingly, hypocotyl lengths of *bbx14* and *glk1* mutants were similarly elongated (**Figure 6 B**, **C**).

During the early developmental stages of germinating seedlings, chloroplast biogenesis is intricately regulated by environmental cues, with "biogenic control" facilitating signaling from chloroplasts to the nucleus (see 1.1). This process involves a module comprising GLK1 and GUN1 (Leister & Kleine, 2016; Martin et al., 2016). Under conditions of very low white light (1 µmol m⁻² sec⁻¹), the presence of LIN partially inhibits de-etiolation in WT seedlings, leading to longer hypocotyls (Martin et al., 2016). Since the elongated hypocotyl of the bbx14 seedlings was observed under 100 μ mol m⁻² sec⁻¹, which is routinely used to screen for *gun* phenotypes, it was further used to compare hypocotyl growth between WT, bbx14 and glk1 line in the presence of LIN. When subjected to these conditions, *bbx14* seedlings exhibited extended hypocotyls, akin to gun phenotype, suggesting a defect in the regulatory pathway. However, hypocotyl lengths in WT seedlings were further reduced in the presence of LIN (Figure 6 C), implying that the etiolation phenotype induced by LIN primarily manifests under extremely low light levels. Concordantly to this, when 2-day-old etiolated seedlings were exposed to white light at levels of 25 µmol m⁻² sec⁻¹, comparable hypocotyl lengths were observed regardless of the presence of LIN by Martin et al., (2016), indicating that LIN's effect on hypocotyl length is contingent upon light intensity. Notably, the extended hypocotyl phenotype

of bbx14 and glk1 seedlings was mitigated when grown on LIN, aligning their hypocotyl lengths with those of the WT (**Figure 6 C**). Moreover, this effect could not be attributed to energy deficiency, as addition of sugar did not alleviate the effects of LIN and did not affect hypocotyl lengths in a significant way (**Figure 6 D**), thus suggesting a dependence on a retrograde signal rather than energy availability. The observed effects of LIN-induced retrograde signal on hypocotyl growth in bbx14 and glk1 mutant was also observable when growing seedling in absence of light (**Figure 6 E**) implying that the regulation of hypocotyl growth occurs via a pathway independent of light. It is also noteworthy that hypocotyl growth in mutants deficient of GLK1 rather mimicked the partial constitutively photomorphogenic dark-grown phenotype the *pifq* mutant with significantly shorter hypocotyls than the WT. This is in stark contrast to the bbx14 which exhibits significantly elongated hypocotyls in etiolated condition, although not as strong as in presence of light (**Figure 6 C**).

Previous research has demonstrated the antagonistic regulation between RS and phytochrome pathways on the PIF-repressed transcriptional network, with PIF4 and GLK1 binding to the core promoter of *BBX14*. To address this, dark-grown Col-0 and *pifq* seedlings, which lack PIF1, -3, -4, -5, were grown in the presence and absence of LIN and *BBX14* expression was analyzed. In etiolated *pifq* seedlings, mRNA levels of BBX14 were de-repressed compared to WT seedlings, indicating a regulatory role for PIFs in *BBX14* expression, which was abrogated by lincomycin treatment (**Figure 6 F**). Taken together, these results suggested that *BBX14* is a PIF-repressed gene during seedling establishment in the dark and is induced by light in a GLK1-mediated manner.





(B) Phenotypes of Col-0 and mutant (bbx14-1, bbx14-2, and glk1) seedlings grown for 6 days under standard growth conditions without lincomycin (-LIN) supplementation. Scale bar = 0.5 cm.

(C) Quantification of hypocotyl lengths of Col-0 and mutant (bbx14-1, bbx14-2, bbx14-3, glk1 and gun1-102) seedlings grown for 6 days under standard growth conditions on MS medium without (-LIN), or with inhibitor supplementation (+LIN). The center line of boxplots indicates the median, the box defines the interquartile range, and the whiskers indicate minimum and maximum values from three independent experiments, each containing at least 50 seedlings. Statistically significant differences between the wild-type and each mutant line under every condition are highlighted by letters above the plots (two-way ANOVA; a, no significant difference; b, P < 0.0002). (D) Quantification of hypocotyl lengths of seedlings grown under the same conditions as in (C), but with addition of sucrose (1%) to the growth medium.

(E) Quantification of hypocotyl lengths of dark-grown Col-0 and mutant (bbx14-1, bbx14-2, bbx14-3, glk1, gun1-102, and pifq) seedlings grown for 3 days under standard growth conditions on MS medium without (-LIN), or with inhibitor supplementation (+LIN). Data are shown as mean values \pm SD of the 15 longest seedlings from three independent experiments. Statistically significant differences between the wild-type and each mutant line under every condition are highlighted by letters above the plots (t-test; a, no significant difference; b, P < 0.05). (F) RT-qPCR of *BBX14* mRNA levels in 3-day-old dark-grown Col-0 and *pifq* seedlings in the absence (-LIN) or presence of lincomycin (+LIN). RT-qPCR was performed and evaluated as described in (A). Expression values are reported relative to the corresponding transcript levels in Col-0 grown without LIN, which were set to 1.

4.4. Repression of *BBX14* expression during biogenic signaling depends on GUN1

BBX14 was identified as part of the OGE core module encompassing other TFs involved in stress and signaling responses that showed differential expression under NF and LIN treatment (Kleine & Leister, 2016). To confirm whether this also applies for other members of the BBX TF family or it's a unique feature of BBX14, data regarding 25 members of the BBX protein family in Arabidopsis was extracted from Genevestigator (https://genevestigator.com) and analyzed. The results indicated that among the BBX members evaluated on the Affymetrix ATH1 chip, mRNA levels of BBX3, BBX14, BBX16, and BBX27 were reduced in seedlings treated with NF, while under LIN conditions, only BBX14 and BBX16 mRNAs showed partial repression (Figure 7 A). Complementing these findings, re-analysis of previously published RNA-Seq data (Habermann et al., 2020; Richter et al., 2020; Xu et al., 2020) confirmed reduced transcript levels of BBX14 and BBX16 under NF and LIN treatments, as indicated by their Transcripts Per Kilobase Million (TPM) values (Figure 7 B) and when compared to two controls – LIGHT HARVESTING CHLOROPHYLL A/B-BINDING PROTEIN 1.2 (LHCB1.2) and BBX8. LHCB1.2 expression is known to decrease under NF or LIN treatment, and BBX8, representing other BBX members was shown to be unaffected by NF or LIN, behaved as expected, further validating the Genevestigator results (Figure 7 A). Additionally, the data revealed that the decrease in BBX14 and BBX16 mRNA levels under NF conditions is mitigated in gun1 and gun5 mutants. Since BBX16 has recently been connected to GUN1-mediated RS (Veciana et al., 2022) and similarly affected as BBX14 by NF and LIN treatments based on previously analysis (Figure 7 B) it was further tested if this could also be the case for BBX14. The gun1 mutant is unique as it exhibits de-repression of *PhANGs* (e.g. *LHCB1.2*, *1.4* and *2.2*) under LIN conditions. Therefore, to investigate whether LIN-mediated repression of BBX14 is reliant on GUN1, the expression of BBX14 mRNA was assessed in 4-day-old Col-0 and gun1-102 seedlings grown on medium with or without LIN. Under LIN treatment, BBX14 levels decreased to 17% in Col-0 compared to control conditions (Figure 7 C), and this reduction was GUN1-dependent, as BBX14 expression almost fully recovered in gun1-102 seedlings treated with LIN. Combined with ChIP-Seq data (Figure S1) and the nuclear localization of BBX14 (Figure 7 D), these findings suggest that BBX14 may serve as a mediator for GUN1/GLK1-dependent retrograde signals in the nucleus. GUN1-mediated retrograde signaling regulates a multitude of crucial TFs linked to many processes and consequently their down-stream targets (Hernandez-Verdeja et al., 2022). In order to elucidate weather this regulation occurs not only on mRNA levels, but also post-transcriptionally, the steady state expression levels of BBX14 in two gun mutants - gun1-102 and oeGLK1 were compared to the *bbx14* and WT in 7-days-old seedlings in the presence and absence of LIN (Figure 7 E). The results revealed that BBX14 accumulation in mutants with lacking GUN1 or overexpression GLK1 is independent of retrograde signaling as addition of LIN to the media did not significantly alter BBX14 protein synthesis, suggesting that the GUN1-mediatited response to RS (i.e. LIN treatment) does not contribute to the protein accumulation but rather negatively impacts the BBX14 gene expression.





(A) The reduction of *BBX14* mRNA levels during biogenic signaling depends on GUN1. Global profiling of *BBX* mRNA levels in response to perturbations were determined with Genevestigator, and studies involving lincomycin

58

(LIN) and norflurazon (NF) treatments are shown. Note that seven out of the 32 *BBX* genes were not assessed due to their absence from the Affymetrix ATH1 genome array.

(B) TPM (Transcripts Per Kilobase Million) values of re-analyzed RNA-Seq data published by (Habermann et al., 2020), (Richter et al., 2020) and (Xu et al., 2020).

(C) RT-qPCR of *BBX14* mRNA levels in Col-0 and *gun1* seedlings grown for 4 days in continuous light (100 μ mol photons m⁻² s⁻¹) in the absence (MS) or presence of lincomycin (+LIN). Expression values are reported relative to the corresponding transcript levels in Col-0 grown on MS, which were set to 1. Mean values ± SEM were derived from three independent experiments, each with three technical replicates. Statistically significant differences (Tukey's test; ***P* < 0.01) between wild-type and mutant are indicated.

(**D**) BBX14 is localized to the nucleus. Fluorescence microscopy of tobacco protoplasts transiently expressing BBX14 fused to eGFP. The eGFP fluorescence (green) and chloroplast autofluorescence (red) are shown together in the overlay picture. BBX14-GFP fusion protein was observed in freshly prepared protoplast two days after Agrobacteria-mediated transfection using a fluorescence microscope Scale bar = $10 \mu m$.

(E) Steady state expression levels of BBX14 in *gun* mutants (*gun1-102* and oeGLK1) compared to *bbx14* mutant lines and wild-type (Col-0). Aliquots of total proteins were isolated from 7-days-old whole seedlings grown on $\frac{1}{2}$ MS medium in absence (-LIN) or presence or 220 mM lincomycin (+LIN) at 100 µmol photons m⁻² s⁻¹ continuous white light. Proteins were fractionated on polyacrylamide gels (10 %) under reducing conditions and subjected to immunoblotting using monoclonal antibody raised against BBX14. PVDF membranes were stained with Coomassie brilliant blue (CBB) to visualize protein loadings after western blot transfer. Band intensity was quantified using ImageJ software.

4.5. Overexpression of BBX14 potentially affects seedling growth

To further evaluate the biological role of BBX14 in seedling establishment and retrograde signaling, mutant lines overexpressing BBX14 were generated and characterized. Based on previous knowledge it was posited that overexpression of BBX14 might induce a *gun* phenotype, or conversely, a deficiency in BBX14 could trigger a *LHCB1.2* hypersensitive phenotype, akin to oeGLK lines (Leister & Kleine, 2016; Martin et al., 2016). To generate plants overexpressing BBX14 (oeBBX14), Col-0 plants were transformed with a DNA fragment comprising the 35S Cauliflower Mosaic Virus promoter and the coding sequence of *BBX14*, fused upstream of either the enhanced green fluorescence protein (eGFP) or a hemagglutinin (HA) tag. Following selection for the resistance marker, 10 lines for each construct were identified, but fusion proteins were detected in only three of the oeBBX14-eGPF lines and two oeBBX14-HA lines (**Figure 8 A**). Only one of these lines exhibited elevated levels (2.2-fold) of the BBX14 transcript compared to Col-0 plants, while the others contained slightly less than the WT control (**Figure 8 B**). As such, the remaining seeds from Col-0 plants bearing the overexpression constructs underwent another round of selection, and all resistant seedlings were transferred to medium without herbicide. Through this process, the

selection process based on a paler and smaller phenotype compared to Col-0 seedlings (Figure 8 C). Western blot analysis suggested that the severity of the seedling phenotype might correlate with the degree of BBX14 overexpression (Figure 8 D). However, this phenotype was absent in the T2 generation (Figure 8 E) as well when seedlings were further grown for up to 3 weeks and longer (Figure S6). To elucidate this phenomenon, an inducible BBX14 line (designated TPT14; only one line available) from the TRANSPLANTA collection was utilized (Coego et al., 2014). After 4 days of induction with ß-estradiol, TPT14 seedlings exhibited clear perturbations (Figure 8 E) and shorter hypocotyls (Figure 8 F), much like lines overexpressing BBX16 (Veciana et al., 20220), whereas they displayed a WT-like hypocotyl length when not induced. As previously shown here, deficiency in BBX14 resulted in longer hypocotyls (Figure 5), thus, the hypocotyl phenotype appears to be linked to the degree of BBX14 overexpression. In the T2 generation, the oeBBX14-tag lines only exhibited a 2-fold increase in BBX14 transcript abundance compared to Col-0 plants, a level of BBX14 overexpression similar to that observed in previously published BBX14 overexpressors (Buelbuel et al., 2023). Conversely, BBX14 mRNA levels were elevated 5-fold in the induced TPT14 plants (Figure 8 G).



Figure 8. Overexpression of BBX14 may have detrimental effects on seedling phenotype

(A) Total leaf proteins were isolated from 2-week-old Col-0 and Col-0 plants transformed with constructs containing *BBX14-eGFP* or *BBX14-HA* fusions, which were placed under the control of the *35S* promoter. Aliquots were fractionated by 10% SDS-PAGE gels under reducing conditions and subjected to immunoblotting

using antibodies raised against the GFP- or HA-tag, respectively. PVDF membranes were stained with Coomassie brilliant blue (CBB) to control for protein loading. Representative blots from two experiments are presented. Relative sizes of the BBX14-GFP and BBX14-HA fusion proteins are indicated.

(B) RT-qPCR of *BBX14* mRNA expression in 7-day-old wild-type (Col-0), and in Col-0 plants "overexpressing" BBX14 (oeBBX14). RT-qPCR was performed as described in the legend to Figure 5 **(A)**.

(C) Phenotypes of 10-day-old wild-type (Col-0) seedlings, and Col-0 seedlings transformed with constructs containing the coding region of *BBX14* fused to either the GFP- (left panel) or the HA-tag (right panel), which were placed under the control of the 35S promoter. Seedlings labeled in red provided the protein extracts from T1 plants that were subjected to SDS-PAGE in panel (D). The T2 generation of seedlings marked in turquoise was utilized to create images and data in panels (E) and (F), respectively. Scale bar = 0.5 cm.

(**D**) Aliquots of total leaf proteins were isolated from plants as indicated in (**C**), fractionated on SDS-PAGE gels (10%) under reducing conditions, and subjected to immunoblotting using antibodies raised against the GFP- or HA-tag, respectively. PVDF membranes were stained with Coomassie brilliant blue (CBB) to show protein loading.

(E) Phenotypes of 4-day-old Col-0 seedlings and the inducible BBX14 (TPT14) overexpression line grown under standard conditions (16-h light/8-h dark and 100 μ mol photons m⁻² s⁻¹) in the absence (- β -estradiol) or presence of β -estradiol. Scale bars = 0.5 cm.

(F) Quantification of hypocotyl lengths of seedling grown as in (E). The center line of boxplots indicates the median, the box defines the interquartile range, and the whiskers indicate minimum and maximum values from three independent experiments, each containing at least 50 seedlings. Statistically significant differences between the wild-type and each mutant line under every condition are highlighted by letters above the plots (two-way ANOVA; a, no significant difference; b, P < 0.0002).

(G) RT-qPCR of *BBX14* mRNA expression in seedlings shown in panel (E). RT-qPCR was performed and evaluated as described in the legend to Figure 5 (A).

4.6. Role of BBX14 and BBX15 in GUN1-mediated retrograde signaling

Building on the notion that BBX14 is involved in *gun*-type singling via the GUN1/GLK1module, it was hypothesized that BBX14 could participate in the downregulation of *PhANGs* expression in response to retrograde signals. Therefore, the expression of known RS-regulated *PhANGs* (i.e. *LHCB1.2, LCHB1.4, LHCB.2.2* and *CA1* (Waters et al., 2009)) was examined. To this end, Col-0, *gun1-102* (as a control), the *bbx14* mutant, and the strongest "overexpression" seedlings obtained (oeBBX14-GFP#10; **Figure 8 B**) were cultured in the presence or absence of LIN for 4 days under continuous light (100 µmol m⁻² sec⁻¹). Following LIN treatment, *gun1-102* exhibited the expected upregulation of *LHCB1.2* mRNA compared to WT seedlings, while *LHCB1.2* levels remained unchanged in both *bbx14* mutants and the "oeBBX14" line (**Figure S3 A**). Additionally, the expression of *LHCB2.1* and *LHCB2.4* was unchanged in lines with altered BBX14 levels (**Figure S3 B**). However, slightly higher *CA1* expression levels were observed in the "oeBBX14" line in comparison to WT (**Figure S3 B**). Given that a 2.2-fold induction of BBX14 (Figure 5 B) might not be sufficient to induce a true gun phenotype, instead the gun phenotype in the TPT14 line was sought to be examined. To mitigate potential secondary effects (Figure 8 E), a different experimental approach to assess gun phenotypes was implemented. Seedlings were initially grown for 3 days in darkness in the absence or presence of inhibitors (NF or LIN), then treated with the inducer, returned to darkness for 2 hours, transferred to light for 16 hours (100 µmol m⁻² sec⁻¹), and subsequently harvested for quantitative real-time PCR (qRT-PCR). Intriguingly, BBX14 induction was higher in seedlings treated with NF compared to those treated with LIN or grown without inhibitors (Figure 9 A). In the absence of inhibitors, RBCS1A expression levels resembled those observed in Col-0 across all lines tested, whereas LHCB1.2 and CA1 levels were slightly elevated in the gunl control and the inducible TPT14 line (Figure 9 B). Furthermore, the eligibility of this approach in evaluating gun phenotypes was validated by the de-repression of the RS marker genes LHCB1.2, CARBONIC ANHYDRASE 1 (CA1), and RIBULOSE BISPHOSPHATE CARBOXYLASE SMALL CHAIN 1A (RBCS1A) in gun1 seedlings (Figure 9 **B**). In the TPT14 line, the accumulation of *LHCB1.2* mRNA exhibited considerable variability across experiments and was only upregulated 2-fold (Figure 9 B), as indicated by the expression ratio of LHCB1.2 between NF and MS samples. On the other hand, under NF treatment, the mRNA levels of CA1 and RBCS1A within the TPT14 line were closely resembled those observed in the gunl mutant, implying that BBX14 might be required for the derepression of genes outside of the *LHCB* cluster during biogenic signaling.



Figure 9. Overexpression of BBX14 or BBX15 does not result in clear gun phenotypes.

(A) Levels of *BBX14* mRNAs in seedlings grown for three days in the dark in the presence of NF, LIN, or no supplementation, sprayed with inducer, put back for 2 h in the dark, placed for 16 hours into light (100 μ mol m⁻² s⁻¹) and then harvested for qRT-PCR. The results were normalized to *RCE1*. Expression values are reported relative to the corresponding transcript levels in Col-0, which were set to 1. Mean values were derived from four

independent experiments, each with three technical replicates. Bars indicate standard deviations. Statistically significant differences (Tukey's test; P < 0.05) between Col-0 and mutant samples are indicated by an asterisk.

(**B**, **C**) Transcript levels of the retrograde marker genes *LHCB1.2*, *CA1*, and *RBCS1A* (**B**), and *PHOTOSYSTEM I* (*PSI*) *SUBUNIT H-1* (*PSAH-1*), and *PSII SUBUNIT P* (*PSBP*) and *-Tn* (*PSBTn*) (**C**) in seedlings treated as in (**A**). Statistics were done as described in (**A**). To account for expression differences in the different genotypes observed in the absence of NF, the ratio of the expression ratio in seedlings grown in the presence of inhibitor to that in seedlings grown in the absence of inhibitor was calculated (NF/MS). The results were normalized to *RCE1*. Mean values were derived from four independent experiments, each with three technical replicates. Bars indicate standard deviations.

(D) Snapshots of RNA-Seq data. The read depths were visualized with the Integrative Genomics Viewer (IGV). The red arrow points out *LHCB1.2* expression, which is not increased in TPT14.

(E) Snapshots demonstrating the accumulation of the photosynthesis genes PSAH-1 and PSAL.

(F, G) Transcript levels of *BBX15* and retrograde marker genes in Col-0, *gun1* and TPT15-1 and -2 seedlings treated as in (A) and grown on MS plates without inhibitor (F) or supplemented with NF (G). Statistics were done as described in (A).

To gain a comprehensive understanding of potential targets regulated by BBX14 during initial steps of retrograde signaling, RNAs extracted from Col-0, gun1, and TPT14 seedlings grown on NF, induced as described above, and subjected to RNA-Seq analysis. In the gun1 mutant, 901 genes exhibited mRNA levels reduced by more than 2-fold (no adjusted p-value; see 3.2.4.2.) relative to WT, while 1080 genes showed elevated expression, with transcripts encoding LHCB proteins among the most strongly up-regulated (Figure S4 A). The number of differentially regulated transcripts in TPT14 was comparatively lower, with 252 genes identified to have elevated expression in both gun1 and TPT14, whereas 148 exhibited downregulation in both lines (Figure S4 A). These included *RBCS1A* and *CA1*, validating qRT-PCR findings shown previously in Figure 9 A, B. Notably, GO analysis of these 252 up-regulated genes revealed "Photosynthesis" and "Cellular nitrogen compound biosynthesis" as significantly enriched categories (Figure S4 B). In order to solidify the findings from the RNA-Seq analysis (Figure S4) due to the lack of adjusted P-value cutoff, three of the identified targets involved in photosynthesis underwent further investigation through RT-qPCR. Under inhibitor-free conditions, mRNA accumulation of PHOTOSYSTEM I (PSI) SUBUNIT H-1 (PSAH-1), PSII SUBUNIT P (PSBP), and -Tn (PSBTn) remained comparable across the two genotypes. Upon NF treatment, however, mRNA levels of all examined transcripts were elevated in the gun1 mutant, with only PSBT showing a significant increase in the TPT14 line (Figure 9 C). It is noteworthy that *LHCB1.2* did not exhibit higher expression in TPT14 post-NF treatment. This finding is in accordance with the RNA-Seq data visualization whereby read depths were plotted over *LHCB1.2*, *CA1*, and *RBCS1A* genes (Figure 9 D). Furthermore, visualization of photosynthesis transcript accumulation, as identified by the enrichment analysis (Figure S4), yielded an inconclusive result (Figure 9 E).

Knowledge of the exact molecular function of clade III of AtBBX proteins BBX14-BBX17 is relatively limited. Previous research on BBX16 has provided fundamental data in this regard. In particular, the impact of BBX16 overexpression on gun signaling has been highlighted (Veciana et al., 2022). In addition to BBX16 and BBX14 being identified as direct target of GLK1 (Figure S1), the promoter of BBX15 was also among the identified targets of GLK1 (Table S1) and this finding is further reinforced by the high homology between BBX14 and BBX15 (Figure S7). Together, this prompted the evaluation of inducible BBX15 lines, TPT15-1 and -2. Successful induction of BBX15 expression in the TPT15 lines was observed (Figure 6 F), with no alterations in the mRNA levels of retrograde marker genes under control conditions (Figure 9 F). Upon NF treatment, both TPT15 lines exhibited elevated expression of CA1, while RBCS1A and LHCB1.2 levels remained comparable to those in the WT (Figure 9 G). These findings indicate that, similar to BBX16 (Veciana et al., 2022), both BBX14 and BBX15 do not directly regulate LCHB1.2 expression during RS. However, they appear to rather influence the expression of certain PhANGs, such as CA1 and RBCS1A (in the case of BBX14) or CA1 (in the case of BBX15). This divergence hints at potential branching in signaling pathways downstream of GLK1, whereby GLK1-mediated regulation of some PhANGs could be indirect through the transcriptional control of BBX14 and BXX15, and potentially other factors. This is further supported by the finding that while LCHB1.4 and LHCB.2.2 are identified as primary targets of GLK1, CA1 and RBCS1A do not meet the criteria to be classified within this group (Waters et al., 2009).

4.7. BBX14 is required for high light stress acclimation

The reduction in *BBX14* transcript levels under high light conditions has been consistently observed in various studies (Garcia-Molina et al., 2020; Huang et al., 2019; Kleine et al., 2007; Leister & Kleine, 2016). Moreover, *BBX* members, including *BBX14*, have been shown to exhibit significant changes in transcript levels during both short and long term (de)acclimation to HL and when shifted from normal growth light conditions to conditions with increased irradiance, thereby underscoring the role of BBX14 in light stress acclimation. This is further corroborated by data from the Genevestigator perturbations tool (https://genevestigator.com; **Figure 10 A**). Notably, among all the *BBX* members analyzed on the Affymetrix ATH1 chip,

this decrease in expression levels after HL treatment was particularly pronounced for BBX14. Furthermore, Huang et al. (2019) identified several BBX members as one of the most severely repressed under HL treatment and proposed BBX14 as one of the top three hub genes in an HL co-expression network, suggesting its pivotal role as a core regulator in the HL response. It is therefore reasonable to assume that overexpression of BBX14 could enhance plant tolerance to HL, with even a 2-fold increase in BBX14 levels potentially offering significant support. To explore the potential role of BBX14 in the response to HL, 1-week-old plants of Col-0, bbx14-1, bbx14-2, and "oeBBX14" were subjected to increased light intensity (1000 µmol photons m⁻ ² sec⁻¹) from their standard growth conditions (80 µmol photons m⁻² sec⁻¹), a condition known to drastically reduce BBX14 mRNA levels, as seen by the inhibition of BBX14 expression for up to 48 hours of HL exposure (Figure 10 B). Notably, LED chambers were employed to ensure precise temperature control and eliminate heat contribution. Maximum quantum yield of PSII (F_v/F_m) was monitored under control temperature and humidity conditions, after 3, 8, and 12 hours of HL exposure, and following 12 and 36 hours of de-acclimation under normal growth light conditions. The time series analysis revealed that under control light conditions (0h), *bbx14* and "oeBBX14" seedlings closely resembled the WT (Figure 10 C; Figure S5), whereas upon HL treatment, the "oeBBX14" line exhibited behavior similar to the WT (Figure S5). In contrast, bbx14 mutant plants exhibited a noticeable reduction in F_v/F_m compared to WT as early as 3 hours into HL exposure (Figure 10 C, D), with this reduction persisting in a staggering manner throughout the duration of HL treatment (3h-12h). However, the F_v/F_m values of seedlings lacking BBX14 recovered after de-acclimation in standard growth conditions (Figure 10 C, D). Additionally, while the chlorophyll content of bbx14 mutant seedlings was comparable to that of the WT under normal conditions (0h), it decreased slightly but significantly at all time points of the HL treatment (3h–12h; Figure 10 E). Importantly, the observed HL phenotype in bbx14 mutant was not attributed to reduced chlorophyll accumulation, as evidenced by comparisons with the gun4-2 mutant, which exhibited reduced chlorophyll levels (Figure S5 C) but significantly higher Fv/Fm values (Figure S5 B) relative to WT during HL exposure. These findings collectively suggest a beneficial role for BBX14 in maintaining plant growth under the tested HL conditions, reinforcing the notion that HL damage partially inhibits BBX14 induction, in agreement with recent transcriptomic data obtained under HL stress (Huang et al., 2019).



Figure 10. BBX14 is involved in high light (HL) acclimation.

(A) Global profiling of *BBX* mRNA levels in response to perturbations was carried out with Genevestigator, and studies involving HL treatments are shown. The cladogram at the top summarizes the degree of relatedness between the expression profiles of the different *BBX* genes. SAM, shoot apical meristem.

(B) RT-qPCR of *BBX14* expression in 7-day-old Col-0 plants grown under control conditions and then shifted to light level for up to two days. The results were normalized to *AT4G36800*, which encodes a RUB1-conjugating enzyme (RCE1). Expression values are reported relative to the corresponding transcript levels in Col-0, which were set to 1. Mean values \pm SE were derived from two independent experiments, each performed with three technical replicates per sample. Statistically significant differences (Tukey's test; ***P* < 0.01) between control and each HL time point are indicated.

(C) Phenotypes and Imaging PAM pictures of Col-0 and mutant (*bbx14-1*, *bbx14-2*) plants grown for 1 week under control conditions (16-h light/8-h dark, 80 μ mol photons m⁻² s⁻¹; left panel), shifted to high light (HL) conditions (16-h light/8-h dark, 1000 μ mol photons m⁻² s⁻¹), and then de-acclimated (de-acc.) in control conditions. Scale bar = 1 cm.

(D) Photosystem II maximum quantum yield (Fv/Fm) of wild-type (Col-0) and mutant (*bbx14-1 and bbx14-2*) seedlings grown as described in **(C)**.

(E) Determination of total chlorophyll (Chl a + b) contents of seedlings grown as in (C). Data are shown as mean values \pm SD from 3 different plant pools. Each pool contained more than 100 seedlings. Statistically significant differences between the wild-type and each mutant line at each time point are highlighted by letters above the plots (t-test; a, no significant difference; b, P < 0.05).

5. Discussion

In Arabidopsis, BBX proteins constitute a diverse family with various members playing distinct roles in plant physiology and development. While BBX14, BBX15, BBX16, and BBX17 have garnered significant attention, other BBX proteins also contribute to various aspects of plant biology. For example, BBX18 has been implicated in the regulation of flowering time through its interaction with CONSTANS (Suarez-Lopez et al., 2001). Similarly, BBX19, another member of the family, has been identified as a regulator of the circadian clock, modulating the expression of genes involved in photoperiodic responses (Yuan et al., 2021). Furthermore, BBX24 has been linked to photomorphogenesis and regulation of hypocotyl elongation in response to light stimuli (Gangappa et al., 2013). Additionally, BBX32 has been associated with the regulation of chloroplast development and photosynthesis-related gene expression (Kang et al., 2019). These studies collectively highlight the diverse functions of BBX proteins in Arabidopsis, spanning from the control of flowering time and circadian rhythms to modulation of light signaling pathways and chloroplast biogenesis. Further exploration of the roles and regulatory mechanisms of other BBX proteins will contribute to a comprehensive understanding of their involvement in plant growth, development, and adaptation to changing environmental conditions. BBX proteins are pivotal regulators of light-responsive genes, integrating diverse light signals from photoreceptors to modulate plant development. Their interactions with signaling pathways, regulation of developmental processes, evolutionary conservation, and potential for crop improvement make them compelling subject for research in the context of photomorphogenesis. Moreover, the multifaceted roles of BBX proteins in light signaling and photomorphogenesis make them intriguing targets for research aimed at understanding how plants perceive and respond to light cues to optimize their growth and development extending beyond developmental processes to encompass responses to environmental cues and stressors.

BBX proteins play crucial roles in plant development and have emerged as significant contributors to the plant's ability to adapt to adverse environmental conditions, as evidenced by studies such as those by Alvarez-Fernandez et al. (2021) and Talar & Kielbowicz-Matuk (2021). Among these proteins, BBX14, along with BBX15–BBX17, is classified within clade III of the B-box proteins, as outlined by the fundamental classification of Arabidopsis BBX transcription factors from Khanna et al. (2009). Despite well-established classification framework and phylogenetic studies within the BBX TF family, not limited to Arabidopsis, but extending across other plant species, such as rice, barley, and maize, the precise biochemical

functions of many members remain largely unknown or poorly understood (Griffiths et al., 2003; Vaishak et al., 2019 Talar & Kielbowicz-Matuk, 2021). The conservation of BBX proteins is observed across various plant species, including cryptogams and entire angiosperms, as evidenced by a similar number of BBX genes present in these species. This conservation is not limited to structural features but may extend to functional aspects as well, as indicated by the evolutionary pattern observed in BBX genes across different plant species. However, despite the continuous discovery of various roles of BBX proteins in Arabidopsis, the extent of their functions in other species is still limited. Even in the well-established model crop plant *Oryza sativa* (rice), only a handful of these proteins have undergone functional characterization with *Hd1*, *OsCO3*, *OsCOL4*, *OsBBX14*, *OsCOL9*, and *OsCOL16* identified to regulate flowering under different light regimes (Huang et al., 2012). Similar to Arabidopsis, rice BBX proteins are also classified into five subfamilies. However, in rice the *OsBBX14* encodes a BBX protein with two B-boxes classified into subfamily IV and lacks a CCT domain (Bai et al., 2016).

Within clade III of BBX proteins in Arabidopsis, BBX16, initially characterized a decade ago, was identified as a phytochrome-B-dependent regulator involved in modulating branching and the shade avoidance response (Wang et al., 2013; Zhang et al, 2014). Over time, further insights into the functionalities of members within this clade have emerged. For instance, recent research has proposed that BBX17 interacts with CONSTANS to exert negative regulation over flowering time (Xu et al., 2022). Moreover, recent investigations by Buelbuel et al. (2023) have revealed BBX14's role in negatively modulating senescence induced by nitrogen starvation and darkness. Additionally, studies have identified BBX14, BBX15, and BBX16 as constituents of a GLK-BBX module implicated in the inhibition of precocious flowering, as demonstrated by Susila et al. (2023). Functional redundancy among BBX proteins complicates their study, as demonstrated by the shorter hypocotyls observed in the bbx28bbx29bbx30bbx31 quadruple mutant compared to double and single mutants, indicating additive repression of seedling photomorphogenesis by clade V members BBX28-31 (Song et al., 2022). Feedback regulation adds another layer of complexity to the study of BBX proteins. For instance, while BBX30 and BBX31 are repressed by HY5 (Heng et al., 2019), BBX28 and BBX29 cooperate to prevent HY5 from binding to BBX30 and BBX31 promoters, leading to their expression. Moreover, BBX30 and BBX31 interact with BBX28 and BBX29 promoters, enhancing their expression, and BBX29 undergoes COP1-mediated degradation in darkness (Heng et al., 2019; Song et al., 2020), thereby indicating the intricate network that BBX proteins constitute in the regulation of COP1/SPA-HY5-mediated seedling establishment.
Within clade III, BBX15 shows the closest relationship to BBX14, followed by BBX16 and BBX17 (Khanna et al., 2009) While loss of BBX14 resulted in a distinct seedling phenotype (**Figure 6 B, C**), its involvement in flowering time regulation was only evident upon simultaneous knockdown of BBX14, BBX15, and BBX16 (Susila et al., 2023). Conversely, overexpression of BBX16 more clearly revealed cotyledon phenotypes compared to *bbx16* mutant lines (Veciana et al., 2022). Additionally, BBX16 has been recognized as a facilitator of seedling photomorphogenesis and a component acting downstream of the GUN1/GLK1 module in retrograde signaling (Veciana et al., 2022). Similarly, BBX14 captured attention when identified within a core-response module for HL and retrograde signaling, highlighting its involvement at the intersection of seedling development, retrograde signaling, and acclimation pathways (Leister & Kleine et al., 2016). Although *BBX14-16* are all GLK1 targets, future investigations are likely to unveil more intricate modes of action for these proteins, shedding light on whether BBX15 influences seedling development and whether a *bbx14bbx15bbx16* triple mutant exhibits a more pronounced impact on plant development than any of the single or double mutant combinations.

5.1. BBX14 is part of the GLK1/GUN1-dependent retrograde signaling mechanism regulating seedling development

Interactions between cellular compartments play a crucial role in coordinating developmental processes, optimizing metabolic pathways, and orchestrating responses to environmental stimuli and stresses (Xiao et al., 2012). The coordinated regulation of gene expression in both nuclear and plastid genomes through anterograde and retrograde signaling pathways is particularly vital during plastid biogenesis and transition to photomorphogenic program under conditions where chloroplast integrity and function are susceptible to environmental damage. RS pathways, which transmit information from plastids to the nucleus, serve two main functions: optimizing cellular responses to environmental cues (operational control) and regulating chloroplast development, especially plastid biogenesis (biogenic control), by modulating the expression of nuclear genes associated with photosynthesis (Woodson et al., 2013; Hernandez-Verdeja et al., 2022). While the concept of anterograde communication has long been established, the recognition of retrograde control, emerged much later as a widespread phenomenon in eukaryotes. Across all non-photosynthetic eukaryotes, ranging from unicellular fungi to humans, RS pathways play crucial roles in adjusting nuclear gene expression to mitochondrial physiology (Butow and Avadhani, 2004; Battersby and Richter,

2013). Similarly, in photosynthetic eukaryotes, spanning from unicellular algae to seed plants, additional retrograde pathways have been implemented to finely tune nuclear gene expression not only to mitochondrial but also to plastid demands (Woodson and Chory, 2008; Kleine et al., 2009; Van Aken and Whelan, 2012; De Clercq et al., 2013).

The establishment of young seedlings during de-etiolation is a delicate process influenced by various factors, with light playing a pivotal role (Gommers & Monte, 2018). Light triggers transcriptional alterations in numerous genes involved in de-etiolation (Ma et al., 2001), with many directly controlled by the phytochrome/PIF system, including GLK1 (Leivar et al., 2009; Pfeiffer et al., 2014). However, excessive light can be detrimental to chloroplast function, potentially hindering seedling establishment, leading to the initiation of RS and inhibition of de-etiolation (Martín et al., 2016). Chloroplast-derived retrograde signals play crucial roles in regulating photomorphogenesis through the modulation of transcriptional networks involving CRY1 and PIF-GLK1 (Waters et al., 2009; Martín et al., 2016). Additionally, these signals finely tune plant responses to environmental stresses such as drought and high light (Lee et al., 2007; Estavillo et al., 2011; Jung et al., 2013). Among the classical gun mutants, affecting enzymes or coenzymes in tetrapyrrole biosynthetic pathways (Mochizuki et al., 2001; Larkin et al., 2003; Strand et al., 2003; Woodson et al., 2011), the identification of the sixth GUN gene, GUN1, has led to the hypothesis that it serves as a central integrator where multiple RS pathways converge (Koussevitzky et al., 2007). GUN1, an enigmatic nuclear-encoded chloroplast-localized PRR protein, plays a crucial role in this process, particularly during the early stages of chloroplast biogenesis and under RS conditions (Wu et al., 2018). Although the precise mechanism remains unclear, GUN1 likely interacts physically with numerous proteins involved in plastid translation machinery, tetrapyrrole biosynthesis and RNA editing (Tadini et al., 2016; Marino et al., 2019; Shimizu et al., 2019; Zhao et al., 2019), suggesting a multifaceted role as a central hub that facilitates a plethora of crucial processes in the cell (Colombo et al., 2016). While GUN1 has predominantly been associated with RS processes as a central regulator of plastid-to-nucleus signaling (Koussevitzky et al., 2007) much about its exact mode of action in plastid protein homeostasis, expression, and accumulation in relation to the activity of RS, precise targets and affected down-stream processes has remained largely unknown. In recent studies GUN1 has been highlighted as key component in the RS-mediated regulation of seedling morphology (Martin et al., 2016, Veciana et al., 2022). Together with other nuclear-localized TFs (i.e. PIFs and GLK1), GUN1 orchestrates the expression of PhANGs to modulate chloroplast development (Waters et al., 2009) and seedling development during de-etiolation (Martin et al., 2016). During GUN1-dependent signaling, the GLK1/2

proteins function as key regulators of *PhANG*s transcript accumulation within the nucleus (Leister & Kleine, 2016; Martin et al., 2016; Waters et al., 2009). Recent studies have highlighted the convergence of light-dependent and chloroplast signaling pathways, with BBX16 identified as a component bridging these pathways (Veciana et al., 2022; Leister et al., 2014; Ruckle et al., 2007). BBX16, shown to be a direct target of GLK1, mediates the expression of a subset of GLK1-regulated *PhANGs* under specific conditions, indicating its role in integrating signals from these pathways (Veciana et al., 2022; Susila et al., 2023). Arabidopsis BBX proteins clustered within the same clade are often found to be involved in

the regulation of similar processes (Gangappa & Botto, 2014). As one of the few AtBBX protein that required further study, BBX14 gained prominence upon its discovery within a coreresponse module implicated in HL and RS, underscoring its role at the crossroads of seedling development, retrograde signaling, and stress acclimation pathways (Leister & Kleine et al., 2016). In this work, the role of BBX14 as an integrator of biogenic signals and nuclear target of retrograde signals downstream of the GUN1/GLK1 module in the context of seedling development under abiotic stress is argued, establishing it as the second BBX protein in Arabidopsis, after BBX16, involved in RS. In particular, BBX14 displayed light-induced expression in a GLK1-dependent manner as well as is PIF-dependent repression in the dark. Furthermore, BBX14 is revealed to be required for the chlorophyll accumulation during early light exposure, hypocotyl shortening and acclimation to HL stress. The results presented here collectively provide evidence for the GUN1/GLK1-dependent role of BBX14 in enchanting seedling development during de-etiolation and in biogenic signaling. Additionally, the identification of BBX14 as direct target of GLK1 sheds light on a novel safeguarding mechanism in modulation of PhANGs expression and seedling development during RS activation against unfavorable light conditions.

To expand our understanding of GLK1-mediated regulation, a genome-wide ChIP-Seq approach was employed and identified *BBX14*, *BBX15*, *BBX2*, *BBX4*, and *BBX5* as direct targets of GLK1 (**Figure S1; Table S1**), meeting the first criterion for involvement in the GUN1/GLK-dependent biogenic signaling pathway. The second and third criteria, indicative of transcript reduction in the presence of both NF and LIN and dependence on GUN1, respectively, were evaluated. Among the BBX members satisfying criteria 2 and 3 (**Figure S5**), only BBX14, BBX15, and BBX16 also fulfilled criterion 1. Notably, overexpression of BBX14 resulted in a "*gun*" phenotype akin to oeBBX16 lines (**Figure 9**), indicating that *LHCB1.2* transcript levels remained unrepressed, similar to observations in BBX16 overexpressors (Vaciana et al., 2022). Strikingly, in lines overexpressing BBX15 only one target (*CA1*) was

identified to be de-repressed. Together, these finding are indicative of a diversification of BBX members clade III in their role of regulating PhANGs, despite commonality in their up-stream regulation via GLK1. It is, however, crucial to underline the original definition of a gun mutant at this point, which hinges on the de-repression of LHCB1.2 transcript levels despite seedlings being cultivated on NF (or LIN) as postulated initially in several studies (Susek et al., 1993; Ruckle et al., 2007). While the relative gene expression data might suggest higher LHCB1.2 expression in TPT14 compared to Col-0 when grown on NF (Figure 9 B), several points need to be considered: (i) LHCB1.2 transcript levels exhibited variability from experiment to experiment, (ii) they were already slightly increased on MS without inhibitor (Figure 9 B), (iii) they remained lower those observed in the gun1 mutant, and (iv) notably, they did not show an increase in TPT14 when RNA-Seq data were plotted over the LHCB1.2 gene (Figure 9 D). It is important to interpret these findings cautiously, particularly considering that the stable "overexpression" line, while displaying elevated CA1 expression levels, it exhibited a 2.2-fold increase in BBX14 transcript levels compared to Col-0. The reliance solely on RT-qPCR results, especially when dealing with only a 2-fold variation, may not provide entirely reliable insights. Additionally, as discussed by Veciana et al. (2022), the possibility of branching in the signaling pathway downstream of GLK1 might enable BBX14, BBX15, and BBX16 to regulate a subset of target genes, rather than collectively exerting control over all PhANGs, with potential additive functions not being excluded. This notion is further supported by the finding that BBX14 and BBX15 appear to influence the expression of certain PhANGs, as seen from results presented in Figure 7. Hence, classification of BBX14 and BBX15 overexpressors as gun mutants based on certain PhANGs expression should be further elucidated and critically evaluated as there might yet unknown factors that play a role. Moreover, the observation that reduced GLK1 protein levels in damaged plastids are partially restored by MG132, a proteasome inhibitor, suggests the involvement of the ubiquitin-proteasome system in the degradation of GLK1 in response to plastid signals, further adding to the complexity of the regulatory network (Tokumaru et al., 2017). It therefore stands to reason, whether emerging "gun" mutants should be categorized based on subtle PhANGs phenotype alone. For instance, among the recently identified new "gun" mutants in the GUN1 branch are the overexpressors of MORF2 (Zhao et al., 2019). In this study, RT-qPCR was employed to detect LHCB1.2 transcript levels that were 3-fold and 2-fold higher in two MORF2 overexpressors, akin to those observed in TPT14. However, it remains unclear whether LHCB1.2 levels were already elevated in MORF2 lines prior to overexpression when grown in absence of inhibitors. Finally, constitutive expression often confounds primary and secondary effects, that lead to

discrepancies or sometimes pleiotropic effects. Moreover, expression in a wild-type background could hide certain effects or lead to reduced sensitivity to treatments. Hence, the employment of inducible expression approach to overcome this could leads to more reliable and conclusive results, as demonstrated in this work.

In elucidating the regulatory framework downstream of GLK1, it becomes evident that GLK1 directs its influence toward BBX proteins from clade III to intricately modulate seedling development and potentially exert indirect control over specific PhANGs, as demonstrated here for BBX14 and BBX15. Concurrently, GLK1 directly regulates other *PhANGs*, as shown by Waters et al., (2009) marking a crucial juncture in the intricate orchestration of seedling morphology downstream of the GUN1/GLK1 module. This unveils a nuanced signaling landscape where the relayed signal from GLK1 diversifies, finely tuning diverse processes pivotal to seedling de-etiolation. Notably, the phenomenon of signal network branching, ubiquitous across organisms, plays a pivotal role in sculpting intricate responses to distinct stimuli (Purvis et al., 2008). It's noteworthy that previous studies have delineated signal branching downstream of the PIFs, orchestrating distinct pathways specific to different organs during seedling de-etiolation. For instance, BBX23 was implicated in primarily regulating hook unfolding in this context (Zhang et al., 2017). The current findings suggest that while the direct targeting of certain PhANGs genes by GLK1 facilitates swift adjustments in chloroplast protection in response to light fluctuations, the divergence of the signal to suppress BBX14 and its downstream effectors could entail a more gradual response, particularly in sustained HL conditions, although this hypothesis warrants further exploration, as discussed later.

5.2. Involvement of BBX14 in circadian rhythm dynamics

Another interesting aspect that emerged when analyzing the role of BBX14 during seedling deetiolation was the potential involvement of BBX14 in the circadian rhythm. Transcriptome analysis of seedling lacking *BBX14* revealed a significant enrichment of down-regulated genes associated with the circadian rhythm when transferred from dark to light, including genes such as *PRR5* and *TOC1* (**Figure 5 C**). Additionally, the misregulated expression of early day *PRR* genes in the *bbx14* mutant supports the notion that BBX14 is likely linked to the circadian cloak (**Figure 5 E**). While it has already been shown that light and the circadian clock can tightly regulate the expression of several BBX members like *BBX2*, *BBX3*, *BBX22*, *BBX24*, and *BBX25* (Ledger et al., 2001, Gangappa & Botto, 2014), evidence of the direct influence of BBX transcription factors on the circadian cloak is rather limited, with the exception of BBX18 and BBX19, which only recently have been reported to interact with PRRs in circadian clock regulation (Yuan et al., 2021). Although similar interaction for BBX14 could not be shown here, another possible mechanism, evidenced here by the interaction with PIF4 (Figure 5 D) as means to achieve circadian regulation should not be excluded. PIFs have long been establish as key components of the circadian clock by not only regulating the expression of other clock gene such as CCA1 and LHY, but also by directly interacting with them in protein-protein complexes thereby recruiting other transcription factors to bind promoters of core clock genes. The interaction between PIFs and other TFs allows the coordination of gene expression in response to both light and circadian cues, thereby optimizing plant growth and development in response to environmental conditions. In the context of BBX proteins, interactions with members of the PIF family have only begun to become evident. A study by Bai et al. (2012) demonstrated that PIF1 interacts with BBX18 to regulate light-mediated hypocotyl elongation, whereas Gangappa et al. (2013) showed that PIF3 interacts with BBX32 to regulate photomorphogenesis and flowering time. Moreover, a recent study by Zhang et al. (2021) identified an interaction between PIF7 and BBX24, which regulates shade-induced hypocotyl elongation in Arabidopsis. Finally, BBX23 has been linked to a PIF1/PIF3-HY5 TF cascade regulating photomorphogenesis (Zhang et al., 2017). These studies collectively suggest that there is indeed a link between PIFs and AtBBX proteins, particularly in the regulation of light signaling pathways and circadian clock control. The interactions between PIFs and BBX TFs contribute to the fine-tuning of gene expression and the coordination of seedling growth and development in response to light cues. The identification of BBX14 as an interacting partner of PIF4 in this work sheds new light on the intricate regulatory network governing lightmediated responses in plants. Considering that other BBX protein have been identified to interact with a specific PIF, points towards a trend where PIF-BBX protein complexes functionally cooperate in regulating gene expression and signaling pathways. The specific interaction between PIF4 and BBX14 hints at a tailored regulatory mechanism that may modulate gene expression and signaling pathways in response to environmental cues, particularly light stimuli. This finding underscores the specificity and selectivity of proteinprotein interactions in orchestrating complex physiological responses in plants. Moreover, it highlights the functional diversity within the BBX TF family and emphasizes the potential for combinatorial interactions with PIFs to fine-tune gene expression dynamics. Further investigation into the molecular mechanisms underlying the PIF4-BBX14 interaction is, however, required in order to precisely elucidate the regulatory mechanism and whether other TFs are involved in this process, like in case of BBX23 (Zhang et al., 2017).

5.3. BBX14 promotes chlorophyll accumulation and seedling establishment

Upon de-etiolation, the establishment of photosynthetic capacity depends on successful chloroplast biogenesis, a process expected to be intricately coordinated with the metabolism and development of other organelles. In angiosperms, chlorophyll synthesis halts in the absence of light but promptly resumes upon seedling exposure to irradiation (Von Wettstein et al., 1995). Given that all LHCB genes and chlorophyll biosynthesis genes are nuclear-encoded, it stands to reason that these genes might be co-regulated to facilitate efficient photosynthetic development. Nonetheless, despite this expectation, few examples of TFs governing chloroplast biogenesis have been identified to directly coordinate photosystem assembly, with prime examples being the homologous pair GLK1 and GLK2 as demonstrated by Waters et al., (2009). The chloroplast, a highly dynamic organelle, undergoes metabolic and functional shifts to adapt to changing environmental conditions. During daylight, it must finely balance light interception and carbon fixation rates, while at night, photosynthesis ceases, and starch reserves are mobilized within the chloroplast. Although many of these adjustments are mediated through rapid post-translational mechanisms, the circadian regulation of numerous photosynthesisrelated transcripts suggests that transcriptional control in the nucleus plays a significant role. Findings in this work indicate that BBX14 play a crucial role in orchestrating adequate development of seedlings both during light exposure and darkness (Figure 4). This, together with the finding that BBX14 is bound by GLK1 (Figure S1) implies that BBX14 is required for the synchronous transcription of genes essential for de-etiolations processes, which encompass the coordinated transcription of photosynthesis-related genes alongside other aspects. Moreover, the putative interaction between BBX14 and GLK2 further supports this notion (Figure 5 D) and highlights a potential functional evolution of GLKs to adjust early seedling establishment in different levels and via different pathways. Moreover, BBX14 is responsive to retrograde signals originating from the chloroplast. Thus, BBX14 emerges as pivotal nuclear regulator governing photosynthetic capacity (Figure 7 A, B).

While several TFs have been implicated in the co-regulation of genes involved in photosynthesis, GLKs stand out as key regulators primarily dedicated to modulating such targets. For instance, the bZIP protein HY5 operates downstream of photoreceptors that oversees photomorphogenesis (Oyama et al., 1997). Despite the prevalence of photosynthesis-related genes among HY5 targets compared to the genome at large, the majority of HY5 targets consist of other TFs, reflecting HY5's broader role as a master regulator of photomorphogenesis (Lee et al., 2007). This is underscored by the identification of BBX proteins as rate-limiting

cofactors of HY5 (Bursch et al., 2020), as well as by their close interplay in facilitating photomorphogenesis (Gangappa, Crocco, et al., 2013; Gangappa, Holm, et al., 2013; Li et al., 2021; Zhang et al., 2017). Intriguingly, HY5 binding sites, primarily G-box elements, are abundant in the promoters of various TFs, including GLK2, yet conspicuously absent in BBX14 and GLK1 promoters (Lee et al., 2007). During the regulation of seedling photomorphogenesis, certain BBX proteins are intricately linked to the COP1/SPA-HY5 regulatory network, as evidenced by studies (Gangappa & Botto, 2014; Song et al., 2020). Many of these BBX proteins interact with COP1 and are modulated in a COP1-dependent manner, and/or exert influence on HY5 transcription, stability, or activity (see 1.2.2). However, whether BBX14 is subject to regulation by the COP/SPA system, and the involvement of HY5 or other interacting proteins in BBX14-mediated seedling development, remain open questions necessitating further investigation.

Another group of TFs known to regulate the expression of photosynthetic genes are the PIF family members (Castillon et al., 2007). PIF3 and PIF4, for instance, exert control over numerous genes involved in photomorphogenesis, including *CHLH* and *CAO*, which encode key enzymes in the chlorophyll biosynthesis pathway (Monte et al., 2004). Although the extent of interaction between BBX14 and other TFs remains to be fully elucidated, given that BBX14 can interact with GLK2 and PIF4, provides an interesting point that links BBX14 to chlorophyll accumulation. Moreover, a study of the chloroplast biogenesis during de-etiolation by Pipitone et al. (2021) showed that the initial time post light exposure is crucial for structure for chloroplast establishment, corroborating with the finding that seedlings lacking *BBX14* displayed a hampered photomorphogenesis during early onset of light (**Figure 4 A, B**). Moreover, the authors showed that while no tremendous changes occurred on proteomic level, including proteins constituting the photosynthetic machinery, the massive reorganization of the transcriptome during photomorphogenesis is the main event that governs the promotion of photomorphogenesis.

5.4. The role of BBX14 in acclimation to light stress

The regulation of gene expression stands as a critical facet of the response and adaptation to high light stress. Extensive evidence indicates that HL induces the transcriptional suppression of genes encoding antenna proteins while simultaneously activating genes responsible for scavenging ROS. What's more, HL can detrimentally damage chloroplast integrity by inducing the overproduction of ROS, disrupting energy metabolism, and impairing antioxidant defense

mechanisms. This damage can have profound effects on photosynthesis, chloroplast function, and overall plant growth and development (Rossel et al., 2002; Kleine et al., 2007; Jung et al., 2013). Hence, the Arabidopsis transcriptional response to HL must be rapidly initiated within seconds or minutes to prevent excessive damage. (Suzuki et al., 2015; Crisp et al., 2017). Furthermore, transcriptional regulatory networks play a pivotal role in mediating light signaling by orchestrating the coordinated activation and repression of specific downstream genes (Jiao et al., 2007). The intricate transcriptomic response to HL stress in plants remains inadequately characterized, partly due to the confounding effects of heat in previous studies. A study by Huang et al. (2019), circumventing heat-induced artifacts, provided valuable insights by elucidating the specific and dynamic transcriptome associated with HL stress in plants. Their study identified BBX14 and two other uncharacterized genes as core HL-responsive hub genes among a total of 250 HL-responsive genes and revealed the dynamic regulation of key biological processes including hormones, anthocyanin biosynthesis, photosynthesis-related genes, photoreceptors, and genes encoding PIF TFs. Importantly, the indispensable role of PIFs in mediating the plant's response to HL stress was highlighted and specifically showed that PIF4 plays a prominent role in HL stress response. Even though no further evidence was provided that directly links BBX14 and PIF4 within the same HL-driven transcriptional network, the above discussed BBX14-PIF4 interaction underscores a potential interplay between the TFs that may be a part of a regulatory mechanism during HL stress and that further research should be attributed to elucidate this relationship.

In this work, it was noteworthy that BBX14 transcript accumulation was significantly hampered in seedling exposed to HL (**Figure 10 A, B**). One plausible hypothesis regarding the function of BBX14 in HL acclimation suggests that overexpression of BBX14 might enhance the plant's ability to tolerate HL conditions. Conversely, it was anticipated that *bbx14* mutant lines would exhibit behavior similar to the wild-type under HL stress, as BBX14 levels are naturally downregulated in these mutants. However, contrary to expectations, the "oeBBX14" plants behaved comparably to the WT under HL conditions (**Figure S5**), while the *bbx14* mutant plants displayed increased susceptibility to HL stress. This observation indicates that BBX14 plays a beneficial role in promoting plant growth and tolerance under HL conditions. This finding aligns with the concept of accelerated HL acclimation, as proposed by Alvarez-Fernandez et al. (2021), which involves a significant enhancement of the operating efficiency of photosystem II (PSII; Y(II)). Given that *BBX14* is co-regulated with *PhANGs* transcripts under HL conditions (Huang et al., 2019; Garcia-Molina et al., 2020), it is plausible that higher BBX14 levels may contribute to increased transcription of *PhANGs* under HL stress, thereby

facilitating enhanced HL acclimation. Conversely, the absence of BBX14 appears to result in reduced HL tolerance in plants, as evidenced by the observed phenotype in the *bbx14* mutant lines (Figure 10). In addition to BBX14, it has been observed that transcriptional levels of all other clade III members, as well as of BBX27, decrease under HL conditions, whereas transcripts of other BBX members, including those from clade V such as BBX29-BBX32, show elevated expression (Garcia-Molina et al., 2020; Huang et al., 2019). Notably, a bbx32 mutant exhibited slightly higher photosystem II operating efficiency (Y(II)) after 5 days of HL treatment, whereas plants overexpressing BBX32 demonstrated impaired acclimation to HL stress. This pattern parallels the correlation observed between BBX32 transcript levels and HL phenotype, akin to what has been observed for BBX14. However, it is worth mentioning that overexpression of BBX32 was already slightly detrimental under growth conditions with reduced levels of several PhANGs transcripts (Alvarez-Fernandez et al., 2021). Interestingly, HL reduces the expression of class III BBX TF genes and GLK1 (Martin et al., 2016; Huang et al., 2019). This is achieved via HL-mediated antagonization of GLK1 expression, at least in part through GUN1-mediated retrograde signaling. Furthermore, HL intensities prevent the informational low-light induction of GLK1-induced genes, such as BBX14 and BBX16, or the genes whose light-induction is inhibited by RS. GLK1 expression under HL is repressed in a PIF-independent fashion by a GUN1-facilitated pathway, to antagonize the light induction of the photomorphogenic program (Martin et al., 2016). Together, with the finding that BBX14-BBX17 are direct downstream targets of GLK, imply that BBX members of clade III might play a specialized role in the RS-mediated response to chloroplast damage and solidifies them as part of a regulatory stress-induced signaling pathway. Indeed, this function has already been attributed to other members of the BBX TF family in Arabidopsis, such as BBX18 and BBX23 in heat stress responses (Ding et al., 2018), BB24 in salt-induced stress (Gangappa & Botto, 2014) and BBX7 and BBX8 in cold (Li et al., 2021). Moreover, Lyu et al., (2020) conducted a bioinformatics analysis covering all members of BBX TF family and identified that the promoter region of BBX14 contains cis elements related to ABA, light, drought, auxin, and stress responsiveness. This suggests a potential role for BBX14 in the crosstalk between different stress pathways and could be translated to other members of clade III, as some of the cis elements are shared across all four members.

In terms of stress acclimation, BBX TF factors are just now emerging as key players and mediators. While no evidence suggests that BBX proteins of clade III are functionally equivalent, the notion that they may be differentially regulated at the transcriptional level should be considered. Given the common occurrence of functional redundancy among

members of the same clade within other TF families (Pfeiffer et al., 2014; Leivar et al., 2020; Martín et al., 2020), it is plausible to speculate that BBX14-BBX16 might share some functional aspects. This redundancy within the clade suggests that the *bbx14* mutant likely retains some functionality, explaining the more prominent hypocotyl phenotypes observed in the *bbx14* mutant compared to lines overexpressing BBX14. Future genetic characterization of higher-order mutant combinations of *bbx14*, *bbx15*, and *bbx16* will shed more light on potential functional redundancy and clarify whether BBX14-BBX16 synergistically contribute to the RS-mediated regulatory response. This would also aid the understanding of the multifaceted role of BBX proteins in other processes and whether absence of several can result in additive phenotype effects. For instance, in case of the *bbx15bbx14* double mutant the maximum PS II quantum yield in young plants was significantly lower already under standard growth conditions (own observations, data not published). Moreover, it will be of interest to explore whether the BBX family of TFs has functionally evolved and diverged to specialize exclusively in glade III clade in RS regulation, or if BBX factors from other clades might also participate in these processes.

In summary, the complexity of BBX proteins' roles in plant development and stress responses, including their impact on chloroplast development, is becoming increasingly apparent. Yet, our comprehension of their specific functions remains incomplete. Challenges such as functional redundancies and feedback loops add layers of complexity to their analysis, necessitating further investigation to unravel the intricate regulatory networks and molecular mechanisms governing signaling and coordinated responses in nuclear gene regulation.

To summarize, this work provides evidence supporting a model wherein *BBX14* is a direct target of GLK1, driving hypocotyl photomorphogenesis under favorable light conditions conducive to seedling de-etiolation, as well as chlorophyll accumulation and HL acclimation. Conversely, activation of GUN1-mediated retrograde signaling inhibits *GLK1*, *BBX14*, and certain *PhANG*s expression, limiting chloroplast development to mitigate light damage and enhance photoprotection. Such a mechanism would safeguard an etiolated seedling, particularly vulnerable upon emergence into excessive light. This transient response likely enables the seedling to avert damage, awaiting a reduction in light intensity due to shading or the natural movement of the sun.

6. References

- Afgan, E., Baker, D., van den Beek, M., Blankenberg, D., Bouvier, D., Cech, M., Chilton, J., Clements, D., Coraor, N., Eberhard, C., Gruning, B., Guerler, A., Hillman-Jackson, J., Von Kuster, G., Rasche, E., Soranzo, N., Turaga, N., Taylor, J., Nekrutenko, A. and Goecks, J. (2016). The Galaxy platform for accessible, reproducible and collaborative biomedical analyses: 2016 update. *Nucleic Acids Res*, 44, W3-W10.
- Alonso, J. M., Stepanova, A. N., Leisse, T. J., Kim, C. J., Chen, H., Shinn, P., Stevenson, D. K., Zimmerman, J., Barajas, P., Cheuk, R., Gadrinab, C., Heller, C., Jeske, A., Koesema, E., Meyers, C. C., Parker, H., Prednis, L., Ansari, Y., Choy, N., Deen, H., ... Ecker, J. R. (2003). Genome-wide insertional mutagenesis of Arabidopsis thaliana. Science (New York, N.Y.), 301(5633), 653–657.
- Alvarez-Fernandez, R., Penfold, C.A., Galvez-Valdivieso, G., Exposito- Rodriguez, M., Stallard, E.J., Bowden, L. (2021). Time-series transcriptomics reveals a BBX32directed control of acclimation to high light in mature Arabidopsis leaves. *The Plant Journal*, 107, 1363–1386.
- Archibald, J. M. (2015). Endosymbiosis and Eukaryotic Cell Evolution. *Current biology :* CB, 25(19), R911–R921
- Bai, B., Zhao, J., Li, Y., Zhang, F., Zhou, J., Chen, F., & Xie, X. (2016). OsBBX14 delays heading date by repressing florigen gene expression under long and short-day conditions in rice. *Plant Sci*, 247, 25-34.
- Baillo, E. H., Kimotho, R. N., Zhang, Z., & Xu, P. (2019). Transcription Factors Associated with Abiotic and Biotic Stress Tolerance and Their Potential for Crops Improvement. *Genes (Basel)*, 10(10).
- Bakshi, M.; Oelmüller, R. (2014). WRKY transcription factors, Plant Signalling and Behavior. J. Plant Signal. Behav. 9, e27700.
- Barkan, A., and Goldschmidt-Clermont, M. (2000). Participation of nuclear genes in chloroplast gene expression. *Biochimie* 82, 559–572.
- Barkan, A., and Small, I. (2014). Pentatricopeptide repeat proteins in plants. *Annu. Rev. Plant Biol.* 65, 415–442.
- **Battersby, B.J., Richter, U.** (2013). Why translation counts for mitochondria: retrograde signalling links mitochondrial protein synthesis to mitochondrial biogenesis and cell proliferation. *J Cell Sci* 126: 4331–4338
- Bolger, A.M., Lohse, M. and Usadel, B. (2014). Trimmomatic: a flexible trimmer for Illumina sequence data. *Bioinformatics*, 30, 2114-2120.

- Borden, K.L., Lally, J.M., Martin, S.R., O'Reilly, N.J., Etkin, L.D., and Freemont, P.S. (1995). Novel topology of a zinc-binding domain from a protein involved in regulating early Xenopus development. *EMBO J.* 14: 5947–5956.
- Brandão, M. M., Dantas, L. L., & Silva-Filho, M. C. (2009). AtPIN: Arabidopsis thaliana protein interaction network. *BMC bioinformatics*, 10, 454.
- Buelbuel, S., Sakuraba, Y., Sedaghatmehr, M., Watanabe, M., Hoefgen, R., Balazadeh, S., & Mueller-Roeber, B. (2023). Arabidopsis BBX14 negatively regulates nitrogen starvation- and dark-induced leaf senescence. *The Plant journal : for cell and molecular biology*, *116*(1), 251–268.
- Bursch, K., Toledo-Ortiz, G., Pireyre, M., Lohr, M., Braatz, C., & Johansson, H. (2020). Identification of BBX proteins as rate-limiting cofactors of HY5. *Nat Plants*, 6(8), 921-928.
- Butow, R.A., Avadhani, N.G. (2004) Mitochondrial signaling: the retrograde response. *Mol Cell* 14: 1–15
- Cao, S., Kumimoto, R. W., Gnesutta, N., Calogero, A. M., Mantovani, R., & Holt, B. F., 3rd (2014). A distal CCAAT/NUCLEAR FACTOR Y complex promotes chromatin looping at the FLOWERING LOCUS T promoter and regulates the timing of flowering in Arabidopsis. *The Plant cell*, 26(3), 1009–1017.
- Castillon, A., Shen, H., and Huq, E. (2007). Phytochrome interacting factors: Central players in phytochrome-mediated light signaling networks. *Trends Plant Sci.* 12: 514–521.
- Chang, C. S., Li, Y. H., Chen, L. T., Chen, W. C., Hsieh, W. P., Shin, J., Jane, W. N., Chou, S. J., Choi, G., Hu, J. M., Somerville, S., & Wu, S. H. (2008). LZF1, a HY5regulated transcriptional factor, functions in Arabidopsis de-etiolation. *The Plant journal: for cell and molecular biology*, 54(2), 205–219
- Chang, C. S., Maloof, J. N., & Wu, S. H. (2011). COP1-mediated degradation of BBX22/LZF1 optimizes seedling development in Arabidopsis. *Plant physiology*, 156(1), 228–239.
- Chattopadhyay, S., Ang, L.H., Puente, P., Deng, X.W., Wie, N. (1998). Arabidopsis bZIP protein HY5 directly interacts with light-responsive promoters in mediating light control of gene expression. *The Plant Cell* 10: 673–683.
- Chen, H., Zhang, J., Neff, M. M., Hong, S. W., Zhang, H., Deng, X. W., & Xiong, L. (2008). Integration of light and abscisic acid signaling during seed germination and early seedling development. *Proceedings of the National Academy of Sciences of the United States of America*, 105(11), 4495–4500.
- Chi, W., Sun, X., and Zhang, L. (2013). Intracellular signaling from plastid to nucleus. *Annu. Rev. Plant Biol.* 64, 559–582.
- Chi, W., Sun, X., Zhang, L. (2013). Intracellular signaling from plastid to nucleus. Annu Rev *Plant Biol* 64: 559–582

- Coego, A., Brizuela, E., Castillejo, P., Ruíz, S., Koncz, C., del Pozo, J. C., Piñeiro, M., Jarillo, J. A., Paz-Ares, J., León, J., & TRANSPLANTA Consortium (2014). The TRANSPLANTA collection of Arabidopsis lines: a resource for functional analysis of transcription factors based on their conditional overexpression. *The Plant journal : for cell and molecular biology*, 77(6), 944–953.
- Cohen, S.P.; Leach, J.E. (2019). Abiotic and biotic stresses induce a core transcriptome response in rice. *Sci. Rep.* 1–11.
- Colombo, M., Tadini, L., Peracchio, C., Ferrari, R., and Pesaresi, P. (2016). GUN1, a jackof-all-trades in chloroplast protein homeostasis and signaling. *Front. Plant Sci.* 7:1427.
- Crisp, P.A., Ganguly, D.R., Smith, A.B., Murray, K.D., Estavillo, G.M., Searle, I., Ford, E., Bogdanović, O., Lister, R., Borevitz, J.O. (2017). Rapid recovery gene downregulation during excess-light stress and recovery in Arabidopsis. *Plant Cell* 29, 1836–1863.
- Crocco, C. D., Holm, M., Yanovsky, M. J., & Botto, J. F. (2010). AtBBX21 and COP1 genetically interact in the regulation of shade avoidance. *The Plant journal: for cell and molecular biology*, *64*(4), 551–562.
- Crocco, C. D., & Botto, J. F. (2013). BBX proteins in green plants: insights into their evolution, structure, feature and functional diversification. *Gene*, 531(1), 44-52.
- Cutler, S. R., Rodriguez, P. L., Finkelstein, R. R., & Abrams, S. R. (2010). Abscisic acid: emergence of a core signaling network. *Annual review of plant biology*, *61*, 651–679.
- **Datta, S., Hettiarachchi, C., Johansson, H., & Holm, M.** (2007). SALT TOLERANCE HOMOLOG2, a B-box protein in Arabidopsis that activates transcription and positively regulates light-mediated development. *The Plant cell*, *19*(10), 3242–3255.
- Datta, S., Johansson, H., Hettiarachchi, C., Irigoyen, M. L., Desai, M., Rubio, V., & Holm, M. (2008). LZF1/SALT TOLERANCE HOMOLOG3, an Arabidopsis B-box protein involved in light-dependent development and gene expression, undergoes COP1mediated ubiquitination. *The Plant cell*, 20(9), 2324–2338.
- Davuluri, R.V., Sun, H., Palaniswamy, S.K., Matthews, N., Molina, C., Kurtz, M. (2003). AGRIS: Arabidopsis gene regulatory information server, an information resource of Arabidopsis cis- regulatory elements and transcription factors. *BMC Bioinformatics* 4: 25.
- De Clercq, I., Vermeirssen, V., Van Aken, O., Vandepoele, K., Murcha, M.W., Law, S.R., Inzé, A., Ng, S., Ivanova, A., Rombaut, D. (2013). The membrane-bound NAC transcription factor ANAC013 functions in mi- tochondrial retrograde regulation of the oxidative stress response in Arabidopsis. *Plant Cell* 25: 3472–3490
- de Pater, S., Greco, V., Pham, K., Memelink, J., and Kijne, J. (1996). Characterization of a zinc-dependent transcriptional activator from Arabidopsis. *Nucleic Acids Res.* 24: 4624–4631.

- de Wit, M., Galvão, V. C., & Fankhauser, C. (2016). Light-Mediated Hormonal Regulation of Plant Growth and Development. *Annual review of plant biology*, 67, 513–537.
- **Ding L, Wang S, Song Z-T, Jiang Y, Han J-J, Lu S-J, Li L, Liu J-X.** (2018). Two B-box domain proteins, BBX18 and BBX23, interact with ELF3 and regulate thermomorphogenesis in Arabidopsis. *Cell Reports* 25: 1718–1728.e4.
- Dobin, A., Davis, C. A., Schlesinger, F., Drenkow, J., Zaleski, C., Jha, S., Batut, P., Chaisson, M., & Gingeras, T. R. (2013). STAR: ultrafast universal RNA-seq aligner. *Bioinformatics*, 29(1), 15-21.
- **Dubos, C.; Stracke, R.; Grotewold, E.; Weisshaar, B.; Martin, C.; Lepiniec, L**. (2010). MYB transcription factors in Arabidopsis. *Trends Plant Sci.* 15, 573–581.
- Erpen, L.; Devi, H.S.; Grosser, J.W.; Dutt, M. (2018). Potential use of the DREB/ERF, MYB, NAC and WRKY transcription factors to improve abiotic and biotic stress in transgenic plants. *Plant Cell Tissue Organ Cult. 132*, 1–25.
- Estavillo, G.M., Crisp, P.A., Pornsiriwong, W., Wirtz, M., Collinge, D., Carrie, C., Giraud, E., Whelan, J., David, P., Javot, H. (2011). Evidence for a SAL1- PAP chloroplast retrograde pathway that functions in drought and high light signaling in Arabidopsis. *Plant Cell* 23: 3992–4012
- Fan, X. Y., Sun, Y., Cao, D. M., Bai, M. Y., Luo, X. M., Yang, H. J., Wei, C. Q., Zhu, S. W., Sun, Y., Chong, K., & Wang, Z. Y. (2012). BZS1, a B-box protein, promotes photomorphogenesis downstream of both brassinosteroid and light signaling pathways. *Molecular plant*, 5(3), 591–600.
- Fankhauser, C., and Chory, J. (1997). Light control of plant development. Annu. Rev. Cell Dev. Biol. 13: 203-229.
- Fitter, D.W., Martin, D.J., Copley, M.J., Scotland, R.W., and Langdale, J.A. (2002). GLK gene pairs regulate chloroplast develop- ment in diverse plant species. *Plant J.* 31: 713–727.
- Fitter, D.W., Martin, D.J., Copley, M.J., Scotland, R.W., Langdale, J.A. (2002). GLK gene pairs regulate chloroplast development in diverse plant species. *The Plant Journal* 31: 713–727.
- **Fowler, S., Thomashow, M.F.** (2002). Arabidopsis transcriptome profiling indi- cates that multiple regulatory pathways are activated during cold acclimation in addition to the CBF cold response pathway. *The Plant Cell* 14: 1675 1690.
- Foyer, C.H.; Rasool, B.; Davey, J.W.; Hancock, R.D. (2016). Cross-tolerance to biotic and abiotic stresses in plants: A focus on resistance to aphid infestation. *J. Exp. Bot.* 67, 2025–2037.
- Franco-Zorrilla, J.M., Lopez-Vidriero, I., Carrasco, J.L., Godoy, M., Vera, P. & Solano, R. (2014). DNA-binding specificities of plant transcription factors and their potential

to define target genes. *Proceedings of the National Academy of Sciences of the USA*, 111, 2367–2372.

- Fu, L. Y., Zhu, T., Zhou, X., Yu, R., He, Z., Zhang, P., Wu, Z., Chen, M., Kaufmann, K., & Chen, D. (2022). ChIP-Hub provides an integrative platform for exploring plant regulome. *Nature communications*, 13(1), 3413.
- Gangappa, S. N., & Botto, J. F. (2014). The BBX family of plant transcription factors. *Trends Plant Sci*, *19*(7), 460-470.
- Gangappa, S. N., Crocco, C. D., Johansson, H., Datta, S., Hettiarachchi, C., Holm, M., & Botto, J. F. (2013). The Arabidopsis B-BOX protein BBX25 interacts with HY5, negatively regulating BBX22 expression to suppress seedling photomorphogenesis. *Plant Cell*, 25(4), 1243-1257.
- Gangappa, S. N., Holm, M., & Botto, J. F. (2013). Molecular interactions of BBX24 and BBX25 with HYH, HY5 HOMOLOG, to modulate Arabidopsis seedling development. *Plant Signal Behav*, 8(8).
- Garcia-Molina, A., Kleine, T., Schneider, K., Muhlhaus, T., Lehmann, M. and Leister, D. (2020). Translational Components Contribute to Acclimation Responses to High Light, Heat, and Cold in Arabidopsis. *iScience*, 23, 101331
- Garcia-Molina, A., Kleine, T., Schneider, K., Muhlhaus, T., Lehmann, M. & Leister, D. (2020). Translational components contribute to acclimation responses to high light, heat, and cold in Arabidopsis. *iScience*, 23, 101331.
- Ge, S.X., Jung, D., Yao, R. (2020). ShinyGO: a graphical gene-set enrichment tool for animals and plants. *Bioinformatics*. 36(8):2628-2629.
- Gollan, P. J., Tikkanen, M., and Aro, E. M. (2015). Photosynthetic light reactions: integral to chloroplast retrograde signalling. *Curr. Opin. Plant Biol.* 27, 180–191.
- Gommers, C.M.M., Monte, E. (2018). Seedling establishment: a dimmer switch-regulated process between dark and light signaling. *Plant Physiology* 176: 1061–1074.
- Gray, W. M. (2004). Hormonal regulation of plant growth and development. *PLoS biology*, 2(9), E311.
- Griffiths, S., Dunford, R.P., Coupland, G., Laurie, D.A. (2003). The evolution of CONSTANS-like gene families in barley, rice, and Arabidopsis. *Plant Physiol.* 131, 1855–1867
- Guo, A., He K., Liu, D., Bai, S., Gu X., Wei, L. (2005). DATF: a database of Arabidopsis transcription factors. *Bioinformatics* 21: 2568–2569.
- Habermann, K., Tiwari, B., Krantz, M., Adler, S.O., Klipp, E., Arif, M.A. (2020). Identification of small non-coding RNAs responsive to GUN1 and GUN5 related retrograde signals in Arabidopsis thaliana. *The Plant Journal*, 104, 138–155.

- Han, X., Huang, X. & Deng, X.W. (2020). The photomorphogenic central repressor COP1: conservation and functional diversification during evolution. *Plant Communications*, 1, 100044.
- Heng, Y., Lin, F., Jiang, Y., Ding, M., Yan, T., Lan, H. (2019). B-box containing proteins BBX30 and BBX31, acting downstream of HY5, negatively regulate photomorphogenesis in Arabidopsis. *Plant Physiology*, 180, 497–508.
- Heng, Y., Lin, F., Jiang, Y., Ding, M., Yan, T., Lan, H., Zhou, H., Zhao, X., Xu, D., Deng, X.W. (2019). B-box containing proteins BBX30 and BBX31, acting downstream of HY5, negatively regulate photomorphogenesis in Arabidopsis. *Plant Physiology* 180: 497–508.
- Hernandez-Verdeja, T., Vuorijoki, L., Jin, X., Vergara, A., Dubreuil, C., & Strand, A. (2022). GENOMES UNCOUPLED1 plays a key role during the de-etiolation process in Arabidopsis. *New Phytol*, 235(1), 188-203.
- Hoang, X.L.T.; Nhi, D.N.H.; Thu, N.B.A.; Thao, N.P.; Tran, L.-S.P. (2017). Transcription Factors and Their Roles in Signal Transduction in Plants under Abiotic Stresses. *Curr. Genomics.* 18, 483–497.
- Holm, M., Hardtke, C. S., Gaudet, R., & Deng, X. W. (2001). Identification of a structural motif that confers specific interaction with the WD40 repeat domain of Arabidopsis COP1. *The EMBO journal*, 20(1-2), 118–127.
- Holtan, H. E., Bandong, S., Marion, C. M., Adam, L., Tiwari, S., Shen, Y., Maloof, J. N., Maszle, D. R., Ohto, M. A., Preuss, S., Meister, R., Petracek, M., Repetti, P. P., Reuber, T. L., Ratcliffe, O. J., & Khanna, R. (2011). BBX32, an Arabidopsis B-Box protein, functions in light signaling by suppressing HY5-regulated gene expression and interacting with STH2/BBX21. *Plant physiology*, 156(4), 2109–2123.
- Honkanen, S., & Small, I. (2022). The GENOMES UNCOUPLED1 protein has an ancient, highly conserved role but not in retrograde signalling. *The New phytologist*, 236(1), 99–113.
- Hrmova, M., & Lopato, S. (2014). Enhancing Abiotic Stress Tolerance in Plants by Modulating Properties of Stress Responsive Transcription Factors. In *Genomics of Plant Genetic Resources* (pp. 291-316).
- Huang, J., Zhao, X., & Chory, J. (2019). The Arabidopsis Transcriptome Responds Specifically and Dynamically to High Light Stress. *Cell Rep*, 29(12), 4186-4199 e4183.
- Huang, J., Zhao, X., Weng, X., Wang, L., & Xie, W. (2012). The rice B-box zinc finger gene family: genomic identification, characterization, expression profiling and diurnal analysis. *PLoS One*, 7(10), e48242.
- Indorf, M., Cordero, J., Neuhaus, G., & Rodríguez-Franco, M. (2007). Salt tolerance (STO), a stress-related protein, has a major role in light signalling. *The Plant journal* : *for cell and molecular biology*, *51*(4), 563–574.

- Inukai, S.; Kock, K.H.; Bulyk, M.L. (2017). Transcription factor-DNA binding: Beyond binding site motifs. *Curr. Opin. Genet.* 34, 110–119.
- Jiang, L., Wang, Y., Li, Q. F., Björn, L. O., He, J. X., & Li, S. S. (2012). Arabidopsis STO/BBX24 negatively regulates UV-B signaling by interacting with COP1 and repressing HY5 transcriptional activity. *Cell research*, *22*(6), 1046–1057.
- Jiao, Y., Lau, O. S., & Deng, X. W. (2007). Light-regulated transcriptional networks in higher plants. *Nature reviews. Genetics*, 8(3), 217–230. Kami, C., Lorrain, S., Hornitschek, P., & Fankhauser, C. (2010). Light-regulated plant growth and development. *Current* topics in developmental biology, 91, 29–66.
- Jiao, Y., Lau, O.S., and Deng, X.W. (2007). Light-regulated transcriptional networks in higher plants. *Nat. Rev. Genet* 8, 217–230.
- Jing, Y., Lin, R. (2020). Transcriptional regulatory network of the light signaling pathways. *New Phytologist* 227: 683–697.
- Job, N., Yadukrishnan, P., Bursch, K., Datta, S., & Johansson, H. (2018). Two B-Box Proteins Regulate Photomorphogenesis by Oppositely Modulating HY5 through their Diverse C-Terminal Domains. *Plant Physiol*, 176(4), 2963-2976.
- Jung, H-S., Crisp, P.A., Estavillo, G.M., Cole, B., Hong, F., Mockler, T.C., Pogson, B.J., and Chory, J. (2013). Subset of heat-shock transcription factors required for the early response of Arabidopsis to excess light. *Proc. Natl. Acad. Sci. USA* 110, 14474–14479.
- Jung, H.S., Crisp, P.A., Estavillo, G.M., Cole, B., Hong, F., Mockler, T.C., Pogson, B.J., Chory, J. (2013). Subset of heat-shock transcription factors required for the early response of Arabidopsis to excess light. *Proc Natl Acad Sci USA* 110: 14474–14479
- Karimi, M., Inzé, D., Depicker, A. (2002) GATEWAY vectors for Agrobacterium mediated plant transformation. *Trends Plant Sci.* 7(5):193-5.
- Kato, T., Murakami, M., Nakamura, Y., Ito, S., Nakamichi, N., Yamashino, T., & Mizuno, T. (2007). Mutants of circadian-associated PRR genes display a novel and visible phenotype as to light responses during de-etiolation of Arabidopsis thaliana seedlings. *Biosci Biotechnol Biochem*, 71(3), 834-839.
- Kaufmann, K., Muino, J.M., Osteras, M., Farinelli, L., Krajewski, P. and Angenent, G.C. (2010). Chromatin immunoprecipitation (ChIP) of plant transcription factors followed by sequencing (ChIP-SEQ) or hybridization to whole genome arrays (ChIP-CHIP). *Nat Protoc*, 5, 457-472.
- Kenrick, P., Crane, P.R. (1997). The origin and early evolution of plants on land. *Nature*, 389 , pp. 33-39
- Khanna, R., Shen, Y., Toledo-Ortiz, G., Kikis, E. A., Johannesson, H., Hwang, Y. S., & Quail, P. H. (2006). Functional profiling reveals that only a small number of phytochrome-regulated early-response genes in Arabidopsis are necessary for optimal deetiolation. *The Plant cell*, 18(9), 2157–2171.

- Khanna, R., Kronmiller, B., Maszle, D. R., Coupland, G., Holm, M., Mizuno, T., & Wu, S. H. (2009). The Arabidopsis B-box zinc finger family. *Plant Cell*, *21*(11), 3416-3420.
- **Kielbowicz-Matuk A.** (2012). Involvement of plant C(2)H(2)-type zinc finger transcription factors in stress responses. *Plant science : an international journal of experimental plant biology*, *185-186*, 78–85.
- Kleine, T., Kindgren, P., Benedict, C., Hendrickson, L., and Strand, A. (2007). Genomewide gene expression analysis reveals a critical role for CRYPTOCHROME1 in the response of Arabidopsis to high irradiance. *Plant Physiol*. 144, 1391–1406.
- Kleine, T., Maier, U. G., & Leister, D. (2009). DNA transfer from organelles to the nucleus: the idiosyncratic genetics of endosymbiosis. *Annual review of plant biology*, 60, 115–138.
- Kleine, T., Voigt, C., & Leister, D. (2009). Plastid signalling to the nucleus: messengers still lost in the mists? *Trends Genet*, *25*(4), 185-192.
- Kleine, T., & Leister, D. (2013). Retrograde signals galore. Front Plant Sci, 4, 45.
- Kleine, T., & Leister, D. (2016). Retrograde signaling: Organelles go networking. *Biochim Biophys Acta*, 1857(8), 1313-1325.
- Kleine, T., Nagele, T., Neuhaus, H. E., Schmitz-Linneweber, C., Fernie, A. R., Geigenberger, P., Grimm, B., Kaufmann, K., Klipp, E., Meurer, J., Mohlmann, T., Muhlhaus, T., Naranjo, B., Nickelsen, J., Richter, A., Ruwe, H., Schroda, M., Schwenkert, S., Trentmann, O., Leister, D. (2021). Acclimation in plants - the Green Hub consortium. *Plant J*, 106(1), 23-40.
- Klug, A., and Schwabe, J.W.R. (1995). Zinc fingers. FASEB J. 9: 597-604.
- Kobayashi, K., Obayashi, T. & Masuda, T. (2012) Role of the G-box element in regulation of chlorophyll biosynthesis in Arabidopsis roots. *Plant Signaling & Behavior*, 7, 922–926.
- Koussevitzky, S., Nott, A., Mockler, T.C., Hong, F., Sachetto-Martins, G., Surpin, M., Lim, J., Mittler, R., Chory, J. (2007). Signals from chloroplasts converge to regulate nuclear gene expression. *Science* 316: 715–719
- Koussevitzky, S., Nott, A., Mockler, T.C., Hong, F., Sachetto-Martins, G., Surpin, M., Lim, J., Mittler, R., Chory, J. (2007). Signals from chloroplasts converge to regulate nuclear gene expression. *Science* 316: 715–719
- Kumagai, T., Ito, S., Nakamichi, N., Niwa, Y., Murakami, M., Yamashino, T., and Mizuno, T. (2008). The common function of a novel subfamily of B-Box zinc finger proteins with reference to circadian-associated events in *Arabidopsis thaliana*. *Biosci. Biotechnol. Bio- chem.* 72: 1539–1549.
- Langmead, B. and Salzberg, S.L. (2012). Fast gapped-read alignment with Bowtie 2. Nat Methods, 9, 357-359

- Larkin, R. M., Alonso, J. M., Ecker, J. R., and Chory, J. (2003). GUN4, a regulator of chlorophyll synthesis and intracellular signaling. *Science* 299, 902–906.
- Ledger, S., Strayer, C., Ashton, F., Kay, S.A., Putterill, J. (2001). Analysis of the function of two circadian-regulated CONSTANS-LIKE genes. *Plant J* 26: 15–22
- Lee, J., He, K., Stolc, V., Lee, H., Figueroa, P., Gao, Y., Tongprasit, W., Zhao, H., Lee, I., & Deng, X. W. (2007). Analysis of transcription factor HY5 genomic binding sites revealed its hierarchical role in light regulation of development. *The Plant cell*, 19(3), 731–749.
- Lee, J., He, K., Stolc, V., Lee, H., Figueroa, P., Gao, Y., Tongprasit, W., Zhao, H., Lee, I., and Deng, X.W. (2007). Analysis of transcription factor HY5 genomic binding sites revealed its hierarchical role in light regulation of development. *Plant Cell* 19: 731– 749.
- Lee, K.P., Kim, C., Landgraf, F., Apel, K. (2007). EXECUTER1- and EXECUTER2dependent transfer of stress-related signals from the plastid to the nu- cleus of Arabidopsis thaliana. *Proc Natl Acad Sci USA* 104: 10270–10275
- Leister, D. (2012). Retrograde signaling in plants: from simple to complex scenarios. *Front Plant Sci*, *3*, 135.
- Leister, D., & Kleine, T. (2016). Definition of a core module for the nuclear retrograde response to altered organellar gene expression identifies GLK overexpressors as gun mutants. *Physiol Plant*, 157(3), 297-309.
- Leister, D., Romani, I., Mittermayr, L., Paieri, F., Fenino, E., & Kleine, T. (2014). Identification of target genes and transcription factors implicated in translation-dependent retrograde signaling in Arabidopsis. *Mol Plant*, 7(7), 1228-1247.
- Leister, D., Wang, L., & Kleine, T. (2017). Organellar Gene Expression and Acclimation of Plants to Environmental Stress. *Front Plant Sci*, *8*, 387.
- Leister, D., Wang, X., Haberer, G., Mayer, K. F., & Kleine, T. (2011). Intracompartmental and intercompartmental transcriptional networks coordinate the expression of genes for organellar functions. *Plant Physiol*, 157(1), 386-404.
- Leivar, P., Martın, G., Soy, J., Dalton-Roesler, J., Quail, P.H., Monte, E. (2020). Phytochrome-imposed inhibition of PIF7 activity shapes photoperiodic growth in Arabidopsis together with PIF1, 3, 4 and 5. *Physiologia Plantarum* 169: 452–466.
- Leivar, P., Monte, E., Oka, Y., Liu, T., Carle, C., Castillon, A., Huq, E., Quail, P.H. (2008). Multiple phytochrome-interacting bHLH transcription factors repress premature seedling photomorphogenesis in darkness. *Current Biology* 18: 1815–1823.
- Leivar, P., Tepperman, J.M., Monte, E., Calderon, R.H., Liu, T.L., Quail, P.H. (2009). Definition of early transcriptional circuitry involved in light-induced reversal of PIFimposed repression of photomorphogenesis in young Arabidopsis seedlings. *Plant Cell.*; 21(11):3535-53.

- Li, M., Lee, K. P., Liu, T., Dogra, V., Duan, J., Li, M., Xing, W., & Kim, C. (2022). Antagonistic modules regulate photosynthesis-associated nuclear genes via GOLDEN2-LIKE transcription factors. *Plant Physiol*, *188*(4), 2308-2324.
- Li, Y., Shi, Y., Li, M., Fu, D., Wu, S., Li, J., Gong, Z., Liu, H., & Yang, S. (2021). The CRY2-COP1-HY5-BBX7/8 module regulates blue light-dependent cold acclimation in Arabidopsis. *Plant Cell*, 33(11), 3555-3573.
- Liao, Y., Smyth, G.K. and Shi, W. (2014). featureCounts: an efficient general purpose program for assigning sequence reads to genomic features. *Bioinformatics*, 30, 923-930
- Lin, F., Jiang, Y., Li, J., Yan, T., Fan, L., Liang, J., Chen, Z. J., Xu, D., & Deng, X. W. (2018). B-BOX DOMAIN PROTEIN28 Negatively Regulates Photomorphogenesis by Repressing the Activity of Transcription Factor HY5 and Undergoes COP1-Mediated Degradation. *The Plant cell*, 30(9), 2006–2019.
- Lippuner, V., Cyert, M. S., & Gasser, C. S. (1996). Two classes of plant cDNA clones differentially complement yeast calcineurin mutants and increase salt tolerance of wild-type yeast. *The Journal of biological chemistry*, 271(22), 12859–12866.
- Lorick, K. L., Jensen, J. P., Fang, S., Ong, A. M., Hatakeyama, S., & Weissman, A. M. (1999). RING fingers mediate ubiquitin-conjugating enzyme (E2)-dependent ubiquitination. *Proceedings of the National Academy of Sciences of the USA*, 96(20), 11364–11369.
- Love, M.I., Huber, W. and Anders, S. (2014). Moderated estimation of fold change and dispersion for RNA-seq data with DESeq2. *Genome Biol*, 15, 550.
- Lyska, D., Engelmann, K., Meierhoff, K., Westhoff, P. (2013). pAUL: a gateway-based vector system for adaptive expression and flexible tagging of proteins in Arabidopsis. *PLoS One.* 8(1)
- Lyu, G., Li, D., Li, S. (2020). Bioinformatics analysis of BBX family genes and its response to UV-B in Arabidopsis thaliana. *Plant Signaling & Behavior* 15: 1782647.
- Ma, L., Li, J., Qu, L., Hager, J., Chen, Z., Zhao, H., Den,g X.W. (2001). Light control of Arabidopsis development entails coordinated regulation of genome expression and cellular pathways. *The Plant Cell* 13:2589–2607.
- Marino, G., Naranjo, B., Wang, J., Penzler, J-F., Kleine, T., Leister, D. (2019). Relationship of GUN1 to FUG1 in chloroplast protein homeostasis. *The Plant Journal* 99: 521–535.
- Martin, G., Leivar, P., Ludevid, D., Tepperman, J. M., Quail, P. H., & Monte, E. (2016). Phytochrome and retrograde signalling pathways converge to antagonistically regulate a light-induced transcriptional network. *Nat Commun*, *7*, 11431.
- Martın, G., Veciana, N., Boix, M., Rovira, A., Henriques, R., Monte, E. (2020). The photoperiodic response of hypocotyl elongation involves regulation of CDF1 and CDF5 activity. *Physiologia Plantarum* 169: 480–490.

- Massiah, M.A. (2007). Solution structure of the MID1 B-box2 CHC(D/C)C(2)H(2) zincbinding domain: insights into an evolutionarily conserved RING fold. *J. Mol. Biol.* 369, 1–10.
- Massiah, M.A., Simmons, B.N., Short, K.M., Cox, T.C. (2006). Solution structure of the RBCC/TRIM B-box1 domain of human MID1: B-box with a RING. *J. Mol. Biol.* 358, 532–545.
- Meroni, G., Diez-Roux, G. (2005). TRIM/RBCC, a novel class of 'single protein RING finger' E3 ubiquitin ligases. *Bioessays* 27, 1147–1157.
- Mitsuda, N., & Ohme-Takagi, M. (2009). Functional analysis of transcription factors in Arabidopsis. *Plant Cell Physiol*, 50(7), 1232-1248.
- Mochizuki, N., Brusslan, J. A., Larkin, R., Nagatani, A., and Chory, J. (2001). *Arabidopsis* genomes uncoupled 5 (GUN5) mutant reveals the involvement of Mg-chelatase H subunit in plastid-to-nucleus signal transduction. *Proc. Natl. Acad. Sci. U.S.A.* 98, 2053–2058.
- Mochizuki, N., Tanaka, R., Tanaka, A., Masuda, T., & Nagatani, A. (2008). The steadystate level of Mg-protoporphyrin IX is not a determinant of plastid-to-nucleus signaling in Arabidopsis. *Proceedings of the National Academy of Sciences of the United States* of America, 105(39), 15184–15189.
- Monte, E., Tepperman, J.M., Al-Sady, B., Kaczorowski, K.A., Alonso, J.M., Ecker, J.R., Li, X., Zhang, Y., and Quail, P.H. (2004). The phytochrome-interacting transcription factor, PIF3, acts early, selectively, and positively in light-induced chloroplast development. *Proc. Natl. Acad. Sci. USA* 101: 16091–16098.
- Moulin, M., McCormac, A. C., Terry, M. J., & Smith, A. G. (2008). Tetrapyrrole profiling in Arabidopsis seedlings reveals that retrograde plastid nuclear signaling is not due to Mg-protoporphyrin IX accumulation. *Proceedings of the National Academy of Sciences* of the USA, 105(39), 15178–15183.
- Nakamichi, N., Kiba, T., Henriques, R., Mizuno, T., Chua, N. H., & Sakakibara, H. (2010). PSEUDO-RESPONSE REGULATORS 9, 7, and 5 are transcriptional repressors in the Arabidopsis circadian clock. *Plant Cell*, 22(3), 594-605.
- Nott, A., Jung, H. S., Koussevitzky, S., & Chory, J. (2006). Plastid-to-nucleus retrograde signaling. *Annu Rev Plant Biol*, 57, 739-759.
- Nuruzzaman, M., Sharoni, A. M., & Kikuchi, S. (2013). Roles of NAC transcription factors in the regulation of biotic and abiotic stress responses in plants. *Front Microbiol*, *4*, 248.
- **Oelmüller, R., Levitan, I., Bergfeld, R., Rajasekhar, V. K., & Mohr, H.** (1986). Expression of nuclear genes as affected by treatments acting on the plastids. *Planta*, 168(4), 482–492.

- Osterlund, M. T., Hardtke, C. S., Wei, N., & Deng, X. W. (2000). Targeted destabilization of HY5 during light-regulated development of Arabidopsis. *Nature*, 405(6785), 462–466.
- **Oyama, T., Shimura, Y., and Okada, K.** (1997). The Arabidopsis HY5 gene encodes a bZIP protein that regulates stimulus-induced devel- opment of root and hypocotyl. *Genes Dev.* 11: 2983–2995.
- Paddock, T.N., Mason, M.E., Lima, D.F., Armstrong, G.A. (2010) Arabidopsis protochlorophyllide oxidoreductase A (PORA) restores bulk chlorophyll synthesis and normal development to a porB porC double mutant. *Plant Mol Biol.* 72(4-5):445-57.
- Peers, G., & Niyogi, K. K. (2008). Pond scum genomics: the genomes of Chlamydomonas and Ostreococcus. *The Plant cell*, 20(3), 502–507.
- Paik, I., Kathare, P. K., Kim, J. I., & Huq, E. (2017). Expanding Roles of PIFs in Signal Integration from Multiple Processes. *Mol Plant*, 10(8), 1035-1046.
- Pesaresi, P., Masiero, S., Eubel, H., Braun, H.P., Bhushan, S., Glaser, E., Salamini, F., and Leister, D. (2006). Nuclear photosynthetic gene expression is synergistically modulated by rates of protein syn- thesis in chloroplasts and mitochondria. *Plant Cell*. 18, 970–991.
- Pfannschmidt, T., Nilsson, A., Allen, J.F. (1999). Photosynthetic control of chloroplast gene expression. *Nature* 397: 625–628.
- Pfeiffe,r A., Shi, H., Tepperman, J.M., Zhang, Y., Quail, P.H. (2014). Combinatorial complexity in a transcriptionally centered signaling hub in Arabidopsis. *Molecular Plant* 7: 1598–1618.
- Pipitone, R., Eicke, S., Pfister, B., Glauser, G., Falconet, D., Uwizeye, C., Pralon, T., Zeeman, S.C., Kessler, F., Demarsy, E. (2021). A multifaceted analysis reveals two distinct phases of chloroplast biogenesis during de-etiolation in *Arabidopsis*. *Elife*. 25;10:e62709.
- Podolec, R. & Ulm, R. (2018). Photoreceptor-mediated regulation of the COP1/-SPA E3 ubiquitin ligase. *Current Opinion in Plant Biology*, 45, 18–25.
- Purvis, J., Ilango, V., Radhakrishnan, R. (2008). Role of network branching in eliciting differential short-term signaling responses in the hypersensitive epidermal growth factor receptor mutants implicated in lung cancer. *Biotechnology Process* 24: 540–553.
- Quinlan, A.R. and Hall, I.M. (2010). BEDTools: a flexible suite of utilities for comparing genomic features. *Bioinformatics*, 26, 841-842.
- Richter, A.S., Tohge, T., Fernie, A.R. & Grimm, B. (2020). The genomes uncoupleddependent signalling pathway coordinates plastid biogenesis with the synthesis of anthocyanins. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 375, 20190403.

- Richter, A. S., Nagele, T., Grimm, B., Kaufmann, K., Schroda, M., Leister, D., & Kleine, T. (2023). Retrograde signaling in plants: A critical review focusing on the GUN pathway and beyond. *Plant Commun*, 4(1), 100511.
- Riechmann, J.L., Heard, J., Martin, G., Reuber, L., Jiang, C., Keddie, J. (2000). Arabidopsis transcription factors: genome-wide comparative analysis among eukaryotes. *Science* 290: 2105–2110.
- Robson, F., Costa, M. M., Hepworth, S. R., Vizir, I., Piñeiro, M., Reeves, P. H., Putterill, J., & Coupland, G. (2001). Functional importance of conserved domains in the flowering-time gene CONSTANS demonstrated by analysis of mutant alleles and transgenic plants. *The Plant journal: for cell and molecular biology*, 28(6), 619–631.
- Rossel, J.B., Wilson, I.W., and Pogson, B.J. (2002). Global changes in gene expression in response to high light in Arabidopsis. *Plant Physiol.* 130, 1109–1120.
- Ruckle, M.E., DeMarco, S.M. & Larkin, R.M. (2007). Plastid signals remodel light signaling networks and are essential for efficient chloroplast bio- genesis in Arabidopsis. *Plant Cell*, 19, 3944–3960.
- Rushton, P.J., Macdonald, H., Huttly, A.K., Lazarus, C.M., and Hooley, R. (1995). Members of a new family of DNA-binding proteins bind to a conserved cis-element in the pro- moters of alpha-Amy2 genes. *Plant Mol. Biol.* 29: 691–702.
- Saibo, N. J., Lourenco, T., & Oliveira, M. M. (2009). Transcription factors and regulation of photosynthetic and related metabolism under environmental stresses. *Ann Bot*, 103(4), 609-623.
- Sambrook, J. & Russell, D.W. (2001). Molecular Cloning A Laboratory Manual, 3rd edition. New York: Cold Spring Harbor Laboratory Press.
- Sánchez, J. P., Duque, P., & Chua, N. H. (2004). ABA activates ADPR cyclase and cADPR induces a subset of ABA-responsive genes in Arabidopsis. *The Plant journal: for cell* and molecular biology, 38(3), 381–395.
- Shahzad, R., Jamil, S., Ahmad, S., Nisar, A., Amina, Z., Saleem, S., Zaffar Iqbal, M., Muhammad Atif, R., & Wang, X. (2021). Harnessing the potential of plant transcription factors in developing climate resilient crops to improve global food security: Current and future perspectives. *Saudi J Biol Sci*, 28(4), 2323-2341.
- Sherman, B.T., Hao, M., Qiu, J., Jiao, X., Baseler, M.W., Lane, H.C. (2022). DAVID: a web server for functional enrichment analysis and func- tional annotation of gene lists (2021 update). *Nucleic Acids Research*, 50, W216–W221.
- Shi, H., Lyu, M., Luo, Y., Liu, S., Li, Y., He, H., Wie, N., Deng, X.W., Zhong, S. (2018). Genome-wide regulation of light-controlled seedling morphogenesis by three families of transcription factors. *Proceedings of the National Academy of Sciences, USA* 115: 6482–6487.

- Shimizu, T., Kacprzak, S. M., Mochizuki, N., Nagatani, A., Watanabe, S., Shimada, T., Tanaka, K., Hayashi, Y., Arai, M., Leister, D., Okamoto, H., Terry, M. J., & Masuda, T. (2019). The retrograde signaling protein GUN1 regulates tetrapyrrole biosynthesis. *Proc Natl Acad Sci U S A*, 116(49), 24900-24906.
- Shimizu, T., Kacprzak, S. M., Mochizuki, N., Nagatani, A., Watanabe, S., Shimada, T., Tanaka, K., Hayashi, Y., Arai, M., Leister, D., Okamoto, H., Terry, M. J., & Masuda, T. (2019). The retrograde signaling protein GUN1 regulates tetrapyrrole biosynthesis. *Proc. Natl. Acad. Sci. USA*, 116(49), 24900–24906.
- Shin, J., Kim, K., Kang, H., Zulfugarov, I.S., Bae, G., Lee, C-H., Lee, D., Choi, G. (2009). Phytochromes promote seedling light responses by inhibiting four negatively- acting phytochrome-interacting factors. *Proceedings of the National Academy of Sciences*, USA 106: 7660–7665.
- Short, K.M., Cox, T.C. (2006). Sub-classification of the RBCC/TRIM superfamily reveals a novel motif necessary for microtubule binding. *J. Biol. Chem.* 281, 8970–8980.
- Singh, D., Datta, S. (2023). BBX30/miP1b and BBX31/miP1a form a positive feedback loop with ABI5 to regulate ABA-mediated postgermination seedling growth arrest. *New Phytol.* 238(5):1908-1923.
- Song, Z., Yan, T., Liu, J., Bian, Y., Heng, Y., Lin, F. (2020). BBX28/BBX29, HY5 and BBX30/31 form a feedback loop to fine-tune photomorphogenic development. *The Plant Journal*, 104, 377–390.
- Song, Z., Yan, T., Liu, J., Bian, Y., Heng, Y., Lin, F., Jiang, Y., Deng, XW., Xu, D. (2020). BBX28/BBX29, HY5 and BBX30/31 form a feedback loop to fine-tune photomorphogenic development. *The Plant Journal* 104: 377–390.
- Sornaraj, P., Luang,S., Lopato, S., Hrmova, M. (2016). Basic leucine zipper (bZIP) transcription factors involved in abiotic stresses: A molecular model of a wheat bZIP factor and implications of its structure in function. *Biochim. Biophys. Acta 1860*, 46–56.
- Strand, A., Asami, T., Alonso, J., Ecker, J.R., Chory, J. (2003). Chloroplast to nucleus communication triggered by accumulation of Mg-protoporphyrin IX. *Nature* 421: 79– 83
- Strand, A., Asami, T., Alonso, J., Ecker, J.R., Chory, J. (2003). Chloroplast to nucleus communication triggered by accumulation of Mg-protoporphyrinIX. *Nature* 421:79–83
- Sullivan, J.A., and Deng X.W. (2003). From seed to seed: The role of photoreceptors in *Arabidopsis* development. *Dev. Biol.* 260: 289–297.
- Sun, Y., Fan, X. Y., Cao, D. M., Tang, W., He, K., Zhu, J. Y., He, J. X., Bai, M. Y., Zhu, S., Oh, E., Patil, S., Kim, T. W., Ji, H., Wong, W. H., Rhee, S. Y., & Wang, Z. Y. (2010). Integration of brassinosteroid signal transduction with the transcription network for plant growth regulation in Arabidopsis. *Developmental cell*, 19(5), 765–777.

- Sun, X., Feng, P., Xu, X., Guo, H., Ma, J., Chi, W., Lin, R., Lu, C., & Zhang, L. (2011). A chloroplast envelope-bound PHD transcription factor mediates chloroplast signals to the nucleus. *Nat Commun*, 2, 477.
- Susek, R. E., Ausubel, F. M., and Chory, J. (1993). Signal transduction mutants of arabidopsis uncouple nuclear *CAB* and *RBCS* gene expression from chloroplast development. *Cell* 74, 787–799.
- Susila, H., Nasim, Z., Gawarecka, K., Jung, J. Y., Jin, S., Youn, G., & Ahn, J. H. (2023). Chloroplasts prevent precocious flowering through a GOLDEN2-LIKE-B-BOX DOMAIN PROTEIN module. *Plant Commun*, 4(3), 100515.
- Suzuki, N., Devireddy, A.R., Inupakutika, M.A., Baxter, A., Miller, G., Song, L., Shulaev, E., Azad, R.K., Shulaev, V., and Mittler, R. (2015). Ultra-fast alterations in mRNA levels uncover multiple players in light stress acclimation in plants. *Plant J.* 84, 760–772.
- Suzuki, N., Miller, G., Salazar, C., Mondal, H. A., Shulaev, E., Cortes, D. F. (2013). Temporal-spatial interaction between reactive oxygen species and abscisic acid regulates rapid systemic acclimation in plants. *Plant Cell* 25, 3553–3569.
- Suzuki, N., Miller, G., Salazar, C., Mondal, H. A., Shulaev, E., Cortes, D. F., Shuman, J. L., Luo, X., Shah, J., Schlauch, K., Shulaev, V., & Mittler, R. (2013). Temporalspatial interaction between reactive oxygen species and abscisic acid regulates rapid systemic acclimation in plants. *The Plant cell*, 25(9), 3553–3569.
- Tadini, L., Pesaresi, P., Kleine, T., Rossi, F., Guljamow, A., Sommer, F., Muehlhaus, T., Schroda, M., Masiero, S., Pribil, M. (2016). GUN1 controls accumulation of the plastid ribosomal protein s1 at the protein level and interacts with proteins involved in plastid protein homeostasis. *Plant Physiology* 170: 1817–1830.
- Talar, U., & Kielbowicz-Matuk, A. (2021). Beyond Arabidopsis: BBX Regulators in Crop Plants. *Int J Mol Sci*, 22(6).
- Tamura, K., Peterson, D., Peterson, N., Stecher, G., Nei, M., Kumar, S. (2011). MEGA5: molecular evolutionary genetics analysis using maximum likelihood, evolutionary distance, and maximum parsimony methods. *Mol. Biol. Evol.* 28, 2731–2739.
- Terry, M. J., and Smith, A. G. (2013). A model for tetrapyrrole synthesis as the primary mechanism for plastid-to-nucleus signaling during chloroplast biogenesis. *Front. Plant Sci.* 4:14.
- **Terry, M.J., Kacprzak, S.M.** (2019). A Simple Method for Quantification of Protochlorophyllide in Etiolated Arabidopsis Seedlings. *Methods Mol Biol.* 2026:169-177.
- Terry, M.J., Smith, A.G. (2013). A model for tetrapyrrole synthesis as the primary mechanism for plastid-to-nucleus signaling during chloroplast biogenesis. *Front Plant Sci* 4: 14

- Tokumaru, M., Adachi, F., Toda, M., Ito-Inaba, Y., Yazu, F., Hirosawa, Y. (2017). Ubiquitin-proteasome dependent regulation of the GOLDEN2-LIKE 1 transcription factor in response to plastid signals. *Plant Physiology*, 173, 524–535.
- **Torok, M., and Etkin, L.D.** (2001). Two B or not two B? Overview of the rapidly expanding B-box family of proteins. *Differentiation* 67: 63–71.
- Tripathi, P., Carvallo, M., Hamilton, E. E., Preuss, S., & Kay, S. A. (2017). Arabidopsis B-BOX32 interacts with CONSTANS-LIKE3 to regulate flowering. *Proc Natl Acad Sci U S A*, *114*(1), 172-177.
- Tripathi, S., Hoang, Q.T.N., Han, Y.J., Kim, J.I. (2019). Regulation of Photomorphogenic Development by Plant Phytochromes. *Int J Mol Sci.* 20(24):6165.
- **Tripathy, B. C., & Pattanayak, G. K.** (2012). Chlorophyll biosynthesis in higher plants. *Photosynthesis: plastid biology, energy conversion and carbon assimilation*, 63-94.
- Vaishak, K. P., Yadukrishnan, P., Bakshi, S., Kushwaha, A. K., Ramachandran, H., Job, N., Babu, D., & Datta, S. (2019). The B-box bridge between light and hormones in plants. J Photochem Photobiol B, 191, 164-174.
- Van Aken, O., Whelan, J. (2012). Comparison of transcriptional changes to chloroplast and mitochondrial perturbations reveals common and specific responses in Arabidopsis. *Front Plant Sci* 3: 281
- Veciana, N., Martin, G., Leivar, P., & Monte, E. (2022). BBX16 mediates the repression of seedling photomorphogenesis downstream of the GUN1/GLK1 module during retrograde signalling. *New Phytol*, 234(1), 93-106.
- Von Wettstein, D., Gough, S., Kannangara, C.G. (1995). Chlorophyll biosynthesis. *The Plant Cell* 7:1039–1057.
- Wang, C. Q., Sarmast, M. K., Jiang, J., & Dehesh, K. (2015). The Transcriptional Regulator BBX19 Promotes Hypocotyl Growth by Facilitating COP1-Mediated EARLY FLOWERING3 Degradation in Arabidopsis. *The Plant cell*, 27(4), 1128–1139.
- Wang, H., Zhang, Z., Li, H., Zhao, X., Liu, X., Ortiz, M. (2013). CONSTANS-LIKE 7 regulates branching and shade avoidance response in Arabidopsis. *Journal of Experimental Botany*, 64, 1017–1024.
- Wang, J.; Zhou, J.; Zhang, B.; Vanitha, J.; Ramachandran, S.; Jiang, S.Y. (2011). Genome-wide Expansion and Expression Divergence of the Basic Leucine Zipper Transcription Factors in Higher Plants with an Emphasis on Sorghum. J. Integr. Plant Biol. 53, 212–231.
- Wang, L., Xu, D., Scharf, K., Frank, W., Leister, D. and Kleine, T. (2022). The RNAbinding protein RBP45D of Arabidopsis promotes transgene silencing and flowering time. *Plant J*, 109, 1397-1415.

- Wang, Q., Tu, X., Zhang, J., Chen, X., & Rao, L. (2013). Heat stress-induced BBX18 negatively regulates the thermotolerance in Arabidopsis. *Molecular biology reports*, 40(3), 2679–2688.
- Wang, Q., Zeng, J., Deng, K., Tu, X., Zhao, X., Tang, D., & Liu, X. (2011). DBB1a, involved in gibberellin homeostasis, functions as a negative regulator of blue lightmediated hypocotyl elongation in Arabidopsis. *Planta*, 233(1), 13–23.
- Wang, Z.P., Xing, H.L., Dong, L., Zhang, H.Y., Han, C.Y., Wang, X.C. and Chen, Q.J. (2015). Egg cell-specific promoter-controlled CRISPR/Cas9 efficiently generates homozygous mutants for multiple target genes in Arabidopsis in a single generation. *Genome Biol*, 16, 144.
- Waters, M.T., Moylan, E.C., and Langdale, J.A. (2008). GLK transcription factors regulate chloroplast development in a cell- autonomous manner. Plant J. 56: 432–444.
- Waters, M. T., Wang, P., Korkaric, M., Capper, R. G., Saunders, N. J., & Langdale, J. A. (2009). GLK transcription factors coordinate expression of the photosynthetic apparatus in Arabidopsis. *Plant Cell*, 21(4), 1109-1128.
- Wei, C. Q., Chien, C. W., Ai, L. F., Zhao, J., Zhang, Z., Li, K. H., Burlingame, A. L., Sun, Y., & Wang, Z. Y. (2016). The Arabidopsis B-box protein BZS1/BBX20 interacts with HY5 and mediates strigolactone regulation of photomorphogenesis. *Journal of genetics* and genomics, 43(9), 555–563.
- Winter, D., Vinegar, B., Nahal, H., Ammar, R., Wilson, G.V. & Provart, N.J. (2007). An "Electronic Fluorescent Pictograph" browser for exploring and analyzing large-scale biological data sets. *PLoS One*, 2, e718.
- Woodson, J. D., Perez-Ruiz, J. M., & Chory, J. (2011). Heme synthesis by plastid ferrochelatase I regulates nuclear gene expression in plants. *Current biology* : *CB*, 21(10), 897–903.
- Woodson, J.D., Chory, J. (2008). Coordination of gene expression between organellar and nuclear genomes. *Nat Rev Genet* 9: 383–395
- Woodson, J.D., Perez-Ruiz, J.M., Schmitz, R.J., Ecker, J.R., Chory, J. (2013) Sigma factor-mediated plastid retrograde signals control nuclear gene expression. *Plant J* 73: 1–13
- Wu, G. Z., Chalvin, C., Hoelscher, M., Meyer, E. H., Wu, X. N., & Bock, R. (2018). Control of Retrograde Signaling by Rapid Turnover of GENOMES UNCOUPLED1. *Plant physiology*, 176(3), 2472–2495.
- **Wu, S.H.** (2014). Gene expression regulation in photomorphogenesis from the perspective of the central dogma. *Annual Review of Plant Biology* 65:311–333.
- Xiao, Y., Savchenko, T., Baidoo, E.E.K., Chehab, W.E., Hayden, D.M., Tolstikov, V., Corwin, J.A., Kliebenstein, D.J., Keasling, J.D., Dehesh, K. (2012). Retrograde

signaling by the plastidial metabolite MEcPP regulates expression of nuclear stressresponse genes. *Cell* 149: 1525–1535

- Xu, D. (2020). COP1 and BBXs-HY5-mediated light signal transduction in plants. *The New Phytologist*, 228, 1748–1753.
- Xu, D., Jiang, Y., Li, J., Holm, M., & Deng, X. W. (2018). The B-Box Domain Protein BBX21 Promotes Photomorphogenesis. *Plant physiology*, 176(3), 2365–2375.
- Xu, D., Jiang, Y., Li, J., Lin, F., Holm, M., & Deng, X. W. (2016). BBX21, an Arabidopsis B-box protein, directly activates HY5 and is targeted by COP1 for 26S proteasomemediated degradation. *Proceedings of the National Academy of Sciences of the United States of America*, 113(27), 7655–7660.
- Xu, D., Marino, G., Klingl, A., Enderle, B., Monte, E., Kurth, J., Hiltbrunner, A., Leister, D. and Kleine, T. (2019). Extrachloroplastic PP7L Functions in Chloroplast Development and Abiotic Stress Tolerance. *Plant Physiol*, 180, 323-341.
- Yadukrishnan, P., Job, N., Johansson, H., & Datta, S. (2018). Opposite roles of group IV BBX proteins: Exploring missing links between structural and functional diversity. *Plant Signal Behav*, 13(8), e1462641.
- Yan, H., Marquardt, K., Indorf, M., Jutt, D., Kircher, S., Neuhaus, G., & Rodríguez-Franco, M. (2011). Nuclear localization and interaction with COP1 are required for STO/BBX24 function during photomorphogenesis. *Plant physiology*, 156(4), 1772– 1782.
- Yan, W., Chen, D., Smaczniak, C., Engelhorn, J., Liu, H., Yang, W., Graf, A., Carles, C.C., Zhou, D.X. and Kaufmann, K. (2018). Dynamic and spatial restriction of Polycomb activity by plant histone demethylases. *Nat Plants*, 4, 681-689.
- Yanagisawa, S. (1995). A novel DNA-binding domain that may form a single zinc finger motif. Nucleic Acids Res. 23: 3403–3410.
- Yilmaz, A., Mejia-Guerra, M. K., Kurz, K., Liang, X., Welch, L., & Grotewold, E. (2011). AGRIS: the Arabidopsis Gene Regulatory Information Server, an update. *Nucleic acids research*, 39(Database issue), D1118–D1122.
- Yuan, L., Yu, Y., Liu, M., Song, Y., Li, H., Sun, J., Wang, Q., Xie, Q., Wang, L., & Xu, X. (2021). BBX19 fine-tunes the circadian rhythm by interacting with PSEUDO-RESPONSE REGULATOR proteins to facilitate their repressive effect on morningphased clock genes. *Plant Cell*, 33(8), 2602-2617.
- Zhang, X., Huai, J., Shang, F., Xu, G., Tang, W., Jing, Y., & Lin, R. (2017). A PIF1/PIF3-HY5-BBX23 Transcription Factor Cascade Affects Photomorphogenesis. *Plant Physiol*, 174(4), 2487-2500.
- Zhang, Y., Liu, T., Meyer, C.A., Eeckhoute, J., Johnson, D.S., Bernstein, B.E., Nusbaum, C., Myers, R.M., Brown, M., Li, W. and Liu, X.S. (2008). Model-based analysis of ChIP-Seq (MACS). *Genome Biol*, 9, R137.

- Zhang, Y., Mayba, O., Pfeiffer, A., Shi, H., Tepperman, J.M., Speed, T.P., Quail, P.H. (2013). A quartet of PIF bHLH factors provides a transcriptionally centered signaling hub that regulates seedling morphogenesis through differential expression-patterning of shared target genes in Arabidopsis. *PLoS Genetics* 9: e1003244.
- Zhang, Y., Tian, L., & Lu, C. (2023). Chloroplast gene expression: Recent advances and perspectives. *Plant communications*, 4(5), 100611.
- Zhang, Z., Ji, R., Li, H., Zhao, T., Liu, J., Lin, C. (2014). CONSTANS-LIKE 7 (COL7) is involved in phytochrome B (phyB)-mediated light-quality regulation of auxin homeostasis. *Molecular Plant*, 7, 1429–1440.
- Zhao, X., Huang, J., and Chory, J. (2019). GUN1 interacts with MORF2 to regulate plastid RNA editing during retrograde signaling. *Proc. Natl. Acad. Sci. USA* 116:10162– 10167.
- **Zhao, X., Huang, J., Chory, J.** (2019). GUN1 interacts with MORF2 to regulate plastid RNA editing during retrograde signaling. *Proceedings of the National Academy of Sciences, USA* 116: 10162–10167.

7. Supplemental information



D Gene ontology (GO) enrichment analysis









Figure S1. BBX14 is a target of GLK1.

(A) Chromatin-immunoprecipitation followed by sequencing (ChIP-seq) was performed with 14-day-old seedlings of a plant line that expresses GLK1 from its endogenous promoter in the Col-0 background (pGLK1:GLK1-GFP), and a snapshot of the *BBX14* gene region is shown.

(B) Snapshots of selected genes targeted by GLK1.

(C) Additional motifs bound by GLK1 identified by the MEME Suite (Bailey et al., 2015).

(**D**) Top 20 ranked GO terms according to fold enrichment within 1 kb (left side) and 3 kb (right side) of GLK1 binding site. A total of 761 and 1365 genes withing 1 kb and 3 kb of the GLK1 binding site were analyzed, respectively. GO terms are presented in biological pathways on the y-axis and ranked from highest to lowest fold enrichment. Circle sizes indicate the gene count in a GO term. A cut-off of 5-fold enrichment compared to the expected frequency in the Arabidopsis genome was applied. The gradual color represents the FDR (Benjamini-Hochberg). Results were visualized at P < 0.05 using ShinyGO v0.7 (http://bioinformatics.sdstate.edu/go75/).



The score displays the calculated error of the predicted distance for every pair of residues. Both axes indicate the position of the individual amino acids. The uncertainty in the predicted distance of two amino acids is color coded from 0 Å (blue) to 30 Å (red). The color of the intersection of a horizontal line drawn from the position of an amino acid on the y-axis and a vertical line from the position of another amino acid on the x-axis indicates the error in the predicted distance between these two residues. The upper left quadrant in all plots corresponds to errors in the distances of residues within BBX14, the lower right quadrant to errors within the respective potential interacting partner, the upper right and lower left quadrant to errors between BBX14 and potential interacting partner. Plots were generated via AlphaFold2 (https://alphafold.ebi.ac.uk).



Figure S3. Investigation of putative *gun* phenotypes of seedlings containing altered levels of *BBX14*. RT-qPCR of retrograde marker genes *LHCB1.2* (A), and *LHCB2.1*, *LHCB2.4* and *CA1* (B) in Col-0, *gun1* and *bbx14-1* mutants, and the *35S:BBX14* line with strongest overexpression (2.5-fold) of *BBX14* ("oeBBX14"). Seedlings were grown for 4 days in continuous light (100 µmol photons $m^{-2} s^{-1}$) in the absence (MS) or presence of lincomycin (LIN). RT-qPCR was performed as described in the legend to Figure 3 (C).



Figure S4. RNA-Seq of Col-0, TPT14 and gun1 seedlings.

(A) Analysis of transcriptome changes in *gun1* and TPT14 seedlings. Venn diagrams depicting the degree of overlap between the sets of genes whose expression levels were reduced or elevated by at least 2-fold in seedlings that had been treated like in **Figure 9** (A) compared with the WT (Col-0) control. Note that gene sets were selected based on two-fold change without adjusted p-value

(B) GO analysis of genes whose expression is upregulated in both *gun1* and TPT14 seedlings. The bar lengths represent the frequency of assignment (expressed as fold change compared with the whole genome) to the respective GO categories. GO annotations were determined with agriGO (Du et al., 2010).



Figure S5. Hight light acclimation of gun4-2 and "oeBBX14" plants.

(A) Phenotypes and ImagingPAM pictures of wild-type (Col-0) and mutant (*gun4-2*, oeBBX14-GFP#12 and oeBBX14-HA#4) seedling grown for 1 week under control conditions (16-h light/8-h dark, 80 μ mol photons m⁻² s⁻¹; left panel), shifted to HL conditions (16-h light/8-h dark, 1000 μ mol photons m⁻² s⁻¹), and then de-acclimated (de-acc.) in control conditions for the indicated time. A representative image from three independent plates is shown. Scale bar = 1 cm.

(B) Photosystem II maximum quantum yield (Fv/Fm) of wild-type (Col-0) and mutant (gun4-2, oeBBX14-GFP#12 and oeBBX14-HA#4) seedlings grown as described in (A). Data is shown as mean values \pm SEM of three measuring points from three different plant pools. Each pool contained more than 50 seedlings.

(C) Determination of total chlorophyll (Chl a + b) contents of seedlings grown as in (A). Data are shown as mean values \pm SD from three different plant pools. Each pool contained more than 50 seedlings.



Figure S6. Plants overexpressing BBX14 are indistinguishable from Col-0 plant at later developmental stages. Growth phenotypes of 3-weeks-old (upper panel) and 6-weeks-old (lower panel) wild-type (Col-0) and Col-0 plants carrying constructs overexpressing BBX14 under the 35S promoter (oeBBX14-HA and oeBBX14-GFP). Seedlings were first selected on plates containing 7,6 μ g/ml BASTA and surviving seedlings were transferred to soil following growth at 100 μ mol m⁻² s⁻¹ for two weeks. Scale bar = 1 cm.

AT1G25440 AT1G68520				MM <mark>K</mark> SLAN MM <mark>K</mark> SLAS	AV <mark>GAK</mark> TARAC AV <mark>GGK</mark> TARAC	DSC-VKRRAR DSC-VKRRAR	WY <mark>CAADD</mark> AFL WY <mark>CAADD</mark> AFL
AT1G25440	CQSCDSLVHS	ANP LA <mark>RR</mark> HER	V <mark>RLK</mark> TASPAV	V <mark>K</mark> HSNHSSAS	PPHEVATWHH	GFT <mark>RKAR</mark> TPR	G <mark>SGKK</mark> NNSSI
AT1G68520	CHACDGSVHS	ANP LA <mark>RR</mark> HER	V <mark>R</mark> LKS	ASA <mark>GKYR</mark> HAS	PPHQ-ATWHQ	GFT <mark>RKAR</mark> TPR	G- <mark>GKK</mark> SHTMV
AT1G25440	FHD	LVPDISIEDQ	TDNY	ELEEQLI <mark>C</mark> QV	PVLDPLVSE-	QFL	NDVVEP <mark>K</mark> IEF
AT1G68520	FHD	LVPEMSTEDQ	AESY	EVEEQLIFEV	PVMNSMVEE-	QCF	NQSLE <mark>K</mark> QNEF
AT1G25440	₽		MI	<mark>R</mark> SGLMIEEEE	DNAESCLNGF	FPTDME	L <mark>EE</mark> FAA
AT1G68520	₽		MMPL	SF <mark>K</mark> SSDEEDD	DNAESCLNGL	FPTDME	LAQFTA
AT1G25440 AT1G68520	DVETLLG <mark>R</mark> GL DVETLLGGGD	DTESYAMEEL REFHSIEELG	GLSN L <mark>GEM</mark>				<mark>SEMF</mark> KIEK
AT1G25440	DEIEEEVEEI	<mark>K</mark> AMSMDIFDD	D <mark>RK</mark> DVDGTVP	FELSFDYESS	H	–– <mark>KTSEEEVM</mark>	<mark>K</mark> NVESSGECV
AT1G68520	-L <mark>K</mark> IE <mark>K</mark> EEVE	EEGVVT <mark>R</mark> EVH	DQDEGDETSP	FEISFDYEYT	H <mark>K</mark> TTFDEGEE	D–E <mark>K</mark> EDVM <mark>K</mark> N	VMEM <mark>GVNEM</mark> S
AT1G25440	V <mark>K</mark> VKEEE	H <mark>K</mark> NVLML <mark>R</mark> LN	Y <mark>DSVISTW</mark>	<mark>GGQ</mark> GPP	WSS <mark>GEPPER</mark> D	MDISGWPAFS	MVEN <mark>GGE</mark> STH
AT1G68520	GGIKEEK	KEKALMLRLD	YESVISTW	<mark>GGQGI</mark> P	WTA <mark>R</mark> VPSEID	LDMVCFPTHT	M <mark>GESGAEA</mark> HH
AT1G25440	Q <mark>K</mark> QYVGGCLP	SSGFGDGG <mark>R</mark> E	ARVSRYREKR	RTRLFSKKIR	YEV <mark>RKLNAEK</mark>	RPRMKGRFVK	RASLAAAASP
AT1G68520	HNHF <mark>R</mark> GL <mark>GL</mark> H	LGDAGDGGRE	A <mark>R</mark> VS <mark>R</mark> YREKR	RTRLFSKKIR	YEV <mark>RK</mark> LNAEK	RPRMKGRFVK	RSSI <mark>GVAH</mark>
AT1G25440 AT1G68520	L <mark>GVNY</mark>						

Figure S7. FASTA format sequence alignment of Arabidopsis *BBX14* (AT1G68520) and *BBX15* (AT1G25440) proteins with MUSCLE. The conserved amino acids are color-labelled to indicate identical and similar amino acids purple and orange lines indicate the B-box B1 and CCT domains, respectively.



Figure S8. Circadian series expression of Arabidopsis *BBX14* (AT1G68520) according to the eFP browser. Light eFP Browser imagine of circadian expression for *BBX14* (http://bar.utoronto.ca/; Winter et al., 2007) from Arabidopsis seedlings grown under different conditions as indicated on left. Data from AtGenExpress Consortium and other labs, as indicated. Data normalized by the GCOS method with TGT value of 100. The AtGenExpress data were generated from triplicates and the average is shown. For the eFP Browser "relative" view the values are
displayed relative to the first sample in the series, or to the dark control, in the case of the AtGenExpress. Yellow and grey bars indicate lighting regimes prior to constant light or dark. Blue bars indicate the entrainment temperature dipped to 12°C from 22°C.

Table S1. GLK1 ChIP-seq data analysis. Peaks with adjusted P-values < 0.05 are shown. Analysis was performed by DESeq 2 of both ChIP-seq samples versus input DNA.

Postion	haseMean	log2(FC)	IfcSF	n-value	n-adi	gene 1 kb upstream to 1 kb downstream	gene 3 kb unstream to 3 kb downstream
Chr1-8025405	2409 93413	5 47880403	0.28020011	2 225-85	9 52F-92	AT1625440	AT1 G25440 AT1 G25450
ChrE 9590374 5	2263,53415	5,47000403	0,220030011	5 705 90	1 105 76	ATE C 24020	ATE C24020 ATE C24040
Chil 3-0305274.5	2333,81900	3,24178903	0,27734301	3,701-80	1,100-70	AT10024550	AT 5 C 5 F 10 AT 1 C 5 F 20 AT 1 C 5 F 20 AT 1 C 5 F 20
Chr1-25/11091	1832,54032	4,64310229	0,25651423	1,5/E-/3	2,01E-70	A11668520 A11668526	A11Gb8510 A11Gb8520 A11Gb852b A11Gb8530
Chr1-30018343	1688,68773	4,70446474	0,2603393	2,72E-73	2,61E-70	AT1G79790 AT1G79800	A11G79770 A11G79780 A11G79790 A11G79800 A11G79810 A11G09917
Chr5-5178146	1772,31986	4,67088078	0,26987461	2,06E-67	1,58E-64	AT5G15845 AT5G15850 AT5G15853 AT5G15860	AI5G15845 AI5G15850 AI5G15853 AI5G15860
Chr2-10567022.5	1107,71032	4,70111504	0,28363292	5,31E-62	3,40E-59	AT2G24780 AT2G24790	AT2G24765 AT2G24780 AT2G24790
Chr3-7910129	1229,30575	4,61857993	0,2894482	1,28E-57	7,04E-55		AT3G22370 AT3G22380
Chr3-5812881.5	916,404219	4,60941725	0,28982539	2,97E-57	1,42E-54	AT3G17040	AT3G17040
Chr1-6601966	1259,01107	4,18520159	0,2694263	1,03E-54	4,37E-52	AT1G19100 AT1G19110	AT1G19100 AT1G19110
Chr1-2047811	1107,81187	4,30391715	0,29316483	4,27E-49	1,64E-46	AT1G06670 AT1G06680	AT1G06670 AT1G06680 AT1G06690
Chr2-6947106	955,027933	3,79535098	0,26699538	3,70E-46	1,29E-43	AT2G15950 AT2G15960	AT2G15950 AT2G15960 AT2G15970
Chr3-5469893	914,62533	3,82009504	0,27614518	7,99E-44	2,56E-41	AT3G16140	AT3G16130 AT3G16140 AT3G16150
Chr1-29735975	767,521719	3,86730836	0,28536224	3,84E-42	1,13E-39	AT1G79040 AT1G79050	AT1G79030 AT1G79040 AT1G79050
Chr3-17494708.5	1066,66378	3,64683189	0,27157796	2,06E-41	5,66E-39	AT3G47470 AT3G07765	AT3G47460 AT3G47470 AT3G07765 AT3G47480
Chr4-7521478	909.165409	3.73601401	0.28442695	1.03E-39	2.65E-37	AT4G12800	AT4G12790 AT4G12800 AT4G12810
Chr1-27778671.5	988,16484	3,79191187	0.28963629	1.83F-39	4.39F-37	AT1G73870	AT1 G7 3860 AT1 G7 3870 AT1 G7 3875
Chr1-22444513	793 390027	3 69267589	0 28247872	2 37F-39	5 35F-37	AT1G60950 AT1G60960	AT1 G60940 AT1 G60950 AT1 G60960
Chr1-20803511	678 001962	3 81587188	0 29509678	1 51E-38	3 21E-36	AT1655670 AT1655673 AT1655675	AT1655660 AT1655670 AT1655673 AT1655675 AT1655680
Chr5-6730707 5	1110 48377	3 72400869	0 29040316	6.05E-38	1 225-35	AT5G19930 AT5G19940 AT5G19950	AT5G19920 AT5G19920 AT5G19940 AT5G19950
Chr1 2520296 5	719 645702	3,72400000	0,29040510	0,052-50	1,220-35	AT1C04812 AT1C10557	ATI COAR13 ATI CIDEET ATI CIDEED
Chir 1-5550280.5	718,043702	3,3563147	0,28113831	0,321-30	1,000-33	ATEC 4300 ATEC 4370	
Chr5-22038305	594,090954	3,78106019	0,29846923	4,44E-37	8,112-35	AT5054260 AT5054270	AI5G54260 AI5G54270 AI5G54280
Chr1-104//613	632,207279	4,07630856	0,33407579	1,52E-34	2,66E-32	AI1629930	A11629920 A11629930 A11629940
Chr2-8736699.5	490,237818	3,61972123	0,30071888	1,14E-33	1,90E-31	AT2G20250 AT2G20260	AT2G20250 AT2G20260 AT2G20270
Chr1-16851322	421,703564	3,80938568	0,32739505	1,36E-31	2,18E-29	AT1G44446	A11G44414 AT1G44446 AT1G44478
Chr4-2673061	602,265691	3,68597858	0,32180058	1,12E-30	1,72E-28	AT4G05180	AT4G05180 AT4G05190
Chr4-493529	658,480066	3,6412469	0,32132658	4,56E-30	6,73E-28	AT4G01150	AT4G01140 AT4G01150 AT4G01160
Chr2-13007314	835,414879	3,22182484	0,285632	8,27E-30	1,18E-27	AT2G08395 AT2G08400	AT2G30520 AT2G08395 AT2G08400 AT2G30530
Chr5-26568578	506,076031	3,47225364	0,30793945	8,64E-30	1,19E-27	AT5G66564 AT5G66567 AT5G66568 AT5G66570	AT5G66558 AT5G66560 AT5G66562 AT5G66564 AT5G66567 AT5G66568 AT5G66570
Chr5-579290	459,815645	3,25792496	0,29979385	8,26E-28	1,09E-25	AT5G02580	AT5G02560 AT5G02570 AT5G02580
Chr2-14524078.5	578,815087	3,12587692	0,28975061	1,96E-27	2,51E-25	AT2G08665 AT2G34420 AT2G34430	AT2G34410 AT2G08665 AT2G34420 AT2G34430 AT2G34450 AT2G34440
Chr4-14204041.5	496,993318	3,36292155	0,31194044	2,12E-27	2,63E-25	AT4G28750 AT4G28755	AT4G28740 AT4G28750 AT4G28755
Chr2-16501629	439,177224	3,26886425	0.30478827	3.88F-27	4.66F-25	AT2G39540 AT2G39550	AT2G39530 AT2G39540 AT2G39550
Chr3-8381301	433 63109	3 28759826	0 31237178	3 33E-26	3.87F-24		AT3G23400 AT3G23410
Chr2 22201766 5	661 607602	2 02720266	0.28007006	4 015 26	4 5 25 24	AT2C62060 AT2C62070	AT3C62062 AT3C00886 AT3C62060 AT3C62070
Chr2 21242208 5	275 7609	3,03730200	0,20050338	4,012-20	1 205 22	AT3C0803E AT3CE7410	AT3CE7400 AT3C0801E AT3C0803E AT3CE7410
Chr3-21242398.5	3/5,/608	3,22241626	0,30950238	1,10E-25	1,20E-23	AT3608925 AT3657410	A13G57400 A13G08915 A13G08925 A13G57410
Chr2-14849448	398,002668	3,21257648	0,31137489	2,94E-25	3,14E-23	A12G35250 A12G35260	A12G55250 A12G55260
Chr1-21092763.5	403,070738	3,32608114	0,32253416	3,10E-25	3,22E-23	AI1656340 AI1656345	A11G56340 A11G56345 A11G56350
Chr4-14135369	375,750488	3,23311524	0,31620181	7,67E-25	7,75E-23	AT4G28610 AT4G28620	AT4G28600 AT4G28610 AT4G28620 AT4G28630
Chr1-10722416.5	750,980338	2,85954782	0,28032713	9,84E-25	9,69E-23	AT1G30380	AT1G30370 AT1G30380
Chr2-1824422	364,572406	3,63593831	0,36395058	8,41E-24	8,08E-22	AT2G05100	AT2G05100
Chr1-7140368.5	524,320548	3,14977162	0,32029362	4,02E-23	3,76E-21		AT1G20610 AT1G20620
Chr5-4634111.5	517,177939	2,74258464	0,27941881	4,84E-23	4,42E-21	AT5G14370	AT5G14360 AT5G14370 AT5G14380
Chr1-754289	388,254512	2,89819197	0,29929914	1,78E-22	1,59E-20	AT1G03130 AT1G03140	AT1G03110 AT1G03120 AT1G03130 AT1G03140 AT1G03150
Chr4-13908325.5	287,121021	3,19483847	0,33120496	2,55E-22	2,23E-20	AT4G27940 AT4G07925	AT4G27940 AT4G07925 AT4G27950
Chr2-19446724	328,892628	3,26191251	0,33923185	3,44E-22	2,93E-20	AT2G47390 AT2G47400	AT2G47390 AT2G09895 AT2G47400 AT2G47410
Chr3-20476601.5	394,959985	3,23193089	0,34138576	1,44E-21	1,20E-19	AT3G08455 AT3G08460 AT3G08465	AT3G55240 AT3G08455 AT3G08460 AT3G08465 AT3G55250
Chr4-2351860.5	261,232522	3,2382759	0,34243124	1,59E-21	1,30E-19	AT4G04640	AT4G04915 AT4G04640 AT4G04650
Chr4-5723447	377.292288	2.94084354	0.31288829	2.75E-21	2.20E-19	AT4G08920	AT4G08920
Chr5-309136.5	398,206726	2.82904951	0.30271672	4.57E-21	3.58E-19	AT5G01800 AT5G01810	AT5G01800 AT5G01810
Chr4-8883873.5	267,506709	3,30724974	0.35694453	9.71F-21	7.46F-19	AT4G15560	AT4G15560
Chr1-28750747	245 729714	3 3464456	0 36314381	1.55E-20	1 17F-18	AT1G76610	AT1G76600 AT1G76610
Chr4-11224208 5	346 47426	2 8152307	0 30596438	1,775-20	1,215-19	AT4G21270 AT4G21280	AT4621270 AT4621280 AT4621300
Chr4 12725510 5	425 055 205	2,0152557	0,30330438	2,165,20	1,510-10	AT4021270 AT4021200	AT4621270 AT4621280 AT4621300
Ch-2 10472022	430,033303	2,75470152	0,30444017	2,100-20	1,500-10	AT3C 47450	
Ciri 2"174/3022	720,479210	2,01221400	0,50050188	2,25E-20	1,0UE-18		ATE COD440 ATE CO222E ATE CO222E ATE CO1000
Chr5-7270482.5	234,767599	3,2635319	0,35717346	3,21E-20	2,24E-18	AT5G00440 AT5G03325 AT5G03335	AISG00440 AISG03325 AISG03335 AISG21990
CH13-2441263.5	340,765347	2,80284898	0,30/05722	3,49E-20	2,39E-18	A13007050	A13607040 A13607650
Cnr2-1800587	390,03103	3,21602512	0,35326999	4,37E-20	2,94E-18	A120000/0	A12605000 A12605070
cnr5-4392371	435,629441	2,85628879	0,31464799	5,54E-20	3,67E-18	AI5G13630 AT5G13640	AI5G13630 AI5G13640
cnr1-5447414	ь02,368854	2,58548736	0,28805949	1,41E-19	9,18E-18	A11G15810 A11G15820 AT1G05207 AT1G15830 A1	A11G15810 A11G05203 A11G15820 A11G05207 AT1G15830 AT1G15825
Chr5-5664235	282,230832	2,92882259	0,33103038	4,47E-19	2,86E-17		AT5G17230 AT5G17240
Chr1-21626255.5	421,154911	3,50815071	0,3969021	4,84E-19	3,04E-17	AT1G58290	AT1G58290 AT1G58300
Chr5-23786837.5	344,36647	2,84526035	0,32441202	8,89E-19	5,51E-17		AT5G58900 AT5G58910
Chr1-2952980	347,541182	3,04032769	0,34688724	9,37E-19	5,71E-17	AT1G09157 AT1G09160	AT1G09155 AT1G09157 AT1G09160
Chr5-1337036.5	295,264508	2,83880858	0,32822605	2,60E-18	1,56E-16	AT5G04670 AT5G04660	AT5G04670 AT5G04660
Chr1-25174963.5	245,672032	2,89139299	0,33828075	6,30E-18	3,72E-16	AT1G08917 AT1G08923 AT1G67265	AT1G08917 AT1G08923 AT1G67265
Chr5-2679239.5	345,999827	2,62540198	0,31583891	4,69E-17	2,73E-15	AT5G08320	AT5G08315 AT5G08320 AT5G08330 AT5G08335
Chr5-8372853	348,022819	2,49838311	0,30118232	5,42E-17	3,11E-15	AT5G24520	AT5G24510 AT5G24520
Chr3-2717593.5	401,370896	2,62900953	0,31763681	6,33E-17	3,57E-15	AT3G08930 AT3G08940	AT3G08930 AT3G08940 AT3G08943
Chr3-629891.5	401,31445	3,27339536	0,39610419	7,04E-17	3,92E-15	AT3G02870 AT3G01195	AT3G02860 AT3G02870 AT3G01195 AT3G02875
Chr5-23692349	407,237787	2.36851772	0.28804856	9,95F-17	5,46F-15	AT5G58610 AT5G58620	AT5G58610 AT5G58620 AT5G08870
Chr4-5779468 5	291.18109	2.82113800	0.34513467	1.49F-16	8.07F-15	AT4G09010 AT4G05690 AT4G09012	AT4G09000 AT4G05685 AT4G09010 AT4G05690 AT4G09012
Chr2-12020189 5	227 080762	2 45500664	0 20252227	2 / 3 E 1 C	1 205.14	AT2G20570 AT2G20575	AT2G20550 AT2G20560 AT2G20570 AT2G20575
Chr1-2010450 5	337,003703	2,455000004	0,30232337	2,450-10	1,250-14	AT1609340 AT1609350	AT1609340 AT1609350 AT1609360
Cin 1-3013439.3	320,/02408	2,70042957	0,34180503	2,906-16	1,525-14	AT1670600 AT1670610	AT1 C70500 AT1 C70500 AT1 C70510
Cin 1-20021830.3	233,49/21/	2,00540598	0,33692342	1,05E-15	3,45E-14	A110/0000 A110/0010	AT3053430 AT3053430
CIII 3-1980/381.5	257,57505	2,0011/989	0,33085209	1,391-15	7,13E-14	473 00000	AT3C15050 AT3C00500
CIII 2-0523848.5	186,469398	3,09/92973	0,39290931	1,58E-15	7,97E-14		A12G15050 A12G00600
cnr4-10414577	264,942887	2,64418291	0,33980801	3,59E-15	1,79E-13	A14G19010 A14G19020	A14G19010 A14G19020
Chr1-19052672	279,477021	2,56673899	0,33560419	1,02E-14	5,02E-13	AT1G51390 AT1G07733 AT1G51400 AT1G07737 AT	AT1G51380 AT1G51390 AT1G07733 AT1G51400 AT1G07737 AT1G51402 AT1G07743
Chr4-6408085	365,523408	2,7429888	0,36179287	1,71E-14	8,29E-13	AT4G10330 AT4G10340	AT4G10330 AT4G10340
Chr5-19648336	340,125873	2,95536549	0,39214295	2,41E-14	1,16E-12	AT5G48490	AT5G48480 AT5G48485 AT5G48490
Chr1-22422153	168,574981	2,95402121	0,4018479	9,83E-14	4,66E-12		AT1G60900
Chr5-25071345.5	291,058912	2,45895647	0,3355498	1,17E-13	5,46E-12	AT5G62430 AT5G62440	AT5G62430 AT5G62440

	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr1-29429351.5	232,838336	2,51691092	0,34398791	1,27E-13	5,87E-12	AT1G09793 AT1G09797 AT1G78230	AT1G78220 AT1G09793 AT1G09797 AT1G78230
Chr5-25192020	282,495617	2,4527708	0,33572427	1,38E-13	6,29E-12	AT5G62720	AT5G62710 AT5G62720
Chr1-29359559	307,341144	2,21017088	0,30267142	1,42E-13	6,39E-12	AT1G78070	AT1G78070 AT1G09965
Chr5-14913749	352,57226	2,22165993	0,30589478	1,90E-13	8,46E-12	AT5G37540	AT5G37540
Chr5-3163830.5	288,881667	2,47731774	0.34126855	1.95F-13	8.60F-12	AT5G01655	AT5G10100 AT5G01655 AT5G10110
Chr5-3000587	332 730129	2 39264584	0 32992232	2 05E-13	8 95E-12	AT5G09680 AT5G09690	AT5G09670 AT5G09680 AT5G09690
Chr4 12104505	397 690476	2,332040349	0,32352232	2,03213	0.255.12	AT4C2E000	AT4635000 AT4635000
CIII 4 2 400 700 7 5	287,080470	2,23049248	0,30787873	2,170-13	9,55E-12	A14023330	
Chr1-24097897.5	251,440879	2,36996217	0,32746775	2,29E-13	9,76E-12	A11G64850 A11G64860	A11Gb484U A11Gb485U A11Gb48bU
Chr3-15092591	273,274712	2,49088199	0,34423885	2,31E-13	9,76E-12	AT3G43110	AT3G43110 AT3G43120
Chr1-2641910.5	252,629369	2,50415883	0,34863687	3,42E-13	1,43E-11	AT1G08380 AT1G08390	AT1G08370 AT1G08380 AT1G08390 AT1G08400
Chr3-17551253.5	380,700712	2,1003592	0,29402767	4,55E-13	1,88E-11	AT3G47610	AT3G47610
Chr5-23165996	237,324756	2,58409966	0,36355015	5,89E-13	2,41E-11		AT5G57170 AT5G57180
Chr1-18176415.5	247,027667	2,43361732	0,34479602	8,44E-13	3,41E-11	AT1G49130 AT1G49140	AT1G49120 AT1G49130 AT1G49140 AT1G49150 AT1G49160
Chr4-455753.5	258,879762	2,26164933	0,32157174	1,01E-12	4,04E-11	AT4G01040 AT4G01050	AT4G01037 AT4G01040 AT4G01050
Chr1-6445314	192 41 2376	2 59927465	0 3698751	1.05E-12	4 16E-11		AT1618700
Chr2-7377267 5	220 402005	2 31 207 184	0 32940376	1 105-12	4,10E 11	AT3G21055 AT3G21060	AT3G21055 AT3G21060 AT3G21070
Ch-2 5359796	223,455055	2,51257104	0,32340370	1,100-12	4,250-11	AT3G21033 AT3G21000	
Chr3-5358780	232,200918	2,29892257	0,327738	1,156-12	4,48E-11	AT3G13840 AT3G13850	A13G13830 A13G13840 A13G13850 A13G13800
Chi 2-19643996.5	308,541278	2,1902/011	0,31531946	1,886-12	7,216-11	A12G48010 A12G48020	A12G48000 A12G48010 A12G48020
Chr1-22/00027.5	249,920188	2,2889345	0,32992443	1,99E-12	7,57E-11	A11G61520	A11G61520 A11G61540
Chr5-426313	248,709806	2,3531707	0,34112132	2,63E-12	9,90E-11	AT5G02150 AT5G02160	AT5G02140 AT5G00815 AT5G02150 AT5G00820 AT5G02160 AT5G02170
Chr4-12876944	236,09355	2,24446301	0,32816187	3,97E-12	1,48E-10	AT4G25070 AT4G25080	AT4G25070 AT4G25080 AT4G25090
Chr5-21763594	188,356799	2,45798329	0,36061529	4,68E-12	1,73E-10	AT5G53570	AT5G53570 AT5G53580
Chr3-20772072	293,637642	2,86793519	0,4253847	7,81E-12	2,86E-10		AT3G55970
Chr1-5018113.5	214,507682	2.28318798	0.3402062	9.65E-12	3.50E-10		AT1G14620 AT1G14630
Chr3-18819454	204 250679	2 33677691	0 34843768	9 97F-17	3 58E-10		AT3G50660
Chr3-17758246 5	237.454104	2.26298626	0.33753301	1,01F-11	3.59F-10	AT3G48090 AT3G48100	AT3G48090 AT3G48100
Chr2-0045222 5	202 022704	2 28805237	0 34244020	1 165 14	4 105 10	AT3624770	AT3624770 AT3600440
Chr2 10227520	203,323784	2,20003327	0.20744226	1 205 11	4,100-10		473646790
CIII 2-1922/539	210,080848	2,58421856	0,38/44326	1,28E-11	4,42E-10		
cnr1-3951164	215,320427	2,3334748	0,3498783	1,28E-11	4,42E-10	A11G11710 AT1G11720 AT1G04873	A11G11/10 A11G11720 A11G04873
Chr4-13279675.5	257,504273	2,26013832	0,33890761	1,29E-11	4,42E-10		A14G26200 AT4G26210
Chr2-7934727.5	208,852675	2,31888642	0,35012551	1,76E-11	5,98E-10	AT2G18230 AT2G18240	AT2G18220 AT2G18230 AT2G18240 AT2G18245
Chr4-18233421.5	179,778927	2,43129872	0,36957379	2,37E-11	8,00E-10	AT4G39150	AT4G39140 AT4G39150 AT4G39160
Chr3-22745644	243,948469	2,3126954	0,35388158	3,18E-11	1,06E-09	AT3G61470	AT3G61460 AT3G61470
Chr3-21831371	414.344428	1,90079268	0.29250277	4.06F-11	1.34F-09	AT3G59060 AT3G09185 AT3G59068 AT3G59070	AT3G59060 AT3G09185 AT3G59068 AT3G59070
Chr5-208869	337,514266	2,43836244	0.37925706	6.41F-11	2.10F-09	AT5G01520 AT5G01530	AT5G01520 AT5G01530 AT5G01540 AT5G01542
Chr4-1176213 5	203 221963	2 21384926	0 34484604	6.82F-11	2 22E-09	AT4G02670	AT4G02660 AT4G02670 AT4G04235
Chr2 17228600	102 521240	2,21504520	0,34464664	7 495 11	2,222-05	473046790	AT3C46780 AT3C46700
CIII 3=17228090	165,521246	2,33302311	0,30704343	7,460-11	2,410-09	AT3040780	AT3 G50200 AT3 G50 400 AT3 G50 440
Chr3-21949644.5	265,419256	2,07720927	0,32584128	9,15E-11	2,92E-09	AI3G59400 AI3G59410	AI3G59390 AI3G59400 AI3G59410
Chr3-21076386.5	240,968889	2,07607209	0,32570551	9,20E-11	2,92E-09	AT3G56930 AT3G56940 AT3G08795	AT3G56930 AT3G56940 AT3G08795 AT3G56950 AT3G08805
Chr3-4462010.5	196,310512	2,21242221	0,34915911	1,18E-10	3,70E-09	AT3G13640 AT3G13650	AT3G13640 AT3G13650 AT3G13660
Chr1-20814667.5	249,116056	2,20050251	0,34948685	1,52E-10	4,76E-09		AT1G55690
Chr2-12666964.5	207,075061	2,83248926	0,45106162	1,70E-10	5,26E-09	AT2G29620 AT2G29628 AT2G29630	AT2G29620 AT2G29628 AT2G29630
Chr3-20340740.5	404,945354	2,17805329	0,34750312	1,83E-10	5,63E-09	AT3G54890 AT3G54900	AT3G54880 AT3G54890 AT3G54900 AT3G54910
Chr4-297330.5	196,60045	2,15334717	0,34386802	1,90E-10	5,79E-09	AT4G00720	AT4G00720 AT4G00730
Chr1-25047903.5	228,475179	2,18623661	0.34941685	1.96F-10	5.94F-09	AT1G67080 AT1G67090	AT1G67080 AT1G67090
Chr2-14592861 5	201 257046	2 15410187	0 34540928	2 24E-10	6 72E-09		AT2G34650 AT2G34655
Chr2-4541862.5	103 580800	2 21964699	0 3561 2034	2,246.10	6 825-09	AT3G13800	AT3G12800 AT3G12810
Chr3+4541802.5	193,380899	2,21904099	0,33012934	2,290-10	7.075.00	AT3G13800	AT3G13600 AT3G13610
Chr3-3084703	209,259599	2,15080087	0,34654729	2,71E-10	7,97E-09	AT3G11670	A13G11070 A13G11080
Chr3-1817795	201,749035	2,18965825	0,35283067	2,72E-10	7,97E-09	A13G06030	A13G06030
Chr1-11216013.5	252,1341	2,10475821	0,34041141	3,15E-10	9,15E-09	AT1G31330 AT1G31335	AT1G31320 AT1G31330 AT1G31335 AT1G31340
Ch-2 0700C00	175 58/516	2 21207054	0,37463973	3.38E-10	9,77E-09		AT3G26490
CH13-9700699	175,504510	2,31207654		.,		AT2G06635 AT2G16440	
Chr2-7125935	183,28369	2,21285904	0,36117447	4,48E-10	1,28E-08		AT2G16430 AT2G06625 AT2G06635 AT2G16440
Chr2-7125935 Chr5-2758765	183,28369 165,503153	2,21285904 2,20774744	0,36117447 0,36384261	4,48E-10 6,48E-10	1,28E-08 1,84E-08	AT5G08520 AT5G08530	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530
Chr2-7125935 Chr5-2758765 Chr3-20167516	183,28369 165,503153 173,053858	2,21285904 2,20774744 2,25421087	0,36117447 0,36384261 0,37217624	4,48E-10 6,48E-10 6,94E-10	1,28E-08 1,84E-08 1,96E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G5460 AT3G54470
Chr2-7125935 Chr5-2758765 Chr3-20167516 Chr1-19454671	183,28369 165,503153 173,053858 155,148945	2,21285904 2,20774744 2,25421087 2,30979745	0,36117447 0,36384261 0,37217624 0.38235919	4,48E-10 6,48E-10 6,94E-10 7,66E-10	1,28E-08 1,84E-08 1,96E-08 2,15E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240
Chr3-9700899 Chr2-7125935 Chr5-2758765 Chr3-20167516 Chr1-19454671 Chr3-22078296	183,28369 165,503153 173,053858 155,148945 177,052333	2,31207654 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796	0,36117447 0,36384261 0,37217624 0,38235919 0 35840178	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08	AT5G08520 AT5G08530 AT3G5460 AT3G54470 AT1G52220 AT3G52230 AT1G52240 AT3G59765 AT3G5970	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G08520 AT3G08530 AT3G54400 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT1G5220 AT1G52230 AT1G52240
Chr3-3700699 Chr2-7125935 Chr5-2758765 Chr3-20167516 Chr1-19454671 Chr3-22078296 Chr3-2265508 5	183,28369 165,503153 173,053858 155,148945 177,052333 240,498839	2,21207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,68E-10	1,28E-08 1,84E-08 2,15E-08 2,68E-08 2,68E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59765 AT3G59770	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62900 AT3G67910
Chr3-3700699 Chr2-7125935 Chr3-2758765 Chr3-20167516 Chr1-19454671 Chr3-22078296 Chr3-22962508.5	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10	1,28E-08 1,84E-08 2,15E-08 2,68E-08 2,68E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59765 AT3G59770 AT3G59760	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010
Chr3-9700899 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-22962508.5 Chr1-19454671 Chr3-22962508.5 Chr1-26477793 Chr3-629672	173,554510 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 467, 52355	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 2,68E-08 3,18E-08	AT5008220 AT5608330 AT3654460 AT3654470 AT1652220 AT1652240 AT3659765 AT3659770 AT1670300 AT1670300	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G52000 AT3G62010 AT1G70290 AT1G70300 AT1G70290 AT1G70300
Chr3-9700899 Chr2-7125935 Chr5-2758765 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-22078296 Chr3-22962508.5 Chr1-26477793 Chr3-5433969	173,354310 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68434	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09	1,28E-08 1,84E-08 2,15E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT3G5220 AT1G52230 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 0A T5G08530 AT3G54460 AT3G54470 AT1G5220 AT1G5220 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT3G15000 AT3G61010 AT3G16000 AT3G16010
Chr3-7125935 Chr5-2758765 Chr3-20167516 Chr3-20167516 Chr3-2018296 Chr3-22962508.5 Chr1-26477793 Chr1-26477793 Chr1-10476025.5	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865	2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,5550036	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09 1,17E-09 1,44E-09	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G169920	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 0AT3G508530 AT3G54400 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT3G61000 AT3G16010 AT1G29910 AT1G29920 AT1G29930 AT1G29940
Chr3-9700593 Chr2-7125935 Chr3-2758765 Chr3-20167516 Chr3-2078296 Chr3-22962508.5 Chr3-22962508.5 Chr3-5433969 Chr3-5433969 Chr1-10476025.5 Chr1-28892328.5	173,053319 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577	2,21207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,5550036 2,61569641	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09 1,17E-09 1,44E-09 1,51E-09	1,28E-08 1,84E-08 2,15E-08 2,68E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08 4,06E-08	AT5008220 AT5608530 AT3654460 AT3654470 AT3652240 AT1652230 AT1652240 AT36529765 AT3659770 AT1670300 AT3616000 AT3616010 AT1629920 AT1676920	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G52000 AT3G62010 AT1G70290 AT1G70300 AT3G160000 AT3G16010 AT1G29920 AT1G29930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930
Chr3-712935 Chr3-2712935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-2427793 Chr3-5433969 Chr3-647793 Chr3-5433969 Chr3-10476025.5 Chr3-2882328.5 Chr3-28420.5	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304	2,31207834 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,5550036 2,61569641 2,21205869	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627 0,37357352	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09 1,17E-09 1,44E-09 1,51E-09 1,60E-09	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,90E-08 4,06E-08 4,23E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT3G5220 AT1G52220 AT1G52240 AT3G529765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G79920 AT1G76920 AT3G2300	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G5740 AT3G53765 AT3G55770 AT3G65706 AT3G59750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT3G161001 AT1G29920 AT1G29930 AT1G29940 AT1G09915 AT1G09693 AT1G76920 AT1G76930 AT1G79300 AT1G79300
Lin 3-7100539 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-2078205 Chr3-2078205 Chr3-22962508.5 Chr3-2477793 Chr3-6433969 Chr3-0477793 Chr3-0477793 Chr3-0470025.5 Chr1-04892328.5 Chr1-04892328.5 Chr3-041400.5	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304 216,565027	2,21207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,5550036 2,61569641 2,21205869 1,94101764	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627 0,37357352 0,32780634	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09 1,17E-09 1,51E-09 1,51E-09 1,51E-09 1,50E-09 1,60E-09	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08 4,06E-08 4,23E-08	AT5008220 AT5008330 AT3654460 AT3654470 AT1652220 AT1652240 AT165220 AT1652240 AT1657200 AT1670300 AT3616000 AT3616010 AT1629920 AT1629920 AT1629300 AT16203300 AT1604330 AT1604540	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G52000 AT3G62010 AT1G70290 AT1G70300 AT3G16000 AT3G16010 AT1G29910 AT1G29920 AT1G29930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT1G04520 AT1G04530 AT1G04540
Lth 3-7100839 Chr3-2758765 Chr3-20167516 Chr3-20167516 Chr3-201826671 Chr3-20278296 Chr3-20278296 Chr3-2627793 Chr3-5433969 Chr3-10476025.5 Chr3-2892328.5 Chr3-2914300.5 Chr3-289238.5 Chr3-2914300.5 Chr3-738511	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304 216,565027 206,451549	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 2,30979745 2,30387814 2,30387814 2,30387814 2,5550036 2,61569641 2,21205869 1,94101764 1,98140201	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627 0,37357352 0,32780634 0,33517232	4,48E-1C 6,48E-1C 6,94E-1C 7,66E-1C 9,70E-1C 9,70E-1C 1,16E-0S 1,17E-0S 1,51E-0S 1,60E-0S 1,60E-0S 1,69E-0S	1,28E-08 1,84E-08 1,96E-08 2,58E-08 2,58E-08 3,18E-08 3,18E-08 3,90E-08 4,05E-08 4,23E-08 4,23E-08 4,23E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT3G5240 AT1G52220 AT1G52240 AT3G5270 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT1G29920 AT1G2920 AT1G2920 AT1G23300 AT1G64530 AT1G04540 AT5G23060 AT5G00450	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 0A T5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59756 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT1G702910 AT1G2920 AT1G29300 AT1G29940 AT1G29910 AT1G2920 AT1G2930 AT1G29940 AT1G0958 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G23065
Lth 3-7100839 Cth 2-7125935 Cth 2-7258765 Cth 2-0167516 Cth 2-0167516 Cth 2-0262508.5 Cth 2-0262508.5 Cth 2-0262508.5 Cth 2-0262508.5 Cth 2-0262508.5 Cth 2-0262508 Cth 2-0266708 Cth 2-026708 Cth 2	183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304 216,565027 206,451549 256,969071	2,31207834 2,21285904 2,20774744 2,25421087 2,30979745 2,35148796 1,93504918 2,30387814 2,5550036 2,61569641 2,21205869 1,94101764 1,98140201 2,20278526	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,4302906 0,44107627 0,37357352 0,32780634 0,33517232 0,32285636	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,16E-09 1,17E-09 1,51E-09 1,60E-09 1,60E-09 1,60E-09 1,60E-09 1,69E-00 1,73E-00	1,28E-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08 4,06E-08 4,23E-08 4,23E-08 4,46E-08 4,45E-08	AT5008220 AT5608330 AT3654460 AT3654470 AT1652220 AT1652240 AT165220 AT1652240 AT1657200 AT1670300 AT3616000 AT3616010 AT1629200 AT1629200 AT1629200 AT1620300 AT1604530 AT1604540 AT5623060 AT5600450 AT5623060 AT5600450	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT3G61000 AT3G16010 AT1G29910 AT1G29920 AT1G29930 AT1G29940 AT1G09915 AT1G09637 AT1G09633 AT1G76920 AT1G76930 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G0450 AT5G23065 AT4G17810
Lth 3-7100693 Chr2-7125935 Chr2-7125935 Chr2-0167516 Chr3-0167516 Chr3-02962508 Chr3-02962508.5 Chr3-02962508.5 Chr3-02962508.5 Chr3-02892328.5 Chr3-029143000000000000000000000000000000000000	183,28369 165,503153 173,053858 177,052333 165,68428 101,477865 217,742577 152,414304 216,565027 206,451549 156,969071 159,01903	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 2,30387814 2,30387814 2,30387814 2,15464141 2,5550036 2,61569641 2,21205869 1,94101764 1,98140201 2,20278526	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627 0,37357352 0,32780634 0,33517232 0,37285636 0,36631756	4,48E-10 6,94E-10 9,66E-10 9,66E-10 9,70E-10 1,16E-09 1,17E-09 1,51E-09 1,51E-09 1,51E-09 1,60E-09 1,60E-09 1,69E-09 1,73E-09 1,94E-00	1,28E-08 1,96E-08 2,15E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08 4,23E-08 4,23E-08 4,23E-08 4,46E-08 4,53E-08 5,03E-08	AT5008220 AT5608530 AT3652460 AT365470 AT365220 AT1652230 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT1629920 AT162920 AT162920 AT1604530 AT1604540 AT5623060 AT5600450 AT4617810 AT1676350 AT1676360	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 0A T5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G62010 AT1G70290 AT3G62010 AT1G702910 AT1G29920 AT1G79930 AT1G79940 AT1G09915 AT1G09687 AT1G09633 AT1G76920 AT1G76930 AT2G23300 AT1G04530 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G0450 AT5G23065 AT4G78350 AT1G76360 AT1G09523
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-19454671 Chr3-22078296 Chr3-22962508.5 Chr3-24677793 Chr3-6477793 Chr3-6477793 Chr3-6497793 Chr3-6497793 Chr3-6497793 Chr3-6497793 Chr3-6497793 Chr3-6497793 Chr3-649773 Chr3-649773 Chr3-649773 Chr3-649773 Chr3-9914200.5 Chr1-1236308 Chr3-7738511 Chr4-9906031.5 Chr1-230775	183,28369 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304 216,565027 206,451549 156,969071 179,501993 228,87002	2,31207634 2,21285904 2,20774744 2,25421087 2,30979745 1,93504918 2,30387814 2,15464141 2,5550036 2,61569641 2,21205869 1,94101764 1,98140201 2,20278526 2,15732223 2,0119392	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4302906 0,44107627 0,37357352 0,32780634 0,33517232 0,337285636 0,36631256 0,36631256	4,48E-10 6,48E-10 6,94E-10 7,66E-10 9,68E-10 9,70E-10 1,17E-05 1,44E-05 1,51E-05 1,60E-05 1,60E-05 1,60E-05 1,73E-05 1,73E-05 1,94E-05 2,23E-07	1,28E-08 1,84E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 4,06E-08 4,23E-08 4,23E-08 4,46E-08 4,53E-08 5,57E-09	AT5008220 AT5008330 AT3654460 AT3654470 AT3652240 AT1652230 AT1652220 AT1652240 AT3659755 AT3659770 AT1670300 AT3616000 AT3616010 AT1629920 AT1676920 AT1676920 AT1620300 AT5623000 AT5623000 AT5623060 AT5600450 AT5623060 AT5600450 AT4617810 AT1676350 AT1676360 AT1677850	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 0AT5G08530 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G62010 AT1G70290 AT3G16010 AT1G29910 AT1G2920 AT1G2930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G09520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT3G23300 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G0450 AT5G23065 AT1G17810 AT1G76350 AT1G76360 AT1G09623 AT1G07480 AT1G04852 AT1G07480
Lth 3-7100693 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-20278266 Chr3-20278266 Chr3-22962508.5 Chr3-24892328.5 Chr3-24892328.5 Chr3-0412467793 Chr3-04124892328.5 Chr3-041248208 Chr5-7738511 Chr4-996031.5 Chr3-2843800.5 Chr3-2843800.5	183,28369 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,64428 111,477865 217,74257 152,414304 216,565027 206,451549 156,969071 179,501993 228,870033 261,76547 261,45547 261,45547 261,45547 261,45547 262,45547 263,45547 263,45547 264,455477 264,455477 264,4554777 264,4554777777777777777777777777777777777	2,312/07534 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,21205869 1,945140201 2,947140201 2,9471400000000000000000000000000000000000	0,36117447 0,36384261 0,37217624 0,38235919 0,35840178 0,32236122 0,38571796 0,36074486 0,4407627 0,37357352 0,32780634 0,332780634 0,3325536 0,3525536 0,35631256 0,35322166	4,48E-10 6,48E-10 6,48E-10 7,66E-10 9,70E-10 1,16E-00 1,16E-00 1,60E-00 1,60E-00 1,60E-00 1,60E-00 1,73E-00 1,94E-00 2,23E-00	1,28E-08 1,84E-08 2,68E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 4,06E-08 4,23E-08 4,23E-08 4,23E-08 4,46E-08 5,03E-08 5,03E-08 5,76E-08 6,23E,02 6,25E,02 6,25E,	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5220 AT1G52240 AT3G5270 AT1G52240 AT3G59765 AT3G59770 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G09200 AT1G79200 AT1G79200 AT1G79200 AT3G23060 ATSG00450 AT3G23060 ATSG00450 AT4G17810 AT1G76350 AT3G76360 AT1G77830 AT1G76350 AT3G76820 AT3G76220	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 0A T5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT3G13000 AT3G62010 AT3G14000 AT3G16010 AT1G729910 AT1G2920 AT1G29930 AT1G29940 AT1G29910 AT1G2920 AT1G2930 AT1G29940 AT1G09951 AT1G09857 AT1G09633 AT1G76920 AT1G76930 AT2G23300 AT1G09520 AT1G09587 AT1G09630 AT1G76350 AT5G23060 AT5G23065 AT4G17810 AT1G76350 AT1G76360 AT1G09523 AT1G76350 AT1G76360 AT1G09523 AT1G76350 AT1G09857 AT1G07485 AT1G7490
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-19454671 Chr3-22962508.5 Chr3-24677793 Chr3-24892308.5 Chr3-24892308.5 Chr3-0476025.5 Chr1-0476025.5 Chr3-04892308.5 Chr3-738511 Chr4-9906031.5 Chr3-738511 Chr4-9306031.5 Chr3-7212484.5 Chr3-7212484.5	115,50315 183,28369 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 217,742577 152,414304 216,565027 216,555027 206,451549 156,969071 179,501993 351,785917	2,312/07534 2,21285904 2,20774744 2,25421087 2,30979745 2,30979745 2,30979745 2,31548796 1,93504918 2,30387814 2,215550036 2,615569641 2,21205869 1,94101764 1,94101764 1,94101764 1,94101764 1,94101764 1,94101764 1,94101764 2,07192913 1,950822 2,07192913	0,36117447 0,36384261 0,37217624 0,38235910 0,38235912 0,38541078 0,382541796 0,38571796 0,38571796 0,38574290 0,4302906 0,44010727 0,37357352 0,37285636 0,33512232 0,3631256 0,36332256	4,48E-10 6,48E-10 6,48E-10 9,68E-10 9,68E-10 9,76E-10 1,17E-00 1,47E-00 1,67E-00 1,69E-00 1,69E-00 1,69E-00 1,69E-00 2,23E-00 2,23E-00 2,24E-00 2,2	1,28E-08 1,84E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 4,06E-08 4,23E-08 4,23E-08 4,23E-08 4,23E-08 4,53E-08 5,76E-08 5,76E-08 5,76E-08	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT3G524460 AT3G5470 AT3G5220 AT1G52220 AT3G52740 AT3G5270 AT3G1500 AT3G15000 AT3G16010 AT3G15000 AT3G16010 AT1G2920 AT1G2920 AT1G2920 AT3G2300 AT1G4530 AT1G04540 AT3G2300 AT5G00450 AT4G17810 AT3G2300 AT5G0360 AT1G7350 AT1G76360 AT1G07480 AT3G08910 AT3G08920 AT3G08930 AT3G08910 AT3G08920 AT3G08930	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT1G70290 AT1G70300 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G094520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G00450 AT5G23065 AT4G17810 AT1G07480 AT1G04587 AT1G09623 AT1G04580 AT1G04587 AT1G07485 AT1G07490 AT3G08900 AT3G02085 AT3G08910 AT3G08920 AT3G08930
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-2046716 Chr3-22962508.5 Chr1-26477793 Chr3-262508.5 Chr1-26477793 Chr3-262508.5 Chr1-26477793 Chr3-2914300.5 Chr1-28892328.5 Chr2-9914300.5 Chr1-236308 Chr3-7738511 Chr4-9906031.5 Chr1-2843800.5 Chr1-2843800.5 Chr3-2712484.5 Chr3-2712484.5	113,2830 165,502153 173,053858 155,148996 177,052333 240,499839 244,169833 244,169833 111,477865 217,745277 152,414304 216,555027 206,451549 156,969071 179,501993 228,870033 351,785917 138,844933	2,3120/054 2,21285904 2,20774744 2,25421087 2,30979745 2,15148796 1,93504918 2,03087814 2,03087814 2,03087814 2,03087814 2,03087814 1,98140201 2,0278526 2,15732223 2,007192913 1,950822 2,3240226	0,36117447 0,36384261 0,37217624 0,38235919 0,38540178 0,32531795 0,38571795 0,38571795 0,37357352 0,37357352 0,37357352 0,37357352 0,37357352 0,37357352 0,37357352 0,33512722 0,3728563 0,36531256 0,3552157 0,33777054	4,48E-10 6,94E-10 9,76E-10 9,76E-10 9,76E-10 1,17E-00 1,17E-00 1,60E-00 1,60E-00 1,60E-00 1,60E-00 1,60E-00 1,94E-00 2,23E-00 2,27E-00 2,27E-00	1,28F-08 1,84E-08 1,96E-08 2,15E-08 2,68E-08 2,68E-08 3,18E-08 3,18E-08 3,90E-08 4,06E-08 4,23E-08 4,23E-08 4,23E-08 4,45E-08 5,03E-08 5,76E-08 6,53E-08 6,53E-08	AT5008220 AT5008530 AT3654460 AT3654470 AT365220 AT1652230 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT1629200 AT1629200 AT1629200 AT1629200 AT1629300 AT1604530 AT1604540 AT5623060 AT5600450 AT4617810 AT1676350 AT1676360 AT1676350 AT1676360 AT1676380 AT1676360 AT1676380 AT1676360 AT1676380 AT1676360 AT1676380 AT1676360 AT1676380 AT1676360 AT1609830 AT169820 AT3608930 AT1609300 AT1603010	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G54470 AT3G50852 00 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT3G16000 AT3G16010 AT1G7299 AT1G70300 AT3G16000 AT3G16010 AT1G29910 AT1G29920 AT1G29930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT1G09520 AT1G09687 AT1G09633 AT1G76920 AT1G76930 AT3G23050 AT5G23060 AT5G00450 AT5G23065 AT4G17810 AT1G76350 AT1G76360 AT1G09623 AT1G7480 AT1G02485 AT1G07485 AT1G7490 AT3G08900 AT1G020387 AT1G07485 AT1G07490 AT1G033000 AT1G03010
Lin 3-7100893 Chr3-2125935 Chr3-20167516 Chr3-20167516 Chr3-19454671 Chr3-22062508.5 Chr3-24647793 Chr3-23962508.5 Chr3-24892328.5 Chr3-438939 Chr3-043969 Chr3-10476025.5 Chr3-24892328.5 Chr3-24892328.5 Chr3-24892328.5 Chr3-2489231 Chr3-738511 Chr4-9906031.5 Chr3-29124843800.5 Chr3-2124843800.5 Chr3-29551.5 Chr3-29551.5 Chr3-29551.5	113,2030 165,503153 173,053858 155,148945 177,052333 240,499839 224,169833 165,68428 111,477865 114,477865 1216,565027 216,565027 216,565027 216,5550	2,3120/0534 2,20724744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387844 2,15464141 2,21205869 1,94101764 1,98140201 2,02078526 2,15732223 1,950822 2,3240226 2,27319225	0,36117447 0,36384261 0,37217624 0,38235919 0,38235919 0,382361796 0,382371796 0,382371796 0,382371796 0,4302906 0,44107627 0,37285636 0,3285636 0,33517232 0,3285636 0,33522166 0,335322166 0,33532857 0,39377054	4,48E-10 6,48E-10 6,48E-10 9,68E-10 9,68E-10 9,70E-10 1,16E-00 1,17E-00 1,44E-00 1,60E-00 1,60E-00 1,60E-00 1,78E-00 2,23E-00 2,47E-00 2,47E-00 2,47E-00 2,47E-00 2,47E-00 2,47E-00 2,47E-00 3,87E-00 3,87E-00	1,28E-08 1,28E-08 2,15E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 4,25E-08 4,25E-08 4,25E-08 4,25E-08 4,25E-08 5,57E-08 5,5	AT5G08520 AT5G08530 AT3G54460 AT3G54470 AT3G522 AT1G52230 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT1G29920 AT1G29920 AT1G2920 AT1G2920 AT1G2920 AT3G2300 AT3G04540 AT3G2300 AT5G04540 AT4G17810 AT3G2300 AT5G0450 AT4G17810 AT1G76350 AT1G76360 AT1G07480 AT1G07480 AT3G08920 AT3G08920 AT3G08930 AT1G03000 AT1G03010 AT3G56800 AT3G56810	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G70300 AT1G70290 AT3G62010 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G094520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G0450 AT5G23050 AT5G23060 AT5G0450 AT3G7350 AT1G76350 AT1G07490 AT3G7350 AT1G03210 AT3G08900 AT3G0285 AT3G08910 AT3G08920 AT3G08930 AT3G56780 AT3G55790 AT3G56800 AT3G56810
Lth 3-7100839 Cth 2-7125935 Cth 2-7259765 Cth 2-20167516 Cth 2-20167516 Cth 2-2078296 Cth 2-2078296 Cth 2-20420508.5 Cth 2-20420508.5 Cth 2-2042005 Cth 2-204200.5 Cth 2-2042000000000000000000000000000000000	113,2630 163,2630 165,503153 177,053885 155,148945 177,052333 224,169833 165,68428 114,477865 217,742577 152,414304 114,477865 125,414304 125,414304 125,414304 155,6969071 179,501993 228,870033 351,785917 138,844933 142,201011 213,197721	2,312(0)/534 2,2128590/ 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,21205869 1,9410201 2,20278526 2,1573223 2,07192913 1,951022 2,27319225 2,35878527	0,36117447 0,36384261 0,37217624 0,38235919 0,38540178 0,32236122 0,38571796 0,36074486 0,44007627 0,37357352 0,37285636 0,3631256 0,3532216 0,3532176 0,353216 0,353216 0,3542176 0,35420	4,48E-10 6,94E-10 9,68E-10 9,70E-10 1,17E-09 1,47E-09 1,60E-09 1,60E-09 1,60E-09 1,60E-09 1,60E-09 1,73E-09 1,73E-00 2,23E-00 2,247E-09 2,25F-00 3,87E-00 4,04E-09 4,04E-09	1,28E-08 1,84E-08 1,34E-08 2,15E-08 2,68E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 3,18E-08 4,23E-08 5,76E-08 4,23E-08 5,76E-08 5,7	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT1G29200 AT1G29200 AT1G29200 AT1G29200 AT1G29200 AT1G29200 AT1G29200 AT3G29300 AT3G29300 AT3G29300 AT3G09310 AT3G08500 AT1G7480 AT3G08910 AT3G08920 AT3G08930 AT1G03000 AT3G58810 AT3G56800 AT3G56810 AT4G36730 AT4G09375	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 00 AT3G508530 AT3G54460 AT3G508530 AT3G54460 AT3G508530 AT3G59760 AT3G509765 AT3G59770 AT3G62000 AT3G62010 AT1G0290 AT3G62010 AT1G0290 AT3G16010 AT1G0290 AT1G70300 AT3G16000 AT3G16010 AT1G02915 AT1G09687 AT1G09693 AT1G79940 AT1G09915 AT1G09687 AT1G09693 AT1G79940 AT1G094520 AT1G09687 AT1G09693 AT1G79940 AT3G23300 AT3G04520 AT1G04580 AT1G09623 AT1G07480 AT1G04587 AT1G07485 AT1G07490 AT3G08900 AT3G65790 AT3G56810 AT3G68800 AT3G56790 AT3G56810 AT3G6720 AT3G56730 AT3G58810 AT4G37810
Lth 3-7100839 Chr2-7125935 Chr2-7125935 Chr2-2017516 Chr3-20167516 Chr3-20278296 Chr3-20278296 Chr3-222962508.5 Chr1-26477793 Chr3-6433969 Chr3-64308 Chr3-7738511 Chr4-12647800.5 Chr1-28643800.5 Chr1-28643800.5 Chr1-23643800.5 Chr1-23643800.5 Chr1-23643800.5 Chr1-23643800.5 Chr1-23643800.5 Chr3-2712484.5 Chr3-2712484.5 Chr3-712455.5 Chr4-17312455.5	113,2830 165,503153 173,053858 173,053858 173,053858 177,052333 165,68428 114,477865 217,742577 152,414304 156,969071 179,50193 228,870033 351,785917 138,844933 142,201011 213,197721 145,647965	2,3120/0534 2,20724744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387844 2,15464141 2,21205869 2,61569641 2,21205869 2,61569641 1,94101764 1,94101764 1,94101764 1,94101764 2,02078526 2,07192913 1,950822 2,3240226 2,2340225 2,35878527 2,3473229	0,36117447 0,36384261 0,37217624 0,38235919 0,32840178 0,3236122 0,38571796 0,36074486 0,34302960 0,44107627 0,37357352 0,3278634 0,337528536 0,3631256 0,3631256 0,3632126 0,33352857 0,33352857 0,39377054 0,39377054	4,48E-10 6,94E-11 7,66E-10 9,70E-11 1,16E-05 1,71E-05 1,60E-05 1,60E-05 1,60E-05 1,60E-05 1,60E-05 1,60E-05 1,60E-05 2,23E-05 2,25E-05 2,2	1,28:08 1,36:08 2,15:08 2,66:08 2,66:08 3,38:08 3,30:08 4,23:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:0	ATGO8820 ATGO8530 ATG5820 ATG68530 ATG5220 ATG52230 ATG52240 ATG5220 ATG52230 ATG52240 ATG5220 ATG52230 ATG52240 ATG7300 ATG7300 ATG7300 ATG7320 ATG7320 ATG7320 ATG73300 ATG73300 ATG73300 ATG73300 ATG73300 ATG7330 ATG60820 ATG608930 ATG7300 ATG608920 ATG608930 ATG63300 ATG55810 ATG6330 ATG60875 ATG6330 ATG60875	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G508530 AT3G5740 AT3G508530 AT3G59760 AT3G509750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G70300 AT3G16000 AT3G16010 AT1G702910 AT1G2920 AT1G79930 AT1G29940 AT1G0915 AT1G09587 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT2G23300 AT2G23300 AT3G1604530 AT1G09693 AT1G76920 AT1G76930 AT3G5000 AT3G500 AT1G09673 AT1G07480 AT1G09587 AT1G07685 AT4G17810 AT1G07480 AT1G04587 AT1G07485 AT1G07490 AT3G08900 AT3G0290 AT3G56800 AT3G56810 AT4G3720 AT1G63730 AT4G09375 AT4G36740 AT4G36720 AT4G36730 AT4G09375 AT4G36740 AT4G36720 AT1G13730
Lth 3-7100839 Cth 2-7125935 Cth 2-7258765 Cth 2-20167516 Cth 2-20167516 Cth 2-2078296 Cth 2-2078296 Cth 2-2078296 Cth 2-2078296 Cth 2-2078296 Cth 2-407793 Cth 2-	113,2030 163,20315 173,05385 155,148945 177,05233 224,169833 165,68428 111,477865 217,742577 152,414304 216,566027 206,451549 156,969071 179,501993 228,870033 228,870033 228,870033 213,197511 213,197721 213,197721 215,086691 215,086691 215,08	2,312(10) 2,212(85)(0) 2,20747(4) 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,155036 1,94101764 1	0.36117447 0.36384261 0.37217624 0.32235919 0.35840178 0.3236122 0.32531796 0.36074486 0.4302906 0.440107627 0.3607485 0.3607486 0.36372856 0.36372856 0.3631256 0.3632256 0.35322166 0.33522166 0.3352257 0.39777054 0.393569069 0.49904148 0.40305547 0.441861133	4,48E-10 6,94E-10 9,68E-10 9,70E-10 1,16E-00 1,17E-00 1,60E-00 1,60E-00 1,60E-00 1,60E-00 1,60E-00 1,78E-00 1,78E-00 2,27E-00 2,47E-00 2,8	1,28:08 1,84:08 2,15:08 2,68:08 2,68:08 3,18:08 3,18:08 3,18:08 3,18:08 4,06:08 4,06:08 4,23:08 4,23:08 4,23:08 4,43:08 6,34:08 6,34:08 6,34:08 6,34:08 6,34:08 7,74:0	AT5008220 AT5008330 AT3654460 AT3654470 AT365220 AT1652220 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT1629920 AT1679920 AT1679920 AT1679200 AT1604530 AT1604540 AT5023060 AT500450 AT1604530 AT1604540 AT5023060 AT500450 AT1607480 AT167350 AT1676360 AT167350 AT1676360 AT167350 AT16736810 AT3608910 AT3608920 AT3608930 AT3605800 AT3656810 AT4636730 AT4609375 AT1663490	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 00 AT3G508530 AT3G50852 00 AT3G508530 AT3G54460 AT3G508530 AT3G59760 AT3G509765 AT3G59770 AT3G659760 AT3G59765 AT3G59770 AT3G659760 AT3G509760 AT3G62000 AT3G62010 AT1G09915 AT1G09587 AT1G09693 AT1G29940 AT1G09915 AT1G09587 AT1G09693 AT1G76920 AT1G76930 AT1G09415 AT1G09587 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G09587 AT1G09693 AT1G76920 AT1G76930 AT3G523050 AT5G23060 AT5G00450 AT5G23065 AT4G17810 AT4G17810 AT1G07830 AT1G04530 AT1G09623 AT1G07840 AT3G565790 AT3G56810 AT3G56780 AT3G56790 AT3G56810 AT3G56780 AT3G56730 AT3G56810 AT3G56780 AT3G56730 AT3G56810 AT3G5720 AT3G5720 AT3G56780 AT1G13730 AT1G13720 AT1G13730 AT1G6340 AT1G63500
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-2078206 Chr3-2078208 Chr3-2078208 Chr3-2082208.5 Chr1-26477793 Chr3-643306 Chr3-2082050.5 Chr1-28892328.5 Chr3-9914300.5 Chr3-2738511 Chr4-9906031.5 Chr3-2712484.5 Chr3-2712484.5 Chr3-2712484.5 Chr3-2712484.5 Chr3-2712485.5 Chr3-2712485.5 Chr3-2712485.5	113,2830 163,20315 173,05385 173,05385 173,05385 173,05385 177,05233 224,169833 165,68428 114,477865 217,742577 152,414304 156,969071 152,414304 156,969071 156,5629071 138,844933 142,201011 138,844933 142,201011 134,547965 135,108681 202,29982	2,21285904 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,21205869 1,94101764 1,94101764 1,94101764 1,94101764 1,94101764 2,20278526 2,07192913 1,950822 2,3240226 2,2340226 2,2340227 2,31773229 2,3878527 2,31773229 2,38789275 2,31773229	0.36117447 0.36384261 0.37217624 0.32235919 0.35840178 0.32236122 0.36074486 0.4020906 0.4302906 0.44107627 0.37357352 0.3278654 0.33517232 0.32785636 0.33522166 0.33522166 0.3352285 0.3352285 0.33528585 0.33528585 0.33528585 0.33528585 0.33528585 0	4,48E1C 6,44E1C 6,94E1C 7,66E1C 9,68E1C 9,70E1C 1,16E0C 1,17E0C 1,51E0C 1,51E0C 1,51E0C 1,54E0C 1,54E0C 2,23E0C 2,23E0C 2,23E0C 2,23E0C 2,257E0C 3,87E0C 4,04E0C 4,04E0C 4,04E0C	1,28:08 1,36:08 2,15:08 2,68:08 3,38:08 3,38:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 5,76:0	AT5008220 AT5608530 AT3654460 AT3654470 AT365220 AT1652230 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT1629200 AT1629200 AT1629200 AT1629200 AT1604530 AT1604540 AT5623060 AT5600450 AT4617810 AT1607350 AT5600450 AT1607480 AT1607800 AT3608920 AT3608930 AT1603000 AT1603010 AT3608910 AT3608920 AT3608930 AT1603300 AT365810 AT4636730 AT4609375 AT1663490 AT5660460	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 0A T5G08530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G62010 AT1G70290 AT3G62010 AT1G702910 AT1G2920 AT1G79930 AT1G79940 AT1G09915 AT1G09687 AT1G09693 AT1G76930 AT2G23300 AT1G04530 AT1G04530 AT1G04540 AT5G23050 AT5G22060 AT5G23065 AT4G17810 AT1G7480 AT1G04587 AT1G07485 AT1G07490 AT3G68900 AT3G62085 AT3G08910 AT3G08920 AT3G08930 AT1G03900 AT3G62085 AT3G08910 AT3G08920 AT3G08930 AT1G03900 AT3G56780 AT3G56800 AT3G56810 AT3G6780 AT3G5870 AT3G56800 AT3G56810 AT4G3720 AT1G3730 AT1G63730 AT4G36730 AT4G0975 AT4G36740 AT1G13720 AT1G3730 AT1G63490 AT1G5640460 AT5G04505
Lth 3-7100839 Chr2-7125935 Chr2-7125935 Chr2-0167516 Chr2-1047516 Chr2-1047516 Chr2-1047516 Chr2-2078296 Chr2-20482508.5 Chr2-20482508.5 Chr2-4047793 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-6477775 Chr2-647755 Chr2-647755	173,05385 163,28369 175,053153 177,053858 155,148945 177,052333 240,499839 240,499839 241,69833 111,477865 217,742577 156,56427 206,451549 156,96907 179,501993 252,870033 351,785917 138,844933 351,785917 138,844933 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,64493 351,785917 138,74493 351,785917 138,74493 351,785917 138,74493 351,785917 138,74493 351,785917351,785917 3	2,312(8)90 2,2027474 2,2027474 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,1550636 1,94101766 1,98140201 2,21205869 1,94101766 1,95140201 2,20278526 2,15732223 2,0278526 2,35878527 2,31773229 2,38799715 1,91305395 2,01970354	0,36117447 0,37217624 0,37217624 0,32235919 0,35840178 0,3236122 0,32531796 0,36074486 0,4302906 0,44007627 0,37357352 0,37357352 0,37357352 0,37357352 0,33557128 0,39356006 0,33352165 0,39356006 0,41861133 0,33551228	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,70E1C 1,17E0C 1,17E0C 1,17E0C 1,60E0C 1,60E0C 1,60E0C 1,60E0C 2,47E0	1,28:08 1,38:08 2,15:08 2,68:08 2,68:08 3,18:08 3,38:08 3,30:08 4,06:08 4,23:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT1G52230 AT1G52240 AT1G52220 AT1G52240 AT1G5720 AT1G52270 AT1G70300 AT3G16000 AT3G16010 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G70300 AT1G04530 AT1G04540 AT3G23060 AT3G04540 AT3G23060 AT3G0850 AT1G7180 AT3G7800 AT1G7580 AT1G7180 AT3G7800 AT3G58810 AT3G55801 AT3G55810 AT4G36730 AT4G09375 AT1G63490 AT3G40460	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59763 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT1G70290 AT1G70300 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G09915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G094520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G04530 AT1G04540 AT5G23050 AT5G23060 AT5G00450 AT5G23065 AT4G17810 AT1G74350 AT1G04530 AT1G07425 AT1G07490 AT1G09800 AT3G0285 AT3G08910 AT3G08920 AT3G08930 AT1G04530 AT1G04537 AT1G09623 AT1G04530 AT1G054570 AT3G56800 AT3G08920 AT3G08930 AT1G0300 AT1G033010 AT3G56780 AT3G56790 AT3G56800 AT3G56810 AT4G15720 AT4G35730 AT4G09375 AT4G36740 AT1G63490 AT1G63500 AT1G63490 AT1G63500 AT1G63490 AT1G63500
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-20262508.5 Chr1-26477793 Chr3-2625208.5 Chr1-26477793 Chr3-2625208.5 Chr1-26477793 Chr3-27126308 Chr3-27126308 Chr3-27126308 Chr3-2712643800.5 Chr1-28643800.5 Chr3-26484300.5 Chr3-2712484.5 Chr3-2651.5 Chr3-271248.5 Chr3-2712485.5 Chr3-2712485.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-27212475.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-2721245.5 Chr3-272725 S	113,2836 163,20315 173,05385 155,148945 177,052333 224,169833 165,68428 114,477865 217,742577 152,414304 216,565027 179,501993 228,87003 351,785917 138,844933 142,201011 133,97721 135,6786071 135,5188613 102,298882 204,346636 202,298882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,346636 202,89882 204,9985	2,312(10) 2,21285904 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,21205869 4,9350964 1,9410176 1,9410176 1,9410176 1,9410176 2,0278526 2,0278526 2,0278276 2,0278776 2,02787776 2,02787776 2,02787777777777777777777777777777777777	0,36117447 0,36384261 0,37217624 0,3223519 0,3236122 0,325371796 0,36074486 0,4302306 0,44017627 0,33757352 0,33757352 0,33757352 0,33752875 0,33752875 0,33728563 0,3352857 0,33777054 0,33352857 0,33977054 0,33352857 0,33977054 0,33352857 0,33977054 0,3355287 0,33977054 0,3355287 0,33977054 0,3355287 0,33977054 0,3355287 0,33572128 0,3356287 0,34094148 0,4094148 0	4,48E1C 6,48E1C 6,94E1C 7,66E1C 9,70E1C 1,16E00 1,17E00 1,17E00 1,17E00 1,60E00 1,60E00 1,60E00 1,60E00 1,78E00 2,27E00 2,27E00 2,57F00 2,87F00 4,45E00 5,88E00 6,24E00 5,88E00 6,24E00	1,28:08 1,36:08 2,15:08 2,65:08 2,65:08 3,18:08 3,39:0-08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 5,05;08,08 5,05;08,08,08 5,05;08,08,08,08 5,05;08,08,08,08,08,08,08,08,08,08,08,08,08,0	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G52250 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G18000 AT3G16010 AT1G09200 AT1G79200 AT1G79200 AT1G79200 AT1G79200 AT1G04530 AT3G08520 AT4G17810 AT3G08910 AT3G08920 AT3G08930 AT1G03000 AT1G03010 AT3G08910 AT3G08920 AT3G08930 AT1G03300 AT1G03010 AT3G540460 AT3G540460 AT5G40460	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G54470 AT1G502220 AT1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G62010 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G70290 AT3G2020 AT1G29930 AT1G29940 AT1G70290 AT1G09867 AT1G76920 AT1G76930 AT2G23300 AT3G11G0985 AT1G09687 AT1G76920 AT1G76930 AT3G23050 AT5G23060 AT5G2365 AT4G17810 AT1G76350 AT1G76360 AT1G09623 AT1G76350 AT1G76360 AT1G07490 AT3G628000 AT3G62087 AT1G07480 AT3G628000 AT3G62087 AT1G07480 AT3G68900 AT3G6270 AT3G56800 AT3G56810 AT4G3720 AT1G63530 AT3G6870 AT3G68780 AT3G56790 AT3G56800 AT3G56810 AT4G3720 AT1G63530 AT1G63400 AT1G6350 AT1G63500 AT3G5670 AT3G686780 AT3G56790 AT3G56800 AT3G56810 AT4G3720 AT1G63750 AT3G68700 AT3G5720 AT3G56800 AT3G5700 AT5G5720 AT3G56750 AT5G62505 AT5G4260 AT5G5250 AT5G52520 AT5G52580
Lin 3-7100893 Chr2-7125935 Chr2-7125935 Chr2-0167516 Chr2-1047516 Chr2-1047516 Chr2-1047516 Chr2-2078266 Chr2-2078260 Chr2-20477793 Chr2-647779 Chr2-647779 Chr	173,05385 163,2836 155,5148945 177,052383 177,052333 240,499839 124,169833 111,477865 217,742577 155,64243 115,56424 216,565027 206,451549 155,969071 179,501993 252,870033 351,785917 138,844933 142,201011 213,197721 143,647965 135,108681 202,299882 204,346636 222,891974	2,312(10) 2,212(8) 2,22(82) 2,2542)(20) 2,2542)(20) 2,2542)(20) 2,2542)(20) 2,2550(20) 2,4550(20) 1,9410(176) 1,98140(20) 2,1215(86)(41) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 2,1215(86)(41) 1,98140(20) 1,98140	0.36117447 0.36317447 0.37217624 0.37217624 0.32235919 0.35840178 0.35840178 0.32236122 0.36074486 0.4302906 0.44107627 0.37357322 0.37357322 0.37357322 0.33557126 0.33552126 0.33552126 0.33552126 0.33956002 0.49090148 0.33557128 0.3602829 0.36557128 0.36557128 0.3657758 0.3657758 0.3557578 0.3557758 00	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,70E1C 1,1EE0C 1,1EE0C 1,1EE0C 1,1EE0C 1,1EE0C 1,16E0C 1,60E0C 1,60E0C 1,60E0C 2,47E0C 2,77E0	1,28:08 1,38:08 2,15:08 2,68:08 2,68:08 3,18:08 3,38:08 3,30:08 4,23:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT1G52230 AT1G52240 AT3G5755 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G74530 AT1G04540 AT5G23060 ATSG0450 AT4G17810 AT3G7830 AT1G04540 AT3G08910 AT3G08920 AT3G08930 AT1G07480 AT3G5880 AT3G56810 AT4G36730 AT4G09375 AT1G63490 AT3G40460 AT3G4040 AT3G4040 AT3G4040 AT3G45280 AT3G4040 AT3G45280 AT3G4040 AT3G45280 AT3G4040 AT3G45280 AT3G4040 AT3G45280 AT3G4040 AT3G45280	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 0A T3G508530 AT3G54460 AT3G54470 AT1G52220 AT1G52230 AT1G52240 AT3G59760 AT3G59750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT1G70290 AT1G70300 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G9915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT2G23300 AT3G52300 AT3G04530 AT1G04540 AT5G23050 AT1G04530 AT1G04540 AT1G7430 AT1G04530 AT1G07490 AT1G7430 AT1G04587 AT1G07485 AT1G07490 AT3G08900 AT3G02085 AT3G08910 AT3G08920 AT3G08930 AT1G03400 AT1G03310 AT1G63400 AT1G03300 AT1G63400 AT1G63570 AT3G56800 AT3G56810 AT1G3730 AT1G5730 AT4G09735 AT4G36740 AT1G3730 AT1G350 AT1G63400 AT1G63500 AT1G63400 AT1G63500 AT5G61270 AT3G661280 AT5G61270 AT5G61280 AT5G61270 AT5G61280
Lth 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-22078296 Chr3-2262508.5 Chr1-26477793 Chr3-2433969 Chr3-42962508.5 Chr1-28632800.5 Chr1-2863800.5 Chr1-236308 Chr3-7738511 Chr3-291480.5 Chr3-200871.5 Chr3-201848.5 Chr3-21036229.5 Chr4-13013425.5 Chr3-21036229.5 Chr3-12036229.5 Chr3-212485.5 Chr3-2623336 Chr5-16203585.5 Chr3-24642010.5 Chr5-21307252.5	113,2630 163,2630 165,503153 177,053885 155,148945 177,052333 224,169833 165,68428 114,477865 217,742577 152,414304 114,477865 125,6969071 179,501993 122,841304 142,201011 179,501993 142,201011 179,501993 142,201011 135,108681 202,299882 204,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 202,346565 202,299882 203,346565 202,299882 203,346565 202,299882 203,346565 202,299882 203,346565 202,299882 203,346565 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 202,299882 203,34655 203,3455 203,3455 203,3455 203,3455 203,3455 203,3455 204,3455 203,3455 204,34555 204,34555 204,34555	2,312(10) 2,212(13) 2,212(13) 2,212(13) 2,212(14) 2,212(0.36117447 0.36384261 0.37217624 0.32235919 0.32840178 0.3236122 0.325817196 0.36074486 0.36074486 0.36074486 0.36074486 0.36372856 0.36372856 0.3632286 0.35322166 0.3352857 0.393960969 0.40904148 0.4090547 0.33602829 0.35621228 0.360276 0.360276 0.360276 0.360286 0.360276 0.3602	4,48E1C 6,48E1C 6,94E1C 7,66E1C 9,68E1C 9,70E1C 1,11FE0C 1,11FE0C 1,44E0C 1,44E0C 1,60E0C 1,73E0C 1,60E0C 1,73E0C 1,75	1,28:08 1,36:08 2,15:08 2,68:08 3,38:08 4,28:084,28:08 4,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,28:084,28:08 4,28:08 4,29:084,29:08 4,29:084,29:08 4,29:084,29:08 4,29:08	AT5008220 AT5008300 AT3654460 AT3654470 AT365220 AT1652220 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT3616000 AT3616010 AT1602920 AT1602920 AT1602920 AT1602920 AT1602920 AT1604530 AT3604540 AT5623060 AT366450 AT1607480 AT3608910 AT3608920 AT3608930 AT1603000 AT3608920 AT3608930 AT1603400 AT3605810 AT1663490 AT36540460 AT5652570 AT5652580 AT2664140 AT2646150 AT2664140 AT2646150 AT5652970	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 0A T3G54470 AT1G50252 0A T1G52230 AT1G52240 AT3G59760 AT3G59765 AT3G59770 AT3G62000 AT3G639765 AT3G59770 AT3G62000 AT3G639765 AT3G59770 AT3G62000 AT3G63010 AT3G16000 AT3G16010 AT1G72920 AT1G70300 AT3G16000 AT3G16010 AT1G92910 AT1G92930 AT1G29940 AT1G92910 AT1G92930 AT1G29940 AT1G92910 AT1G92930 AT1G76920 AT1G76930 AT2G23300 AT1G04520 AT1G04530 AT1G0450 AT5G23050 AT5G23060 AT5G0450 AT3G23050 AT5G23060 AT5G0450 AT3G1780 AT1G76360 AT1G09623 AT1G7350 AT1G76360 AT1G09623 AT1G0480 AT1G04587 AT1G07485 AT1G07490 AT3G082900 AT3G02085 AT3G08910 AT3G08920 AT3G08930 AT1G03300 AT1G03010 AT3G65780 AT3G5780 AT3G56800 AT3G56800 AT3G56810 AT4G3720 AT1G13730 AT1G63400 AT1G63503 AT1G63400 AT1G63503 AT1G63400 AT1G63503 AT1G63400 AT5G52870 AT3G56280 AT5G5250 AT5G52570 AT3G562580 AT5G5250 AT5G52570 AT5G52580 AT2G46140 AT2G45150 AT2G46150
Lin 3-7100893 Chr3-2125935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-19454671 Chr3-22962508.5 Chr3-23962508.5 Chr3-24892328.5 Chr3-438939 Chr3-043969 Chr3-043969 Chr3-043969 Chr3-043969 Chr3-043969 Chr3-04380.5 Chr3-2914280.5 Chr3-2914280.5 Chr3-2914280.5 Chr3-2914280.5 Chr3-2914281.5 Chr3-29551.5 Chr3-20551.5 Chr3-20551.5 Chr3-20551.5 Chr3-20555.5 Chr3-235533.6 Chr3-20358.5 Chr3-23553.5 Chr3-23555.5 Chr3-2385.5 Chr3-2385.5 Chr3-2385.5 Chr3-2385.5	173,503476 183,28369 165,503153 177,053858 155,148945 177,052333 244,169833 177,052333 244,169833 177,052333 244,169833 165,68428 111,477865 217,742577 155,414304 216,555027 206,451549 156,969071 179,501993 252,870033 51,785917 138,844937 138,844937 138,844937 138,844937 138,844937 138,844937 138,844937 139,7648 135,106861 202,299882 204,346636 222,891974 166,376971 165,43068	2,312(0) 2,2128590 2,2027474 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,30387814 2,30387814 2,15464141 2,15464141 2,15464141 2,1555036 2,1573223 2,1078526 2,27319225 2,3587527 2,357525 2,357527 2,357577527 2,3575277527 2,357527 2,357527 2,357527757777777777777777777777777	0.36117447 0.36384018 0.37217624 0.32235919 0.3236122 0.35840178 0.3236122 0.36074486 0.3402906 0.44107637 0.37357322 0.37286634 0.33517232 0.33528536 0.36322857 0.3532166 0.335322166 0.33532165 0.369069 0.40905418 0.369069 0.40905418 0.369069 0.40905418 0.369069 0.40905418 0.3602376 0.36864133 0.3686287 0.36864133 0.36571228 0.3602376 0.36864453 0.3684463	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,76E1C 9,76E1C 9,76E1C 1,17E0C 1,44E0C 1,44E0C 1,60E0C 1,60E0C 1,60E0C 1,60E0C 1,73E0C 1,64E0C 2,24F0C 2,24F0C 2,24F0C 2,24F0C 2,24F0C 3,87E0C 3,77E0	1,28:08 1,36:08 2,15:08 2,68:08 2,68:08 3,38:08 4,23:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:0	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G59765 AT3G59770 AT1G5720 AT1G52270 AT1G70300 AT3G16000 AT3G16010 AT1G7920 AT1G7920 AT1G7920 AT1G79300 AT3G7800 AT3G23060 ATSG00450 AT3G23060 ATSG00450 AT4G17810 AT1G7330 AT1G76360 AT1G7780 AT3G08910 AT3G08920 AT3G08930 AT1G7830 AT3G08920 AT3G08930 AT1G56300 AT3G5810 AT3G56800 AT3G5810 AT4G36730 AT4G09375 AT1G5490 AT3G640460 AT3G640460 AT3G6425250 AT3G52580 AT3G640460 AT3G64040 AT3G640 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G640 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G640 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G6400 AT3G640 AT3G6400 AT3	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT5G0852 00 AT3G508530 AT3G54460 AT3G54470 AT1G502220 AT1G52230 AT1G52240 AT3G59760 AT3G59756 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT3G70300 AT1G70290 AT3G62010 AT1G70290 AT3G62010 AT1G70320 AT3G62020 AT1G29930 AT1G29940 AT1G70320 AT3G62020 AT3G2930 AT1G29940 AT1G04520 AT1G0983 AT1G09633 AT1G76920 AT1G76930 AT2G23300 AT2G23300 AT3G62040 AT3G04540 AT5G23050 AT5G02500 AT5G0500 AT5G23065 AT4G17810 AT1G76350 AT1G7350 AT1G09623 AT1G07480 AT1G04530 AT1G09623 AT1G07480 AT3G07805 AT3G08910 AT3G68920 AT3G08930 AT3G08900 AT3G02085 AT3G08910 AT3G6820 AT3G08930 AT1G3720 AT1G3370 AT3G58800 AT3G58610 AT4G3720 AT1G37300 AT3G56800 AT3G56810 AT4G36720 AT1G63500 AT3G50605 AT5G40460 AT5G0505 AT3G5000 AT3G640460 AT5G052580 AT3G61270 AT5G61280 AT5G51270 AT5G61280 AT5G5250 AT5G52570 AT5G52580 AT5G61270 AT5G62830 AT5G65280 AT5G52570 AT5G52580 AT5G65280 AT5G65250 AT5G52580 AT5G55280 AT5G55280 AT5G55280 AT5G55280 AT5G55280 AT5G55280 AT5G5550 AT5G5550 AT5G55580 AT5G5550 AT5G5550 AT5G55580 AT5G5550 AT5G5550 AT5G55580 AT5G5550 AT5G5550 AT5G55580 AT5G5550
Lin 3-7100839 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-22078296 Chr3-24827793 Chr3-2482738 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-647970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-747970 Chr3-74790 Chr3-747970 Chr3-747970 Chr3-74790 Chr3-747970 Chr3-74790	173,054376 183,28369 155,503153 177,052383 224,169833 165,68428 114,477865 217,742577 206,451549 216,565027 206,451549 155,969071 179,501993 228,870033 351,785917 138,844933 142,201011 213,197721 135,108661 202,2989822 204,346636 202,289174	2,312(10) 2,212(8) 2,212(8) 2,212(8) 2,20) 2,212(8) 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,155036 2,61569641 2,154659641 2,154659641 2,154659641 2,154659641 2,154659641 2,154659641 2,154659641 2,154659641 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,15465964 2,1546596 2,15465964 2,1546596 2,15465964 2,15465964 2,15465966 2,15465966 2,1546596666666666666666666666666666666666	0.36117447 0.36384261 0.37217624 0.32235919 0.35840178 0.3236122 0.32531796 0.36074486 0.36074486 0.36074486 0.3607486 0.36372856 0.36372856 0.3631256 0.3352857 0.393750054 0.3935600547 0.3935600547 0.3632476 0.3652128 0.3602829 0.3623476 0.36234	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,68E1C 9,70E1C 1,10E0C 1,10E0C 1,44E0C 1,44E0C 1,60E0C 1,70E0C 1,60E0C 1,70E0	1,28:08 1,36:08 2,15:08 2,68:08 3,38:08 3,39:06 3,39:06 4,06:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 6,33:08 6,33:08 6,33:08 6,33:08 6,33:08 6,33:08 1,01:07 1,16:07 1,16:07 1,16:07 1,26:07 1,70:07 1,70:07 1,70:07 1,70:07 2,05:0	ATSC08220 ATSC08330 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G59765 AT3G59770 AT1G57230 AT1G52230 AT1G52240 AT3G597055 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT1G29200 AT1G70920 AT1G70920 AT1G70920 AT1G703300 AT3G0920 AT1G703300 AT1G703300 AT3G08920 AT3G08930 AT1G703000 AT1G70500 AT4G3730 AT4G09375 AT1G63490 AT3G54204G0 AT3G54204G0 AT3G552570 AT3G52580 AT3G55920	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 00 AT3G508530 AT3G54400 AT3G508530 AT3G54400 AT3G508530 AT3G59760 AT3G508530 AT3G59760 AT3G59750 AT3G59770 AT3G62000 AT3G59750 AT3G59770 AT3G62000 AT3G59750 AT3G7930 AT1G02910 AT1G70300 AT1G02910 AT1G70300 AT1G02910 AT1G2920 AT1G2930 AT1G29940 AT1G0915 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT1G04520 AT1G04530 AT1G04540 AT1G0520 AT1G04530 AT1G04540 AT1G78530 AT1G04530 AT1G07450 AT1G7850 AT1G04587 ATG07485 AT1G07490 AT3G08900 AT3G02085 AT3G08910 AT3G08920 AT3G08930 AT1G03400 AT1G04857 AT1G07485 AT1G07490 AT3G56780 AT3G55790 AT3G56800 AT3G56810 AT4G3720 AT4G36730 AT4G09375 AT4G36740 AT1G13720 AT1G13730 AT1G63490 AT1G63500 AT5G5920 AT5G61280 AT3G56720 AT5G61280 AT2G45100 AT5G09580 AT2G45100 AT5G09580 AT2G45100 AT5G09580 AT2G45100 AT5G55930 AT2G45100 AT5G55930 AT2G45100 AT5G55930 AT2G45100 AT5G55930 AT2G4520 AT5G55930 AT2G4520 AT5G55930 AT2G4520 AT5G55930 AT2G4520 AT5G55930 AT2G4570 AT5G55930 AT2G45
Lin 3-7100893 Chr3-2125935 Chr3-20167516 Chr3-20167516 Chr3-20167516 Chr3-20826508.5 Chr3-24647793 Chr3-43869 Chr3-43869 Chr3-43869 Chr3-43869 Chr3-43869 Chr3-43869 Chr3-738511 Chr3-991400.5 Chr3-738511 Chr3-991400.5 Chr3-738511 Chr3-991400.5 Chr3-2124843800.5 Chr3-2124843800.5 Chr3-2124843800.5 Chr3-212484380.5 Chr3-21248435 Chr3-2124845.5 Chr3-21036229.5 Chr3-21036255.5 Chr3-2103585.5 Chr3-21837252.5 Chr3-21837252.5 Chr3-2183755.5 Chr3-2183755.5 Chr3-2183755.5 Chr3-2183755.5 Chr3-2183755.5 Chr3-2183755.5 Chr3-2186267 Chr3-266267 Chr3-267003	173,05385 163,2836 155,148945 177,052383 177,052383 177,052333 224,169833 177,052333 124,14945 177,052333 124,14945 177,052333 124,14945 155,68428 114,477865 127,742577 155,44134 125,414345 125,414345 125,414345 125,414345 125,414345 126,545927 128,54023 128,54023 142,201011 123,349274 124,547955 135,108681 120,29882 124,547955 135,108681 120,29882 124,547955 135,108681 126,547971 165,43068 200,582448 203,41245 145,547955 145,54785 145,547955 145,54795 145,547955 145,54795 145,54795 145,54795 145,54795 145,54795 145,54795 145,54795 145,54795 145,54755 145,54755 145,54755 145,54755 145,54755 145,54755 145,54755 145,54755 145,54755 145,5475 145,54755 145,5475 145,5475 145,54755 145,5475 145,5475 145,5475 145,5475 145,5475 145,5475 145,54755 145,5475 145,5475 145,5475 145,5475 145,5475 145,54755 145,5475 145,5475 145,54755 145,5475 145,547555 145,547555 145,547555 145,547555 145,547555 145,547555 145,547555 145,547555 145,547555 145,547555 1	2,312(10) 2,2128590 2,2027474 2,25421087 2,30979745 2,15144796 1,93504918 2,30387814 2,30387814 2,21205869 1,94101764 1,98140201 2,21205869 2,15732223 2,1573229 2,3879275 1,9310205 2,3373229 2,38799715 1,91305395 2,01970514 2,01970	0.36117447 0.36384018 0.37217624 0.32235919 0.35840178 0.32236122 0.35840178 0.36074486 0.402066 0.44107627 0.33517232 0.3278654 0.33517232 0.335278536 0.36631256 0.3352857 0.36631256 0.3352877 0.349004148 0.3360069 0.40305477 0.44036137 0.33627879 0.3357128 0.3362777 0.3464133 0.336277 0.3664133 0.336277 0.3664133 0.336277 0.36643443 0.3362476 0.3302476 0.36298989 0.35298989	4,48E1C 6,48E1C 7,66E1C 9,70E1C 9,70E1C 1,17E0C 1,17E0C 1,17E0C 1,51E0C 1,60E0C 1,73E0	1,28:08 1,38:08 2,15:08 2,68:08 3,38:08 3,38:08 4,23:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:0	AT5008220 AT5008530 AT3654460 AT3654470 AT3652420 AT1652230 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT3616000 AT3616010 AT1607920 AT1607930 AT360920 AT1607330 AT1604540 AT5623060 AT5600450 AT4617810 AT1607350 AT56050 AT4617810 AT1607350 AT5605020 AT3608910 AT3608920 AT3608930 AT1607300 AT3608920 AT3608930 AT1607300 AT3608920 AT3608930 AT1663490 AT3656400 AT5660460 AT5660460 AT5652570 AT3652580 AT364410 AT2646150 AT563880 AT2608775 AT2635890 AT363880 AT2608775 AT2635890 AT3636880 AT263675 AT2635890 AT3636520	AT2616430 AT2606625 AT2G06635 AT2G16440 AT506852 0A T50508330 AT3654460 AT3654470 AT1652220 AT1652230 AT1652240 AT3659760 AT3659755 AT3659770 AT3665020 AT3659755 AT3659770 AT3662000 AT3662010 AT16702300 AT3662010 AT16702300 AT3662010 AT1609910 AT1629920 AT1629930 AT1629940 AT1609920 AT1609857 AT1609693 AT1676920 AT1676930 AT2623300 AT3623005 AT5623060 AT1609630 AT1676920 AT1676930 AT2623300 AT1604530 AT1609653 AT1609630 AT1676920 AT1676930 AT2623300 AT5623060 AT5600450 AT5623065 AT4617810 AT1607480 AT1609623 AT1607480 AT1609623 AT1609623 AT1607480 AT1609800 AT3608910 AT3608920 AT3608930 AT3607080 AT360280 AT3608910 AT3608920 AT3608930 AT1607480 AT1603010 AT360700 AT365800 AT3656800 AT3656810 AT4636720 AT4636730 AT3656800 AT4636720 AT1635700 AT16320 AT1635800 AT163200 AT1655200 AT5661270 AT5661280 AT5661270 AT5661280 AT5661270 AT5652570 AT5652580 AT5661270 AT5652570 AT5652580 AT564140 AT2646150 AT366450 AT565250 AT
Lin 3-7100839 Chr2-7125935 Chr2-7125935 Chr2-0167516 Chr2-1045716 Chr2-1045716 Chr2-1045716 Chr2-20452508.5 Chr1-24677793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477793 Chr2-6477773 Chr2-64777777777777777777777777777777777777	173,05436 163,2836 155,148945 177,05233 240,49983 125,148945 177,05233 240,49983 124,169833 114,477865 127,742577 126,456027 206,451549 125,414304 2165,65027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,565027 126,567057 135,108681 202,2998822 203,46265 222,891974 165,570971 165,54058 203,588248 233,412145 134,247524 134,247524 134,247524 134,247524 134,247524 135,108681 135,108681 135,108681 135,108681 135,108681 135,108681 135,108681 135,108682 135,108524 13	2,312(0) 2,21285904 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,15464141 2,155036 1,93504918 2,455036 1,94101764 1,98140201 2,21205859 1,94101764 1,98140201 2,20278526 2,35732223 2,3739225 2,35878527 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,31773229 2,3177329 2,3177429 2,317747	0,36117447 0,36384261 0,37217624 0,32235919 0,35840178 0,3236122 0,32531736 0,36074486 0,4302906 0,4407627 0,3357325 0,32785636 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,3358216 0,362376 0,362376 0,362376 0,362376 0,3643443 0,3342405 0,3643443 0,3342405 0,3643443 0,3342405 0,3643443 0,3342405 0,3643443 0,3342405 0,3643443 0,3342405 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3434430 0,3643443 0,3643445 0,364445 0,3644545 0,3644545 0,36445456 0,364456667 0,36445667 0,36445667 0,36445667 0,3645667 0,36456	4,48E1C 6,48E1C 6,94E1C 7,66E1C 9,68E1C 9,68E1C 9,70E1C 1,17E0C 1,17E0C 1,17E0C 1,60E0C 1,60E0C 1,60E0C 1,60E0C 1,60E0C 2,47E0C 2,247E0C 2	1,28:08 1,38:08 2,15:08 2,68:08 2,68:08 3,18:08 3,30:08 4,06:08 4,23:0	AT5008520 AT5008530 AT3654460 AT3654470 AT365240 AT3652230 AT1652240 AT365765 AT3659770 AT3659765 AT3659770 AT36700 AT360920 AT3608200 AT3608200 AT4617810 AT4617810 AT3608910 AT3608920 AT3608930 AT3608910 AT3608920 AT3608930 AT3608910 AT3608920 AT3608930 AT366400 AT36640460 AT36652570 AT3652580 AT2664410 AT2645150 AT365200 AT3664200 AT365200 AT3664200 AT365200 AT3664200 AT365200 AT3604200 AT3604430	AT261430 AT2606625 AT2G06635 AT2G16440 AT506852 00 AT36508530 AT36576082 30 AT1652230 AT1652240 AT365760 AT36508530 AT3659760 AT36559770 AT3659760 AT3659770 AT3659760 AT3659770 AT3659700 AT3659770 AT3659700 AT3659770 AT3659700 AT3659770 AT3659700 AT3659770 AT3659700 AT3659770 AT361000 AT3616010 AT1679290 AT1679300 AT3629910 AT1629940 AT1609915 AT1609687 AT1609693 AT1676920 AT1676930 AT2623300 AT362300 AT1604530 AT1604540 AT5623050 AT5603050 AT56030565 AT4617810 AT1607436 AT1607636 AT1607485 AT1607490 AT3605800 AT360285 AT3608910 AT3608920 AT3608930 AT16030301 AT3656780 AT3656780 AT3656810 AT16030301 AT365720 AT4636730 AT4609375 AT4636740 AT1635720 AT3665400 AT5604075 AT564720 AT4636730 AT4609375 AT4636740 AT163520 AT3665400 AT366610 AT564720 AT4636730 AT460975 AT564720 AT4636730 AT460975 AT564720 AT5661280 AT564720 AT5661280 AT565520 AT5662550 AT565520 AT5662580
Lth 3-7100839 Cth 2-7125935 Cth 2-7259765 Cth 2-20167516 Cth 2-20167516 Cth 2-20162508 Cth 2-2078296 Cth 2-2078296 Cth 2-2078296 Cth 2-2078296 Cth 2-2078297 Cth 2-20787 Cth 2-20	173,05385 163,28369 165,503153 177,052385 157,148945 177,052333 224,169833 155,6424 114,77865 217,742577 155,6424 115,6424 156,969071 179,501993 228,870033 142,201011 213,187721 145,647667 135,108681 202,89882 204,346636 222,891974 164,576971 165,58288 204,346636 222,891974 164,576971 165,58288 204,34636 223,891974 164,576971 105,58288 234,12145 134,247524 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 134,24754 313,702518 234,24754 313,702518 345,24754 345,247	2,21285904 2,20724744 2,224251047 2,30979745 2,15148796 1,15148796 1,15148796 1,15148796 2,30387814 2,15464141 2,21205869 1,94101764 1,94101764 1,94101764 1,94101764 1,94101764 2,21278252 2,078526 2,078526 2,078526 2,2731925 2,3240226 2,2731925 2,3878527 2,31773229 2,3878927 2,31773229 2,3878927 2,31773229 2,3878927 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,04316748 2,04366248 2,0466248 2,0466248 2,0466248 2,0466248 2,0466248 2,0466248 2,0466248 2,0466248 2,046648 2,04648 2,04648 2,0464848 2,0464848 2,04664848 2,04664848 2,04664	0.36117447 0.36384261 0.37217624 0.32235919 0.35840178 0.32236122 0.35840178 0.36074486 0.402066 0.4302906 0.33757352 0.3278654 0.33512122 0.32785636 0.3352126 0.3352216 0.33522857 0.33522857 0.33522857 0.33522857 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3362217 0.3454205 0.3362426 0.3362276 0.3663127 0.36634463 0.36634463 0.36344475 0.33629889 0.4071231 0.31743804 0.3174804 0.31748	4,48E1C 6,48E1C 7,66E1C 9,70E1C 9,70E1C 1,17E0C 1,47E0C 1,47E0C 1,60E0C 1,73E0C 1,60E0C 1,73E0C 1,60E0C 1,70E0C 1,70E0C 1,70E0C 1,90E0	1,28:08 1,36:08 2,15:08 2,65:08 2,65:08 3,38:08 3,30:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 5,76:0	AT5008220 AT5008300 AT3654460 AT3654470 AT365220 AT1652220 AT1652240 AT3659765 AT3659770 AT1670300 AT3616000 AT3616010 AT3629200 AT1679200 AT1679200 AT1679200 AT1604300 AT3604540 AT5623060 AT5600450 AT4617810 AT1607330 AT460950 AT4617810 AT1674300 AT3608920 AT3608930 AT1603000 AT1603010 AT3608910 AT3608920 AT3608930 AT1603300 AT1603010 AT365400 AT365810 AT4634730 AT3608975 AT1653490 AT5640460 AT5640460 AT365420 AT3608450 AT263880 AT2608775 AT2635890 AT363880 AT2608775 AT2635890 AT363880 AT2608775 AT2635890 AT364420 AT3604430 AT3624050 AT3624050	AT2616430 AT2606625 AT2C00635 AT2G16440 AT3608520 AT5008530 AT3654460 AT3654470 AT1652220 AT1652230 AT1652240 AT3659760 AT3659765 AT3659770 AT3662000 AT3662010 AT1670290 AT3662010 AT1670290 AT3662010 AT16702910 AT1629920 AT1629930 AT1679940 AT1609915 AT1609867 AT1609693 AT1676920 AT1676930 AT2623300 AT2623300 AT362200 AT362940 AT1604530 AT1604530 AT1604540 AT5623050 AT5622060 AT5622365 AT4617810 AT1607450 AT1604587 AT1607485 AT1607490 AT3608900 AT3662085 AT360810 AT3608920 AT3608930 AT1603950 AT3656780 AT3656800 AT3568800 AT3608930 AT163370 AT1604530 AT4609575 AT4636740 AT3636720 AT3656790 AT3656800 AT356810 AT3636720 AT3656790 AT3656800 AT356810 AT3636720 AT3656790 AT3656800 AT356810 AT3636720 AT366790 AT3656800 AT356810 AT3636720 AT366790 AT3656800 AT356810 AT363670 AT365670 AT3656800 AT356810 AT363670 AT365670 AT3656800 AT3656700 AT365670 AT3646470 AT366730 AT365800 AT3669060 AT366740 AT363670 AT366720 AT365820 AT3660400 AT3662055 AT3640400 AT3662280 AT364510 AT364520 AT366525 AT364440 AT3604430 AT3642400 AT3604430 AT3642400 AT3624050
Lin 3-7100693 Chr 2-7125935 Chr 2-7125935 Chr 2-758765 Chr 2-0167516 Chr 1-19454671 Chr 3-22078296 Chr 3-24677793 Chr 3-42962508.5 Chr 1-24677793 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-400.5 Chr 1-248518 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20321.5 Chr 3-20325.5 Chr 3-2132725.5 Chr 3-206267 Chr 3-1056267 Chr 3-1056267 Chr 3-107524 Chr 3-175324 Chr 3-175324	173,05385 183,28369 165,503153 177,052383 177,052383 177,052333 224,169833 177,052333 224,169833 177,05233 111,477865 121,742577 125,414304 115,56428 125,414304 125,54027 206,451549 135,969071 138,844933 142,201011 213,107861 135,108681 202,299882 204,346636 222,891974 164,576971 165,430682 134,247524 134,24754 134,24754 1	2,312(8)00 2,2074744 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,1550636 1,94104764 1,98140201 2,21205869 1,94104764 1,98140201 2,21205869 1,94104764 1,98140201 2,21205825 2,35878527 2,3479229 2,34792915 1,91305395 2,01970354 2,01970355 2,01970555 2,01970555 2,0197055	0.36117447 0.36317447 0.37217624 0.32235919 0.3236122 0.3254012 0.3254012 0.3254012 0.32236122 0.327367322 0.32780634 0.33517232 0.33517232 0.33517232 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.3352217 0.3357123 0.3362329 0.3602376 0.3686467 0.3684443 0.3324705 0.3209888 0.40712351 0.31274844	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,70E1C 1,1EE0C 1,1EE0C 1,1EE0C 1,1EE0C 1,1EE0C 1,12E0C 1,60E0C 1,60E0C 1,60E0C 2,47E0C 2,70E0	1,28:08 1,38:08 2,15:08 2,68:08 2,68:08 3,18:08 3,38:08 3,30:08 4,23:08 4,24:084,24:08 4,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:084,24:08 4,24:0	AT5008220 AT5608330 AT365240 AT3654470 AT365220 AT1652230 AT1652240 AT365755 AT3659770 AT1670300 AT3616000 AT3616010 AT1679920 AT1679920 AT1679920 AT1679920 AT16792300 AT5623060 AT3604540 AT5623060 AT3604540 AT5623060 AT3604540 AT56350 AT1675360 AT167350 AT1675360 AT167350 AT1675360 AT3608910 AT3608920 AT3608930 AT1603000 AT1603010 AT365680 AT3656810 AT365680 AT3656810 AT366490 AT5640460 AT5640460 AT5640460 AT5655920 AT264140 AT2645150 AT3655920 AT2645270 AT5652580 AT2645150 AT3655920 AT3655890 AT3655920 AT3654920 AT3654920 AT3654920 AT3654920 AT3654920 AT364420 AT364430 AT364420 AT364430 AT3667690 AT1676090	AT2G16430 AT2G06625 AT2G06635 AT2G16440 AT3G0852 0A T3G508530 AT3G54460 AT3G508530 AT3G59760 AT3G508530 AT3G59760 AT3G59750 AT3G59770 AT3G62000 AT3G62010 AT1G70290 AT1G70300 AT1G70290 AT1G70300 AT1G70290 AT1G2920 AT1G2930 AT1G29940 AT1G702910 AT1G2920 AT1G2930 AT1G29940 AT1G04520 AT1G09687 AT1G09693 AT1G76920 AT1G76930 AT2G23300 AT2G23300 AT1G04520 AT1G04530 AT1G04540 AT3G523050 AT1G04530 AT1G04540 AT3G623050 AT1G04530 AT1G07490 AT3G6300 AT3G02085 AT3G08920 AT3G08930 AT1G0458 AT1G04587 AT1G07850 AT3G5780 AT3G56790 AT3G56800 AT3G56810 AT3G5780 AT3G56790 AT3G56800 AT3G56810 AT3G3570 AT3G56790 AT3G56800 AT3G56810 AT3G3570 AT3G5730 AT4G0975 AT5G61270 AT5G61280 AT5G61270 AT5G61280 AT5G61270 AT5G61280 AT5G61270 AT5G65270 AT3G52580 AT5G5590 AT3G5579 AT3G55280 AT5G5590 AT3G5579 AT3G55280 AT3G56790 AT3G5579 AT3G52880 AT5G5590 AT3G5579 AT3G52880 AT3G5590 AT3G5579 AT3G52880 AT3G5590 AT3G5579 AT3G55280 AT3G5590 AT3G5579 AT3G55780 AT3G5590 AT3G5579 AT3G55780 AT3G5579 AT3G5579 AT3G55780 AT3G5579 AT3G5579 AT3G55780 AT3G5579 AT3G5579 AT3G55780 AT3G5579 AT3G5579 AT3G5578 AT3G5579 AT3G5579 AT3G55780 AT3G5579 AT3G5579 AT3G55780 AT3G5590 AT3G5579 AT3G55780 AT3G5590 AT3G5579 AT3G55780 AT3G5590 AT3G5579 AT3G55780 AT3G5590 AT3G5790 AT3G5780 AT3G5590 AT3G5790 AT3G5780 AT3G5590 AT3G5790 AT3G5790 AT3G5790 AT3G57
Lin 3-7100839 Chr3-7125935 Chr3-72167516 Chr3-20167516 Chr3-20167516 Chr3-22078296 Chr3-22078296 Chr3-22078296 Chr3-22962508.5 Chr3-22962508.5 Chr3-22962508.5 Chr3-2914300.5 Chr1-236308 Chr3-738511 Chr3-26308 Chr3-738511 Chr3-26308 Chr3-738511 Chr3-26308 Chr3-71248.5 Chr3-21248.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-2650042.5 Chr3-2650042.5 Chr3-2650042.5 Chr3-2650042.5 Chr3-266207 Chr3-2620703 Chr3-17324 Chr3-868000.5 Chr3-2848872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84884872 Chr3-84848	113,2830 163,20315 173,05385 155,148945 177,05233 224,169833 165,68428 114,477865 217,742577 152,414304 216,565027 206,451549 156,969071 179,501993 228,87003 351,785917 138,844933 142,201011 135,108681 202,299882 204,346546 222,891974 165,43068 200,588248 234,412145 136,247765 136,247765 136,247765 136,247875 136,247875 136,247875 136,247875 136,247875 136,247875 137,2518 307,567709 205,58228 205,5828 205	2,312(10) 2,212(13) 2,212(13) 2,212(13) 2,212(14) 2,212(0.36117447 0.363840174 0.32217624 0.32235919 0.35840178 0.32236122 0.35871796 0.36074486 0.4020906 0.44107627 0.37357352 0.3278654 0.33517232 0.32785636 0.33651226 0.33651226 0.36322166 0.3352287 0.3582166 0.3365127 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.3686667 0.36342705 0.3699889 0.4071231 0.31743804 0.31743804 0.301132 0.3265475 0.32665475 0.3268475 0.3268475 0.327856 0.31748804 0.3302120 0.31748804 0.3302120 0.31748804 0.3302120 0.3265475 0.327555 0.327555 0.327555 0.327555 0.327555 0.327555 0.327555 0.327555 0.3275555 0.3275555 0.3275555 0.3275555 0.32755555 0.32755555 0.327555555 0.327555555555555555555555555555555555555	4,48E1C 6,48E1C 6,94E1C 9,70E1C 9,70E1C 1,17E00 1,17E00 1,160E00 1,160E00 1,160E00 1,160E00 1,160E00 1,160E00 1,160E00 1,28E000 1,28E000 2,23E000 2,25E0000 2,25E00000000000000000000000000000000000	1,28:08 1,36:08 2,15:08 2,65:08 3,18:08 3,38:08 3,38:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 5,76:0	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G54470 AT3G5270 AT1G52240 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G02920 AT1G76920 AT2G23300 AT1G04530 AT3G04540 AT5G23060 AT3G04540 AT5G23060 AT3G0820 AT3G08930 AT1G04330 AT1G0750 AT1G7330 AT1G73010 AT3G58800 AT3G6810 AT3G5880 AT3G6810 AT3G5800 AT3G6810 AT1G63490 AT3G40460 AT5G52570 AT5G52580 AT2G4140 AT2G46150 AT3G4980 AT3G68775 AT2G35890 AT3G6380 AT3G68775 AT2G35890 AT3G6420 AT3G04430 AT3G64420 AT3G04430 AT3G64420 AT3G04430 AT3G44057 AT3G40460 AT3G64420 AT3G04430 AT3G6420 AT3G64420 AT3G6420 AT3G64430 AT3G40450 AT3G40450 AT3G64420 AT3G04430 AT3G40450 AT3G40520 AT	AT2616430 AT2606625 AT2C06635 AT2G16440 AT506852 0A T50508330 AT3654460 AT3654470 AT1652220 AT1652230 AT1652240 AT3659760 AT3659765 AT3659770 AT3665200 AT3659765 AT3659770 AT3665200 AT3659765 AT3659770 AT3662000 AT3662010 AT1670230 AT362010 AT3676000 AT3662010 AT1670290 AT362000 AT3616000 AT3616010 AT1670290 AT1629920 AT1629930 AT1629940 AT1609910 AT1609857 AT1609693 AT1676920 AT1676930 AT2623300 AT604520 AT1609657 AT1609693 AT1676920 AT1676930 AT2623000 AT3602085 AT1609623 AT1604520 AT1609687 AT1609623 AT1604530 AT1604530 AT1609623 AT1607800 AT3602085 AT3608910 AT3608920 AT3608930 AT1603000 AT1603010 AT3665780 AT3656790 AT3656800 AT3656810 AT463720 AT16036700 AT3656800 AT3656810 AT463720 AT1636370 AT3656800 AT3656810 AT463720 AT1636370 AT4636780 AT3656800 AT3656740 AT164390 AT1663200 AT3656200 AT3665270 AT3652580 AT3652590 AT5652580 AT2645140 AT2646150 AT2646160 AT362580 AT3615520 AT3616525 AT3604420 AT3604430 AT3624400 AT3604430
Lin 3-7100693 Chr 2-7125935 Chr 2-71578765 Chr 2-758765 Chr 2-758765 Chr 2-1945716 Chr 1-194546771 Chr 3-22962508.5 Chr 1-24677793 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43999 Chr 3-43998 Chr 3-43998 Chr 3-4399 Chr 3-4399 Chr 3-4399 Chr 3-4397 Chr 3-20327.5 Chr 3-20327.5 Chr 3-20328.5 Chr 3-20328.5 Chr 3-20328.5 Chr 3-2485.5 Chr 3-2439.5 Chr 3-2439.5 C	173,05385 163,2836 175,05233 177,05385 155,148945 177,052333 240,498939 124,169833 177,052333 240,498939 124,169833 111,477865 121,742577 125,2414304 126,565027 206,451549 175,501993 228,870033 151,785917 138,844933 142,20101 133,108681 202,299882 204,346636 135,108681 132,4124524 135,108681 132,4124524 135,108681 134,247524 133,702518 137,2551828 133,72518 137,2551828 132,278424 132,78424 132,78424 132,78424 132,78424 132,78424 132,78424 132,78424 132,78424 133,702518 134,72558 134,72558 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 134,7258 14	2,312(8) 2,212(8) 2,212(8) 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,35550036 2,61569641 2,35550036 2,61569641 2,9350402 1,95104201 2,12205865 1,94104764 1,98140201 2,20278526 2,3527022 2,32731222 2,32731222 2,3379272 2,3379272 2,3379272 2,33793272 2,337927272 2,337927272 2,337927272 2,337927272 2,3379272727272727	0.36117447 0.36384261 0.37217624 0.32235919 0.3236122 0.32540128 0.3236122 0.32540128 0.36074486 0.4302906 0.44107627 0.33571228 0.372578634 0.33551228 0.3352126 0.3352857 0.3977054 0.335287 0.33977054 0.335287 0.39977054 0.335287 0.39977054 0.335287 0.39977054 0.335287 0.39977054 0.335287 0.39977054 0.335287 0.33977054 0.335287 0.33977054 0.335287 0.33977054 0.335287 0.339278 0.302376 0.336434453 0.332298 0.402357 0.336434453 0.3324705 0.3209889 0.40712351 0.31743844 0.3390112351 0.31743844 0.3390112351 0.31743844 0.3390112351 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.339011251 0.31743844 0.319011251 0.317458545 0.317458545 0.317458545 0.317458545 0.317458545 0.317458545 0.317458545 0.317458545 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585455 0.3174585555555 0.3174555555555555555555555555555555555555	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,68E1C 9,70E1C 1,17E0C 1,44E0C 1,17E0C 1,44E0C 1,17E0C 1,44E0C 1,17E0C 1,44E0C 1,44E0C 1,44E0C 2,37E0C 2,47E0	1,28:08 1,36:08 2,15:08 2,65:08 2,65:08 2,68:08 3,18:08 3,30:08 4,23:08 4,24:084,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:08 4,24:084,24:08 4,24:084,24:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G52755 AT3G59770 AT1G52220 AT1G52240 AT3G5020 AT3G5020 AT1G78920 AT1G78920 AT1G78920 AT1G78920 AT1G78920 AT1G74530 AT1G04540 AT3G23000 AT3G04540 AT3G23000 AT3G0450 AT4G17810 AT1G7480 AT3G7890 AT3G7850 AT1G7480 AT3G5880 AT3G56810 AT4G36730 AT4G09375 AT1G63490 AT3G540460 AT3G40460 AT3G40460 AT3G5520 AT3G52580 AT2G4540 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G520 AT3G5520 AT3G520 AT3G520 AT3G5580 AT3G5520 AT3G5520 AT3G5520 AT3G5520 AT3G520 AT	AT2616430 AT2606625 AT2G06635 AT2G16440 AT506852 0A T50508530 AT36576082 30 AT1652230 AT1652240 AT365760 AT36508530 AT365760 AT36508530 AT3659760 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT365010 AT1670290 AT1670300 AT1670290 AT162920 AT162930 AT1629940 AT1609915 AT1609687 AT1609693 AT167920 AT1676930 AT2623300 AT2623300 AT5623060 AT3604540 AT5623050 AT5623060 AT360450 AT5623065 AT46747810 AT1607480 AT1604530 AT1607485 AT1607490 AT1603040 AT3608920 AT3608920 AT3608930 AT1603040 AT3605805 AT3608910 AT3608920 AT3608930 AT163520 AT1605300 AT36056810 AT4636730 AT4636730 AT3605820 AT3656810 AT4636730 AT4636730 AT4636730 AT36561200 AT3652500 AT5652500 AT3652500 AT5661270 AT5661280 AT5652500 AT3652580 AT264150 AT361525 AT3615520 AT3652580 AT264150 AT3615520 AT3615525 AT3615520 AT3615525 AT361520 AT3615525 AT361520 AT3615525
Lin 3-7100839 Chr3-7125935 Chr3-72167516 Chr3-72167516 Chr3-72067516 Chr3-72067516 Chr3-72962508.5 Chr3-72962508.5 Chr3-72962508.5 Chr3-72962508.5 Chr3-7296250.5 Chr3-7296200.5 Chr3-720800.5 Chr3-720800.5 Chr3-720800.5 Chr3-72080.5 Chr3-72080.5 Chr3-72080.5 Chr3-720885.5 Chr3-1086155 Chr3-1086155 Chr3-21086155 Chr3-21086155 Chr3-21086155 Chr3-21086155 Chr3-21086155 Chr3-1506225 Chr3-1506225 Chr3-150625 Chr3-150625 Chr3-150625 Chr3-150625 Chr3-150625 Chr3-16005.5 Chr3-189005.5 Chr3-189005.5 Chr3-189005.5 Chr3-189005.5 Chr3-14073476.5	113,2030 113,2030 165,503153 175,5148945 177,052333 224,169833 165,68428 114,477865 217,742577 125,2414304 216,565027 206,451549 155,969071 179,501993 228,870033 51,785917 138,844933 142,201011 213,197721 145,647965 135,108661 202,298124 204,346636 202,89174 165,576971 165,43068 200,588248 203,58228 234,11245 134,247254 139,24558228 234,21245 234,2124	2,312(10) 2,21285904 2,2074744 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,13546141 2,21205869 2,61569641 2,21205869 2,61569641 2,21205869 2,1593223 2,0718226 2,1573223 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,0718226 2,07186 2,071826 2,07186 2,07186 2,07186 2,071866 2,07186 2,07186 2,07186 2,071866 2,071866 2,07186 2,071	0,36117447 0,36384261 0,37217624 0,32235919 0,32840178 0,3236122 0,32571796 0,36074486 0,4302906 0,44010627 0,36707486 0,36372456 0,36372456 0,36372456 0,3632256 0,3632256 0,3632256 0,39356905 0,40904148 0,40904148 0,4090547 0,36547128 0,36547128 0,36547128 0,3623476 0,3624345 0,3624345 0,3624345 0,3624345 0,3624345 0,3205472 0,3205475 0,3209889 0,40712351 0,31743804 0,32065475 0,326	4,48E1C 6,48E1C 6,94E1C 7,66E1C 9,68E1C 9,68E1C 9,70E1C 1,10FC0 1,10FC0 1,44E0C 1,60E0C 1,70E0C 1,70E0C 1,70E0C 1,60E0C 1,70E0	1,28:08 1,36:08 2,15:08 2,65:08 3,38:08 3,38:08 4,25:0	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G59765 AT3G59770 AT1G5720 AT1G52230 AT1G70300 AT3G16000 AT3G16010 AT1G70300 AT1G70320 AT1G70320 AT1G70320 AT1G70320 AT1G70320 AT1G04530 AT3G08520 AT3G08910 AT3G08920 AT3G08930 AT1G04300 AT3G08920 AT3G08930 AT1G04300 AT3G08920 AT3G08930 AT1G04300 AT3G08920 AT3G08930 AT1G04300 AT3G08920 AT3G08930 AT1G63490 AT3G5520 AT3G52580 AT3G5520 AT3G52580 AT3G540460 AT3G420450 AT3G420450 AT3G420450 AT3G420450 AT3G0420 AT3G04430 AT3G0420 AT3G04430 AT3G0420 AT3G76090 AT3G150 AT3G12160 AT3G12150 AT3G12160 AT3G12150 AT3G12150 AT1G31910 AT3G1970	AT2616430 AT2606625 AT2606635 AT2G16440 AT3608520 AT50608330 AT365460 AT3654470 AT1652220 AT1652230 AT1652240 AT3655760 AT3659765 AT3659770 AT3659760 AT3659765 AT3659770 AT3659760 AT3659765 AT3659770 AT3662000 AT3662010 AT3672000 AT3662010 AT367200 AT362020 AT1629930 AT1629940 AT16029910 AT162920 AT1609693 AT1676920 AT1676930 AT2623300 AT3622000 AT36200 AT5623061 AT362500 AT3623060 AT5623065 AT467250 AT1604530 AT1604540 AT5623050 AT5623060 AT5604540 AT3607800 AT3602085 AT1604540 AT3608900 AT3602085 AT1609623 AT1603000 AT1603010 AT3608900 AT3602085 AT1604540 AT3608900 AT3602085 AT3608910 AT3608920 AT3608930 AT1603000 AT1603010 AT3656780 AT3656780 AT3656800 AT3656810 AT163720 AT1613730 AT163720 AT1613730 AT1663500 AT16056375 AT3656270 AT3652570 AT3656270 AT3652570 AT3656270 AT36562570 AT3652580 AT3656270 AT36562570 AT3652580 AT3664140 AT2645150 AT2645160 AT365450 AT3604450 AT364520 AT3664525
Lin 3-7100693 Chr2-7125935 Chr3-20167516 Chr3-20167516 Chr3-194546711 Chr3-22078296 Chr3-22062508.5 Chr3-2362508.5 Chr3-236909 Chr3-10476025.5 Chr3-438969 Chr3-10476025.5 Chr3-238900.5 Chr3-23811 Chr4-906031.5 Chr3-23811 Chr3-203811 Chr3-203815 Chr3-203815 Chr3-203815 Chr3-2038515 Chr3-2038515 Chr3-203855.5 Chr3-2353336 Chr3-21052555 Chr3-2353336 Chr3-24085.5 Chr3-24085.5 Chr3-24085.5 Chr3-2462010.5 Chr3-24085.5 Chr3-2462010.5 Chr3-2650042.5 Chr3-2650042.5 Chr3-2650042.5 Chr3-868006.5 Chr3-8787003.5 Chr3-8879005.5 Chr3-8879005.5 Chr3-87876.5 Chr3-87876.5 Chr3-87876.5 Chr3-87875.5 Chr3-87875.5 Chr3-8879005.5 Chr3-8879005.5 Chr3-868005.5 Chr3-868005.5 Chr3-868778.5	173,05385 163,2836 165,503153 177,053858 155,148945 177,052333 240,499839 124,169833 165,68428 111,477865 217,742577 152,414304 116,56927 179,501993 228,870033 151,785917 138,844933 154,201011 133,844933 135,285917 138,844933 135,285917 138,844933 135,285917 136,4576971 154,43068 200,588248 233,412145 134,247524 134,24754 134,2475	2,312(10) 2,212(13) 2,212(13) 2,212(13) 2,2542(10) 2,2542(10) 2,2542(10) 2,2550(13) 2,3097945 2,3037814 2,3037814 2,3037814 1,950(14) 2,150(14) 2,150(14) 2,212(15) 1,981(14) 2,150(14) 2,212(15) 1,981(14) 2,150(14) 2,212(14) 2,	0.36117447 0.36384018 0.37217624 0.32235919 0.3236122 0.35840178 0.32236122 0.35840178 0.3023612 0.37357322 0.3728634 0.33517232 0.3728563 0.36321256 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.33602376 0.32605575 0.34205575 0.3420577 0.3420577 0.3420577 0.3420577 0.3420577 0.3420577 0.3420577 0.3560237 0.357025 0.3575 0	4,48E1C 6,48E1C 7,66E1C 7,66E1C 9,68E1C 9,70E1C 1,17E0C 1,44E0C 1,17E0C 1,44E0C 1,60E0C 1,73E0C 1,73E0C 1,74E0C 2,24F0	1,28:08 1,36:08 2,15:08 2,65:08 2,68:08 3,38:08 3,38:08 4,23:08 4,24:084,24:08 4,24:08 4,24:084,24:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT3G52230 AT1G52240 AT3G52755 AT3G59770 AT1G52220 AT1G52240 AT3G70300 AT3G16000 AT3G16010 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7920 AT1G7430 AT3G60450 AT3G23000 AT3G60450 AT4G17810 AT1G7350 AT3G60450 AT3G08910 AT3G6820 AT3G68930 AT1G7480 AT3G6800 AT3G56810 AT4G3730 AT4G09375 AT1G63490 AT3G5800 AT3G56810 AT3G5890 AT3G5820 AT3G640460 AT3G55920 AT3G64420 AT3G6420 AT3G65890 AT3G6380 AT3G52580 AT3G6420 AT3G6420 AT3G6380 AT3G52580 AT3G6420 AT3G64430 AT3G6380 AT3G649	AT2616430 AT2606625 AT2G06635 AT2G16440 AT506852 0A T50508530 AT365746 0A T36508530 AT365760 AT36508530 AT365760 AT36508530 AT365760 AT3650720 AT3658760 AT36559770 AT3658700 AT3652010 AT16702300 AT3662010 AT16702300 AT3662010 AT16702300 AT3662010 AT1609050 AT3662010 AT1609020 AT3662010 AT160920 AT1609230 AT1629930 AT1629940 AT160920 AT1609530 AT1609630 AT1676920 AT1676930 AT2623300 AT2623300 AT5623060 AT560450 AT5623065 AT4617810 AT1607480 AT1609687 AT1607623 AT1607480 AT1603607 AT1609623 AT1607480 AT1603608 AT3608910 AT3608920 AT3608930 AT1607480 AT1603601 AT3607900 AT365800 AT3656800 AT3656810 AT4636720 AT4636730 AT4609375 AT4636740 AT164340 AT1663500 AT3666120 AT1663520 AT56661270 AT5661280 AT3664120 AT5662580 AT264510 AT2645150 AT56052580 AT264510 AT2645150 AT5652580 AT264510 AT365220 AT3652580 AT264510 AT365220 AT3652580 AT264510 AT365420 AT361525 AT364510 AT366420 AT3664505<
Lin 3-7100639 Chr2-7125935 Chr3-72167516 Chr3-72167516 Chr3-2078276 Chr3-22078296 Chr3-22078296 Chr3-22078296 Chr3-2482508.5 Chr3-24827738 Chr3-5433969 Chr3-5433969 Chr3-5433969 Chr3-5433969 Chr3-543892328.5 Chr3-2914200.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2012484.5 Chr3-2103229.5 Chr3-1732485.5 Chr3-2408255.5 Chr3-2408255.5 Chr3-2408255.5 Chr3-2408255.5 Chr3-2408255.5 Chr3-240825.5 Chr3-240825.5 Chr3-240825.5 Chr3-240825.5 Chr3-2486155 Chr3-2486200.5 Chr3-1372324 Chr3-8520703 Chr3-1372324 Chr3-886006.5 Chr3-147324 Chr3-8879005.5 Chr3-1473920 Chr3-23167782 Chr3-3167782 Chr3-2167772	173,504316 183,28369 165,503153 177,053885 155,148945 177,052333 244,0499833 165,68428 111,477865 127,742577 155,414304 216,566027 206,451549 155,969071 179,501993 228,870033 228,870033 228,870033 228,870033 228,870033 228,870033 228,870033 228,870033 228,870033 228,870033 228,870034 203,46456 200,588248 203,58248 203,58248 203,58248 203,58248 203,58248 203,58248 203,58248 203,58248 203,58248 203,58258 203,58258 203,55559 208,55059	2,312(10) 2,212(0,36117447 0,36384261 0,37217624 0,32235919 0,35840178 0,3236122 0,32531736 0,36074486 0,4302906 0,4407627 0,36074486 0,335737232 0,37357352 0,37357352 0,37357352 0,37357352 0,33552126 0,3532126 0,3532126 0,3632475 0,36434453 0,36434453 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3643445 0,3645475 0,3465475 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,3440547 0,3520022 0,354140547 0,3520022 0,352002 0,352002 0,3500000000000000000000000000000000000	4,48E10 6,48E10 6,94E10 7,66E10 9,68E10 9,68E10 9,70E10 1,16E00 1,17E00 1,60E00 1,60E00 1,60E00 1,73E00 1,60E00 2,47E0	1,28:08 1,28:08 1,96:08 2,15:08 2,68:08 3,28:08 3,38:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 6,33:08 5,76:08 6,33:08 5,76:08 6,33:08 6,33:08 5,76:08 6,33:08 7,76:09 1,11:07 1,11:07 1,12:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT3G54470 AT3G5270 AT1G52240 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G29200 AT1G70320 AT1G703200 AT2G23300 AT1G04530 AT1G04540 AT5G23060 ATSG04540 AT5G23060 ATSG04540 AT1G76350 AT1G76360 AT1G76350 AT1G76360 AT1G77830 AT3G58810 AT1G76350 AT1G76360 AT3G58900 AT3G56810 AT3G58900 AT3G56810 AT3G56800 AT3G56810 AT3G640460 AT5G52570 AT3G552580 AT2G4580 AT2G64510 AT3G56920 AT3G562580 AT3G64804 AT3G64430 AT3G640460 AT3G64040 AT3G64430 AT3G64040 AT3G7910 AT3G12150 AT3G12160 AT1G31910 AT1G31920 AT5G57180	AT2616430 AT2606625 AT2606635 AT2G16440 AT3608520 AT36508330 AT3669760 AT36508330 AT3659760 AT36508330 AT3659760 AT3659765 AT3659770 AT3659760 AT3659765 AT3659770 AT3659760 AT3659765 AT3659770 AT36262000 AT3662010 AT3672000 AT3662010 AT3616000 AT3616010 AT1672930 AT1629300 AT1629940 AT16092910 AT1609687 AT1607693 AT1676920 AT1676930 AT2623300 AT3623050 AT5623060 AT5602065 AT460420 AT1604530 AT1604540 AT5623050 AT5623060 AT5604540 AT3607800 AT3602087 AT1609623 AT1604350 AT1604530 AT1604540 AT3607800 AT3602087 AT1609623 AT1604380 AT1604580 AT1609623 AT1604380 AT1604580 AT3608920 AT3608920 AT3608930 AT16033000 AT1603010 AT3665800 AT3665800 AT366800 AT3608920 AT3608930 AT1603700 AT16033010 AT3656780 AT3665780 AT3665800 AT366800 AT3608920 AT3608930 AT1603300 AT1604300 AT1603010 AT3656790 AT3656800 AT3656800 AT3656800 AT3656790 AT3656290 AT3656800 AT3656800 AT3656790 AT36562970 AT5652580 AT264510 AT2645100 AT2645100 AT5655920 AT5655930
Lin 3-7100893 Chr2-7125935 Chr2-7125935 Chr2-7258765 Chr2-0167516 Chr3-20167516 Chr3-20162516 Chr3-22962508.5 Chr3-24892308 Chr3-4343969 Chr3-434969 Chr3-1476025.5 Chr3-24892328.5 Chr3-24892328.5 Chr3-2914200.5 Chr3-738511 Chr4-9906031.5 Chr3-2914200.5 Chr3-738511 Chr3-2914280.5 Chr3-2136721.5 Chr3-2136721.5 Chr3-2136721.5 Chr3-213721.5 Chr3-2135725.5 Chr3-12036229.5 Chr3-12036255 Chr3-12036255 Chr3-12036257 Chr3-12660267 Chr3-136005.5 Chr3-28549872 Chr3-8549872 Chr3-28549872 Chr3-24048625 Chr3-14049865.5	173,53476 183,2836 165,503153 177,053885 157,148945 177,052333 224,169833 155,6428 111,477865 217,742577 152,414304 216,55627 206,451549 156,969071 179,501993 228,870033 142,201011 213,197721 145,6479657 135,108681 202,298822 203,3412145 203,24824 203,24824 203,24824 203,4824524 313,702518 30,582288 233,412145 233,412145 234,4124524 313,702518 313,702518 323,412145 234,4124524 313,702518 313,702518 234,51245 2	2,312(10) 2,212(13) 2,212(13) 2,212(13) 2,2542(10) 2,2542(10) 2,2542(10) 2,2550(36) 2,2150(14) 1,951(4	0.36117447 0.363840178 0.32217624 0.32235919 0.35840178 0.32236122 0.35840178 0.32236122 0.35871796 0.3607445 0.302706 0.33557322 0.3278654 0.33557322 0.3278563 0.36631256 0.33527162 0.33527162 0.3522166 0.33527752 0.360047 0.3562162 0.3600478 0.3700478 0.3700478 0.3700478 0.3700478 0.3700478 0.3700478 0.34004785	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,70E1C 1,17E0C 1,47E0C 1,47E0C 1,47E0C 1,51E0C 1,60E0C 1,73E0C 1,60E0C 1,74E0C 1,60E0C 1,74E0C 2,24E0C 2,47E0C 2,47E0C 2,47E0C 2,47E0C 2,47E0C 3,87E0	1,28:08 1,38:08 2,15:08 2,65:08 2,65:08 3,38:08 3,30:08 4,23:08 4,24:0	ATSG08520 ATSG08530 AT3G54460 AT3G54470 AT3G5240 AT3G54470 AT3G5270 AT1G52240 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G29200 AT1G29200 AT1G29300 AT1G04330 AT3G04540 AT3G23060 AT3G04540 AT3G23060 AT3G04540 AT3G23060 AT3G08520 AT3G08930 AT1G7330 AT4G08520 AT3G08930 AT1G7330 AT4G08720 AT3G64910 AT3G08920 AT3G08930 AT1G63300 AT1G03010 AT3G540460 AT3G5420 AT3G0875 AT2G35890 AT2G45440 AT2G46150 AT3G24520 AT3G64420 AT3G04430 AT3G24500 AT3G24500 AT3G64420 AT3G24500 AT3G64430 AT3G24500 A	AT2616430 AT2606625 AT2G06430 AT2G16440 AT3608520 AT36508330 AT3657460 AT36508330 AT3657460 AT36508330 AT365740 AT36508330 AT365740 AT36508330 AT3657500 AT3652010 AT3616000 AT366010 AT16702300 AT3662010 AT16702300 AT3662010 AT16702300 AT3662010 AT160920 AT1609302 AT1629930 AT1629940 AT1609910 AT1609827 AT1609693 AT1676920 AT1676930 AT2623300 AT2623300 AT362200 AT1629930 AT1629940 AT1604530 AT1609637 AT1609693 AT1676920 AT1676930 AT2623300 AT3623060 AT560450 AT5623065 AT4636720 AT4604530 AT1609623 AT1607480 AT1609687 AT1607485 AT1607490 AT1607480 AT1603010 AT366780 AT3658090 AT3656800 AT3656810 AT366780 AT3656790 AT3656800 AT3656810 AT163720 AT4636730 AT3656800 AT3656810 AT163720 AT163780 AT163720 AT163780 AT163720 AT4636730 AT3656800 AT3656810 AT3656790 AT3656800 AT3656810 AT36580 AT365520 AT3656800 AT365270 AT4636730 AT3656800 AT636720 AT4636730 AT4609375 AT4636740 AT164340 AT1664580 AT365520 AT36552580 AT365520
Lin 3-7100693 Chr3-2125935 Chr3-20167516 Chr3-20167516 Chr3-2162508.5 Chr3-204677193 Chr3-24677793 Chr3-42962508.5 Chr3-24892328.5 Chr3-43999 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477793 Chr3-6477715 Chr3-2016725 Chr3-6477715 Chr3-2016725 Chr3-6477715 Chr3-2016725 Chr3-6477775 Chr3-647775 Chr3-647775 Chr3-647775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-74775 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-747755 Chr3-7	173,05385 183,28369 165,503153 177,052383 177,052383 177,052383 177,052383 177,052333 177,052333 177,052333 177,05233 177,05233 177,05233 177,05233 177,05233 165,6420 155,6420 179,501993 179,501993 179,501993 179,501993 179,501993 179,501993 179,50199 165,44049 179,50199 165,44049 179,50199 165,45059 123,412145 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 135,055159 125,58128 123,278421 123,581519 125,58129	2,312(8):00 2,20274744 2,20274744 2,25421087 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,15464141 2,1550036 1,93504918 2,15466414 1,93140201 2,21205869 1,94101764 1,93140201 2,21205869 2,312732223 2,32078252 2,35878527 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,31273229 2,3127329 2,3327532 2,33275	0.36117447 0.36317447 0.37217624 0.32235919 0.35840178 0.35840178 0.32236122 0.38571796 0.36074486 0.4302906 0.44107627 0.37357322 0.32780634 0.33551226 0.33551226 0.36352126 0.3532126 0.3532126 0.36352857 0.36434463 0.3362829 0.4090547 0.41861133 0.3602829 0.4090547 0.36547128 0.362376 0.3624346 0.3324705 0.3624348 0.3209828 0.4030537 0.3320822 0.3209828 0.4030537 0.3434483 0.3320822 0.3209828 0.4030537 0.3434840 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.4300827 0.3209828 0.42235811 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.320828 0.32088	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,70E1C 1,1EE0C 1,1EE0C 1,1EE0C 1,1EE0C 1,60E0C 1,60E0C 1,60E0C 1,60E0C 2,47E0C 2,07E0	1,28:08 1,38:08 2,15:08 2,55:08 2,68:08 3,18:08 3,38:08 3,30:08 4,23:08 4,24:084,24:08 4,24:08 4,24:084,24:0	AT5008520 AT5008530 AT3654460 AT3654470 AT365240 AT3652230 AT1652240 AT365755 AT3659770 AT1657220 AT1652240 AT365765 AT3659770 AT36700 AT360810 AT360450 AT4617810 AT4617810 AT4617810 AT3608910 AT3608920 AT3608930 AT3608910 AT3608920 AT3608930 AT3608910 AT3608920 AT3608930 AT3668400 AT3656810 AT366490 AT366580 AT3656810 AT366580 AT3656810 AT36640460 AT36640460 AT36652570 AT3652580 AT366490 AT366580 AT3608075 AT2635890 AT366420 AT3604430 AT360420 AT3604430 <td>AT2616430 AT2606625 AT2606430 AT3608520 AT36508530 AT36698520 AT36508530 AT3654460 AT36508530 AT3659760 AT36508530 AT3659760 AT3659770 AT3659760 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3616000 AT3659750 AT3659770 AT3616000 AT3662010 AT1670290 AT1679300 AT1629930 AT1629940 AT1609527 AT1609693 AT167920 AT167920 AT167930 AT2623300 AT365700 AT3605200 AT1609693 AT1676920 AT167930 AT36720 AT1604530 AT1609623 AT1607430 AT1604587 AT1607485 AT1607490 AT365780 AT3656790 AT3605810 AT3608920 AT3608930 AT365780 AT3656790 AT3656810 AT4636720 AT4636730 AT4609735 AT4636740 AT163730 AT1603801 AT364500 AT3665200 AT3665810 AT364510 AT366520 AT3655280 AT364510 AT366520 AT3655280 AT36450 AT366520 AT3655280 AT36550 AT365527 AT3655280</td>	AT2616430 AT2606625 AT2606430 AT3608520 AT36508530 AT36698520 AT36508530 AT3654460 AT36508530 AT3659760 AT36508530 AT3659760 AT3659770 AT3659760 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3665000 AT3659770 AT3616000 AT3659750 AT3659770 AT3616000 AT3662010 AT1670290 AT1679300 AT1629930 AT1629940 AT1609527 AT1609693 AT167920 AT167920 AT167930 AT2623300 AT365700 AT3605200 AT1609693 AT1676920 AT167930 AT36720 AT1604530 AT1609623 AT1607430 AT1604587 AT1607485 AT1607490 AT365780 AT3656790 AT3605810 AT3608920 AT3608930 AT365780 AT3656790 AT3656810 AT4636720 AT4636730 AT4609735 AT4636740 AT163730 AT1603801 AT364500 AT3665200 AT3665810 AT364510 AT366520 AT3655280 AT364510 AT366520 AT3655280 AT36450 AT366520 AT3655280 AT36550 AT365527 AT3655280
Lin 3-7100693 Chr3-7125935 Chr3-72167516 Chr3-20167516 Chr3-20167516 Chr3-22062508.5 Chr3-22078296 Chr3-22078296 Chr3-22962508.5 Chr3-22962508.5 Chr3-22962508.5 Chr3-2914300.5 Chr1-236308 Chr3-738511 Chr3-2914300.5 Chr3-2914300.5 Chr3-2300371.5 Chr3-2300371.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-21036229.5 Chr3-2462010.5 Chr3-213336 Chr5-16203585.5 Chr3-2650703 Chr3-28488155 Chr3-2650703 Chr3-2848872 Chr3-8686006.5 Chr3-1473224 Chr3-8686005.5 Chr3-1463920 Chr3-24048625 Chr3-147322 Chr3-1463920 Chr3-2404865 Chr3-147322 Chr3-14738 Chr3-14738	173,05385 163,2830 165,503153 177,052385 157,148945 177,052333 224,169833 157,052332 224,169833 155,68428 111,477865 217,742577 155,48434 156,56272 106,451549 156,966071 179,501993 228,870033 142,201011 213,197721 145,647965 135,108681 202,89822 204,346636 135,028881 202,89822 204,346636 222,891974 164,576971 165,38028 203,3412145 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 134,247524 135,965159 125,184196 226,693466 125,965159 125,184196 226,693466 123,804927 125,184196 226,693466 123,804927 125,184196 226,693456 123,804927 125,184196 226,693456 123,804927 125,184196 226,693456 123,804927 125,184196 226,693456 123,804927 125,184196 125,965197 125,965197 12	2,312(10) 2,2128590(1) 2,2074744 2,25421087 2,30979747 2,30979745 2,30979745 2,3097874 2,3097874 2,30387814 2,15464141 2,21205869 2,61569641 2,21205869 2,61569641 2,21205869 2,1205869 2,1205869 2,1205869 2,2120586 2,21205869 2,2120586 2,2120586 2,2120586 2,2120586 2,2120586 2,2120586 2,212058 2,2120	0.36117447 0.363840178 0.32217624 0.32235919 0.35840178 0.32236122 0.35840178 0.32236122 0.35840178 0.3607486 0.44107627 0.37357352 0.3278654 0.33512122 0.328563 0.36631256 0.3352216 0.3352216 0.3352216 0.3352216 0.3352216 0.360217 0.440064148 0.3360289 0.4000547 0.4360277 0.4360277 0.4360277 0.3602877 0.3702877 0.3702877 0.390287 0.3902877 0.3902877 0.390287	4,48E1C 6,48E1C 6,94E1C 9,68E1C 9,70E1C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,17E0C 1,28E0C 2,24E0C 2,27E0C 3,87E0C 3,87E0C 3,87E0C 6,82E0C 7,05E0C 6,82E0C 7,05E0C 6,82E0C 7,05E0C 8,98E0C 9,47E0	1,28:08 1,36:08 2,15:08 2,56:08 2,66:08 3,38:08 3,30:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 4,23:08 5,76:0	ATSC08520 ATSC08530 AT3G54460 AT3G54470 AT3G5240 AT3G54470 AT3G5270 AT1G52240 AT1G52240 AT3G59765 AT3G59770 AT1G70300 AT3G16000 AT3G16010 AT3G16000 AT3G16010 AT1G29200 AT1G29200 AT1G29200 AT1G29200 AT3G2300 AT3G04540 AT5G23060 AT3G0540 AT3G08910 AT3G08920 AT3G08930 AT1G417810 AT1G7330 AT1G0750 AT1G7300 AT3G08920 AT3G08930 AT1G403000 AT3G08920 AT3G08930 AT1G410480 AT3G40460 AT3G40460 AT3G40460 AT3G40460 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G40480 AT3G64920 AT3G12150 AT3G12150 AT3G12150 AT3G24290 AT3G57280 AT3G57280 AT3G57280 AT3G57280 AT3G57280 AT3G57280 AT3G57280 AT3G57280 AT3G64720 AT3G042720 AT1G67290 AT3G04520 AT3G64720 AT3G042720 AT1G67290 AT3G04520 AT3G4720 AT3G04520 AT3G5780 AT3G4720 AT3G9720 AT3G9720 AT3G9720 AT3G9720 AT3G9720 AT3G9720 AT3G9720 AT3G57280 AT3G64720 AT3G9720 AT3G7270 AT3G7270 AT3G770 AT3G770 AT3G770 AT3G770 AT3	AT2616430 AT2606625 AT2G06430 AT2G16440 AT3608520 AT50508330 AT3665460 AT3650830 AT365760 AT3650830 AT365760 AT3650830 AT365760 AT3650750 AT365760 AT3659763 AT3659770 AT3662000 AT3659763 AT3659770 AT3662000 AT3662010 AT1670230 AT3659760 AT3659770 AT3616000 AT3662010 AT16702300 AT3662010 AT16702300 AT362200 AT1629930 AT1629940 AT1609915 AT1609687 AT1609693 AT1676920 AT1676930 AT2623300 AT3620 AT1609687 AT1609693 AT1676920 AT1676930 AT2623300 AT362300 AT360450 AT5623065 AT467230 AT1607450 AT1609623 AT1603050 AT1603620 AT3608910 AT3608920 AT3608930 AT167330 AT1607360 AT3608910 AT3608920 AT3608930 AT3656780 AT3656790 AT3656800 AT3656810 AT3656780 AT3656790 AT3656800 AT3608075 AT3663720 AT3665780 AT3656800 AT3656810 AT163300 AT1603010 AT3656780 AT3656790 AT3656800 AT3656810 AT3656780 AT3656790 AT3656800 AT366470 AT1663675 AT366470 AT1663670 AT3656790 AT3655280 AT3656790 AT3655280 AT364140 AT3664150 AT566555 AT3642040 AT3664160
Lin 3-7100693 Chr3-2125935 Chr3-20167516 Chr3-2167516 Chr3-2167516 Chr3-19454671 Chr3-22962508.5 Chr3-24677793 Chr3-43969 Chr3-43999 Chr3-43999 Chr3-43999 Chr3-43999 Chr3-43999 Chr3-43999 Chr3-43999 Chr3-2126308 Chr3-2126308 Chr3-200515 Chr3-200515 Chr3-200515 Chr3-200525 Chr3-200525 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-2103229.5 Chr3-210502657 Chr3-210506267 Chr3-21050245.5 Chr3-21506227 Chr3-2137252.5 Chr3-2137278.5 Chr3-2137278.5 Chr3-2137278.5 Chr3-2137278.5 Chr3-2137278.5 Chr3-2137782 Chr3-21463920 Chr3-214778.5 Chr3-10237782 Chr3-102377.5 Chr3-1023778.5 Chr3-1023778.5 Chr3-1023778.5 Chr3-1023778.5 Chr3-102314778.5 Chr3-102387.5	173,05385 163,2836 155,148945 177,052333 240,49833 177,052333 240,49833 177,052333 240,49833 177,05233 177,05233 177,95233 177,95233 175,56423 114,477865 125,241430 175,56193 175,56193 175,56193 175,56193 135,1785917 138,844933 142,20101 133,1785917 138,541965 135,108681 202,299882 203,341245 135,108681 134,547965 135,108681 134,547965 135,108681 134,547955 135,108681 134,247524 313,702518 307,567709 236,5558228 134,247524 313,702518 307,567709 236,555192 123,2184196 226,893456 123,58428 123,124154 123,2184196 123,5184196 124,5184 124,5	2,312(8) 2,212(8) 2,212(8) 2,22421087 2,25421087 2,30979745 2,15148796 1,93504918 2,30387814 2,15464141 2,15464141 2,1550606 1,94101764 1,98140201 2,21205860 1,94101764 1,98140201 2,21205826 2,15732223 2,21205826 2,15732223 2,32731222 2,328799715 2,33879572 2,38799715 2,38799715 2,38799715 2,38799715 2,31773229 2,3179229 2,3179229 2,3179229 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,31792921 2,17939923 2,1793923 2,17	0.36117447 0.36384261 0.37217624 0.32235919 0.3236122 0.32540128 0.3236122 0.32540128 0.36074486 0.402906 0.44107627 0.3357225 0.37285636 0.33551226 0.33551228 0.36977054 0.33551228 0.36977054 0.4305547 0.36434463 0.3362829 0.362867 0.3664463 0.33547128 0.362877 0.36434463 0.336434275 0.3209888 0.4712351 0.31743844 0.3320782 0.3209887 0.320982 0.320982 0.3	4,48E1C 6,48E1C 7,66E1C 9,68E1C 9,67E1C 1,17E00 1,47E00 1,47E00 1,47E00 1,47E00 1,47E00 1,47E00 1,47E00 1,47E00 1,47E00 2,47E0	1,28:08 1,38:08 2,15:08 2,55:08 2,68:08 3,38:08 3,38:08 3,38:08 4,23:08 4,24:0	AT5008520 AT5008530 AT3654460 AT3654470 AT365240 AT3652230 AT1652240 AT365755 AT3659770 AT1670300 AT36700 AT367000 AT367000 AT367000 AT367000 AT367000 AT167920 AT1670300 AT167920 AT1670300 AT502300 AT60350 AT1604540 AT3608910 AT3608920 AT3608930 AT1607480 AT3608910 AT3608920 AT3608930 AT36058010 AT36058010 AT36058010 AT36055910 AT36058010 AT36058010 AT360440 AT360420 AT3605020 AT360420 AT3604430 AT3605920 AT3605000 AT360420 AT3604430 AT360420 AT36012100 AT360	AT2616430 AT2606625 AT2G06635 AT2G16440 AT506852 0AT5068530 AT365760 AT36508530 AT365760 AT36508530 AT365760 AT36508530 AT365760 AT36508530 AT365760 AT365200 AT3652010 AT3616000 AT3662010 AT1670290 AT162920 AT1629300 AT1629930 AT1629940 AT160920 AT1600867 AT1609693 AT1676920 AT1676930 AT2623300 AT365200 AT36200 AT3600450 AT5623050 AT562300 AT1609693 AT1676920 AT1676930 AT2623300 AT1604520 AT1609637 AT16076920 AT1676930 AT1604520 AT1609530 AT1607623065 AT4676350 AT5623000 AT3600450 AT5623065 AT4676350 AT3676300 AT3608910 AT3608920 AT3608930 AT1607480 AT1604587 AT1607485 AT1607490 AT3656780 AT3656790 AT3656800 AT3656810 AT4636730 AT4636730 AT3608910 AT3608920 AT3608930 AT163730 AT1603010 AT3656780 AT3656790 AT3656800 AT3656810 AT4636720 AT4636730 AT3605810 AT4636720 AT4636730 AT4606975 AT5652500 AT565250 AT565250 AT5661270 AT5661280 AT5661280 AT36054160 AT5655920 AT5652590 AT264150 AT361525 AT3604420 AT3604400 AT3612270 AT3624100 AT361520 AT3615255<

Postion	baseMean	iugz(FC)	TICSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr4-13827912	187,010817	2,19978086	0,40539694	2,88E-08	6,31E-07	AT4G27700 AT4G27710	AT4G27690 AT4G27700 AT4G27710 AT4G27720
Chr5-22597714.5	199,386945	1,91719808	0,35587402	3,58E-08	7,80E-07	AT5G55830 AT5G55835 AT5G55840	AT5G55830 AT5G55835 AT5G55840
Chr1-4771564.5	144,591869	2,04192923	0,38253918	4,70E-08	1,02E-06		AT1G05037 AT1G13950
Chr5-15421278	204,896547	1,96199514	0,36839556	5,03E-08	1,08E-06	AT5G38510 AT5G38520	AT5G38510 AT5G38520 AT5G38530
Chr2-18107214	106 29394	2 3653855	0 44503427	5 33E-08	1 14E-06	AT2G43680	AT2G43660 AT2G43670 AT2G43680
Chr2-20474906	145 324515	2 00894918	0.37808064	5 285-08	1 15E-06	AT2655240	AT3655230 AT3655240 AT3608455 AT3608460 AT3608465
Chr3 979062	140,911346	2,00034510	0,37303004	5,500-00	1,150-00	AT3C03000	AT36030200 AT36030240 AT3608433 AT3608400 AT3608403
Chil 0220042	140,811240	2,03318558	0,38727800	5,742-08	1,225-00	AT1C3C030	AT2 C3 C0 20 AT1 C3 C0 21
Chr1-9329042	255,209846	1,88769563	0,35651347	5,95E-08	1,26E-06	A11G26920	A11626920 A11626921
Chr3-5020480.5	230,091509	1,99652208	0,3787088	6,75E-08	1,42E-06	AT3G14920 AT3G14930	AT3G14910 AT3G14920 AT3G14930
Chr4-17735222.5	251,096746	1,68260542	0,3200033	7,28E-08	1,52E-06		AT4G09655
Chr2-19232287	198,813895	1,74675257	0,33240669	7,41E-08	1,54E-06	AT2G46780 AT2G46790	AT2G46780 AT2G46790
Chr1-7570798	178,411832	1,80730837	0,34431028	7,64E-08	1,58E-06	AT1G21590 AT1G21600	AT1G21590 AT1G21600
Chr4-16647344	184,558987	1,99004651	0,38018191	8,27E-08	1,70E-06		AT4G34950 AT4G34960
Chr1-7932484.5	147,442485	1,99396469	0,38359882	1,01E-07	2,06E-06	AT1G05747 AT1G22470	AT1G22460 AT1G05747 AT1G22470 AT1G22480
Chr3-19791826 5	215 312794	1 71825805	0 33085094	1.03E-07	2 10E-06	AT3653380 AT3653390	AT3G53370 AT3G53380 AT3G53390
Chr2-282548 5	207 073003	2 26459549	0.43671614	1.085-07	2 185-06		AT2G01850
Ch-1 20207207	141 021256	1,005000644	0,43071014	1,000-07	2,100-00	471 090 400	AT2 C80400
Chr1-30267367	141,821350	1,93503644	0,37397832	1,14E-07	2,30E-06	A11G80490	AT1080490
Chr3-3758337.5	154,423541	2,04820719	0,39778132	1,31E-07	2,62E-06	AT3G11890 AT3G11900	AT3G11890 AT3G11900 AT3G11910
Chr1-7043399	239,684198	1,61829817	0,31508587	1,40E-07	2,79E-06	AT1G20340 AT1G20350	AT1G20340 AT1G20350 AT1G05537
Chr5-23981880.5	206,94217	1,8108018	0,35298843	1,45E-07	2,87E-06	AT5G59480 AT5G59490	AT5G59470 AT5G59480 AT5G59490
Chr1-4994561	155,027491	2,21593481	0,43627517	1,90E-07	3,73E-06	AT1G05097	AT1G14580 AT1G05097 AT1G05103 AT1G05107
Chr1-26811996.5	180,977962	1,7635617	0,34734546	1,91E-07	3,75E-06	AT1G71080 AT1G71090	AT1G71070 AT1G71080 AT1G71090 AT1G71100
Chr2-7821547	160,420536	1,83093721	0,3619638	2,11E-07	4,12E-06	AT2G17970 AT2G17972 AT2G07015 AT2G17975	AT2G17970 AT2G17972 AT2G07015 AT2G17975 AT2G17980
Chr1-5885072	155,929884	1,86332486	0,36886341	2,19E-07	4,23E-06	AT1G17210 AT1G17220	AT1G17210 AT1G17220
Chr3-10289458	168,847274	2.09525361	0.41479366	2.19E-07	4.23E-06	AT3G27785	AT3G27770 AT3G27785
Chr1-21167222.5	117 92445	2 17073361	0.42082834	2 21 5-07	4.245-06	AT1656500 AT1656510	AT1656500 AT1656510
Chr1-25305007	180 745 267	1 95663777	0 289085 27	2,210-07	4,242-00	AT1650500 AT1650510	AT1657730 AT1657740
Chr5-2771700	200,743207	1 67294140	0 22220770	2,47507	4,7100	AT5611700 AT5611710	AT5G11700 AT5G11710
Chr3-3//1/90	215,144009	1,0/284146	0,33339778	2,02E-07	4,971-06	AT3011/00 AT3011/10	
Cnr3-23153679	189,888688	1,84960787	0,36927525	2,74E-07	5,18E-06	A13G62600 A13G62610	AI3G02000 AI3G02010 AI3G02015
Chr3-20872534	137,050267	1,88835622	0,3777346	2,88E-07	5,42E-06	AT3G56270	AT3G56270
Chr1-29313671.5	387,19942	3,42820314	0,68758856	3,08E-07	5,78E-06	AT1G77960	AT1G77950 AT1G77960 AT1G77980
Chr5-23966211.5	248,326975	1,66312082	0,33533064	3,53E-07	6,58E-06		AT5G59420 AT5G59430
Chr4-6100669	142,037094	1,8866928	0,38134813	3,76E-07	6,98E-06	AT4G09649 AT4G09650	AT4G09647 AT4G09649 AT4G09650
Chr1-30419585.5	152,275721	1,96066879	0,39717972	3,98E-07	7,34E-06	AT1G80960 AT1G09997 AT1G80970	AT1G80960 AT1G09997 AT1G80970 AT1G80980
Chr2-8059275.5	176.026991	1.7642152	0.35886304	4.41E-07	8.11E-06	AT2G18560	AT2G18560
Chr1-7038187 5	224 669171	1 62929316	0 33161080	4 555-07	8 32E-06	AT1620330	AT1G20330
Chr1 27202227 5	112 800572	2,00274959	0,0007045	4,552-07	0,322-00	AT1620550	AT1620530
CIII 1=27302337.3	113,890372	2,00274838	0,40807043	4,002-07	0,300-00	A11072310	A110/2010
Chr2-6018383	172,897805	1,90619311	0,38911294	4,82E-07	8,73E-06	A12G14210	A12G14210
Chr2-14577090	185,189026	1,92498735	0,3934445	4,97E-07	8,94E-06	AT2G34610 AT2G34620	AT2G34610 AT2G34620 AT2G34630
Chr5-4156624	205,184883	1,74067142	0,35580218	4,98E-07	8,94E-06	AT5G13100	AT5G13090 AT5G13100 AT5G13110
Chr5-1578925.5	225,008929	1,73442352	0,35480994	5,09E-07	9,08E-06	AT5G05330 AT5G05340	AT5G05320 AT5G05330 AT5G05340
Chr3-20477921	174,899046	1,7009229	0,34840748	5,25E-07	9,34E-06	AT3G08455 AT3G08460 AT3G08465	AT3G55240 AT3G08455 AT3G08460 AT3G08465 AT3G55250 AT3G55252
Chr4-18580356.5	112,636881	1,98762466	0,40746152	5,36E-07	9,48E-06	AT4G40085 AT4G40080 AT4G40090	AT4G40070 AT4G40085 AT4G40080 AT4G40090 AT4G09995 AT4G40100
Chr1-907630.5	169.27582	1,81934741	0.37321205	5.44E-07	9.59E-06	AT1G03620 AT1G03630	AT1G03620 AT1G03630 AT1G03640 AT1G03650
Chr5-24482466	162 994275	2 06353376	0.42349521	5 51E-07	9.655-06	AT5G60850 AT5G08975	AT5G60850 AT5G08975 AT5G60860 AT5G08980
Chr4-17096551 5	175 876032	1 67491379	0 34493214	6.00E-07	1.05E-05	AT4G38460	ATAG38440 ATAG38460 ATAG09705 ATAG38470
ChrE E670001 E	247 501227	1,07451575	0,34433214	6 805 07	1,050-05	ATE C17260 ATE C0268E	ATE C17360 ATE C03695 ATE C17370
Chr5-5678801.5	247,501227	1,59107266	0,32936787	6,80E-07	1,185-05	A15G17280 A15G02885	AI3G17260 AI3G02685 AI3G17270
Chr1-6352268.5	164,088473	1 680 //100 /					171 04 0450 171 04 0450
		1,00524557	0,3511812	7,54E-07	1,30E-05	A11G18450 A11G18460	AT1G18450 AT1G18460
Chr3-22906511	164,003743	1,75035845	0,3639211	7,54E-07 7,56E-07	1,30E-05 1,30E-05	AT3G61880	AT1G18450 AT1G18460 AT3G61870 AT3G61880
Chr3-22906511 Chr4-16195644.5	164,003743 123,928263	1,75035845 2,19206059	0,35311812 0,3639211 0,45651167	7,54E-07 7,56E-07 7,86E-07	1,30E-05 1,30E-05 1,35E-05	ATIG18450 ATIG18460 AT3G61880 AT4G33770	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5	164,003743 123,928263 170,36043	1,75035845 2,19206059 1,96069499	0,3639211 0,45651167 0,40840952	7,54E-07 7,56E-07 7,86E-07 7,90E-07	1,30E-05 1,30E-05 1,35E-05 1,35E-05	ATGG18450 AT1G18460 AT3G61880 AT4G33770 AT5G48250 AT5G48270	AT1618450 AT1618460 AT3661870 AT3661880 AT4633760 AT46333700 AT5648240 AT5648250 AT5648270
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5	164,003743 123,928263 170,36043 201,034005	1,75035845 2,19206059 1,96069499 1,63843027	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993	7,54E-07 7,56E-07 7,86E-07 7,90E-07 9,23E-07	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05	ATGG88450 ATGG8460 ATGG6880 AT4G33770 AT5G48250 AT5G48270 AT2G46660	AT1G18450 AT1G12460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT5G46840 AT5G46550 AT5G468270 AT5G466640 AT5G46650
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5	164,003743 123,928263 170,36043 201,034005 138,15622	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05	A11618450 A11618460 A13661880 A14633770 A15648250 A15648270 A12646660	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT5G46640 AT5C48650 AT2C46660 AT2C46650 AT2C46650 AT2C46660 AT3G12590 AT3G12700
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr2-18007523.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07 9,53E-07 9,98E-07	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05	ATIG18450 ATIG18460 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350	ATI-G18450 ATI-G12460 AT4G33760 ATI-G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48220 AT5G48270 AT5G48240 AT2G46550 AT2G46560 AT3G12690 AT3G12700 AT3G12690 AT3G12700
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-18007523.5 Chr2-18007523.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07 9,53E-07 9,98E-07 1,09E-06	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05	ATIG18450 ATIG18460 AT4G33770 AT5G48250 AT5G48270 AT2G46660 AT2G43340 AT2G43350 AT1G3350	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT3G48270 AT2G46640 AT2G46650 AT2G46660 AT3G12690 AT3G12700 AT2G09445 AT2G09455 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr2-18007523.5 Chr2-18007523.5 Chr1-12239468 Chr3-10320015	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806	1,750354453 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07 9,53E-07 9,98E-07 1,09E-06	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05	ATIG18450 ATIG18460 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350 AT1G33760	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT2G46640 AT2G46650 AT2G46660 AT3G12690 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G0860
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr2-18007523.5 Chr1-12239468 Chr2-12233091.5 Chr2-12233091.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322	7,54E-07 7,56E-07 7,90E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,09E-06	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,83E-05	ATIG18450 ATIG18460 AT4G33770 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350 AT1G33760	AT1G18450 AT1G18460 AT4G3870 AT3G61880 AT4G3870 AT3G61880 AT4G3870 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT2G46640 AT2G46550 AT2G46560 AT3G12690 AT3G12700 AT2G09445 AT2C09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr1-12239468 Chr2-12233091.5 Chr2-24887208.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,09E-06 1,17E-06	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,61E05 1,68E05 1,82E05 1,83E05 1,94E05	ATIG18450 ATIG18460 ATIG33770 ATG68280 ATG68250 AT5648270 AT2646660 AT2643340 AT2643350 AT1633760	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT3G48270 AT2G46640 AT2G46550 AT2G46660 AT3G12690 AT3G12700 AT2G09455 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT5G61960 AT5G61970
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr1-12239468 Chr1-12239468 Chr2-1223091.5 Chr5-24887208.5 Chr1-4458778 Chr1-4458778	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504	7,54E-07 7,56E-07 7,90E-07 9,53E-07 9,53E-07 9,98E-07 1,09E-06 1,17E-06 1,19E-06	1,30E-05 1,33E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,83E-05 1,94E-05 1,97E-05	ATIG18450 ATIG18460 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350 AT1G33760 AT1G13080	ATIG18450 ATIG18460 ATIG61870 ATIG61840 ATIG61870 ATIG61880 ATIG63870 ATIG648250 ATIG648270 ATIS648240 ATIS648250 ATIS648270 ATIS646640 ATIS646550 ATIS648270 ATIS609450 ATIS64700 ATIS609450 ATIS64700 ATIS609450 ATIS63760 ATIS64770 ATIS67850 ATIS63760 ATIS63770 ATIS67850 ATIS6380 ATIG13090 ATIS604987 ATIS63808 ATIG13090
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-18007523.5 Chr1-2239468 Chr1-22330468 Chr1-22330468 Chr1-2233048.5 Chr3-24887208.5 Chr1-4487778 Chr1-19432928.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509	1,0502433 1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017	0,3511812 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504 0,42132973	7,54E-07 7,56E-07 7,90E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,17E-06 1,19E-06 1,30E-06	1,30E-05 1,33E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,83E-05 1,94E-05 2,14E-05	ATIG18450 ATIG18450 AT4G33770 AT5G48250 AT5G48270 AT2G46660 AT2G43340 AT2G43350 AT1G33760 AT1G13080	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT3G48270 AT2G46640 AT2G46650 AT2G46660 AT3G12690 AT3G12700 AT2G09455 AT3C604550 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT3G61960 AT5G61970 AT1G04987 AT1G13080 AT1G13090 AT1G52185 AT1G07793 AT1G52190
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-4035593.6 Chr3-4035593.5 Chr2-18007523.5 Chr2-18007523.5 Chr2-14233091.5 Chr5-24887208.5 Chr1-19432928.5 Chr4-13911246.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188	1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017 1,59449139	0,3511812 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,4043504 0,40243504	7,54E-07 7,56E-07 7,86E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,09E-06 1,19E-06 1,19E-06 1,30E-06 1,54E-06	1,30E-05 1,33E-05 1,33E-05 1,33E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,82E-05 1,84E-05 1,94E-05 2,14E-05 2,53E-05	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350 AT1G33760 ATIG13080 AT4G27950	AT1G18450 AT1G12460 AT4G33760 AT4G33770 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT3G46540 AT2G46550 AT2G46560 AT3G12590 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT3G51260 AT5G61970 AT1G04987 AT1G13080 AT1G13090 AT1G52185 AT1G07793 AT1G52190 AT1G52185 AT4G07795 AT4G07955
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr1-2233091.5 Chr2-12233091.5 Chr2-2233091.5 Chr2-4287728 Chr1-39432928.5 Chr4-458778 Chr1-39432928.5 Chr4-13911246.5 Chr2-8805015	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188 87,8456146	1,0502435 1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017 1,59449139 2,2121003	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504 0,42132973 0,34181667 0,47429506	7,54E-07 7,56E-07 7,96E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,109E-06 1,17E-06 1,19E-06 1,55E-06	1,30E-05 1,33E-05 1,33E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,83E-05 1,94E-05 1,94E-05 2,53E-05 2,53E-05	ATIG18450 ATIG18460 AT4G38370 AT5G4880 AT4G38370 AT5G48250 AT5G48270 AT2G46660 AT2G43660 AT2G43340 AT2G43350 AT1G33760 AT1G13080 AT4G27950 AT2G20610	AT1G18450 AT1G18460 AT4G3870 AT3G61880 AT4G3870 AT3G61880 AT4G38700 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT2G46640 AT3G48250 AT2G46660 AT3G12690 AT3G12700 AT2G9445 AT2G09455 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT5G61960 AT5G61970 AT2G28540 AT5G61960 AT5G61970 AT1G928 AT1G13080 AT1G13090 AT1G928 AT1G13080 AT1G13090 AT4G07925 AT4G7793 AT1G52190 AT4G07925 AT4G7950 AT4G07955 AT2G2610
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-49035693.5 Chr3-4035593.5 Chr1-142239468 Chr2-12037091.5 Chr5-24887208.5 Chr1-19432928.5 Chr1-19432928.5 Chr1-3911246.5 Chr3-4723918.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188 87,8456146 153,357511	1,0502433 1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017 1,59449139 2,2121003 1,80017867	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504 0,42132973 0,34181667 0,38708318	7,54E-07 7,56E-07 7,96E-07 9,53E-07 9,93E-07 9,98E-07 9,98E-07 1,09E-06 1,09E-06 1,17E-06 1,19E-06 1,30E-06 1,55E-06 1,55E-06	1,30E-05 1,33E-05 1,33E-05 1,57E-05 1,57E-05 1,66E-05 1,66E-05 1,82E-05 1,82E-05 1,82E-05 1,94E-05 2,14E-05 2,53E-05 2,53E-05 2,53E-05 2,69E-05	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G4340 AT2G43350 AT1G33760 AT1G33760 AT1G13080 AT4G27950 AT4G27950 AT2G20610 AT3G02895	AT1G18450 AT1G12460 AT4G33760 AT4G33770 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G4250 AT2G4560 AT3G12690 AT3G12260450 AT2G4650 AT3G12690 AT3G12700 AT2G9445 AT2G09450 AT2G4330 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT3G51260 AT5G61970 AT4G04987 AT1G31080 AT1G13090 AT1G94987 AT1G3793 AT1G31900 AT4G07925 AT4G27950 AT4G07955 AT2G20610 AT3G61265 AT3G02895
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr3-403593.5 Chr3-403593.5 Chr3-12239468 Chr2-12233091.5 Chr3-24887208.5 Chr4-439778 Chr1-19432928.5 Chr4-439778 Chr1-19432928.5 Chr4-439718.5 Chr3-8480515	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188 87,8456146 153,357511 613,304354	1,0502433 1,75035845 2,19206059 1,96069499 1,63843027 1,84429319 2,05572743 1,9766193 2,05572743 1,93844591 2,07960592 1,88911264 1,88012867 1,59449139 2,2121003 1,80017867	0,3511812 0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504 0,402132973 0,34181667 0,37429506 0,38708318 0,30421113	7,54E-07 7,56E-07 7,56E-07 9,23E-07 9,53E-07 9,98E-07 1,09E-06 1,19E-06 1,19E-06 1,30E-06 1,55E-06 1,55E-06 1,65E-06 1,86E-06	1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,82E-05 1,94E-05 2,14E-05 2,53E-05 2,53E-05 2,53E-05 2,94E-05 2,53E-05 2,94E-05	ATIG18450 ATIG18460 ATIG3870 ATSG48250 ATSG48270 ATSG48250 ATSG48270 AT2G46560 AT2G43340 AT2G43350 AT1G33760 ATIG13080 ATIG13080 ATIG27950 AT2G20610 AT3G02895 AT3G00300	ATIG18450 ATIG18460 ATIG370 ATIG61840 ATIG370 ATIG61880 ATIG370 ATIG64820 ATIG648270 ATIS648240 ATIG648250 ATIG648270 ATIS646640 ATIG64650 ATIG648270 ATIS64504 ATIG6450 ATIG64340 ATIG643350 ATIG09455 ATIG63750 ATIG33760 ATIG63370 ATIG63750 ATIG33760 ATIG63970 ATIG6487 ATIG13080 ATIG13090 ATIG6487 ATIG13080 ATIG13090 ATIG652185 ATIG07793 ATIG52190 ATIG6295 ATIG27950 ATIG07955 ATIG20610 AT3614205 AT3600330 ATIG03035 AT3G03045 AT3G15220
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035993.5 Chr2-18007523.5 Chr2-12239468 Chr2-1223301.5 Chr2-24887208.5 Chr2-4458778 Chr1-19432928.5 Chr2-4887218.5 Chr3-472318.5 Chr3-472318.5 Chr3-472318.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188 87,8456146 153,357511 613,304354 84 594547	1,0502435 1,75035845 2,19206059 1,63843027 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017 1,55449139 2,2121003 1,80017867 1,40956349 2,35187857	0,3311812 0,3639211 0,45651167 0,40840952 0,34350933 0,38720125 0,41579616 0,433401647 0,40935322 0,44041658 0,40043504 0,42132973 0,34181667 0,47429506 0,38708318 0,30421113 0,5129360	7,54E-07 7,56E-07 7,56E-07 9,53E-07 9,53E-07 9,98E-07 1,09E-06 1,09E-06 1,17E-06 1,19E-06 1,35E-06 1,55E-06 1,55E-06 1,55E-06 1,55E-06	1,30E-05 1,30E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,68E-05 1,82E-05 1,82E-05 1,94E-05 1,94E-05 2,14E-05 2,53E-05 2,53E-05 2,53E-05 2,53E-05 2,54E-05 2,5	ATIG13450 ATIG13450 ATIG33770 AT3G61880 ATIG33770 AT3G48250 AT5G48270 AT2G46360 AT2G43340 AT2G43350 ATIG33760 ATIG33760 ATIG13080 AT4G27950 AT4G27950 AT3G02855 AT3G00330 AT3G02855 AT3G00330 AT4G22000	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT2G46640 AT2G46650 AT2G46660 AT3G12690 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT1G5185 AT1G3780 AT1G13900 AT1G52185 AT1G0793 AT1G52190 AT4G9792 AT4G27950 AT4G07955 AT2G20E10 AT3G14205 AT3G02895 AT3G15210 AT3G02330 AT3G03035 AT3G03045 AT3G15220 AT4G1990 AT4G1200
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-4035593.5 Chr3-4035593.5 Chr2-18007523.5 Chr2-18007523.5 Chr2-1823091.5 Chr2-488708.5 Chr2-4458778 Chr1-19432928.5 Chr4-3911246.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-192105.5 Chr3-192105.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 250,513188 87,8456146 153,357511 613,304354 84,594542 183,365070	1,0037437 1,75035845 2,19206059 1,96065499 1,63843027 1,84429319 2,05572743 1,93844591 2,0756052 1,88911264 1,98048017 1,59449139 2,2121003 1,80017867 1,40956349 2,35187857	0,3511812 0,3639211 0,45651167 0,40840952 0,34550993 0,38720125 0,41579616 0,43401647 0,40935322 0,44041658 0,40043504 0,42132973 0,34181667 0,47429506 0,38708318 0,30421113 0,30421113 0,31293608	7,54E07 7,56E07 7,90E07 9,33E07 9,33E07 9,98E07 1,09E06 1,17E06 1,17E06 1,19F06 1,155E06 1,55E06 1,65E06 1,80E06 2,27E06	1,30E-05 1,35E-05 1,35E-05 1,35E-05 1,57E-05 1,61E-05 1,61E-05 1,61E-05 1,61E-05 1,61E-05 1,61E-05 1,61E-05 1,82E-05 1,94E-05 2,14E-05 2,53E-05 2,53E-05 2,69E-05 2,91E-05 3,66E-05 2,76E-05	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G4560 AT2G43340 AT2G43350 AT1G33760 ATIG13080 ATIG13080 ATIG13080 AT4G27950 AT3G02895 AT3G02895 AT3G00330 AT4G12000 AT4G12000	ATIG18450 ATIG12460 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G48270 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT2G46540 AT2G46550 AT2G46560 AT3G12690 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G3750 AT1G33760 AT1G33770 AT2G28560 AT3G51250 AT3G61970 AT1G04987 AT1G13080 AT1G13090 AT1G52185 AT1G27939 AT1G52190 AT1G04987 AT1G13080 AT1G13090 AT1G52185 AT1G27939 AT1G52190 AT3G5120 AT3G02895 AT2G20610 AT3G14205 AT3G02895 AT3G1200 AT3G0330 AT3G03035 AT3G03045 AT3G15220 AT4G54270 AT45C54480
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-403593.5 Chr2-18007523.5 Chr2-12239468 Chr2-12233091.5 Chr2-4887208.5 Chr3-4323091.5 Chr3-432328.5 Chr3-4313911246.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 250,37033 121,374509 205,613188 87,8456146 153,357511 613,304354 84,594542 183,365079 214,423225	1,037435 2,19206059 1,9606949 1,9606949 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,89811264 1,93844591 2,2121003 1,80017867 1,6248139 2,35187857 1,62806228	0,3639211 0,45651167 0,40840952 0,34350993 0,34350993 0,34350993 0,34370952 0,410479616 0,43401647 0,40935322 0,44041658 0,40043504 0,4023502 0,44041658 0,40043504 0,4023507 0,44041658 0,40043504 0,4023507 0,3418167	7,54E07 7,56E07 7,90E07 9,33E07 9,33E07 9,38E07 1,09E06 1,09E06 1,09E06 1,17E06 1,19E06 1,15E06 1,55E06 1,55E06 2,27E06 2,33E06	1,30E05 1,33E05 1,35E05 1,35E05 1,57E05 1,67E05 1,68E05 1,82E05 1,97E05 2,14E05 2,14E05 2,53E05 2,53E05 2,53E05 2,53E05 2,55E05 3,66E05 3,75E05	ATIG13450 ATIG13450 ATIG33770 AT3G61380 AT4G33770 AT2G46600 AT2G43340 AT2G43350 AT1G33760 AT1G33760 AT1G13080 AT1G27950 AT4G27950 AT4G27950 AT4G205010 AT3G02855 AT3G00330 AT3G02855 AT3G00330 AT3G52640 AT2G55450	AT1G18450 AT1G18460 AT3G61870 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT5G48240 AT5G48250 AT2G46660 AT3G12690 AT3G12700 AT2G9445 AT2G46550 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G28560 AT5G61960 AT5G61970 AT1G925 AT1G31760 AT1G3170 AT1G52185 AT1G0793 AT1G52190 AT4G07925 AT4G27950 AT4G07955 AT3G1200 AT3G02895 AT3G15210 AT3G0330 AT3G03035 AT3G03045 AT3G15220 AT4G1990 AT4G126560
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-49035693.5 Chr3-4035593.5 Chr1-218007523.5 Chr1-2239468 Chr2-2233091.5 Chr1-24482728.5 Chr1-19432928.5 Chr1-19432928.5 Chr3-418911246.5 Chr3-4123918.5 Chr3-4123918.5 Chr3-5123667.5 Chr3-7192105.5 Chr3-7192105.5 Chr3-211827.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 107,511669 205,613188 87,8456146 153,357511 613,304354 84,594542 183,365079 214,433242	1,003783 2,1200059 1,96069499 1,96069499 1,97661193 2,05572743 1,93844591 2,07960592 1,59449139 2,2121003 1,80017867 1,40956349 2,35187857 1,62806228	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,3435093 0,3430147 0,43001647 0,43001647 0,43001647 0,43001647 0,4300164 0,42132973 0,34181667 0,47429506 0,38708318 0,31042113 0,51523957 0,32552355 0,32575265	7,54E07 7,56E07 7,86E07 7,90E07 9,92E07 9,93E07 1,09E06 1,09E06 1,19F06 1,19F06 1,19F06 1,19F06 1,19E06 1,155E06 1,55E07 1,55E	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,61E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,35E05 2,375E05 3,75E05	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G46560 AT2G4340 AT2G43350 ATIG33760 ATIG13080 ATIG13080 ATIG13080 ATIG27950 AT3G02895 AT3G02895 AT3G00300 AT4G12000 AT3G54470 AT3G554470 AT3G554450	ATIG18450 ATIG18460 ATIG361870 ATIG61880 ATIG361870 ATIG63820 ATSG48240 ATSG68280 ATSG68270 ATSG48240 ATSG68250 ATSG68270 ATSC66640 ATSG68250 ATZG46560 AT3G12690 AT3G1246550 ATZG463340 ATZG43350 ATZG09455 ATIG33750 ATIG33760 ATIG33770 ATZG8750 ATIG33760 ATIG33770 ATIG04987 ATIG13080 ATIG13090 ATIG69150 ATSG61970 ATIG04987 ATIG13080 ATIG13090 ATIG51285 ATIG07793 ATIG52190 ATIG04987 ATIG13080 ATIG1290 ATIG51285 ATIG07793 ATIG52190 ATIG51285 ATIG07793 ATIG52190 ATIG5120 AT3G0330 AT3G03035 AT3G03045 AT3G15220 ATIG15210 AT3G0330 AT3G03035 AT3G03045 AT3G15220 ATAG1972 ATG554480 AT3G55470 AT3G55480 AT3G55470 AT3G55480
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr3-403593.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-124827208.5 Chr1-4487778 Chr1-19432928.5 Chr3-13911246.5 Chr3-812367.5 Chr3-512367.5 Chr3-712105.5 Chr3-20155713 Chr3-28790412 Chr3-28790412	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,8323806 109,215776 107,511669 250,37033 121,374509 250,512188 87,8456146 153,357511 613,3004354 84,594542 183,365079 214,433242 160,520522	1,003783 2,19206059 1,96069499 1,96069499 1,97661193 2,05572743 1,93844591 2,07960592 1,8911264 1,93844591 2,938449139 2,2121003 1,80017867 1,40956349 2,35187857 1,62806228 1,47763491	0,3639211 0,45651167 0,40840952 0,3435093 0,38720125 0,41579616 0,43401467 0,4300147 0,4004354 0,44041658 0,44041658 0,44041658 0,44041658 0,44041658 0,34181667 0,47429506 0,3878318 0,51293608 0,35523957 0,3272525 0,3257255 0,3257555 0,325755 0,325755 0,325755 0,32575550 0,32575550 0,32575550 0,32575550 0,32575550 0,32575550 0,32575550 0,32575550 0,32575550 0,3257555000000000000000000000000000000000	7,54E07 7,56E07 7,86E07 7,80E07 9,32E07 9,32E07 9,32E07 9,93E07 1,09E06 1,09E06 1,09E06 1,19E06 1,19E06 1,34E06 1,55E06 1,55E06 2,27E06 2,33E06 2,34E07 2,34E07 2,55E0	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,61E05 1,61E05 1,82E05 1,82E05 1,82E05 2,44E05 2,34E05 2,35E05 2,53E05 2,53E05 3,66E05 3,75E05 3,75E05 3,75E05	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT2G46560 AT2G46360 ATIG33760 ATIG33760 ATIG13080 ATIG13080 ATIG27950 AT2G20610 AT3G02895 AT3G02895 AT3G0330 AT4G12000 AT3G55440 AT3G55450 AT3G555450 AT2G5560 AT2G45610	ATIG18450 ATIG18460 ATIG3760 T1G13460 ATIG3760 ATIG33770 ATIG61820 ATIG633770 ATIG648240 ATIG648250 ATIG48270 ATIG64560 ATIG64500 ATIG64320 ATIG64500 ATIG64500 ATIG64340 ATIG643350 ATIG09455 ATIG3750 ATIG3750 ATIG3770 ATIG628560 ATIG61960 ATIG61970 ATIG628560 ATIG61970 ATIG13080 ATIG13090 ATIG628587 ATIG13080 ATIG13090 ATIG622185 ATIG07939 ATIG52190 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG62950 ATIG61920 ATIG61920 ATIG51210 ATIG60330 ATIG63035 ATIG63045 ATIG15220 ATIG51210 ATIG55480 ATIG5540 ATIG55450 ATIG65420 ATIG565450 ATIG65420 ATIG565450 ATIG65420 ATIG565450 ATIG65420 ATIG565450 ATIG65420 ATIG654500 ATIG65420 ATIG65500 ATIG65420 ATIG65500 ATIG65420 ATIG65500 ATIG65420 ATIG65500 ATIG65500 ATIC645600 ATIC645600 ATIG6520
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-19563948.5 Chr3-4035593.5 Chr3-4035593.5 Chr3-403593.5 Chr3-403593.5 Chr3-243801.5 Chr3-243801.5 Chr3-4329301.5 Chr3-4732918.5 Chr3-4732918.5 Chr3-4732918.5 Chr3-47129105.5 Chr3-47129105.5 Chr3-215827.5 Chr3-215827.5 Chr3-215827.5 Chr3-2154361.2 Chr3-2154361.2	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,8232806 109,215776 107,511669 205,03703 205,61188 87,8456146 153,357511 613,304354 84,594542 183,356507 214,433242 160,520522 164,574551	1,0037457 1,75035845 2,19206059 1,96069499 1,96349027 1,8429319 1,97661193 2,0572743 1,988911264 1,988911264 1,9849139 2,2121003 1,80017867 1,62806349 2,35187857 1,62806228 1,47763491 1,61670888 1,858211	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,34370125 0,43401647 0,43401647 0,43401647 0,43401647 0,43401647 0,43401647 0,434113 0,34708318 0,347113 0,34708318 0,347113 0,347	7,54E07 7,56E07 7,86E07 7,90E07 9,23E07 9,53E07 9,53E07 9,53E07 9,53E07 9,53E07 9,53E07 9,53E07 1,09E06 1,109E06 1,109E06 1,109E06 1,130E06 1,136E06 1,55E06 1,55E06 1,55E06 2,27E06 2,234E06 2,244E06 2,244E06	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,67E05 1,88E05 1,88E05 1,84E05 2,14E05 2,14E05 2,34E05 2,58E05 2,59E05 3,65E05 3,75E05 3,38E05 3,88E05	Al1018450 Al1018460 Al103370 Al5648250 Al5648270 Al5648250 Al5648270 Al264660 Al1264340 Al2643350 Al1633760 Al1633760 Al1627950 Al1627970 Al1627970 Al1627970 Al1627970 Al1627970 Al162797	ATIG18450 ATIG18450 ATIG61870 ATIG61880 AT4G33760 ATIG64880 AT4G33760 ATIG64820 ATIG648270 ATIG648240 ATIG648250 ATIG648270 ATIG646640 ATIG64500 ATIG12690 ATIG64520 ATIG64370 ATIG09450 ATIG64500 ATIG62850 ATIG60793 ATIG63770 ATIG62850 ATIG61970 ATIG6987 ATIG13080 ATIG13090 ATIG52185 ATIG07793 ATIG52190 ATIG6987 ATIG13080 ATIG13090 ATIG52185 ATIG07793 ATIG52190 ATIG52185 ATIG07793 ATIG52190 ATIG52185 ATIG07793 ATIG52190 ATIG52185 ATIG07893 ATIG52190 ATIG52185 ATIG07830 ATIG03035 AT3G03045 AT3G15220 ATIG1290 ATIG0303 AT3G03035 AT3G03045 AT3G15220 AT4G1925 ATIG27564480 AT3G55470 AT3G554540 AT3G555470 AT3G554510 AT2G4550 AT2G45590 AT2G45500 AT2G4550 AT2G45620 AT2G45590 AT2G45500 AT2G4550 AT2G45620
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr3-4035593.5 Chr1-2233091.5 Chr2-12233091.5 Chr2-2233091.5 Chr2-42887208.5 Chr4-349778 Chr1-19432928.5 Chr4-3911246.5 Chr3-8191246.5 Chr3-8191246.5 Chr3-91267.5 Chr3-91267.5 Chr3-91267.5 Chr3-9211587.5 Chr3-921157.5 Chr3-921157.5 Chr3-921157.5 Chr3-921157.5 Chr3-921157.5 Chr3-921157.5 Chr3-921157.5 C	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,8323806 109,215776 107,511669 250,37033 121,374509 250,513188 7,8456146 153,357511 613,304354 83,365079 183,365791 613,304334 84,594542 183,365079 110,308378	1,053384 2,1920059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,98048017 1,95449139 2,2121003 1,80017867 1,62806228 1,47056349 1,61670888 1,78758211	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,34250125 0,41579616 0,41579616 0,44041658 0,44041658 0,44041658 0,44041658 0,44041658 0,4404165 0,4404165 0,3418167 0,3418167 0,3418167 0,3428110	7,54E07 7,56E07 7,86E07 9,23E07 9,33E07 9,93E07 1,09E06 1,09E06 1,19F06 1,19F06 1,19F06 1,19F06 1,195E06 1,55E06 1,55E06 2,23E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06	1,30E05 1,30E05 1,35E05 1,35E05 1,55E05 1,61E05 1,61E05 1,82E05 1,82E05 1,97E05 2,34E05 2,53E05 2,53E05 2,53E05 2,53E05 3,66E05 3,75E05 3,35E05 3,38E05 3,88E05 3,88E05 3,88E05	ATIG13450 ATIG13450 ATIG3370 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G4560 AT2G4560 AT2G4340 AT2G43350 ATIG13080 ATIG13080 ATIG13080 AT4G27950 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G0285 AT3G55450 AT3G55450 AT3G55450 AT3G558450 AT3G558450 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G55850 AT3G550 AT3G55850 AT3G570 AT3G570 AT3G770 A	ATIG18450 ATIG18460 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G48270 AT3G61880 AT5G48270 AT3G61820 AT5C466400 AT2G46550 AT2G46560 AT3G12590 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G32750 ATIG33760 AT1G33770 AT2G45640 AT3G61870 AT5G61960 AT5G61970 AT1G4287 AT1G13080 AT1G13090 AT1G4287 AT1G13080 AT1G52190 AT4G07925 AT4G27950 AT4G07955 AT2G20610 AT3G1240 AT3G03035 AT3G03045 AT3G15220 AT4G1990 AT4G12000 AT3G55440 AT3G55450 AT2G45590 AT2G45500 AT2G45510 AT2G45520 AT2G35790 AT2G35795 AT2G35800 AT3G3105
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr3-4035593.5 Chr2-18007523.5 Chr2-1223301.5 Chr2-242832031.5 Chr2-242832031.5 Chr2-44887208.5 Chr2-44887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-312318.5 Chr3-472318.5 Chr3-22115827.5 Chr3-20556713 Chr2-320556713 Chr2-18790412 Chr2-18790412 Chr2-18790412 Chr3-47129055	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,832806 109,215776 107,511669 203,0733 121,374509 205,613188 87,8456146 153,357511 613,304354 84,59452 183,365079 214,433242 166,520522 164,574551 110,308378 150,930645	1,0537337 1,7533845 2,19206059 1,63843027 1,84429319 1,97661193 2,05927743 1,93844591 1,93844591 1,93844591 1,93844591 1,93844591 1,93048077 1,6280628 1,47763491 1,4017867 1,6167088 1,7878211 1,9081991 1,9608597 1,6508557 1,650857 1,55085 1,650857 1,55085	0,3639211 0,45651167 0,034350933 0,34350933 0,34350933 0,34350933 0,341579616 0,41379616 0,41379616 0,41379616 0,4034153 0,40404158 0,40043504 0,40243293 0,34181667 0,47429506 0,472429506 0,3470818 0,3421113 0,51293608 0,3555229 0,39118758 0,41519522 0,36201076 0,36201076	7,344-07 7,366-07 7,966-07 9,234-07 9,334-07 9,384-07 9,384-07 1,094-06 1,094-06 1,094-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,2874-06 2,274-06 2,244-06 2,244-06 2,244-06 2,254-06 2,254-06 2,254-06 2,254-06 2,254-06 2,254-06 2,254-06 2,554-06 2,	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,65E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 2,35E05 2,35E05 2,35E05 2,35E05 2,35E05 2,35E05 3,35E05 3,35E05 3,38E05 3,88E05 3,38E05	ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G4560 AT2G4560 AT1G33760 ATIG33760 ATIG13080 ATIG13080 AT4G27950 AT4G27950 AT3G02895 AT3G02895 AT3G0330 AT3G54470 AT3G55450 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G55540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G5540 AT3G540 A	ATIG18450 ATIG18450 ATIG18460 AT4G33760 AT4G33770 AT5G48270 AT3G61880 AT4G33760 AT4G33770 AT5G48240 AT5G48250 AT5G48270 AT5G48240 AT5G48250 AT2G45660 AT3G12690 AT3G12700 AT2G9454 ST2G69540 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G9245 AT1G32080 AT1G13070 AT2G9245 AT1G20793 AT1G52190 AT4G07925 AT4G27950 AT4G07955 AT1G52185 AT1G07793 AT1G52190 AT4G07925 AT4G27950 AT4G07955 AT3G14205 AT3G02895 AT3G15210 AT3G0330 AT3G03035 AT3G03045 AT3G15220 AT4G11990 AT4G12000 AT3G54470 AT3G554480 AT3G55470 AT3G554580 AT3G54570 AT2G45500 AT2G45610 AT2G45520 AT3G15270 AT2G45500 AT2G45610 AT2G45520 AT3G15270 AT2G45500 AT2G4550 AT2G35795 AT2G35800 AT3G30165 AT4G01202 AT4G01023 AT4G01026 AT4G03845 AT4G01030
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr3-4035593.5 Chr2-1223091.5 Chr3-4203593.5 Chr3-1223091.5 Chr3-24887208.5 Chr4-439778 Chr1-19432928.5 Chr4-439778 Chr3-19432928.5 Chr3-43267.5 Chr3-21567.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-20156713 Chr2-1549512 Chr3-11798805 Chr3-11798805 Chr3-446974 Chr3-21795	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,8323806 109,215776 205,613188 87,845614 153,357511 163,304354 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217	1,0533845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960522 1,88911264 1,98048017 1,59449139 2,2121003 1,80017867 1,40956349 2,35187857 1,62806228 1,47763491 1,61670888 1,47763491 1,61670888 1,47763491 1,61670888 1,47763491 1,61670888 1,47763491 1,6165065571 1,42107014	0.311812 0.45651167 0.40840952 0.3435093 0.3435093 0.3435093 0.41579616 0.41579616 0.41579616 0.44041658 0.4004350 0.40401658 0.4004350 0.44041658 0.404350 0.3418167 0.3418167 0.3428167 0.3553957 0.35523957 0.3552229 0.3552229 0.35532229 0.3553122 0.35531200000000000000000000000000000000	7,54E07 7,56E07 7,86E07 7,90E07 9,32E07 9,93E07 9,98E07 1,09E06 1,09E06 1,19E06 1,19E06 1,19E06 1,19E06 1,155E06 1,55E06 1,55E06 2,27E06 2,34E	1,30E05 1,30E05 1,35E05 1,35E05 1,55E05 1,65E05 1,65E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 1,97E05 2,34E05 2,35E05 2,35E05 2,35E05 3,35E05 3,35E05 3,35E05 3,385E05 3,385E05 3,385E05 3,385E05 3,385E05 3,385E05 3,885E053,885E05 3,885E	ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G45650 AT2G43340 AT2G43350 ATIG33760 ATIG13080 ATIG13080 ATIG13080 AT4G27950 AT3G20510 AT3G20510 AT3G20510 AT3G20510 AT3G20510 AT3G55440 AT3G55450 AT2G3570 AT3G55450 AT2G3570 AT3G55450 AT2G3570 AT3G55450 AT3G30165 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1607080	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G46820 AT3G61280 AT5G46820 AT3G642820 AT2646560 AT2G46550 AT2G46560 AT3G12690 AT3G12700 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G32560 AT3G612970 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT4G27950 AT4G0795 AT4G072925 AT4G27950 AT4G0795 AT4G072925 AT4G27950 AT4G0795 AT3G14205 AT3G02895 AT3G1200 AT3G03035 AT3G03045 AT3G15220 AT4G1990 AT4G12000 AT5G54470 AT5G54480 AT3G55440 AT3G55450 AT2G35790 AT2G45600 AT2G45610 AT2G45620 AT2G35790 AT2G35795 AT2G35800 AT3G3106 AT3G3106 AT3G3165 AT3G3165 AT3G3160 AT3G63303 AT3G0335 AT3G03045 AT4G01030
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12239468 Chr2-1223901.5 Chr2-1223901.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-481291246.5 Chr2-8800515 Chr2-8800515 Chr2-8123667.5 Chr2-92115827.5 Chr2-92115827.5 Chr2-92115827.5 Chr2-92115827.5 Chr2-92115805.5 Chr2-18790412 Chr2-15043612 Chr2-142699279 Chr4-4052749.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,832806 109,215776 205,511669 205,613188 87,8456146 153,357511 613,304354 84,59452 183,365079 214,433242 166,520522 164,574551 110,308378 150,930645 282,602217 123,72796	1,0503384 2,19206059 1,63843027 1,84429319 1,97661193 2,0552743 1,98445912 2,07960592 1,88911264 1,9844591 2,07960592 1,88911264 1,98048017 1,59449139 2,2121003 1,80017867 1,6206537 1,620628 1,47763491 1,6167088 1,78758211 1,9081091 1,65065571 1,42107044 1,9825307	0,3639211 0,45651167 0,40840952 0,34350993 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,40404158 0,40043504 0,40043504 0,4044158 0,40421113 0,3472137 0,32553957 0,32575265 0,325523957 0,32575265 0,325523957 0,32575265 0,325523957 0,32575265 0,32527526 0,32527526 0,32577575757575757575757575757757577777777	7,34407 7,36607 7,9667 9,23407 9,33407 9,98607 1,99806 1,99806 1,19806 1,19806 1,19806 1,138066 1,35806 1,35806 2,34806 2,23806 2,23806 2,24806 2,24806 2,24806 2,2580	1,30E05 1,33E05 1,35E05 1,35F05 1,35F05 1,45E05 1,88E05 1,88E05 1,88E05 2,34E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,38E05 3,38E05 4,03E05 4,03E05	Al1018450 Al1018450 Al1038770 Al3061880 Al3061880 Al2648250 Al3648270 Al30648250 Al3648270 Al306180 Al30760 Al30760 Al30760 Al307855 Al300330 Al307855 Al300330 Al3078554470 Al308555 Al300330 Al3078554470 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al30855540 Al308555540 Al30855540 Al308555450 Al3085555550 Al4091023 Al4091026 Al4093845 Al4091030 Al1070780 Al4091023 Al4091026 Al4093845 Al4091030 Al1070780 Al4091023 Al4091026 Al4093845 Al4091030 Al1070780 Al4091021 Al4091025 Al4091026 Al4093845 Al4091030 Al1070780 Al4091021 Al4091021 Al4091021 Al4091021 Al4091030 Al4091021 Al4091021 Al4	ATIG18450 ATIG12460 ATIG61870 ATIG61880 AT4G33760 ATIG61880 AT4G33760 ATIG61880 AT5G48240 AT5G4520 AT5G68270 AT5G48240 AT5G4520 AT2G46560 AT3G12690 AT3G12700 AT2G9945 AT2G99450 AT2G4330 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G9245 AT2G09450 AT2G4330 AT2G43350 AT2G09455 AT1G328560 AT5G51960 AT5G61970 AT4G04987 AT1G13080 AT1G13090 AT4G04987 AT1G13080 AT1G13090 AT4G04987 AT1G13080 ATG152190 AT4G07925 AT4G27950 AT4G07955 AT2G20610 AT3G51250 AT3G02895 AT3G15210 AT3G0330 AT3G03035 AT3G03045 AT3G15220 AT4G1990 AT4G12000 AT5G54470 AT5G54480 AT3G545470 AT5G54480 AT3G554470 AT5G5450 AT2G45590 AT2G45500 AT2G45510 AT2G45520 AT2G45590 AT2G45500 AT2G45510 AT2G45520 AT2G45590 AT2G45500 AT2G45500 AT2G45520 AT4G01020 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G70780 AT1G613820
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr3-4035593.5 Chr2-48007523.5 Chr3-4203593.5 Chr3-4233091.5 Chr3-42487208.5 Chr3-42487208.5 Chr3-432978 Chr3-4942928.5 Chr3-431246.5 Chr3-431246.5 Chr3-5123667.5 Chr3-201567.13 Chr3-192105.5 Chr3-201567.13 Chr3-192057.13 Chr3-192081.2 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-4059.7 Chr3-4059.7 Chr3-4059.7 Chr3-4059.79 Chr3-40557.9 C	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,823806 109,215776 205,613188 87,8456146 153,357511 613,304354 84,594542 183,365079 214,433242 160,520522 160,520522 110,308378 150,930645 282,602217 123,727964	1,05373,07 1,7533845 2,19206059 1,63843027 1,84429319 1,97661193 2,075672743 1,93844591 2,07960592 1,88911264 1,93844591 2,35187857 1,40956349 2,35187857 1,40956349 2,35187857 1,46280528 1,47765491 1,62806228 1,47765491 1,62806228 1,47765491 1,6280528 1,47755491 1,65805571 1,42107014 1,98293074 1,8899304	0.311812 0.45651167 0.40840952 0.3435093 0.38720125 0.41579616 0.41579616 0.44041638 0.40043504 0.40441638 0.40044350 0.44041638 0.44041638 0.44041638 0.44041638 0.3418167 0.47429506 0.3418167 0.32553957 0.32572525 0.35532229 0.355312229 0.355312229 0.355312229 0.355312229 0.355312229 0.355312229 0.355312229 0.31331826 0.31331826 0.43257537	7,544-07 7,566-07 7,566-07 9,234-07 9,334-07 9,384-07 9,988-07 1,098-06 1,098-06 1,1976-06 1,1976-06 1,1976-06 1,1956-06 1,1558-06 1,558-06 1,558-06 1,558-06 1,558-06 1,558-06 2,248-06 2,248-06 2,248-06 2,258-0	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,68E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 1,97E05 2,44E05 2,44E05 2,45E05 2,58E05 3,75E0	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G4660 AT2G4340 AT2G43350 ATIG33760 ATIG13080 ATIG13080 ATIG13080 AT4G27950 AT3G02895 AT3G02895 AT3G00300 AT4G1000 AT4G20540 AT3G55450 AT3G54470 AT3G554470 AT3G554470 AT3G55450 AT3G55450 AT3G30165 AT4G01025 AT4G03845 AT4G01030 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT4G0780 AT4G0520 AT1G05270	ATIG18450 ATIG18460 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G46820 AT3G61820 AT5C46640 AT3G618250 AT5G48270 AT2646650 AT2G46550 AT2G46560 AT42639760 AT3G42700 AT2609445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G3750 AT1G33760 AT1G33770 AT2609445 AT2G09450 AT1G33770 AT2609450 AT1G33760 AT1G33770 AT2628560 AT5G61950 AT1G31709 AT1G3750 AT1G31709 AT1G52190 AT1604987 AT1G13080 AT1G13090 AT16374627950 AT4607955 AT2602610 AT3G1420750 AT4G07955 AT3G1210 AT3G00330 AT3G03035 AT3G03045 AT3G15220 AT3G15210 AT3G00330 AT3G03035 AT3G03045 AT3G15220 AT4G1275 AT3G02895 AT3G15210 AT3G05305 AT2G05800 AT3G55440 AT3G55408 AT3G55470 AT3G55480 AT2G45590 AT2G45500 AT2G45610 AT2G45620 AT2G35790 AT2G35795 AT2G35800 AT3G35165 AT4G01020 AT4601023 AT4G01026 AT4G03845 AT4G01030 AT4G01020 AT4601023 AT4G18630 AT4G01020 AT4G108207 AT4G01020 AT4G10820 AT4G18630 AT4G01020 AT4G1065270
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr2-12233408 Chr2-12233408 Chr2-1223301.5 Chr2-24897208.5 Chr1-4489778 Chr1-4489778 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-912105.5 Chr3-91210.5 Chr3	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8232806 109,215776 205,613188 87,8456146 153,357511 613,304354 88,59452 184,359452 184,59452 164,574551 110,308378 150,930645 282,602217 123,727964 130,593942	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,93844591 2,212103 1,80017867 1,40956349 2,21518785211 1,6157088 1,78758211 1,6157088 1,7858211 1,9681501 1,9685577 1,42107014 1,9825307 1,982557 1,982557 1,982557 1,982557 1,9825577 1,9825577 1,98255777 1,98257777 1,982577	0,3639211 0,45651167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,40404550 0,40043504 0,40043504 0,4024329 0,34704350 0,34704350 0,34704350 0,35129260 0,35522760 0,35527760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,35522760 0,355277760 0,355277777777777777777777777777777777777	7,54E07 7,56E07 7,96E07 9,23E07 9,23E07 9,35E07 9,38E07 1,09E06 1,09E06 1,17E06 1,17E06 1,17E06 1,17E06 1,15E06 1,36E06 2,34E06 2,24E06 2,24E06 2,24E06 2,24E06 2,25E07 2,55E06 2,55E0	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,85E05 1,88E05 1,88E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,35E05 3,35E05 3,38E05 3,38E05 4,03E05 4,03E05 4,03E05 4,05E0	A I I I I I I I I I I I I I I I I I I I	ATIG18450 ATIG18460 ATIG618450 ATIG38460 ATG61870 ATG633770 ATG648240 AT5G48250 AT5G48270 AT5G48240 AT5G48250 AT5G48270 AT2G46560 AT5G48250 AT5G48270 AT2G45640 AT5G48250 AT5G48270 AT2G45640 AT5G48250 AT2G43340 AT2G43350 AT2G09455 AT3G12690 AT3G12700 AT2G3750 AT1G33760 AT1G33770 AT2G45840 AT1G13080 AT1G3090 AT1G4784 AT1G13080 AT1G13090 AT1G94787 AT1G13080 AT1G3190 AT1G94787 AT1G13080 AT1G3190 AT4G07925 AT4G27950 AT4G07955 AT4G07925 AT4G27950 AT4G07955 AT4G1300330 AT3G03303 AT3G03035 AT3G03045 AT3G15220 AT4G11990 AT4G12000 AT3G55440 AT3G5450 AT2G35790 AT2G45600 AT2G45610 AT2G45620 AT2G35790 AT3G55450 AT2G35790 AT2G35795 AT2G35800 AT3G3165 AT3G3105 AT3G3105 AT3G30165 AT4G1920 AT4G10202 AT4G01026 AT4G03845 AT4G01030 AT4G18020 AT4G18630 AT4G192270
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr3-19563948.5 Chr3-4035593.5 Chr3-4035593.5 Chr3-403593.5 Chr3-40329301.5 Chr3-243897208.5 Chr3-4329301.5 Chr3-4329301.5 Chr3-4329318.5 Chr3-4739318.5 Chr3-4739318.5 Chr3-4739318.5 Chr3-47192105.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-213912.5 Chr3-21391.	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,823806 109,215776 107,511669 205,01308 205,013188 87,8456146 153,357511 613,304354 84,594542 164,574551 110,308378 150,930645 286,00217 123,727964 136,748307	1,053345 2,19206059 1,63843027 1,84429319 1,97661133 2,05572743 1,93844591 2,07960529 1,88911264 1,93844591 2,0796052 1,89848017 1,59449139 2,2121003 1,59449139 2,2121003 1,59449139 2,2121003 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,47763491 1,6280528 1,47763491 1,6280528 1,47763491 1,6280528 1,47763491 1,9804001 1,78758211 1,202074 1,5905537 1,202074 1,	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41232973 0,34181667 0,47429506 0,34181667 0,34181667 0,3418167 0,3429506 0,3553927 0,32572525 0,3552327 0,32572525 0,3553272 0,3553272 0,3553275 0,3118758 0,41819582 0,36201076 0,31339826 0,43757537 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,382107557 0,3821075757 0,3821075757 0,3821075757	7,34407 7,56607 7,86607 9,23407 9,33407 9,38407 1,09406 1,09406 1,19406 1,19406 1,19406 1,19506 1,30406 1,35406 1,35406 1,35406 1,35406 1,35406 2,27406 2,24406 2,25606 2,24406 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25606 2,24406 2,25607 2,24607 2,2560	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 1,38E05 2,34E05 2,34E05 2,34E05 2,34E05 2,35E0	ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G46560 AT2G4560 AT1G33760 ATIG33760 ATIG33760 ATIG3080 AT4G27950 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G0300 AT4G1200 AT4G1200 AT4G1200 AT3G53440 AT3G554470 AT3G55440 AT3G55450 AT3G5155 AT2G45600 AT2G45601 AT3G3165 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G70780 AT4G0123 AT4G01026 AT4G03845 AT4G01030 AT1G07280 AT1G05270	ATIG18450 ATIG18460 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G46820 AT3G61820 AT5C46640 AT2G46550 AT2G46560 AT3C612690 AT3C426650 AT2G43340 AT2G43350 AT2G09455 AT1G33750 ATIG33760 AT1G33770 AT2G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G09450 AT3G612700 AT2G09450 AT3G612700 AT2G09450 AT1G33760 AT1G33770 AT2G09450 AT1G09120 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G12090 AT1G04987 AT1G13080 AT1G12090 AT1G52155 AT1G07793 AT1G52190 AT4G0725 AT4C27950 AT4G07955 AT2G0525 AT4C27950 AT4G07955 AT3G1220 AT3G00330 AT3G03035 AT3G03045 AT3G15220 AT4G1290 AT4G1000 AT3G15210 AT3G05303 AT3G03035 AT3G03045 AT3G15220 AT4G1520 AT3G55408 AT3G5540 AT3G55408 AT3G1520 AT3G55408 AT2G45590 AT2G45600 AT2G45610 AT2G45620 AT2G35795 AT2G35800 AT3G35105 AT4G01202 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT4G01202 AT4G01022 AT4G01026 AT4G03845 AT4G01030 AT1G52700 AT1G22770 T
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-1223948 Chr2-1223948 Chr2-1223901.5 Chr2-24887208.5 Chr2-42887208.5 Chr3-13911246.5 Chr3-4391246.5 Chr3-4391246.5 Chr3-4391246.5 Chr3-4391246.5 Chr3-421305.5 Chr3-512367.5 Chr3-2115024612 Chr2-18290513 Chr2-18290512 Chr3-1179805 Chr4-192579 Chr1-12659279 Chr1-1351339 Chr3-152520180 Chr3-192957 Chr3-152520180 Chr3-19297 Chr1-152520180 Chr3-19297 Chr1-152520180 Chr3-19297 Chr1-152520180 Chr3-19297 Chr3-19277 Chr3-1	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,823806 109,215776 205,37033 121,374509 205,613188 87,8456146 153,357511 613,304354 84,594542 166,520522 164,574551 110,308378 150,930645 282,002277 140,3727964 130,593942 130,793942 130,793942	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,89017867 1,40956349 2,2121003 1,80017867 1,40956349 2,2121003 1,61670888 1,78758211 1,61670888 1,78758211 1,61670888 1,78758211 1,9081001 1,9081001 1,9085001 1,9025001 1,9232074 1,925	0,3639211 0,45651167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,40403504 0,4043504 0,4043504 0,41232973 0,34181667 0,47425506 0,38708318 0,362421113 0,34742550 0,35352229 0,39118758 0,35352229 0,35118758 0,35352229 0,35118758 0,35352229 0,35118758 0,35352229 0,35118758 0,35352229 0,3535229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,3555229 0,35552000000000000000000000000000000000	7,54E07 7,56E07 9,23E07 9,23E07 9,23E07 9,23E07 9,23E07 9,23E07 1,09E06 1,09E06 1,17E06 1,17E06 1,17E06 1,17E06 1,17E06 1,15E066 1,55E06 1,55E06 2,27E06 2,24E06 2,24E06 2,25E07 2,50	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 2,34E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,35E05 4,33E05 4,33E05 4,35E05 4,37E0	A I I I I I I I I I I I I I I I I I I I	ATIG18450 ATIG18460 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G48270 AT3G61880 AT5G46820 AT3G648270 AT2646640 AT2G46550 AT2G46560 AT3G12590 AT3G12700 AT2G45640 AT2G46550 AT2G43340 AT2G43350 AT2G09455 AT1G33750 AT1G33760 AT1G33770 AT2G45640 AT3G618770 AT3G61870 AT1G13090 AT1G4978 AT1G13080 AT1G13090 AT1G4787 AT1G13080 AT1G51990 AT1G4978 AT1G27930 AT1G52190 AT4G07925 AT4G27950 AT4G07955 AT2G20610 AT3G1240 AT3G02895 AT3G1240 AT3G02895 AT3G1250 AT3G02895 AT3G1250 AT3G02895 AT3G1250 AT3G02895 AT3G1250 AT3G02895 AT3G1250 AT3G02895 AT3G1520 AT3G02895 AT3G51440 AT3G55440 AT3G5540 AT3G55450 AT2G45590 AT2G45500 AT2G45510 AT2G45520 AT2G35790 AT2G35795 AT2G35800 AT3G31055 <t< td=""></t<>
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1223301.5 Chr2-1232301.5 Chr2-13911246.5 Chr2-13911246.5 Chr2-13911246.5 Chr2-13911246.5 Chr2-13911246.5 Chr2-1391205.5 Chr2-22115827.5 Chr2-20556713 Chr2-130505713 Chr2-145043612 Chr2-14504574 Chr2-14504	164,003743 123,928263 170,36043 201,034005 170,36043 138,15622 126,709879 95,832806 107,511669 200,37033 121,374509 205,613188 87,8456146 153,357511 613,304354 84,59452 183,365079 214,43242 183,365079 214,43242 183,365079 214,43242 110,308378 150,930645 282,602217 123,727964 130,593942 134,748307 134,748307	1,05343,07 1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960529 1,88911264 1,93844591 2,2121003 1,80017867 1,40956349 2,3518785211 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,4785211 1,9081091 1,6206553 1,42107014 1,98253074 1,4299304 1,734338 1,72377383 1,9222453 1,9222453 1,9222453 1,930655 1,93075 1,93075 1,93075 1,93075 1,9305 1	0,3639211 0,45651167 0,034350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,40404155 0,40404155 0,40404155 0,40404155 0,4042113 0,34181667 0,47429506 0,4721297 0,3275265 0,3275265 0,312136 0,3552397 0,3251292 0,3911875 0,4121952 0,36201076 0,3132238 0,42021779 0,38142238 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,42021779 0,3814223 0,4202175 0,4202177 0,381423 0,4202177 0,3814223 0,4202177 0,4404040 0,4202177 0,4404040 0,4202177 0,4404040 0,4202177 0,4404040 0,4404040 0,4404040 0,44040400 0,440400000000	7,34E07 7,36E07 7,36E07 7,96E07 9,33E07 9,33E07 9,33E07 1,09E06 1,09E06 1,19E06 1,19E06 1,13E060 1,35E06 1,35E06 1,35E06 1,35E06 1,35E06 1,36E06 2,23E06 2,33E07 2,34E07 2,34E	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,88E05 1,88E05 1,98E05 2,38E05 2,38E05 2,38E05 2,38E05 3,375E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 4,38E05 4,58E05 4,56E05 4,57E	A I I I I I I I I I I I I I I I I I I I	ATIG18450 ATIG18450 ATIG61870 ATIG61880 AT4633760 AT4633770 AT564870 AT5648250 AT5648270 AT564870 AT5648250 AT5648270 AT2646500 AT2646500 AT2646560 AT3612690 AT3612700 AT2609450 AT2646500 AT2643340 AT2643350 AT2609455 AT4633750 AT1633760 AT1633770 AT2609450 AT5661970 AT4607925 AT4627950 AT4607955 AT4607925 AT4627950 AT4607955 AT4607925 AT4627950 AT4607955 AT3614205 AT3608030 AT3603035 AT3603045 AT3615220 AT461520 AT3660303 AT3603035 AT3603045 AT3615220 AT4613520 AT36554480 AT36554470 AT36554480 AT36554470 AT36554480 AT36555470 AT36554540 AT3635540 AT3655450 AT3645550 AT4601023 AT4601026 AT4603845 AT4601030 AT4601020 AT4601023 AT4601026 AT4603845 AT4601030 AT4601020 AT4601023 AT4601026 AT4603845 AT4601030 AT4601020 AT4601023 AT4601026 AT4603845 AT4601030 AT460120 AT4601023 AT4601026 AT4603845 AT4601030 AT460120 AT4601023 AT4601026 AT4603845 AT4601030 AT460120 AT4601023 AT4601026 AT4603845 AT4601030 AT46018620 AT16085270 AT46018620 AT1608520 AT46018620 AT16058270 AT46018620 AT160606
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-2233091.5 Chr2-24887208.5 Chr2-1233091.5 Chr3-4387778 Chr1-19432928.5 Chr3-13911246.5 Chr3-80515 Chr3-80515 Chr3-912465.7 Chr3-192105.5 Chr3-912467.5 Chr3-192105.5 Chr3-192105.5 Chr3-1025713 Chr2-18790412 Chr2-18790412 Chr2-18790412 Chr3-113805 Chr4-148974 Chr3-131339 Chr1-12605279 Chr4-10255749.5 Chr3-15520180 Chr3-812490.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,832806 109,215776 205,61188 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,593942 130,74876 10	1,7503383 2,19206059 1,63843027 1,84429319 1,97661193 2,07572743 1,97861193 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,98048017 8,714956349 2,2121003 1,80017867 1,40956349 2,215187857 1,62806228 1,78758211 1,6167088 1,78758211 1,69805571 1,69805571 1,69805571 1,698253074 1,8983074 1,78758211 1,998253074 1,78758211 1,78758211 1,998253074 1,998253074 1,998253074 1,998253074 1,998253074 1,998253074 1,998253074 1,998253074 1,998253074 1,9982542 1,98855212	0,3639211 0,45651167 0,46840952 0,34350993 0,34720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,41379616 0,40935322 0,44041658 0,40935322 0,4403532 0,4121923 0,3421113 0,4421113 0,4	7,54E07 7,56E07 7,86E07 7,86E07 9,92E07 9,93E07 9,93E07 1,09E06 1,09E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 1,19E06 2,27E06 2,32E06 2,34E06 2,23E06 2,24E06 2,25266 2,25666 2,25666 2,25666 2,256666 2,256666 2,256666 2,256666 2,2566666 2,2566666 2,256666666666	1,30E05 1,30E05 1,35E05 1,35E05 1,55E05 1,65E05 1,65E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 1,97E05 2,34E05 2,35E05 2,35E05 2,35E05 3,35E05 3,35E05 3,35E05 3,388E05 3,388E05 3,88E053,88E05 3,88E05 3,88E053,88E05 3,88E053,88E05 3,88E053,88	ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G46560 AT2G43340 AT2G43350 AT1G13080 ATIG13080 ATIG13080 AT4G27950 AT3G02895 AT3G0280 AT3G0280 AT3G0280 AT3G0280 AT3G0280 AT3G0280 AT1G0780 AT1G0520 AT1G05270 AT1G0500 AT1G05270 AT1G06040 AT1G06045 ATIG06050 AT3G08050 AT3G0280 AT3G08050 AT3G08	ATI-G18450 ATI-G18460 ATI-G18450 ATI-G61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G46820 AT3G61280 AT2646650 AT3G6428270 AT2646560 AT2G46550 AT2G46560 AT420974264650 AT2G43340 AT2G43350 AT2G09455 AT1G3750 ATI-G33760 AT1G33770 AT2609445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G3750 AT1G33760 AT1G33770 AT2632560 AT5G61950 AT3G12700 AT1G4295 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT4G27950 AT4G0795 AT4G07292 AT4G27950 AT4G0795 AT4G07292 AT4G27950 AT4G0795 AT3G120 AT3G02895 AT3G120 AT3G02895 AT3G120 AT3G02895 AT3G120 AT3G02895 AT3G120 AT3G02895 AT3G120 AT3G02895 AT3G120 AT4G27500 AT2G45610 AT2G45610 AT3G15220 AT4G1570 AT3G54480 AT3G55440 AT3G55450 AT2G45590 AT2G45600 AT2G45610 AT2G45620 AT2G35790 AT2G45600 AT2G45610 AT2G45620 AT2G35790 AT4G1020 AT4G1026 AT4G01024 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G07280 AT1G059270 AT1G22760 AT1G65270 AT1G02260 AT1G605270
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12239468 Chr2-1223945 Chr2-1223901.5 Chr2-42823091.5 Chr2-42823091.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-880615 Chr2-880615 Chr2-880615 Chr2-880615 Chr2-880615 Chr2-1290412 Chr2-15043612 Chr2-1490412 Chr2-145043612 Chr2-145043612 Chr2-145704512 Chr2-145704512 Chr2-145704512 Chr2-14570450 Chr2-1457045 Chr2-	164,003743 123,928263 170,36043 201,034005 170,36043 128,15622 126,709879 95,8232806 109,215776 107,511669 205,613188 87,8456145 121,374509 205,613188 87,8456145 1153,357511 613,304354 84,59452 183,365079 214,43324 183,365079 214,43324 160,520522 164,574551 110,008378 282,602217 123,727964 130,748307 140,470378 97,1381371 254,98048 208,761822	1,0533845 1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,2121003 1,80017867 1,62806228 1,47763491 1,6167088 1,78758211 1,6167088 1,985307 1,62806228 1,47763491 1,6167088 1,78758211 1,9014073 1,9825307 1,282593 1,38365212 1,9614473 1,961473 1,9614473 1,9614473 1,9614473 1,961	0,3639211 0,45651167 0,034350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,40404558 0,4004550 0,4024158 0,4004550 0,4024158 0,4024153 0,34181667 0,47242950 0,472142950 0,341841867 0,32553957 0,3275255 0,318758 0,41819582 0,41819582 0,36201076 0,3132238 0,42021779 0,3812228 0,39118758 0,41819582 0,36201076 0,3132238 0,427578508 0,30752665 0,3450486409 0,30752665	7,344-07 7,366-07 7,966-07 9,234-07 9,324-07 9,384-07 9,384-07 9,384-07 1,094-06 1,094-06 1,094-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,294-06 2,244-06 3,007-06 3,0	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,88E05 1,88E05 1,98E05 2,38E05 2,38E05 2,38E05 2,38E05 3,375E05 3,375E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 4,58E05 4,56E05 4,56E05 4,76E05 4,76E05 5,22E05 5,22E05	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG33770 AT5G48250 AT5G48270 AT2G4560 AT2G4560 AT2G43340 AT2G43350 ATIG33760 ATIG33760 ATIG13080 ATIG27950 AT4G27950 AT4G27950 AT3G02895 AT3G00330 AT3G02895 AT3G00330 AT3G02895 AT3G00330 AT3G54470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G55470 AT3G50 ATIG0780 ATIG0780 ATIG05270 ATIG05260 ATIG05270 ATIG2770 ATIG2650 ATIG050 ATIG6950	ATIG18450 ATIG18450 ATIG61870 ATIG61880 AT4633760 AT4633770 AT5661870 AT3661880 AT5648240 AT5668250 AT5648270 AT2646560 AT2646500 AT2646560 AT3612690 AT3612700 AT2609450 AT266950 AT264330 AT2643350 AT2609455 AT1633750 AT1633760 AT1633770 AT2609450 AT266950 AT264340 AT2643350 AT2609455 AT1639750 AT1633760 AT1633770 AT2609450 AT5661970 AT4607925 AT4627950 AT460795 AT4607925 AT4627950 AT4607955 AT4607925 AT4627950 AT4607955 AT3614205 AT3602895 AT3614205 AT3602830 AT3603045 AT3603045 AT3615220 AT4615120 AT360330 AT2645610 AT2645620 AT2645590 AT2645500 AT2645610 AT2645620 AT2645590 AT2645501 AT2645610 AT2645620 AT4601023 AT4601023 AT4601026 AT4603845 AT4601030 AT401202 AT4601023 AT4601026 AT4603845 AT4601030 AT401202 AT4601023 AT4601026 AT4603845 AT4601030 AT1605260 AT1605270 AT1605260 AT1605270 AT1626820 AT1664950 AT160606050 AT16060
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-24887208.5 Chr4-189778 Chr1-19432928.5 Chr4-19432928.5 Chr4-31911246.5 Chr3-213667.5 Chr4-7192105.5 Chr3-213667.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-20356713 Chr2-18790412 Chr2-18704208 Chr2-18704 Chr2-18704208	164,003743 123,928263 170,36043 201,034005 138,15622 126,708879 95,8323806 109,215776 109,511669 250,37033 121,374509 205,613188 85,7845614 153,357511 613,304354 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,593942 140,593942 140,595942 140,595942 140,	1,00343,07 1,75035845 2,12206059 1,63843027 1,84429319 1,97661193 2,075672743 1,97661193 2,07960592 1,88911264 1,98048017 1,98048017 1,98048017 1,98048017 1,62060228 1,4705491 1,61670888 1,78758211 1,60805571 1,62060228 1,78758211 1,61670888 1,78758211 1,60805571 1,4207044 1,9803027 1,990447 1,990944 1,734338 1,7327288 1,7327288 1,7327288 1,9805407 1,98144773 1,8430327 1,847037 1,8470327 1,8470327 1,8470327 1,8470327 1,8470327 1,8470327 1	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,34320125 0,41379616 0,41379616 0,41379616 0,40401638 0,4004158 0,4004158 0,40404158 0,4040163 0,4127236 0,3418167 0,3418167 0,3418167 0,342812 0,3620176 0,3138826 0,43275537 0,3138826 0,338364409 0,383644090,38364409 0,383644090,38364409 0,383644090,383644090,38364409 0,383644090,38364090,3836409 0,38364090,3836409 0,38364090,3836409 0,38364090,38364090,3836409 0,38364090,3836409 0,38364090,38364090,3836409 0,38364090,38364090,3836409 0,38364090,38564000000000000000000000000000000000000	7,54E07 7,56E07 7,86E07 9,23E07 9,23E07 9,98E07 1,09E06 1,09E06 1,19E06 1,19E06 1,19E06 1,19E06 1,15E06 1,15E06 1,55E06 1,55E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,25E06 2,24E06 3,07E06 3,08E06 3,08E06 3,24E063,24E06 3,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E0	1,30E05 1,30E05 1,35E05 1,35E05 1,57E05 1,85E05 1,85E05 1,85E05 1,85E05 1,85E05 1,85E05 1,87E05 2,44E05 2,44E05 2,44E05 2,45E05 2,45E05 2,45E05 3,75E05 3,75E05 3,375E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 3,476E05 4,76E05 4,76E05 4,76E05 5,22E05 5,22E05 5,27E05	ATIG13450 ATIG13460 ATIG33770 AT5G48250 AT5G48270 AT5G48250 AT5G48270 AT2G46560 AT2G4340 AT2G43350 ATIG3760 ATIG13080 ATIG13080 ATIG13080 AT4G27950 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G02895 AT3G0300 AT4G12000 AT4G21020 AT3G3785 AT2G3580 AT3G30165 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT3G3785 AT2G3580 AT3G30165 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G0780 AT1G0780 AT1G05200 AT1G05270 AT1G05200 AT1G05270 AT1G05200 AT1G05950 AT3G4850 AT3G4850 AT3G6850 AT3G6826 AT3G682820	ATIG18450 ATIG18450 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G48270 AT3G61880 AT5G46820 AT3G61280 AT2646560 AT3G6428270 AT2646560 AT2G46550 AT2G46560 AT42099 AT3G12700 AT2609445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G3750 AT1G33760 AT1G33770 AT2609445 AT2G09450 AT1G33770 AT2609450 AT3G61970 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1604987 AT1G20793 AT1G52190 AT4607925 AT4G27950 AT4G0795 AT2602610 AT3G1205 AT3G02895 AT3G1210 AT3G00330 AT3G03035 AT3G03045 AT3G15220 AT3G1210 AT3G02835 AT3G55440 AT3G55450 AT3G55440 AT3G55450 AT2G35708 AT4G1000 AT3G55440 AT3G55450 AT2G35708 AT4G1000 AT3G55440 AT3G55450 AT2G35708 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G70780 AT1G05197 AT4G1020 AT4G01023 AT4G1026 AT4G03845 AT4G01030 AT1G07280 AT1G05270 AT1G22760 AT1G622770 AT1G007803 AT1G064950 AT1G664950
chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12239468 Chr2-12239408 Chr2-12239408 Chr2-12239408 Chr2-12239408 Chr2-12239408 Chr2-1423091.5 Chr2-14392128.5 Chr4-19432928.5 Chr4-19432928.5 Chr2-8800515 Chr3-4723918.5 Chr3-4723910.5 Chr2-15004512 Chr2-15043612 Chr3-1179805 Chr4-146974 Chr1-1543139 Chr1-15520180 Chr1-15520180 Chr3-15520180 Chr3-15520180 Chr3-165204082 Chr3-10524080.5	164,003743 123,928263 170,36043 201,034005 170,36043 128,15622 126,709879 95,822806 107,511669 250,37033 121,374509 205,613188 87,78456146 153,357511 613,304354 88,59452 121,374509 1214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,74837 134,748307 134,748307 134,748307 134,748307 134,748307 134,748307 134,748307 134,748307 135,748833 151,488562 151,485562 151,48	1,0533845 1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,075627743 1,97661193 2,07960592 1,88911264 1,98048017 1,59449139 2,2121003 1,80017867 1,62806228 1,47763491 1,6157088 1,78758211 1,6157088 1,78758211 1,98140734 1,989304 1,734388 1,72370738 1,9825307 1,6157088 1,922533 1,922533 1,934308 1,923507 1,6157088 1,923507 1,6157088 1,923507 1,924507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,934507 1,935507 1	0,3639211 0,45651167 0,40840952 0,34350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,40401638 0,4004530 0,40404530 0,40404530 0,40421239 0,4421239 0,4421239 0,44212380 0,35523957 0,32272525 0,31275255 0,31275255 0,31275255 0,31275255 0,31275255 0,312752808 0,313723808 0,41575808 0,41575808 0,41575808 0,41575808 0,41575808 0,41575808 0,415723808 0,41575808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,415723808 0,41572336 0,41572336 0,41572336 0,41573808 0,41572336 0,41572336 0,4157336 0,41573808 0,41572336 0,41573808 0,41573808 0,41572336 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,4157380 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,41573808 0,4157380 0,41	7,344-07 7,366-07 7,966-07 9,234-07 9,334-07 9,384-07 9,384-07 1,098-06 1,098-06 1,098-06 1,098-06 1,098-06 1,098-06 1,098-06 1,098-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,218-06 1,218-06 2,218-06 2,218-06 2,248-06 2,248-06 2,248-06 2,258-06 3,078-06 3,078-06 3,088-06 3,088-06 3,088-06 3,218-07 3,218-07 3,2	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,37E05 1,37E05 1,82E05 1,82E05 1,82E05 1,82E05 1,82E05 2,38E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,38E053,38E05 3,38E05 3,38E053,38E05 3,38E05 3,38E053,38E05 3,38E05 3,38E053,38E05 3,38E053,38E05 3,38E053,38E05 3,38E053,38E05 3,38E053,38E05 3,38E053,38E05 3,38E053,38E053,38E05 3,38E053,38E053,38E0	ATIG13450 ATIG13450 ATIG33770 AT3G61880 ATIG33770 AT3G648250 AT3G48270 AT2G46360 AT2G4330 AT2G43350 AT1G33760 AT1G33760 AT1G33760 AT1G13080 AT4G27950 AT3G02855 AT3G00330 AT4G27950 AT3G02855 AT3G00330 AT3G02855 AT3G00330 AT3G0330 AT3G0330 AT3G0330 AT3G0330 AT3G0330 AT3G03355 AT3G0330 AT3G0330 AT3G035540 AT3G55450 AT3G0355 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G0780 AT1G0520 AT1G05270 AT1G0520 AT1G0520 AT1G0520 AT1G0520 AT1G0500 AT1G64950 AT3G28216 AT3G28220 AT3G53770 AT3G53770 AT3G53770 AT3G53570 AT3G53770 AT3G53570 ATIG53570 ATIG53570 ATIG53570 ATIG53570 AT1G5350 AT1G53570 AT1G55770 AT1G57770 AT1G57770 AT1G57770 AT1G57770 AT1G57770 AT1G57770 AT1G57770 AT1G577770 AT1G577770 AT1G5777770 AT1G777777777777777777777777777777777777	ATIG18450 ATIG18450 ATIG618460 AT4G33760 ATIG63820 ATIG64820 ATIG64850 ATIG66820 ATIG68220 ATIG68220 ATIG68220 ATIG68270 ATIG648240 ATIG64820 ATIG64850 ATIG63370 ATIG648240 ATIG64850 ATIG63370 ATIG20945 ATIG63760 ATIG33700 ATIG33700 ATIG20945 ATIG63760 ATIG33700 ATIG52185 ATIG6793 ATIG63770 ATIG52185 ATIG6793 ATIG63790 ATIG6987 ATIG13080 ATIG13090 ATIG52185 ATIG0793 ATIG62190 ATIG60487 ATIG13080 ATIG13090 ATIG52185 ATIG0793 ATIG62190 ATIG52185 ATIG0793 ATIG67955 ATIG52185 ATIG02895 AT3G14205 AT3G02895 AT3G14205 AT3G02895 AT3G14200 AT3G30165 ATIG61900 ATIG60200 AT3G30165 ATIG6030 ATIG09197 ATIG22700 ATIG02700 ATIG22700 ATIG0270 ATIG22700 ATIG0270 ATIG22700 ATIG02600 AT3G18080 ATIG64940 ATIG664950 ATIG664950 ATIG664940 ATIG664950 ATIG664950 AT3G55870 AT3G28210 AT3G28216 AT3G28220 AT3G30155 ATIG64940 ATIG62270 AT3G28210 AT3G28216 AT3G28220 AT3G55970
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr2-12233091.5 Chr3-20323091.5 Chr3-24887208.5 Chr4-13921246.5 Chr4-13911246.5 Chr3-14236778 Chr3-19432928.5 Chr3-19432928.5 Chr3-413911246.5 Chr3-1493267.5 Chr3-201567.13 Chr3-148790412 Chr3-12467.5 Chr3-201567.13 Chr3-149805 Chr3-446974 Chr3-11798805 Chr3-4055713 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10255749.5 Chr3-10524098.5 Chr3-10524098.5 Chr3-10524098.5	164,002743 123,928263 170,36043 201,034005 138,15622 126,708279 95,8323806 109,215776 205,613188 85,78516 107,511669 205,613188 87,785616 153,30751 103,08178 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,939645 282,602217 123,727964 130,959342 134,748307 140,470378 97,7181371 254,98048 150,728833 151,485662	1,0503945 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,98048017 1,59449139 2,2121003 1,89017867 1,40956349 2,35187857 1,40956349 2,35187857 1,409056349 2,35187857 1,62806228 1,47763491 1,62806228 1,47763491 1,62806228 1,478763491 1,6280528 1,478763491 1,6280527 1,42920748 1,734338 1,7343855212 1,9292435 1,38565212 1,9292435 1,83430237 1,650776 1,8549303	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,3435093 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,34181667 0,47429506 0,34181667 0,34181667 0,34181687 0,34181582 0,34181582 0,3553957 0,32275265 0,31339826 0,41729364 0,3613228 0,3613238 0,36135	7,34E07 7,56E07 7,86E07 7,96E07 9,23E07 9,33E07 9,38E07 1,09E06 1,09E06 1,19E06 1,19E06 1,19E06 1,19E06 1,35E06 1,35E06 1,35E06 1,35E06 1,35E06 2,24E06 2,34E06 2,23E06 2,24E06 2,24E06 2,24E06 3,07E06 2,25E06 2,24E06 3,07E063,07E06 3,07E06 3,07E063,07E06 3,07E06 3,07E063,07E06 3,07E063,07E06 3,07E063,07E06 3,07E063,07E06 3,07E063,07E06 3,07E063,07E06 3,07E063,07E06 3,07E0	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 1,38E05 2,34E05 2,35E05 2,35E05 2,35E05 2,375E05 3,375E05 3,375E05 3,38E05 3,38E05 4,36E05 4,36E05 4,36E05 5,32E05 5,37E05 5,37E05 5,38E05 5,38E05 5,38E05	A 11613450 A 11613460 A 1163370 A 15648250 A 15648270 A 15648250 A 15648270 A 17264560 A 1264560 A 11633760 A 11633760 A 11633760 A 11632760 A 11632760 A 11632760 A 11632760 A 1163276 A 11632770 A 1166450 A 116650 A	ATIG18450 ATIG18450 ATIG61870 ATIG61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G46820 AT3G61280 AT2646560 AT3G61280 AT2646560 AT3C646560 AT2646500 AT2643340 AT2643350 AT2609455 AT1G33750 ATIG33760 AT1G33770 AT2609445 AT2609450 AT2643340 AT2643350 AT2609455 AT1G3750 AT1G33760 AT1G33770 AT2609450 AT36612700 AT460987 AT1G13080 AT1G13090 AT1604987 AT1G13080 AT1G13090 AT1621285 AT1607793 AT1G52190 AT4607925 AT4627950 AT4607955 AT2602450 AT3602895 AT361420 AT4602030 AT3603035 AT3603045 AT3615220 AT361420 AT4601030 AT3603035 AT3603045 AT3601520 AT2645590 AT2645600 AT2645610 AT2645620 AT2635790 AT2635795 AT2635800 AT363105 AT4601202 AT4601023 AT4601026 AT4603845 AT4601030 AT167780 AT1605270 AT1605200 AT1605270 AT1605200 AT1605207 AT1605200 AT1664250 AT1664560
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233408 Chr2-12233408 Chr2-12233408 Chr2-12233091.5 Chr2-4887208.5 Chr3-4932091.5 Chr3-4932091.5 Chr3-4932091.5 Chr3-493208.5 Chr3-493208.5 Chr3-191246.5 Chr3-912005.5 Chr3-912005.5 Chr3-912005.5 Chr3-912005.5 Chr3-102105.5 Chr3-102105.7 Chr3-1029805 Chr3-1029805 Chr3-1025749.5 Chr3-1523180 Chr3-1523180 Chr3-1520180 Chr3-1520180 Chr3-1520180 Chr3-1520180 Chr3-162902.7 Chr3-162902.7 Chr3-162902.7 Chr3-102908.5	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,823806 109,215776 205,613188 87,8456146 153,357511 613,304354 88,594542 164,374550 164,374551 163,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,593942 130,728833 134,748307 140,470378 97,1381371 254,98048 103,761822 105,728833 151,485662 142,836708	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 1,93844591 1,63804591 1,6380459 1,47956349 2,2121003 1,80017867 1,40956349 2,21518785211 1,6157088 1,78758211 1,6157088 1,78758211 1,6157088 1,78758211 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,837450277 1,650776 1,87460341 1,36324555 1,36324555 1,363255555 1,363255555555555555555555555555555555555	0,3639211 0,45651167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,44043534 0,40043534 0,40043534 0,4412837 0,3421113 0,347429506 0,38708318 0,36201076 0,313282 0,36201076 0,3133826 0,3555229 0,39118758 0,36201076 0,3133826 0,3355229 0,38132238 0,421758808 0,43757537 0,4322739 0,38132238 0,421758808 0,43755337 0,4322739 0,38132238 0,421758808 0,43755337 0,432238 0,43755337 0,4325538 0,4375533 0,4375533 0,4325588 0,4375533 0,4375533 0,4375533 0,4375533 0,4375588 0,4375533 0,4375588 0,4375580 0,4375580 0,4375680 0,437580 0,	7,344-07 7,366-07 7,366-07 9,234-07 9,334-07 9,384-07 9,384-07 9,384-07 9,384-07 9,384-07 1,095-06 1,195-06 1,195-06 1,195-06 1,195-06 1,195-06 1,364-06 2,345-06 2,345-06 2,345-06 2,345-06 3,095-06 3,095-06 3,345-063,345-06 3,345-06 3,345-06 3,345-06 3,345-06 3,345-06 3,345-06 3,345-063,345-06 3,345-063,3	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,88E05 1,88E05 1,88E05 1,88E05 1,88E05 2,38E05 2,38E05 2,38E05 3,75E05 3,75E05 3,75E05 3,75E05 3,88E05 3,88E05 4,03E05 4,03E05 4,76E05 4,76E05 5,22E05 5,37E05 5,38E05 5,38E05 5,38E05	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G61870 ATI-GG1880 AT4G33760 ATI-GG1880 ATG-G1870 ATI-GG1880 ATS-G4820 ATI-GG4820 ATI-GG48270 ATI-G464240 ATI-G46550 ATI-G64570 ATI-G46420 ATI-G46550 ATI-G43370 ATI-G04454 ATI-G46550 ATI-G3370 ATI-G04954 ATI-G0450 ATI-G3370 ATI-G04957 ATI-G33760 ATI-G3370 ATI-G04987 ATI-G33760 ATI-G3370 ATI-G5285 ATI-G0793 ATI-G33700 ATI-G5285 ATI-G0793 ATI-G3390 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G5285 ATI-G0793 ATI-G0793 ATI-G07955 ATI-G07925 ATI-G27950 AT4-G07955 ATG-G1290 AT3-G0330 AT3-G03035 AT3-G03045 AT3-G15220 AT4-G11990 AT4-G12000 AT5-G55440 AT3-G554480 AT3-G52470 AT3-G55480 AT4-G12900 AT4-G12000 AT3-G554470 AT3-G55480 AT3-G554470 AT3-G55480 AT3-G554470 AT3-G55480 AT4-G12900 AT4-G12000 AT4-G12900 AT4-G12000 AT4-G12900 AT4-G12000 AT4-G12900 AT4-G12000 AT3-G554470 AT3-G55480 AT3-G554470 AT3-G55480 AT3-G52790 AT3-G1205790 AT4-G01020 AT4-G18202 <tr< td=""></tr<>
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr3-4035593.5 Chr3-403593.5 Chr3-1223091.5 Chr3-24887208.5 Chr4-1493778 Chr1-19432928.5 Chr4-13911246.5 Chr3-413911246.5 Chr3-413911246.5 Chr3-41391246.5 Chr3-41391246.5 Chr3-41391246.5 Chr3-201567.13 Chr3-192105.5 Chr3-201567.13 Chr3-192057.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-10257.9 Chr3-10257.9 Chr3-102527.5 Chr3-102408.5 Chr3-102408.5 Chr3-10324098.5 Ch	164,002743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 205,613188 85,75511 103,051457 205,613188 87,8456146 133,04354 84,94542 183,365079 214,433242 160,520522 144,33242 164,574551 110,308378 150,939045 282,602217 123,727964 130,593942 134,748307 140,470378 97,1881371 254,98048 151,485662 142,88768 291,987224 154,485662	1,053343 2,15206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,89811264 1,93048017 1,59449139 2,2121003 1,89017867 1,40956349 2,35187857 1,6280628 1,47763491 1,6280628 1,47763491 1,6280628 1,478758211 1,4207014 1,98253074 1,8993040 1,72370783 1,89459341 1,89459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,85459341 1,8532455	0,3639211 0,45651167 0,40840952 0,3435093 0,3435093 0,3435093 0,3435093 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41232973 0,34181667 0,47422506 0,47212973 0,34181667 0,47242950 0,472129308 0,34181582 0,4121952 0,35523957 0,32527525 0,31918758 0,41819582 0,4187587 0,325127525 0,31918758 0,4187582 0,4187582 0,4187582 0,34352455 0,4187582 0,34352455 0,4187582 0,3452455 0,4187582 0,3452455 0,4187582 0,3452455 0,4187582 0,3452455 0,4187582 0,3452455 0,4187582 0,3452455 0,4187582	7,344-07 7,356-07 7,366-07 9,234-07 9,334-07 9,334-07 9,384-07 9,384-07 1,094-06 1,1094-06 1,1074-06 1,1074-06 1,1074-06 1,1094-06 1,107	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 2,34E05 2,34E05 2,34E05 2,34E05 3,375E05 3,375E05 3,375E05 3,38E05 3,38E05 4,35E05 4,36E05 4,37E05 5,22E05 5,22E05 5,37E05 5,38E05	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G18450 ATI-G61880 AT4G33760 AT4G33770 ATS-G61820 AT3-G61880 ATS-G48240 ATS-G64250 AT3-G648270 AT2-G46560 AT2-G46550 AT2-G46560 AT3-G12970 AT2-G69450 AT2-G43340 AT2-G43350 AT2-G09455 AT1-G32750 AT1-G33760 AT1-G33770 AT2-G69460 AT3-G61970 AT1-G528560 AT4-G0925 AT4-G7950 AT1-G3770 AT1-G5285 AT1-G13080 AT1-G13090 AT1-G5285 AT1-G07793 AT1-G52190 AT4-G07925 AT4-G7950 AT4-G07955 AT2-G02450 AT3-G62895 AT3-G12205 AT3-G02895 AT3-G12205 AT4-G02895 AT3-G1205 AT4-G02895 AT3-G1205 AT3-G02800 AT3-G1205 AT3-G02800
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233961 Chr2-223091.5 Chr2-24807208.5 Chr2-24807208.5 Chr3-4189778 Chr1-19432928.5 Chr3-418911246.5 Chr3-418911246.5 Chr3-8180515 Chr3-612367.5 Chr3-1219805 Chr3-1219805 Chr3-1219805 Chr3-1219805 Chr3-1219805 Chr3-1219805 Chr3-1313805 Chr3-1313805 Chr3-1313805 Chr3-1425278 Chr3-1313805 Chr3-1425278 Chr3-1313805 Chr3-1425278 Chr3-1313805 Chr3-1425278 Chr3-1521805 Chr3-142527 Chr3-1521805 Chr3-142527 Chr3-163132 Chr3-163132 Chr3-163132 Chr3-163132 Chr3-163132 Chr3-163128 Chr3-163227 Chr3-1632808.5 Chr3-14124707.5 Chr3-16412472.5 Chr3-16412472.5 Chr3-1641247.5 Chr3-16	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,823806 109,215776 205,613188 84,594542 103,511669 205,613188 84,594542 163,304354 84,594542 164,33454 84,594542 164,354551 110,308378 850,930645 282,002217 140,437459 110,308378 297,1381371 254,98048 103,728833 151,485662 142,836708 291,98724 166,340707 140,470378 97,1381371 254,98048 105,728833 151,485662 142,836708 291,98724 166,340707	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,93844591 1,93844591 1,6387085 1,40956349 2,2121003 1,80017867 1,40956349 2,2121003 1,65670888 1,78758211 1,47763491 1,65170888 1,78758211 1,4716349 1,9825307 1,9825307 1,9825307 1,9825307 1,83460537 1,87430237 1,8540537 1,87430237 1,8540534 1,3624659 1,87430237 1,8540534 1,3624659 1,87430237 1,8540534 1,3624659 1,87430237 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,8540534 1,3624659 1,362465	0,3639211 0,45551167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,44041658 0,40043504 0,41239273 0,34181667 0,34704350 0,3575265 0,32275265 0,32275265 0,32275265 0,31339826 0,31339826 0,41375337 0,4221779 0,38132238 0,42758808 0,30752665 0,43604886 0,36763741 0,4226394 0,364763741 0,4226394 0,36476555	7,34E07 7,36E07 7,36E07 9,23E07 9,23E07 9,33E07 9,38E07 1,09E06 1,09E06 1,17E06 1,19E06 1,17E06 1,17E06 1,17E06 1,35E06 1,35E06 2,34E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 2,24E06 3,07E06 3,07E06 3,07E06 3,07E06 3,08E06 3,24E06 3,24E06 3,24E06 3,24E06 3,08E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E06 3,24E063,24E063,24E0	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,85E05 1,88E05 1,88E05 2,34E05 2,34E05 2,34E05 2,34E05 3,75E05 3,75E05 3,35E05 3,35E05 3,35E05 3,35E05 4,03E05 4,03E05 4,03E05 4,03E05 4,76E05 5,22E05 5,37E05 5,38E0	A I I I I I I I I I I I I I I I I I I I	ATIG18450 ATIG18460 ATIG61870 ATIG61880 AT4633760 ATIG61880 AT5661870 ATIG661880 AT56461870 ATIG661880 AT54661870 ATIG661870 AT54661870 ATIG661870 AT2646640 AT264650 AT264650 AT3612890 AT3612700 AT2609445 AT2609450 AT264330 AT2643350 AT2609455 AT1633750 ATIG33760 AT1633770 AT2609450 AT5661970 AT2652850 AT36122860 AT36122060 AT5661970 AT1604987 AT1633080 AT1613090 AT162925 AT4627950 AT4607955 AT26226010 AT3614205 AT3602895 AT36140174 AT4612000 AT4617920 AT3602930 AT3603035 AT3G03045 AT3615220 AT4617920 AT36028450 AT363405 AT4601020 AT4612020 AT2645500 AT2645600 AT2645620 AT2645500 AT166350 AT4601020 AT4601023 AT4601026 AT4601030 AT1607280 AT1669270 AT1602706 AT1622770 AT3628210 AT364850 AT1664950<
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233468 Chr2-12233468 Chr2-1223301.5 Chr2-24887208.5 Chr2-4887208.5 Chr3-432928.5 Chr3-432928.5 Chr3-432928.5 Chr3-4723918.5 Chr3-4723918.5 Chr3-8123667.5 Chr3-82215827.5 Chr3-20556713 Chr2-28105.5 Chr3-20556713 Chr2-1890612 Chr2-1890612 Chr3-1079805 Chr1-15131339 Chr1-8060832 Chr1-1513139 Chr1-8060832 Chr1-1513139 Chr1-8060832 Chr1-1513139 Chr1-1513139 Chr1-1520180 Chr1-1542227.5 Chr3-672816 Chr3-167280.5 Chr3-672815 Chr3-672815 Chr3-672816 Chr3-167207.5 Chr3-6727089 Chr3-8072089 Chr3-8072.5 Chr3-2072.5 Chr3-	164,003743 123,928263 170,36043 201,034005 170,36043 128,15622 126,709879 95,822806 109,215776 107,511669 205,613188 87,8456146 121,374509 205,613188 87,8456146 121,374509 216,4537551 161,304354 84,594542 183,365079 214,43324 160,520522 164,574551 10,08378 282,602217 123,727964 130,93942 134,748307 140,470378 97,181371 254,98048 274,98054 214,48307 134,748307 140,470378 97,181371 254,98048 21,34856768 21,34856768 21,34856768 21,34856768 21,3485768 21,3485768 21,3485768 21,3485768 21,348577877878 21,3485778778778777777877777777777777777777	1,0533845 1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,2121003 1,93844591 2,2121003 1,49049037 1,62806228 1,47763491 1,62806228 1,47763491 1,62806228 1,47763491 1,6280628 1,47763491 1,6167088 1,78758211 1,6167088 1,78758211 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98258074 1,98469341 1,8324455 1,8324455 1,8324455 1,9831451 1,982145 1,9832455 1,8324455 1,983145 1,98	0,3639211 0,45651167 0,034350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,4123293 0,34181667 0,47242950 0,4213293 0,34181667 0,47242950 0,3418167 0,3255329 0,32512950 0,33552397 0,325275265 0,3131238 0,42021779 0,38132238 0,42021779 0,38132238 0,42021779 0,38132238 0,42021779 0,38132238 0,427578808 0,30752655 0,412758808 0,412729336 0,412729336 0,4120237 0,4120236 0,4120236 0,4120237 0,410046 0,41004	7,344-07 7,356-07 7,366-07 9,234-07 9,324-07 9,324-07 9,384-07 1,094-06 1,094-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,294-06 1,294-06 2,244-06 3,244-06 3,2	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 2,38E05 2,31E05 2,31E05 2,31E05 2,31E05 2,31E05 3,35E05 3,375E05 3,38E05 3,38E05 3,38E05 4,35E05 4,35E05 5,22E05 5,32E05 5,38E	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 AT4G33770 ATSG61870 ATI-G61820 ATI-G61820 ATI-G46450 ATI-G64820 ATI-G648270 ATI-G46450 ATI-G64820 ATI-G648270 ATI-G46450 ATI-G64820 ATI-G648340 ATI-G643350 ATI-G09455 ATI-G34750 ATI-G33760 ATI-G33700 ATI-G09450 ATI-G61970 ATI-G528560 ATI-G528560 ATI-G528570 ATI-G5285400
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-2233091.5 Chr2-24807208.5 Chr2-24807208.5 Chr3-4189778 Chr1-19432928.5 Chr3-13911246.5 Chr3-41931246.5 Chr3-13911246.5 Chr3-13911246.5 Chr3-13911246.5 Chr3-13911246.5 Chr3-102567.5 Chr3-201567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102567.1 Chr3-102580.2 Chr3-102580.2 Chr3-102580.2 Chr3-102580.2 Chr3-102580.2 Chr3-10268.2 Chr3-10268.2 Chr3-10268.5 Chr3-10268.5 Chr3-10268.5 Chr3-10268.5 Chr3-10268.5 Chr3-1027.5 Chr3-1	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,832806 109,215776 205,61188 87,8456145 103,511669 205,61188 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,39342 136,761822 100,572883 151,485662 142,7827964 105,728833 151,485662 142,882662 144,882662 144,88567 145,8875145,8875 145,88755145,88755 145,887555 145,88755555	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,98449319 2,05572743 1,93844591 2,07960592 1,8991124 1,93844591 1,93844591 1,69804017867 1,49956349 2,2121003 1,80017867 1,49956349 2,212103 1,65065571 1,62806228 1,78758211 1,61670888 1,78758211 1,61670888 1,78758211 1,650576 1,89469341 1,734338 1,9242453 1,82740738 1,82740738 1,9242453 1,82740738 1,9242453 1,3834522 1,95144773 1,850776 1,89469341 1,3632465 1,8324676 1,8346263 1,3324676 1,8346263 1,9331513 1,78711251	0,3639211 0,45651167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,41379616 0,4132937 0,34181667 0,47122937 0,347128 0,36708318 0,367211 0,3275265 0,3139826 0,35552957 0,3227526 0,3139826 0,35552957 0,41219336 0,34139245 0,41219336 0,34757537 0,41229336 0,41229336 0,3675414 0,41229336 0,3675414 0,41229336 0,3675414 0,42263944 0,30489414 0,40376555 0,43664999 0,34132565 0,4442957 0,444577 0,44429577	7,54E07 7,56E07 7,56E07 9,23E07 9,23E07 9,23E07 9,23E07 9,23E07 9,23E07 1,09E06 1,09E06 1,17E06 1,19E06 1,17E06 1,17E06 1,17E06 1,25E06 1,55E06 1,55E06 1,55E06 2,27E06 2,24E06 2,24E06 2,24E06 2,25E06 2,25E06 2,25E06 2,25E06 3,07E06 3,07E06 3,07E06 3,07E06 3,07E06 3,07E06 3,07E06 3,21E06 3,07E06 3,21E06 3,25E0	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 2,34E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,35E05 3,35E05 3,35E05 3,35E05 3,35E05 3,35E05 3,35E05 5,37E0	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G18450 ATI-G61880 AT4G33760 AT4G33770 AT5G61870 AT3G61880 AT5G61870 AT3G61880 AT5C466500 AT3G61250 AT3C48650 AT2C466500 AT2C46650 AT2C463350 AT2G09455 AT1G3750 ATI-G33760 AT2G43340 AT2C43350 AT2G09455 AT12G09445 AT2G09450 AT2G43340 AT2G43350 AT2G09455 AT1G3750 ATI-G33760 AT1G33770 AT2G09445 AT2G09450 AT1G33770 AT2G09450 AT3G61970 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G04987 AT1G13080 AT1G13090 AT1G07925 AT4G27950 AT4G0795 AT2G07925 AT4G27950 AT4G0795 AT3G1205 AT3G02895 AT3G1210 AT3G00330 AT3G03035 AT3G03045 AT3G15220 AT4G1205 AT3G02895 AT3G1205 AT3G02895 AT3G1205 AT3G02895 AT3G1205 AT3G02895 AT3G1205 AT3G02895 AT3G1200 AT4G2000 AT3G55440 AT3G55450 AT2G45590 AT2G45600 AT2G45610 AT2G45620 AT2G35790 AT4G12635795 AT2G35800 AT4G01020 AT4G01023 AT4G01026 AT4G03845 AT4G01030 AT1G70780 AT1G05270 AT1G22760 AT1G22770 AT1G22760 AT1G64950 AT1G64950 AT3G12800 AT3G64950 AT1G649
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-1223305 Chr2-12239468 Chr2-1223305 Chr2-1223305 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-4887208.5 Chr2-8808015 Chr2-8808015 Chr2-8808015 Chr2-8808015 Chr2-8808015 Chr2-980805 Chr2-980805 Chr2-980805 Chr2-15043612 Chr2-15043612 Chr2-15520180 Chr2-1552075 Chr2-16412811 Chr2-156412811	164,003743 123,928263 170,36043 201,034005 170,36043 201,034005 138,15622 126,709879 95,822806 107,511669 250,37033 121,374509 205,613188 87,8456146 153,357511 613,304354 84,59452 183,356579 214,433242 164,574551 110,308378 150,930645 282,602217 123,727964 130,748307 134,748307 134,748307 134,748307 134,748307 134,748307 134,748307 134,748307 135,485662 124,836708 291,987242 146,840707 97,8282799 134,517581 274,52759 146,140707 97,8282799 134,517581 274,5175 274,5175 274,5175 274,5175 275,5175,5175 275,5175 275,5175 275,5175,5175 275,517	1,05035845 2,19206059 1,63843027 1,8449319 1,97661193 2,0552743 1,97661193 2,0552743 1,93844501 2,07960592 1,88911264 1,93844501 2,07960592 1,88911264 1,93844501 1,6380485 1,47763491 1,6167088 1,9825307 1,6167088 1,9825307 1,6167088 1,9825307 1,6167088 1,9825307 1,9825307 1,9825307 1,834522453 1,9825307 1,834522453 1,9825407 1,834522453 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,96144773 1,83456224 1,9825307 1,96144773 1,83456224 1,9825424 1,9825424 1,9825424 1,3622453 1,3622454 1,3632445 1,3632445 1,3632445 1,3632445 1,3787124 1,9787125 1,9794784	0,3639211 0,45551167 0,034350933 0,34350933 0,34350933 0,34350933 0,34350933 0,341579616 0,41379616 0,41379616 0,41379616 0,4034153 0,44041638 0,40044350 0,47212930 0,47212930 0,34181667 0,472429506 0,47212930 0,32553957 0,32275265 0,313238826 0,41819582 0,365012779 0,3261076 0,313328826 0,41375137 0,42021779 0,38132139826 0,313238826 0,41375137 0,32075265 0,313238826 0,41375380 0,3075265 0,313238826 0,41279380 0,3075265 0,313238826 0,41279380 0,3075265 0,31258808 0,41272380 0,3075265 0,435758808 0,41272386 0,41272380 0,3075265 0,435758808 0,4172336 0,41272380 0,412	7,344-07 7,366-07 7,366-07 9,234-07 9,324-07 9,334-07 9,384-07 9,384-07 1,094-06 1,094-06 1,094-06 1,094-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,194-06 1,234-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 3,094-06 3,094-06 3,094-06 3,094-06 3,244-06 3,2	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,88E05 1,98E05 2,38E05 2,38E05 2,38E05 2,375E05 3,375E05 3,375E05 3,38E05 3,38E05 4,35E05 4,76E05 4,76E05 5,22E05 5,38E05 5,3	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 ATI-G63250 ATI-G64820 ATI-G648240 ATI-G64520 ATI-G648270 ATI-G464270 ATI-G64520 ATI-G648270 ATI-G46840 ATI-G64520 ATI-G648270 ATI-G618270 ATI-G6182700 ATI-G04454 ATI-G64520 ATI-G43300 ATI-G43350 ATI-G09455 ATI-G209450 ATI-G33760 ATI-G33770 ATI-G04957 ATI-G33760 ATI-G33770 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G52185 ATI-G07793 ATI-G52190 ATI-G07925 ATI-G27950 AT4C07955 ATI-G52185 ATI-G07793 ATI-G52190 ATI-G07292 AT4C27950 AT4C07955 ATI-G11990 AT4G12000 ATI-G52480 ATI-G52480 ATI-G1290 ATI-G52480 ATI-G52470 ATI-G54480 ATI-G52470 ATI-G54500 AT2-G5510 AT2-G5520 AT2-G55470 AT3-G55480 AT3-G55470 AT3-G55480 AT3-G55470 AT4-G1320 AT4-G132820 AT4-G1320 AT4-G01023 AT4-G01026 AT4-G03845 AT4-G01030 AT1-G7280 AT1-G0197 AT4-G1320 AT4-G132820 AT4-G13845 AT4-G1320 AT4-G132820 AT4-G13845 AT3-G55420 AT1-G64950 AT1-G05200 AT1-G05204 AT1-G64950 AT1-G05200 AT1-G05270 AT1-G05200 AT1-G
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-24887208.5 Chr4-189778 Chr1-19432928.5 Chr4-19432928.5 Chr4-19432928.5 Chr4-31931246.5 Chr3-213667.5 Chr4-7192105.5 Chr3-213667.5 Chr3-21556713 Chr2-18790412 Chr2-187904 Chr	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 205,61318 84,594542 103,511669 225,37033 121,374509 205,61318 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,593942 130,593942 130,572883 154,488662 144,88662 154,7867 105,728833 154,488662 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 214,88562 215,7581	1,7503383 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,97661193 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,98048017 8,6007867 1,40956349 2,2121003 1,80017867 1,40956349 2,212103 1,80017867 1,40956349 2,35187857 1,62806228 1,78758211 1,6167088 1,78758211 1,6167088 1,78758211 1,60805571 1,62805571 1,82805761 1,92922453 1,38365212 1,95144773 1,85405741 1,95405741 1,97405741 1,97405744 1,9740574 1,9740574 1,9740574 1,97405744 1,97405744 1,9740574	0,3639211 0,45651167 0,46840952 0,34350993 0,34720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,41379616 0,4137973 0,34181667 0,34704250 0,34704250 0,3470421113 0,3421113 0,3421113 0,3421113 0,3421113 0,3421113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,347042113 0,34704213 0,347	7,344-07 7,366-07 7,366-07 9,234-07 9,334-07 9,334-07 9,384-07 9,384-07 9,384-07 1,098-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,198-06 1,238-06 1,238-06 2,248-06 3,048-06 3,2	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,57E05 1,85E05 1,85E05 1,85E05 1,85E05 1,85E05 1,85E05 1,85E05 2,44E05 2,44E05 2,45E05 2,45E05 2,45E05 2,45E05 2,45E05 2,45E05 3,75E05 5,75E0	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG33370 ATIG33370 AT5648250 AT5648270 AT264660 AT264660 ATIG33760 ATIG13080 ATIG13080 AT4627950 AT2620610 AT3602895 AT3602800 AT604004 AT3635400 AT363755 AT2635800 AT3602800 AT1605200 AT1605200 AT1605200 AT1605200 AT1605200 AT1605200 AT3602800 AT3602800 AT3602800 AT3602800 AT3602800 AT3602800 AT3602800 <td< td=""><td>ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 ATI-G61870 ATI-G63250 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G61820 ATI-G64520 ATI-G648270 ATI-G04945 ATI-G609450 ATI-G643340 ATI-G643350 ATI-G09455 ATI-G1290 ATI-G133760 ATI-G33700 ATI-G61950 ATI-G61970 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G12454 ATI-G07995 ATI-G04987 ATI-G13080 ATI-G05950 ATI-G14091 ATI-G003030 ATI-G00303 ATI-G03045 ATI-G15220 ATI-G1550 ATI-G554480 ATI-G55440 ATI-G554480 ATI-G55440 ATI-G55480 ATI-G05200 ATI-G55480 ATI-G05200 ATI-G55480 ATI-G05200 ATI-G05270 ATI-G05200 ATI-G05200 ATI-G05200 ATI-G05200 ATI-G052700 ATI-</td></td<>	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 ATI-G61870 ATI-G63250 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G64820 ATI-G64520 ATI-G648270 ATI-G61820 ATI-G64520 ATI-G648270 ATI-G04945 ATI-G609450 ATI-G643340 ATI-G643350 ATI-G09455 ATI-G1290 ATI-G133760 ATI-G33700 ATI-G61950 ATI-G61970 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G12454 ATI-G07995 ATI-G04987 ATI-G13080 ATI-G05950 ATI-G14091 ATI-G003030 ATI-G00303 ATI-G03045 ATI-G15220 ATI-G1550 ATI-G554480 ATI-G55440 ATI-G554480 ATI-G55440 ATI-G55480 ATI-G05200 ATI-G55480 ATI-G05200 ATI-G55480 ATI-G05200 ATI-G05270 ATI-G05200 ATI-G05200 ATI-G05200 ATI-G05200 ATI-G052700 ATI-
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-12233091.5 Chr2-24887208.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-4932928.5 Chr3-20556713 Chr2-18290412 Chr2-18290412 Chr2-15043612 Chr3-1079805 Chr3-1079805 Chr3-1052749.5 Chr3-1052749.5 Chr3-1052749.5 Chr3-10524098.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2015707.5 Chr3-2017088.5 Chr3-201708.5 Chr3-2017	164,003743 123,928263 170,36043 201,034005 170,36043 201,034005 138,15622 126,709879 95,822806 107,511669 205,613188 87,78456146 153,357511 613,304354 88,59452 183,365079 214,433242 183,365079 214,433242 164,574551 110,308378 150,930645 282,602217 123,727964 130,5789342 130,761822 103,761822 103,761822 103,761823 105,76183 105,761823 105,761823 105,761823 105,761823 105,761823 105,7	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,0552743 1,97661193 2,0552743 1,9844501 2,07960592 1,88911264 1,9844501 1,9844501 1,9844501 1,9844501 1,692086 1,47763451 1,6157088 1,78758211 1,47167451 1,6157088 1,78758211 1,47167451 1,6157088 1,78758211 1,47107044 1,989304 1,734738 1,922453 1,8473027 1,6507557 1,834659341 1,3624457 1,84743027 1,507765 1,849469341 1,3624457 1,84743027 1,517155 1,84743027 1,517155 1,847433 1,84743027 1,517155 1,847432 1,847442 1,847442 1,847442 1,847442 1,847442 1,847442 1,947444 1,847442 1,947444 1,847444 1,947444 1,947444 1,947444 1,947444 1,947444 1,94744 1,94	0,3639211 0,45551167 0,40840952 0,34350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,40404158 0,40043504 0,4024329 0,421123 0,4424158 0,4024329 0,38708318 0,36201076 0,3152329 0,39118758 0,41819582 0,41819582 0,41819582 0,41819582 0,41825828 0,43757387 0,422179 0,3813213 0,422578808 0,43757387 0,4325552 0,4364409 0,3676374 0,4376555 0,4364499 0,3048914 0,4037655 0,43757884 0,33757848 0,33757848	7,344-07 7,366-07 7,366-07 9,234-07 9,334-07 9,334-07 9,384-07 9,384-07 1,094-06 1,094-06 1,094-06 1,094-06 1,094-06 1,094-06 1,094-06 1,094-06 1,094-06 1,304-06 1,304-06 1,304-06 1,304-06 2,324-06 2,324-06 2,324-06 2,324-06 2,324-06 2,324-06 3,074-06 3,074-06 3,084-06 3,084-06 3,084-06 3,084-06 3,344-06 3,344-06 3,344-06 3,384-06 3,3	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,37E05 1,82E05 1,82E05 1,82E05 1,82E05 2,33E05 2,33E05 2,34E05 2,34E05 2,34E05 2,34E05 3,35E05 3,35E05 3,38E0	A I I I I I I I I I I I I I I I I I I I	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 ATI-G63250 ATI-G648270 ATS-G48240 ATI-G64520 ATI-G648270 ATI-G464240 ATI-G64520 ATI-G648270 ATI-G464240 ATI-G64520 ATI-G648270 ATI-G264650 ATI-G64520 ATI-G64340 ATI-G43350 ATI-G09455 ATI-G20445 ATI-G33760 ATI-G33770 ATI-G20445 ATI-G61370 ATI-G20450 ATI-G61370 ATI-G20450 ATI-G61370 ATI-G528560 ATI-G52850 ATI-G5280 ATI-G5280 ATI-G12900 ATI-G07980 ATI-G03030 AT3G03045 AT3G03045 AT3G15220 ATI-G52700 ATI-G5270 ATI-G12920 ATI-G1022 AT4C01023 AT4C01023 AT4C01023 AT4C01023 ATI-G07280 ATI-G64950 ATI-G64950 ATI-G64950 ATI-G64950 ATI-G605050 ATI-G06050 ATI-G06050 ATI-G05270 ATI-G528570 AT3-G28220 AT3G45280 ATI-G64950 ATI-G64950 ATI-G64950 ATI
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233091.5 Chr2-12233091.5 Chr3-24887208.5 Chr4-139778 Chr1-19432928.5 Chr4-13911246.5 Chr3-428671.5 Chr3-123667.5 Chr3-212667.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-2215827.5 Chr3-20156713 Chr2-1592018612 Chr3-11798805 Chr3-445974 Chr1-2659279 Chr4-10255749.5 Chr3-812490.5 Chr1-3612490.5 Chr1-3612490.5 Chr1-3612490.5 Chr1-3612490.5 Chr3-10524098.5 Chr3-812490.5 Chr3-812490.5 Chr3-812490.5 Chr3-812490.5 Chr3-812490.5 Chr3-807816 Chr3-807817 Chr3-807816 Chr3-807817 Chr3-807816 Chr3-807817 Chr3-807816 Chr3-807817 Chr3-807816 Chr3-807817 Chr3-80787 Chr3-80787 Chr3	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 203,613188 85,78516 107,511669 203,613188 87,8456146 153,357511 613,304354 84,594542 183,365079 214,433242 160,520522 164,574551 110,308378 150,930645 282,602217 123,727964 130,93942 130,57883 151,488562 144,848562 154,48429 178,725856 124,488562 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,888557 124,85577 124,885577 124,885577 124,885577 124,885577 124,885577 124,8855777 124,885577777 124,88557777777777777777777777777777777777	1,033434 1,7503384 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 2,07960592 1,88911264 1,93844591 2,07960592 1,88911264 1,93048017 1,59449139 2,2121003 1,89017867 1,40956349 2,35187857 1,6280628 1,47763491 1,6280628 1,478758211 1,6280628 1,478758211 1,6280628 1,478758211 1,6280628 1,478758211 1,92922453 1,38365212 1,96144733 1,892453 1,892453 1,832445 1,832445 1,832445 1,73171251 1,79711251 1,79712844 1,729184446 1,729918446 1,729918446 1,729918446 1,72918446 1,729918446 1,72918446 1,72991847 1,72991847	0,3639211 0,45651167 0,40840952 0,3435093 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41232973 0,34181667 0,47422506 0,47212973 0,34181667 0,47212973 0,3418167 0,3472950 0,3472950 0,3552397 0,325272525 0,4121952 0,39118758 0,4127537 0,32527525 0,4127537 0,32527525 0,4127537 0,32527525 0,4127537 0,3252655 0,43275375 0,4262375 0,4262375 0,4262375 0,4262555 0,4325555 0,4325555 0,44252555 0,4325555 0,4325559 0,43935548 0,39355489 0,39355489 0,44252555 0,44252555 0,44252555 0,44252555 0,44252555 0,43955489 0,39315455 0,3931549 0	7,344-07 7,366-07 7,366-07 9,234-07 9,324-07 9,334-07 9,384-07 9,384-07 1,098-06 1,098-06 1,198-06 1,198-06 1,198-06 1,398-06 1,308-06 1,308-06 1,308-06 1,308-06 2,248-06 3,388-06 3,3	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 1,38E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 3,375E05 3,385E05 3,375E05 3,3	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG33370 ATIG33370 ATIG33370 ATIG46260 ATIC46660 ATIG3370 ATIG3370 ATIG3370 ATIG3370 ATIG3370 ATIG3370 ATIG3370 ATIG3080 ATIG3080 ATIG200 ATG60805 AT3602895 AT3602895 AT3602895 AT3602895 AT3602895 AT3602895 AT3602805 AT3602805 AT3602805 AT3602805 AT3602805 AT3602800 AT3602800 AT1602700 AT160500 AT1602700 AT160500 AT160500 AT3602800 AT3602800 AT3602800 AT4602820 AT3602800 AT402820 AT402820 AT402820 AT400280 AT40280	ATI-G18450 ATI-G18450 ATI-G61870 ATI-G61880 ATI-G361870 ATI-G63250 ATI-G648270 ATI-G46450 ATI-G64520 ATI-G648270 ATI-G46450 ATI-G64520 ATI-G648270 ATI-G264560 ATI-G64520 ATI-G648340 ATI-G643350 ATI-G09455 ATI-G3750 ATI-G33760 ATI-G33770 ATI-G3750 ATI-G33760 ATI-G33770 ATI-G3750 ATI-G33760 ATI-G33770 ATI-G64950 ATI-G61970 ATI-G64987 ATI-G13080 ATI-G13090 ATI-G64987 ATI-G13080 ATI-G13090 ATI-G64987 ATI-G13080 ATI-G13090 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G0728 ATI-G27950 AT4C07955 ATI-G0728 ATI-G12080 ATI-G07955 ATI-G0728 ATI-G12080 ATI-G02955 ATI-G1208 ATI-G07950 ATI-G07955 ATG-G125 ATI-G07950 ATI-G07955 ATG-G120 ATI-G07950 ATI-G07950 ATI-G12500 ATI-G554480 ATI-G12500 ATI-G054800 ATI-G12700 ATI-G0790 ATI-G07950 ATI-G0790 ATI-G05420 ATI-G64950 ATI-G64950 ATI-G64950 <
Chr3-22906511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154056.5 Chr2-19154056.5 Chr2-12233981.5 Chr2-223091.5 Chr2-223091.5 Chr2-24807208.5 Chr3-4189728.5 Chr3-4189728.5 Chr3-4189728.5 Chr3-612306.7 Chr3-612306.7 Chr3-612306.7 Chr3-612306.7 Chr3-612306.7 Chr3-612306.7 Chr3-612306.7 Chr3-1029805 Chr3-1021207.5 Chr3-02127088 Chr3-10298125 Chr3-202175 Chr	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,823806 109,215776 205,511689 205,613188 87,3456146 153,357511 613,304354 84,594542 164,574551 110,308378 150,930645 282,602217 144,33242 160,520522 164,574551 110,308378 282,602217 140,372954 214,438240 214,438240 214,438240 214,438240 214,438240 215,485602 142,88708 291,987244 165,1485602 142,88708 291,987244 166,140707 97,08297591 313,517581 214,572989 124,880567 144,897098	1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,97661193 2,05572743 1,9844591 2,07960592 1,88911264 1,9844591 1,9844591 1,9844591 1,5944513 1,80017867 1,40956349 2,2121003 1,80017867 1,40956349 2,215187852 1,47763491 1,6157088 1,78758211 1,42107014 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,83745027 1,83745027 1,83745027 1,83745027 1,83745027 1,93191513 1,77871251 1,9791842 1,774288466 1,7291842 1,72191	0,3639211 0,45651167 0,46840952 0,34350993 0,38720125 0,41579616 0,41379616 0,41379616 0,41379616 0,41379616 0,44043534 0,40043534 0,41232973 0,341381667 0,47429506 0,34704295 0,34704295 0,34704295 0,3470429 0,3470429 0,341252 0,36201076 0,3133223 0,3227796 0,3133223 0,421799 0,38132238 0,421799 0,38132238 0,421793 0,38132238 0,421793 0,38132238 0,421758808 0,43757384 0,41729336 0,3452427 0,345242 0,345242 0,345242 0,345242 0,345252 0,345252 0,345252 0,3455528 0,43757584 0,43757584 0,43757584 0,43757585 0,4355529 0,4355529 0,4355529 0,4355529 0,4355529 0,4355529 0,4355552 0,43555555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,4355555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,43555555 0,435555555 0,43555555555555555555555555555555555555	7,344-07 7,366-07 7,366-07 9,234-07 9,334-07 9,334-07 9,384-07 9,384-07 9,384-07 1,095-06 1,095-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,197-06 1,217-06 2,217-06 2,234-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 2,244-06 3,095-06 3,095-06 3,217-06 3,2	1,30E05 1,33E05 1,35E05 1,35E05 1,35E05 1,35E05 1,82E05 1,88E05 1,88E05 1,88E05 1,88E05 2,34E05 2,34E05 2,34E05 2,34E05 2,34E05 3,75E05 5,75E0	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG361880 ATIG33770 ATG648250 AT5648270 ATG648250 AT5648270 ATIG33760 ATIG33760 ATIG13080 ATIG13080 ATIG2050 ATIG2050 ATIG2000 AT360285 AT461260 AT16023 AT4601026 AT4603845 AT4601030 AT1605260 AT1605270 AT1605260 AT1605270 AT1664950 AT3618050 AT3628216 AT3628220 AT3628216 AT362820 AT3628216 AT362820 AT362800 AT362800 AT362800 AT362800 AT3660540 AT3660540 <td>ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 ATI-G61880 ATG-G61870 ATI-G61880 ATS-G61870 ATI-G61880 ATS-G61870 ATI-G61880 ATS-G61870 ATI-G6183770 ATI-G648240 ATI-G4650 ATI-G648270 ATI-G648240 ATI-G4650 ATI-G63370 ATI-G209450 ATI-G33760 ATI-G3370 ATI-G3350 ATZ-G43350 ATZ-G09455 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G528541 G0793 ATI-G13090 ATI-G528541 G0793 ATI-G0793 ATI-G07955 ATI-G04987 ATI-G13080 ATG-G13050 ATI-G528541 G0793 ATI-G0793 ATI-G07955 AT4G1990 AT4-G12000 AT4G11990 AT4-G12000 AT4G11990 AT4-G12000 AT4G1990 AT4-G12000 AT3G544570 AT3G554480 AT3G54470 AT3G554480 AT3G5470 AT3G554480 AT3G5470 AT3G55450 AT3G5470 AT3G554480 AT3G5470 AT3G55450 AT4G11920 AT4G1023 AT4G01026 AT4G03845 AT4G01030 AT4G70102 AT4G11620 AT4G18630 AT4G11920 AT4G11622770 AT3G5280 AT1-G62870 AT3G5280 AT1-G62870 AT3G28210 AT3G28216 AT3G28220 AT3G48290 AT3G48290 AT3G62820 AT3G48290 AT3G628216 AT3G02820 <</td>	ATI-G18450 ATI-G18460 ATI-G61870 ATI-G61880 AT4G33760 ATI-G61880 ATG-G61870 ATI-G61880 ATS-G61870 ATI-G61880 ATS-G61870 ATI-G61880 ATS-G61870 ATI-G6183770 ATI-G648240 ATI-G4650 ATI-G648270 ATI-G648240 ATI-G4650 ATI-G63370 ATI-G209450 ATI-G33760 ATI-G3370 ATI-G3350 ATZ-G43350 ATZ-G09455 ATI-G04987 ATI-G13080 ATI-G13090 ATI-G528541 G0793 ATI-G13090 ATI-G528541 G0793 ATI-G0793 ATI-G07955 ATI-G04987 ATI-G13080 ATG-G13050 ATI-G528541 G0793 ATI-G0793 ATI-G07955 AT4G1990 AT4-G12000 AT4G11990 AT4-G12000 AT4G11990 AT4-G12000 AT4G1990 AT4-G12000 AT3G544570 AT3G554480 AT3G54470 AT3G554480 AT3G5470 AT3G554480 AT3G5470 AT3G55450 AT3G5470 AT3G554480 AT3G5470 AT3G55450 AT4G11920 AT4G1023 AT4G01026 AT4G03845 AT4G01030 AT4G70102 AT4G11620 AT4G18630 AT4G11920 AT4G11622770 AT3G5280 AT1-G62870 AT3G5280 AT1-G62870 AT3G28210 AT3G28216 AT3G28220 AT3G48290 AT3G48290 AT3G62820 AT3G48290 AT3G628216 AT3G02820 <
Chr3-222005511 Chr4-16195644.5 Chr5-19563948.5 Chr2-19154036.5 Chr2-19154036.5 Chr2-12233091.5 Chr3-243807523.5 Chr3-1223091.5 Chr3-24887208.5 Chr4-1498778 Chr1-19432928.5 Chr4-13911246.5 Chr3-413911246.5 Chr3-812667.5 Chr3-201567.13 Chr3-121667.5 Chr3-201567.13 Chr3-121527.5 Chr3-201567.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-102557.13 Chr3-10257.9 Chr3-10257.9 Chr3-10257.9 Chr3-10257.9 Chr3-10257.9 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-10252.0 Chr3-1025.0	164,003743 123,928263 170,36043 201,034005 138,15622 126,709879 95,8323806 109,215776 205,613188 85,75511 100,511669 205,613188 87,8456146 153,357511 613,304354 84,94542 183,365079 214,433242 160,520522 144,33242 164,574551 110,308378 150,939045 282,602217 123,727964 310,579382 130,579382 134,748307 140,470378 97,381371 254,98048 291,987224 168,440707 97,0823799 131,517581 97,0253253 134,543429 134,55259544	1,75033845 1,75033845 2,19206059 1,63843027 1,84429319 1,97661193 2,05572743 1,93844591 1,97661193 2,0572743 1,93844591 1,93844591 1,93844591 1,93844591 1,4904902 1,490492 1,490492 1,49058049 1,473763491 1,6150788 1,78758211 1,6150788 1,78758211 1,6150788 1,7837054 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,98253074 1,9835451 1,9514737 1,850756 1,89469341 1,3632445 1,9391513 1,77291842 1,72291842 1,62102361 2,72291842 1,72291842 1,62102361 2,72150847 1,61202361 2,72150847 1,61202361 2,72150847 1,61202361 2,72150847 1,61202361 2,721508647 1,7228446 1,7228446 1,7228446 1,7228446 1,722847 1,61477 1,61477 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,614778 1,721578 1,7	0,3639211 0,45651167 0,034350933 0,38720125 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,41579616 0,4123293 0,34181667 0,47242950 0,4213293 0,34181667 0,47242950 0,34184167 0,342042113 0,5129360 0,31552397 0,3252129 0,3911875 0,4129752 0,3911875 0,4129752 0,3911875 0,4129752 0,3911875 0,4129752 0,3121293 0,31275265 0,413075265 0,413075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320429 0,3075265 0,4320528 0,4102936	7,344-07 7,366-07 7,366-07 9,234-07 9,324-07 9,334-07 9,384-07 9,384-07 1,094-06 1,1094-06 1,1094-06 1,1094-06 1,1340-06 1,1340-06 1,1340-06 1,1340-06 1,1340-06 1,340-06 1,340-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 2,2344-06 3,094-06 3,094-06 3,094-06 3,214-06	1,30E05 1,30E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,35E05 1,38E05 1,38E05 1,38E05 1,38E05 2,318E05 2,318E05 2,318E05 2,318E05 3,375E05 3,375E05 3,38E05 3,38E05 3,38E05 3,38E05 3,38E05 5,32E05 5,32E05 5,38E05	ATIG13450 ATIG13450 ATIG13450 ATIG13450 ATIG33370 ATIG33370 ATIG3370 AT5648250 AT5648270 AT2646660 AT1613370 AT163370 ATIG3370 AT1613080 ATIG3080 AT161080 AT161080 AT1612080 AT1603760 AT360285 AT360285 AT360285 AT360285 AT360285 AT360285 AT3602805 AT360285 AT360200 AT365440 AT5654470 AT365450 AT2645600 AT36030165 AT4601026 AT4603845 AT4601030 AT1605260 AT1605270 AT1605260 AT1605270 AT1605260 AT1605270 AT361850 AT361850 AT3628216 AT3628210 AT3628216 AT3628210 AT362800 AT3609315 AT362800 AT3609315 AT4623280 AT3644940 AT364940 AT364940	ATI-G18450 ATI-G18450 ATI-G61870 ATI-G61880 ATI-G361870 ATI-G61880 ATI-G46820 ATI-G64820 ATI-G648270 ATI-G46840 ATI-G64820 ATI-G648270 ATI-G46840 ATI-G64820 ATI-G648270 ATI-G61820 ATI-G64820 ATI-G648340 ATI-G643350 ATI-G09455 ATI-G09455 ATI-G609450 ATI-G643340 ATI-G643350 ATI-G09455 ATI-G09455 ATI-G61970 ATI-G609450 ATI-G61970 ATI-G609450 ATI-G61970 ATI-G60987 ATI-G13080 ATI-G13090 ATI-G5285 ATI-G72950 AT4C07955 ATI-G62925 ATI-G27950 AT4C07955 ATI-G6125 ATI-G72950 AT4C07955 ATI-G6125 ATI-G72950 AT4C07955 ATG-G125 AT460002 ATG-G125 AT4601023 AT4C01023 AT4C01024 AT4C01020 AT4-G01023 AT4C01026 AT4G03845 AT4G01030 ATI-G72780 AT1-G62500 ATI-G12770 AT4G18610 AT1-G64950 AT1-G64950 AT1-G64950 AT1-G64950 AT1-G64950 AT1-G64920 AT1-G64950 AT1-G64950 AT

Col. Job. 201 Col. 201	Postion	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chi LubanNickeNickeNickeNickeChi JanuaNickeNickeNickeNickeNickeChi Jan	Chr1-26241709.5	154,696169	1,79578006	0,40807899	5,40E-06	7,76E-05	AT1G69760	AT1G69760
ChatAlant ChatAlant <t< td=""><td>Chr1-11204881</td><td>100.040988</td><td>2.22722886</td><td>0.50649439</td><td>5.48E-06</td><td>7.85E-05</td><td></td><td></td></t<>	Chr1-11204881	100.040988	2.22722886	0.50649439	5.48E-06	7.85E-05		
Control Contro <thcontrol< th=""> <thcontrol< th=""> <thco< td=""><td>Chr3-5763405 5</td><td>168 18748</td><td>1 57409927</td><td>0 35832028</td><td>5 59E-06</td><td>7 98F-05</td><td>AT3G16870</td><td>AT3G16860 AT3G03385 AT3G16870</td></thco<></thcontrol<></thcontrol<>	Chr3-5763405 5	168 18748	1 57409927	0 35832028	5 59E-06	7 98F-05	AT3G16870	AT3G16860 AT3G03385 AT3G16870
Dots Market Intelling Intelling <	Chr5 1270020 5	176 120220	1,57405527	0,35032020	5,552-00	0.055.05	AT5010870	ATS CO 4 400 ATS CO 4 400
Det Johnson Det Johnson Det Johnson Det Johnson And Link Anderson Det Johnson <	Chr5-12/9938.5	176,139329	1,58606631	0,36126014	5,66E-06	8,05E-05	A15G04490	A15G04480 A15G04490
Ope: 44.007 ID AND 1	Chr4-7589888	134,477132	1,92183721	0,4395153	6,14E-06	8,70E-05	A14G12980	AT4G12970 AT4G12980 AT4G05995
Ch. 2007.01 Solution Langest Allower	Chr2-14426272	127,8422	1,70443382	0,39191524	6,84E-06	9,65E-05	AT2G34160	AT2G34150 AT2G34160 AT2G34170
Chartone Solutione Journame Solutione Anticipae	Chr1-20976239.5	103,91568	1,81126468	0,4167417	6,92E-06	9,74E-05	AT1G56080 AT1G56085	AT1G56080 AT1G56085 AT1G56090
Gamma Source Accesse data Accesse data <	Chr3-17760894	124,987606	1,85212498	0,42657733	7,07E-06	9,90E-05	AT3G48100 AT3G07865	AT3G48090 AT3G48100 AT3G07865 AT3G48110
Control Contro Control Control <td< td=""><td>Chr4-1292644</td><td>139 988638</td><td>1 75815031</td><td>0 40708165</td><td>7 84F-06</td><td>0.00010947</td><td>AT4G02920</td><td>AT4G02920 AT4G02930</td></td<>	Chr4-1292644	139 988638	1 75815031	0 40708165	7 84F-06	0.00010947	AT4G02920	AT4G02920 AT4G02930
One SPECPS PERP 40000 SECURE SPECPS PERP 400000 PERP 4000000 PERP 4000000000000000000000000000000000000	Chr5 270291	121 022124	1,66072501	0.28728274	9 115 06	0.00011395	ATE CO10E0 ATE CO10E0	ATE CO10ED ATE CO10ED ATE CO1070
Dist J. 199 Link J. 1998 Link J. 1998 Dist J. 1998 All 1999 All 19	CIII 3-370381	121,922124	1,009/3391	0,38728374	8,110-00	0,00011285	A13001930 A13001900	A13001330 A13001300 A13001370
Display Display Display Animakan Animakan Animakan Display D	Chr1-27627870	187,484079	1,55405052	0,36231734	8,97E-06	0,00012429	AT1G73470 AT1G73480	AT1G73460 AT1G73470 AT1G73480
Display Display Display Display Display Display Display Display Status Stat	Chr1-23516796	135,043722	1,79799004	0,41931921	9,02E-06	0,00012458	AT1G63420	AT1G08613 AT1G63420
On-19-0001 Statusti Modeling Andeling	Chr1-7732541	110,420156	1,76663907	0,41464378	1,02E-05	0,00013982		AT1G21970 AT1G21980
Charsbox Status Autency Autency Status St	Chr3-17560937.5	157,002161	1,55426953	0,36480314	1,02E-05	0,00013982	AT3G47620	AT3G47620 AT3G47630
Constraint Constraint Anticast	Chr5-25629552.5	194 046123	1 48820474	0 3494097	1.03E-05	0.00014018	AT5G64030 AT5G64040 AT5G64050	AT5664030 AT5664040 AT5664050
One 19 (2004) Bit 19 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charlow 11 (2004) Charow 11 (2004) Charow 11 (2004)	Chr4 10221950 5	194,040125	1 4661444	0 24546475	1,052.05	0.00014051	AT4618800 AT4618810	AT4618700 AT4618800 AT4618810
One Internal Number of State Sta	CIII4-10321830.3	184,320211	1,4001444	0,34340473	1,100-03	0,00014931	A14018800 A14018810	A14010750 A14010000 A14010010
Ch. 16.1001 11.04000 ADD1000 11.04000 ADD1000 ADD10000 ADD10000 ADD10000 ADD10000 ADD10000 ADD100000 ADD100000 ADD100000 ADD1000000 ADD10000000 ADD1000000000 ADD100000000000000000000000000000000000	Chr4-17986348	163,326006	1,50539028	0,35520097	1,13E-05	0,00015291	AT4G38420 AT4G38430	AT4G38420 AT4G38430 AT4G38440
Ch. 1975.02 S. 44, 4040 Application Application Application Application Ch. 1975.02 S. 44, 4040 Application Application Application Application Ch. 295.02 S. 46, 4020 L. 5000 Application Application Application Ch. 295.02 L. 101400 L. 101400 L. 101400 Application Application Ch. 295.02 L. 101400 L. 101400 L. 101400 Application Application Ch. 201400 L. 101400 L. 101400 L. 101400 Application	Chr5-5363238	132,203587	1,7149018	0,40579133	1,19E-05	0,00016077	AT5G16390 AT5G16400	AT5G16380 AT5G16390 AT5G16400 AT5G16410
One-10.1111010.201200AdvancesA	Chr2-17057369.5	154,149423	1,49931422	0,3558683	1,26E-05	0,00016884	AT2G40860 AT2G40880 AT2G40890	AT2G40860 AT2G40880 AT2G40890 AT2G09205
On-LINE Display Southery Lines Display Display Display Control Lines Lines Lines Display Display <td>Chr5-21571860</td> <td>102,501701</td> <td>1,87634098</td> <td>0,44537078</td> <td>1,26E-05</td> <td>0,00016884</td> <td>AT5G53180 AT5G53190</td> <td>AT5G53180 AT5G53190</td>	Chr5-21571860	102,501701	1,87634098	0,44537078	1,26E-05	0,00016884	AT5G53180 AT5G53190	AT5G53180 AT5G53190
0.7.3600001 5.6610 0.000001	Chr2-14331382	115.948036	1.95340922	0.46369924	1.26E-05	0.00016884		AT2G33860
0x225000713 13.468591 1.249719 0.241200 1.249710 0.242000 1.249710 ATTACK 1.25020070 0x4150001 1.211200 0.2212000 1.211200 0.221200071 ATTACK 1.25020070 0x4150011 0.2112001 0.2112001 0.2112001 ATTACK 1.2502077 ATTACK 1.2502077 0x4150011 0.2112001 0.2112001 0.2112001 ATTACK 1.250207 ATTACK 1.250207 0x4150011 0.2112001 0.2112001 0.2112001 ATTACK 1.25020 ATTACK 1.25020 0x4151010 0.2112001 0.2112001 0.0112001 ATTACK 1.2500 ATTACK 1.2500 0x4151010 0.2112001 0.0112011 0.0112011 ATTACK 1.2500 ATTACK 1.2500 0x4151010 0.0112011 0.0112011 0.0112011 ATTACK 1.2500 ATTACK 1.2500 0x4151011 0.0112011 0.0112011 0.0112011 ATTACK 1.2500 ATTACK 1.2500 0x4151011 0.0112011 0.0112011 0.0112011 ATTACK 1.2500 ATTACK 1.2500 0x4151011 0.0112011 0.0112011	Chr1-24959316	156 683204	1 60962801	0 38584566	1.51E-05	0.00020157	AT1666900	AT1G66890 AT1G66900 AT1G66910
One-Show 2 12 Addies 12 Addies <th12 addies<="" th=""> <th12 addies<="" th=""> <th< td=""><td>ch 5 25255310 5</td><td>130,003204</td><td>1,00502001</td><td>0,30304300</td><td>1,510-05</td><td>0,00020137</td><td></td><td>AT1000050 AT1000500 AT1000510</td></th<></th12></th12>	ch 5 25255310 5	130,003204	1,00502001	0,30304300	1,510-05	0,00020137		AT1000050 AT1000500 AT1000510
Chi-Bisoli Ji Albai Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stabis Ji Stabis Ji Stabis Ji Stabis Chi-Bisoli Ji Stabis Ji Stab	Chr5-25065719.5	136,689563	1,54957199	0,37181171	1,54E-05	0,00020448	A15G62420 A15G09065 A15G09070	A15G62420 A15G09065 A15G09070
Christopii Latyses Latyses <thlatyses< th=""> <thlatyses< th=""> <</thlatyses<></thlatyses<>	Chr1-4996046	127,482581	1,75550303	0,42260059	1,63E-05	0,00021626	AT1G05103 AT1G05107	AT1G05097 AT1G05103 AT1G05107 AT1G14590
Chessberg Lishitati Lishitati <thlishitati< th=""> <thlishitati< th=""> <thl< td=""><td>Chr4-15291113.5</td><td>438,264048</td><td>1,1715656</td><td>0,28238694</td><td>1,67E-05</td><td>0,00022052</td><td>AT4G31550</td><td>AT4G08515 AT4G31550</td></thl<></thlishitati<></thlishitati<>	Chr4-15291113.5	438,264048	1,1715656	0,28238694	1,67E-05	0,00022052	AT4G31550	AT4G08515 AT4G31550
Ghi 2,200071,200071,20107 </td <td>Chr3-5242421</td> <td>116,911652</td> <td>1,62527812</td> <td>0,39198434</td> <td>1,69E-05</td> <td>0,00022219</td> <td></td> <td>AT3G03115 AT3G15510</td>	Chr3-5242421	116,911652	1,62527812	0,39198434	1,69E-05	0,00022219		AT3G03115 AT3G15510
One-Source 12,22020 1,751200 1,751200	Chr1-22200279	129.608379	1.58023172	0.38171629	1.74F-05	0.00022778	AT1G60190 AT1G60200	AT1G60190 AT1G60200
cms+session 148.9899 148.9897 148.9877 148.9877 148.9877 148.9877 148.9877 148.9877 148.98777 148.98777 148.98777	Chr5-2509726	122 205020	1 7510270	0.42201092	1 795-05	0.00023404	AT5G11060	AT5G11060
construction memory construction medication construction medication medic	Chr4 1405493 5	149 600 45 5	1,7515579	0.2601612	1,750-05	0.00023404	AT4C02200 AT4C04625	ATAC02200 ATAC04C2E AT4C02400
Umband Umband<	CIII 4-1495483.5	148,099456	1,51885515	0,3081613	1,85E-05	0,00024075	A14005390 A14004025	
OH-117802 447,70207 1288024 4,902204 1288029 44672204 ACC2205 01253817 100327 101327 101327 101327	Chr5-22665507	144,656555	1,66981812	0,40561726	1,92E-05	0,00024926	A15G55960	A15G55960 AT5G55970
chys.388719.4002219.8072319.807819.0760.000279ATORESS ATORESSA ATORESSAchys.388719.80886.8012714.1010.000279ATORESSAATORESSA ATORESSAchys.388719.808819.808819.808819.808819.808819.808819.808819.8088chys.388719.808919.807819.807819.807819.807819.807819.807819.807819.8078chys.388719.807819.807819.807819.807819.807819.807819.807819.807819.8078chys.388719.807819.807819.807819.807819.807819.807810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028chys.388719.807819.807819.807819.807810.802810.802810.8028<	Chr4-11786361	243,742407	1,26860284	0,30925511	2,05E-05	0,00026465	AT4G22290 AT4G22300	AT4G22290 AT4G22300 AT4G22305
Ch-JBB2007.1855280.2025080.20072520.1466500.00072520.00072520.00072520.00072520.0007253 <t< td=""><td>Chr2-2588374</td><td>149,102527</td><td>1,60397231</td><td>0,39129535</td><td>2,07E-05</td><td>0,00026719</td><td>AT2G06510 AT2G06520 AT2G06530</td><td>AT2G06510 AT2G06520 AT2G06530</td></t<>	Chr2-2588374	149,102527	1,60397231	0,39129535	2,07E-05	0,00026719	AT2G06510 AT2G06520 AT2G06530	AT2G06510 AT2G06520 AT2G06530
Dep. 7.9389/2 9.740103 1.844.898 0.81798 0.807781 And 2185 And 2185 0.17.942051 1.464.440 1.464.945 0.807984 1.407140 And 2186 And 2186 0.17.942071 1.464.940 1.4767210 And 2186 And 2186 And 2186 0.17.942071 1.518607 1.464.940 1.466.940 And 2186 And 2186 0.17.942071 1.518607 1.466.940 And 2186 And 2186 And 2186 0.17.92071 1.518727 1.486.940 1.4166.940 And 2186 And 2186 0.17.9208486 1.4197278 1.4166.940 And 2187 And 2186 0.11.818647 1.518727 1.4166.940 And 2187 And 2186 0.11.818647 1.4197278 1.4168480 And 2187 And 2187 0.11.818648 1.4197278 1.4168490 And 2187 And 2187 0.11.81864 1.4197278 1.4168490 And 2187 And 2187 0.11.81864 1.4197278 1.4168290 And 2187 And 2187	Chr3-3988706	71.8552366	2.0528084	0.50172517	2.14F-05	0.00027522	AT3G12570	AT3G12570 AT3G12580
Dom/second Status Status Status Status Dom/second Status	Chr1 7702240 5	02 7401019	1 9042059	0.4412202	2,175.05	0.00027781	AT1631030	471631030
Index Index Index Index Index Index Index Ind	CIII 1=7703349.3	33,7401018	1,8043558	0,4413293	2,175-03	0,00027781	A11021520	
Chr.13600703 16.6.4140 1.4.6.7140 1.2.82480 0.0002015 Control Chr.1360070 Chr.136007 Chr.137007 Chr.1350070 1.0.92171 0.444023 Chr.1350071 Chr.1370071 Chr.1370071071 Chr.1370071 Chr.137007111 Chr.1370071 Chr.1370071 <td>Chr2-9265912</td> <td>270,284424</td> <td>1,2487188</td> <td>0,30589864</td> <td>2,23E-05</td> <td>0,00028465</td> <td>AT2G21660 AT2G21670</td> <td>AT2G21655 AT2G21660 AT2G21670 AT2G21680</td>	Chr2-9265912	270,284424	1,2487188	0,30589864	2,23E-05	0,00028465	AT2G21660 AT2G21670	AT2G21655 AT2G21660 AT2G21670 AT2G21680
Onl. 1580/79 9, 56979 1, 404200 2, 42460 0,000018 All C2315 All C23157 Onl. 35980 1, 1024010 1, 1024010 1, 1024010 0,000019 All C2315 Onl. 379811 11, 2024010 1, 1024010 0,000019 All C2315 All C2315 Onl. 379811 1024010 1, 102400 0,000019 All C2315 All C23150 All C23150 Onl. 379812 1, 123800 1, 13390 All C23150 All C23100 All C23100 Onl. 379812 1, 13390 1, 13390 1, 13390 All C23100 All C23100 Onl. 1397812 1, 1329182 3, 132720 0, 1329182 All C23100 All C23100 Onl. 1397813 1, 1329182 1, 132918 1, 1329182 1, 13291	Chr1-7340760.5	146,441401	1,47497563	0,36178779	2,28E-05	0,00029015		AT1G21000
Onl-Boson14,54571.474081.5247815.244785.244885.244785.24488 <td>Chr1-19580793</td> <td>91,6509765</td> <td>1,80757332</td> <td>0,44443282</td> <td>2,38E-05</td> <td>0,00030158</td> <td>AT1G52565</td> <td>AT1G52565 AT1G52570</td>	Chr1-19580793	91,6509765	1,80757332	0,44443282	2,38E-05	0,00030158	AT1G52565	AT1G52565 AT1G52570
On-12-2481.5 12.46478 2.46468 0.0000990 N100770 N100780 On-12-562464 5.520071	Chr1-9959999	148.555717	1.47403084	0.36293044	2.44E-05	0.00030799		AT1G28375
0n-19-204-00 12-300711 12-300710 2-31600 0.0000274 41068840 Attos 0n-19-2068455 14-30467 15-12500 16-12500 Attos Attos <td>Chr1-2274812.5</td> <td>122 487160</td> <td>1 58569062</td> <td>0 30063870</td> <td>2.465-05</td> <td>0.00030994</td> <td>AT1607670</td> <td>AT1607670 AT1607680</td>	Chr1-2274812.5	122 487160	1 58569062	0 30063870	2.465-05	0.00030994	AT1607670	AT1607670 AT1607680
Display Type Type <	Chr1 25622646	152,000711	1 50711972	0.2041075	2,402-05	0,00030334	AT1669360	AT1669260
Drill 5/7883 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1398 176.1399	CIII 1-23022040	132,900711	1,35/118/2	0,3541073	2,335-03	0,00031754	A11008500	A11008500
Chr.2888455 148,9447 15,15519 0,2145276 0,20650 0,0003219 ATTORYADO ATTORYADO ATTORYADO Chr.112223805 15,947294 15,29729 0,214527 1,214500 ATTORYADO ATTORYA	Chr1-4577838.5	176,123394	1,47339024	0,36364361	2,54E-05	0,00031794	AT1G13360	AT1G13350 AT1G13360 AT1G05007
https://www.com/sci//	Chr1-28689456.5	148,394457	1,51265191	0,37435276	2,66E-05	0,00033219	AT1G76460 AT1G76465 AT1G76470	AT1G76460 AT1G76465 AT1G76470 AT1G76480
Ch-4.1009858 4,3991729 0.813036 2,8075 0.003466 ArG12200 ATG2220 ArG12200 ATG2220 Ch-10058765 9,703201 0.539728 0.549739 2,81750 0.003551 ArG12200 ATG2220 ArG12200 ATG2220 ATG2270 ATG22770 ATG27778 ATG2778 ATG2778 ATG2770 ATG2778 ATG2779 ATG2778 ATG2789 ATG278 ATG278 ATG289 ATG289 ATG278 ATG289	Chr1-11923980.5	159,242504	1,52639789	0,37875231	2,79E-05	0,00034647	AT1G32900	AT1G32900 AT1G32910
Ch-1195286-5 60,21139 1,289582 0,4394827 2,4810 0,0004476 ATG62200 ATTG622100 ATG62200 ATTG62200 Ch-12947845 9,760333 1,5327183 0,332101 3,2056 0,0005821 ATG62200 ATG62700 ATG72700 ATG72780 Ch-14945457 13,18952 1,5138248 0,4049731 3,7266 0,0005821 ATG62700 ATG62700 ATG7270 ATG72780 Ch-14958477 11,89594 1,5138248 0,4049731 3,7266 0,0005734 ATG62400 ATG622100 ATG622100 ATG62100 ATG62120 ATG620100 Ch-139589451 11,895948 0,596888 0,3004784 3,77660 ATG62100 ATG	Chr4-10101988	414.803813	3.30917229	0.82130366	2.80E-05	0.00034668	AT4G18270	AT4G18270 AT4G18280
0ml-102774-50 97,00372 1.6443937 0.4194393 0.4194393 0.4194393 0.4194393 0.4194393 0.4194393 0.41953932 0.119539332 0.11111 <t< td=""><td>Chr1-11605826.5</td><td>86 0321133</td><td>1 78596582</td><td>0 44334829</td><td>2 81F-05</td><td>0.00034676</td><td>AT1G32200 AT1G32210</td><td>AT1G32200 AT1G32210 AT1G32220</td></t<>	Chr1-11605826.5	86 0321133	1 78596582	0 44334829	2 81F-05	0.00034676	AT1G32200 AT1G32210	AT1G32200 AT1G32210 AT1G32220
Int 1449377 195 (98324) 131270182 0.3002451 ArtGUPTO ArtGUPTO Int 144451 211305511 131270182 0.321261 0.30034501 ArtGUPTO ArtGUPTO Int 124451 1117629421 1.702789 0.391416 3.38265 0.00034513 ArtGUPTO	Chr2 10297764 5	07 7602272	1,70550502	0,44334823	2,010-05	0,00034670	AT2C27770 AT2C27785	AT2C052260 AT1032210 AT1032220
Initiation Initiation Initiation Initiation Initiation 11255661 12270250 0.0003802 Attolession Attolession Initiation 11255661 12702780 0.9941165 328465 0.0003802 Attolession Initiation 11255661 12702780 0.9941165 328465 0.0003802 Attolession Attolessio	CIII 3=10287704.5	57,7005372	1,09437993	0,42197111	2,575-05	0,00030321	A1502/770 A15027785	A13003263 A13027730 A13027770 A13027783
Chr1:14541 211,550511 1,2291350 0.3224510 3,22465 0.00091111 ATG623005 ATG62300 ATG62358 ATG62310 Chr1:15689422 111,662462 1,510650 0.00091111 ATG62400 ATG62490 ATG62374 ATG623100 Chr1:15689423 111,6634621 3,54165 0.00091101 ATG62480 ATG62490 ATG62375 ATG62490 ATG62375 Chr1:1532005 112,630681 0.94111634 3,54165 0.0004374 ATG623100 ATG622490 ATG642370 ATG62370 Chr1:1532005 112,55561 0.948578 3,54165 0.0003582 ATG62380 ATG62370 ATG62370 ATG62370 Chr4:15737503 95,445786 0.9003582 ATG62380 ATG62370 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62380 ATG62370 ATG62380 ATG62370 ATG62380 ATG62370 ATG62370 ATG62370	Chr1-3444357	195,905324	1,33270182	0,33212016	3,00E-05	0,00036821	A11G10470	A/1G10470
Chr.4.154707.5 11,89522 1.6188528 0.4092703 3,74°03 0.00041111 AFG2735 AFG2720 AFG27970 Chr.2.1769542.5 11,69242 3,78°05 0.00041131 AFG2735 AFG2720 AFG2280 AFG2280 AFG2280 AFG22810 AFG2810 AFG2	Chr1-1745451	211,505611	1,32921353	0,33264103	3,22E-05	0,00039402	AT1G05805	AT1G05800 AT1G05805 AT1G05810
0h2-12993420 157002780 0.9841450 0.9004123 ATC642490 ATC642490 ATC642500 0h-13933651 15669400 0.586680 0.0004731 ATC62100 ATC62100 ATC632000 ATT622100 ATC62000 ATC622100 ATC62000 ATC622100 ATC62000 ATC622100 ATC620100 ATC622100 ATC620100 ATC622100 ATC620100 ATC622100 ATC620100 ATC6201000 ATC620100 ATC620100 ATC620100 ATC620100 ATC620100 ATC62	Chr4-14564707.5	131,890552	1,61385249	0,40497031	3,37E-05	0,00041111	AT4G29735	AT4G29730 AT4G29735 AT4G29740
0nd-1393901.1 15,969902 1,5499802 0,5490500 0,0004374 Artic2180 Artic22180 Artic22180 Artic22180 Artic22180 Artic22180 0nd-1397405 19,33201 1,4003938 0,350598 0,0004331 Artic2200 Artic22000 Artic23100 Artic22100 Artic2200 Artic22100 0nd-1397405 9,344788 1,597786 0,719997 4,0705 0,0004331 Artic23200 Artic2300 Artic23200 Artic22000 0nd-41207340 13,45555 1,593786 5,48105 0,0005382 Artic2320 Artic3220 Artic1220 Artic2203 Artic2263 Artic2203 0nd-4203377 13,15555 13,831564 1,375987 0,481947 4,8105 0,0005382 Artic1220 Artic2203 Artic3220 Artic2203 Artic2263 Artic2203 Artic2263 Artic2203 0nd-41907942 13,813841 1,810980 1,810980 1,8109780 0,800588 Artic220 Artic220 Artic2203 Artic2403 Artic2403 Artic2403 Artic2403 Artic2403 Artic4203 Artic44	Chr2-17695942.5	117,692462	1,57026798	0,39411456	3,38E-05	0,00041123	AT2G42490	AT2G42490 AT2G42500
Ch-1532009 12,49596 1,390094 0,4155200 ATG32006 ATG32006 ATG32070 Ch-12137400 199,33201 1,4005384 0,352588 3,5560 0,0007584 ATG02160 ATG32106 ATG32006 ATG32070 Ch-13188093.5 80,410456 1,8972786 0,47755010 ATG32707 ATG32707 Ch-4203205.7 13,155389 0,157189 4,47650 0,0005886 AtG1220 ATG32707 Ch-41032052.6 1,5111839 0,8511867 4,54669 0,0005886 AtG12200 ATG3280 ATG3280 ATG3280 Ch-41032052.6 1,51311849 1,4895146 0,3975688 4,54669 0,0005887 AtG22200 ATG2280 ATG32208 ATG32208 Ch-2120407.5 18,314588 1,4895146 0,3975688 4,54669 0,0005473 ATG3170 ATG3280 ATG3230 ATG3230 ATG3230 ATG3230 Ch-2120407.5 18,314581 1,4895514 4,8860 4 0,0005473 ATG32130 ATG3280 ATG3290 ATG3204 ATG3	Chr4-13983961.5	118.693402	1.54968681	0.39044208	3.61E-05	0.00043704	AT4G28180 AT4G08015 AT4G28190	AT4G28162 AT4G28160 AT4G28170 AT4G08005 AT4G28180 AT4G08015 AT4G28190
bit 1193330 1.060390 0.363290 3.955.00 0.0004934 AttaG0100 AttaG01200 AttaG012000 AttaG01200	Chr1 11522000	172 462086	1 25000584	0.24116542	2 755 05	0.00045212	AT1 C220E0 AT1 C220E0	AT16230E0 AT16230E0 AT1623070
International International International International International International International International International International International International International International International International International Internati	Ch-1 2107240 5	100,222201	1,0000004	0,54110542	3,755-05	0,00043513	AT1032030 AT1032000	AT1 C074 F0 AT1 C074 F0 AT1 C074 70
Chr.3 1889931.5 80.100496 LSS 37460 0.471950.0 AUGeS480 ANGGS490 ANGGS490 ANGGS490 Chr.4 2003027 131,25526 15113182 0.381186 4.34565 0.00053060 ANGG3770 ANGG3770 Chr.4 20032057 9.9482260 15131382 0.381186 4.34565 0.00053862 ANGG18200 ANGG18200 ANGG18200 Chr.4 10022657 135,43586 0.3995618 4.34565 0.00053862 ANGG18200 ANGG28200 ANGG28200 Chr.2 1007942 111,11779 1.5554948 0.3996838 4.34565 0.00056382 ANGG2800 ANGG28200	Chr1-219/340.5	199,332301	1,40639384	0,3562985	3,95E-05	0,00047584	A11G0/160	A11G0/150 A11G0/160 A11G0/170
Chr.4.755103 6,944756 1,9752503 1,952165 1,9447565 1,9447565 1,9447565 1,9432565 1,9342286 1,7375987 1,435565 0,0005362 1/4612430 AfGL4230 ArGL4240 Chr.4.1057242 11,115775 1,5554466 0,555686 5,46505 0,0005362 AfGL2250 ArGL2250 ArGL2250 ArGL2250 Chr.2.232241 13,463936 1,4850546 0,82229949 4,60665 0,0005561 AfGL2250 ArGL2250 ArGL2250 ArGL2250 ArGL2250 Chr.2.232241 13,843936 1,4850556 0,4055566 1,0005664 ATGL2130 ArGL21300 ArGL2130	Chr5-13689693.5	80,4108496	1,85977866	0,47198079	4,07E-05	0,00048814	A15G35480 A15G35490	AT5G35475 AT5G35480 AT5G35490 AT5G00525
Chr.4.203272 1,513289 1,515296 1,515526 1,715987 4,6405 0,0003682 ArdC1220 ArdC12200 ArdC12200 ArdC12200 ArdC2200 ArdC2000 ArdC2200 ArdC200 ArdC2000	Chr4-17755103	95,3445786	1,97212953	0,50311867	4,43E-05	0,00053006	AT4G37770	AT4G37770
chc+1052265.5 9,482226 1,737987 0,44395478 4,54605 0,0003362 ArdCa18890 ArdCa18890 ArdCa18890 chc+1109724 111,1379 1,5594460 0,597568 4,5605 0,0003562 ArdCa2250 ArdCa2563 ArdCa2250 ArdCa250 ArdCa50 ArdCa50 ArdCa50 ArdCa50 ArdCa50 ArdCa50 ArdCa50	Chr4-8203327	131,255526	1,51131829	0,38611367	4,54E-05	0,00053862	AT4G14230	AT4G14230 AT4G14240
Chr.4.1097942 L11,37759 L.5584969 L.936756 O.9003362 / JAG22260 ArG22260 ArG22260 ArG22630 ArG2260 ArG22635 Chr.2.2228241 L3364395 L4950156 O.8322994 A.61656 O.00036618 ArG21370 ArG21360 ArG21370 ArG21380 Chr.2.420407.5 L331563 L3186732 A.81656 O.00056618 ArG21370 ArG21370 ArG21370 ArG21370 Chr.3.605666 L14,0420 L51277265 L3585717 L3585717 L3585717 L3585717 L3585717 L3585717 L3585717 L3585717 L2701712 L5217265 L2701791 L5117565 O.00057823 ArG21320 ArG220940 ArG209472 ArG20945 ArG203095 Chr.5135757.7 L10551656 L42200175 L4200455 L4200475 L4420 Ar5614420 Ar56144420 Ar5614440 Ar5614420 Ar5614440Ar5614410Ar5614420 Ar561	Chr4-10352265.5	99,4382286	1,73759877	0,44395478	4,54E-05	0,00053862	AT4G18890	AT4G18880 AT4G18890
Chr32232241 153,46393 1,495934 0,38229949 4,60F30 0,0005437 ATEG03956 ATEG0400 Chr2914007,5 138,316648 1,4812989 0,37980535 4,81F-05 0,0005648 ATGC1370 ATGC1360 ATGC1370 ATGC1380 Chr3655666 114,304203 1,5175615 0,4136739 4,84F-05 0,0005648 ATGC1370 ATGC1380 ATGC1300 ATGC14200 Chr3655666 114,304203 1,5372475 0,4136739 4,84F-05 0,0005648 ATGG1370 ATGG1380 ATGG1300 ATGG1370 Chr3655667 115,77245 0,4357148 5,03F05 0,00058563 ATGG0404 ATGG0494 ATGG0494 ATGG0495 ATGG0495 Chr3655042.5 110,55166 1,5595258 0,4270179 5,11E05 0,0005964 ATGG120042 ATGG0494 ATGG0494 ATGG0495 ATGG0495 Chr3635042.5 110,55166 1,5595278 1,5421017 S,21E05 0,00059614 ATGG1200 ATGG1200 ATGG0205 ATGG0494 Chr3635042.5 115,55160 1,6582774 5,21E05 0,0005615 ATGG1200 ATGG1200 ATGG0205 ATGG0493 ATGG049	Chr4-11907942	111 137759	1 55594496	0 39756368	4 54F-05	0.00053862	AT4G22620 AT4G22630	AT4G22620 AT4G22630 AT4G22635
Lind Statust Lind Statust Process	Chr2-22228241	153 463936	1,0505146	0 38720040	4,542.05	0.00054372	AT3660400	AT3609365 AT3660400
Chr2+20007.3 Displayure Displayure <thdisplayure< th=""> <thdisplayure< th=""> Display</thdisplayure<></thdisplayure<>	Chr2 0140407 5	120 212670	1 40120000	0.30223549	4,000-05	0.00054572	AT2C21270	AT3C31260 AT3C31270 AT3C31280
Lm1-492847 Lip1.14927 Lip3.156515 Lip1.14927 Lip3.156515 Lip1.14927 Lip3.156515 Lip1.14926 Ch5-4600661 135,727451 Lip3.94851 Lip3.94861 Lip3.95763 Lip3.94650 ATGC14200 ATGC14400 ATGC14400 ATGC14400 Ch5-4600663 135,727451 Lip3.94851 Lip3.95763 Lip3.957763 Lip3.957763 Lip3.957765 Lip3.957763 Lip3.95765 Lip3.95764 Lip3.95765 Lip3.957763 Lip3.95765 Lip3.95765 Lip3.95766 Lip3.95766 Lip3.95766 Lip3.95766 Lip3.95766 Lip3.95766 Lip3.95766 Lip3.957665 Lip3.957665 Lip3.957665 Lip3.95766<	CIII 2-9140407.5	138,313648	1,48129889	0,37980535	4,81E-05	0,00056618	A1202137U	A12021500 A12021570 A12021580
Chr3 6855666 114,30428 1,4277282 0,4136279 4,8465 0,0005648 ATSG15720 ATSG15740 ATSG15720 ATSG15740 Chr5 460063 135,7727 1,539463 0,3951712 ATSG1520 ATSG12420 ATSG12420 ATSG12420 ATSG12420 ATSG12420 ATSG124045 Chr5 4157327,75 105,51464 1,699703 1,659700 ATSG14200 ATSG14420 ATSG14220 ATSG0495 ATZG30950 Chr5 4553042.5 110,51169 1,6593265 0,4270179 5,1169 0,0005964 ATSG14200 ATSG1420 ATSG14420 ATSG14430 Chr3 4121445.5 145,14708 1,421917 0,712475 5,21650 0,0005964 ATSG14200 ATGG0503 ATGG0515 Chr1 1397864 1,539716 0,329777 5,5450 0,0005718 ATGG14200 ATGG0420 ATGG0503 Chr1 24821 17,54133 1,3341381 0,3459879 5,5450 0,0006745 ATGG0500 ATGG05510 ATGG0500 ATGG05510 Chr2 3472440 15,83875 0,3542824 5,81805 0,0006774 ATGG1920 ATGG0980 ATGG05980 ATGG05980 ATGG05990 Chr2 34726425 115,83875 0,3542803 6,21650 0,0006778 ATGG1920 ATGG09800 ATGG05980 ATGG05980 ATGG05990 <tr< td=""><td>Chr1-4928637</td><td>105,114937</td><td>1,63156515</td><td>0,41845742</td><td>4,83E-05</td><td>0,00056648</td><td>AT1G14400 AT1G14410</td><td>AT1G14390 AT1G14400 AT1G14410 AT1G14420</td></tr<>	Chr1-4928637	105,114937	1,63156515	0,41845742	4,83E-05	0,00056648	AT1G14400 AT1G14410	AT1G14390 AT1G14400 AT1G14410 AT1G14420
Chr.S. 400963 13,5727.43 1,5394.851 0,39517121 4,896.05 0,00057132 XT564250 AT564250 ATS614260 Chr.S. 4057327.5 10,53168 1,6930572 0,4220182 5,094.05 0,00058803 AT6630940 ATG630942 ATG630945 ATG630945 ATG630950 Chr.S. 4057327.5 10,53166 1,69312572 0,4220182 5,094.05 0,00058904 ATG630942 ATG630940 ATG630940 ATG630943 ATG630940 ATG630940 ATG630943 ATG630940 ATG630945 ATG630950 Chr.S. 4053042.5 110,55168 1,64232773 5,12450 0,00059604 ATG152020 ATG602605 ATG630490 ATG660263 ATG6020453 Chr.J. 333786 9,49764683 1,6977616 0,3287787 5,54450 0,0006513 ATG621000 ATG60260 ATG6026510 Chr.J. 337864 125,4313 1,3341891 0,345787 5,54560 0,0006513 ATG60260 ATG60510 ATG601400 ATG601270 ATG601403 ATG61720 ATG601403 Chr.J. 2482051 15,157391 1,553097 0,403658 5,96465 0,00067763 ATG601570 ATG601403 ATG6170 ATG601607 ATG601600 Chr.J. 2482051 15,15131 1,381481 0,541600 Chr.J. 4569370 ATG659370 ATG659370 ATG659370 ATG659380 ATG659380 ATG659380 ATG659380 ATG659380 ATG604930 Chr.J. 2458052	Chr3-6855666	114,304203	1,61277826	0,41368739	4,84E-05	0,00056648	AT3G19720 AT3G19740	AT3G19720 AT3G19740
Chr2:13172144 81,999038 1,88895705 0,4857168 5,03563 ATGG0940 ATGG0942 ATGG0950 ATGG0940 ATGG0942 ATGG0950 Chr5:4553027.5 100,51568 1,6932568 0,42709179 5,1165 0,00058964 ATGG40940 ATGG0942 ATGG0950 ATGG45800 Chr3:45327.5 110,51568 1,4218127 0,3712477 5,1165 0,0005966 ATGG10205 ATGG1290 ATGG2650 ATGG02505 Chr3:43786 49,476468 1,6797456 0,42397473 5,24560 0,0006015 ATGG1000 ATGG6500 ATGG06510 Chr1:1738764 13,239139 1,4749805 0,3257452 5,34565 0,0006515 ATGG0430 ATGG0420 ATGG026510 Chr3:201574.5 115,47539 1,553077 0,3355682 5,6665 0,0006764 ATGG0940 ATGG1070 ATGG0170 ATGG0170 ATGG0170 ATGG01720 ATIGG1720 ATIGG0520 ATIGG4220 ATGG4220 ATIGG4220	Chr5-4600963	135,727451	1,5394851	0,39517121	4,89E-05	0,00057132	AT5G14250 AT5G14260	AT5G14250 AT5G14260
Chr51857327.5 105,934348 1,64045372 0,42209128 5,09E-05 0,00059994 AT5G45800 AT5G45800 AT5G45800 Chr5-4653042.5 110,55169 1,6593268 0,42709179 5,11E-05 0,00059064 AT5G1430 AT5G14420 AT5G14440 Chr3-41214195 145,147085 1,42170 3712427 5,21E-05 0,00059064 ATGG12920 AT3G02650 ATGG12200 AT3G02650 Chr1-3739766 9,4976683 1,67976160 0,3229773 5,52E-05 0,00065151 ATGG1200 ATGG0500 AT3G04510 Chr1-197864 132,391593 1,35837216 0,3325452 5,88E-05 0,0006518 ATGG0423 AT1G0430 ATGG0500 AT3G06510 Chr2-205975 115,4735976 1,35837216 0,3325452 5,88E-05 0,00069764 ATGG01700 ATGG5100 AT3G04501 Chr2-205975 115,4735976 1,35837216 0,3525452 5,88E-05 0,00069764 ATGG1700 ATGG500 AT3G04510 Chr2-205975 115,473591 1,5163280 6,17E-05 0,00069764 ATGG40404370470 ATGG470070 Chr2-31780445 13,5837230	Chr2-13172144	81,9990938	1,88895705	0,4857168	5,03E-05	0,00058563	AT2G30942 AT2G30945	AT2G30940 AT2G30942 AT2G30945 AT2G30950
Internation	Chr5-18575327 5	105,934349	1.64045372	0.42209128	5.09F-05	0.00058994	AT5G45800	AT5G45790 AT5G45800
Instruct	Chr5-4653042 5	110 551660	1 65922650	0 427001 70	5 11E.05	0.00059064	AT5G14430	AT5614420 AT5614430 AT5614440
Instructures Hastanos Hastanos Hastanos Hastanos Hastanos Chr1239760 94,774062 1,4742162 9,147407 5,14705 1,474308 Chr1239764 132,39153 1,4784980 0,8247787 5,52460 0,0000613 H TIG21000 ATIG0425 ATIG0483 ATIG0426 ATIG0835 ATIG04430 Chr268271 157,7857 1,33341831 0,3457897 5,38160 0,0006513 ATIG0403 ATIG01715 ATIG04043 ATIG01720 ATIG017	Chr2 4124140 5	145 147005	1 44210127	0.27124275	5,110-05	0.00050004	AT2C12020 AT2C02605	AT2C12020 AT2C02605 AT2C02615
Unr1-3937bb 94,776465 1,67976160 0,42297473 5,24505 0,0000015 ATICO ATICOSEI3 ATICO100 Chr1-1197864 123,393726 13,3431891 0,34579879 5,54505 0,0000515 ATICO4425 ATICO8435 ATICO4425 ATICO4425 ATICO4425 ATICO4425 ATICO4425 ATICO4425 ATICO4425 ATICO4425 ATICO4430 Chr1-26291 15,78576 1,35837216 0,3525452 5,38505 0,0000755 ATICO4425 ATICO4403 ATICO1720 ATICO1725 ATICO4403 ATICO1725 ATICO4403 ATICO1720 ATICO1725 ATICO4403 ATICO1720 ATICO1720 ATICO1720 ATICO443 ATICO1720 ATICO4431 ATICO4431 ATICO1720 ATICO4431 ATICO1720 ATICO4431 ATICO1720 ATICO4431 ATICO1720 ATICO4431 ATICO1720 ATICO4431 ATICO4431 ATICO1720 ATICO4431	CIII 3-4124149.5	145,147085	1,44218127	0,3/124275	5,12E-05	0,00059064	A15012920 A15002005	A15012520 A15002005 A15002015
Chr.1.197864 132,391591 1,4784980 0,3247787 5,64-05 0,0006518 ATIG04423 ATIG0833 ATIG0430 ATIG04425 ATIG0833 ATIG0430 Chr3-2015774.5 15,73557 1,3343189 0,3457987 5,76-05 0,0006518 ATIG0420 ATIG0823 ATIG0430 ATIG01710 ATIG01715 ATIG04403 ATIG01720 ATIG01725 ATIG04047 ATIG01730 Chr3-263597.5 115,47537 1,553097 0,03558 5,86-05 0,0006576 ATIG01715 ATIG04043 ATIG01720 ATIG01725 ATIG04047 ATIG01730 Chr3-247804.5 155,9752 1,5131536 0,435498 6,515-05 0,0006978 ATIG0170 ATIG01750 ATIG0570 ATIG057	cnr1-7339786	94,9764683	1,67976166	0,43297473	5,23E-05	0,0006015	A11G21000	A11605613 A11621000
Chr3e15774.5 175,41351 1,33431891 0,3479879 5,706.05 0,0006515 AT3006500 AT3606510 AT3006500 AT3606510 Chr1-268291 15,78597 1,5387716 0,352452 5,886-05 0,0006764 AT1601715 AT1604043 AT1601720 AT1601725 AT1604043 AT1601720 Chr3-21599.5 115,477391 1,558077 0,403568 5,966-05 0,0006763 AT3604700 AT36047430 Chr3-2472840.5 105,99529 1,589228 0,4138425 6,156-05 0,0006978 AT3604730 AT3604500 AT36095380 AT3659380 AT365938	Chr1-1197864	132,391593	1,47849805	0,38247787	5,54E-05	0,00063518	AT1G04425 AT1G04430	AT1G04425 AT1G08835 AT1G04430
Chr1-268291 15,7,85976 1,35837216 0,3525452 5,83.600 0,00066464 ATIG01715 ATIG04043 ATIG01720 ATIG01710 ATIG01715 ATIG04043 ATIG01720 ATIG01725 ATIG04047 ATIG01730 Chr5-251599.5 115,473391 1,5530977 0,4036568 5,96405 0,00066745 ATIG01700 ATIG01710 ATIG01715 ATIG04043 ATIG01720 ATIG01720 ATIG01725 ATIG04047 ATIG01730 Chr5-37352254 118,81318 1,7564001 0,4749072 6,11405 0,00069704 ATIG63700 ATIG69370 ATIG59380 ATIG659380 ATIG659385 ATIG659390 Chr5-3473604.5 123,58025 1,51312538 0,3942880 6,21105 0,0006970 ATIG60570 ATIG06580 ATIG0650ATIG04483 ATIG06570 ATIG06590 Chr1-201675.5 125,00488 1,495483 0,3176002 6,31405 0,0007132 ATIG04500 ATIG04200 ATIG04200 ATIG04200 ATIG06590 ATIG06590 Chr2-17991393 144,5007 1,7308736 0,4176003 6,618605 0,0007132 ATIG042200 ATIG04200 ATIG04200 ATIG04220 ATIG04200 ATIG04220 ATIG04220 ATIG04220 ATIG04200	Chr3-2015774.5	175,413513	1,33431891	0,34579879	5,70E-05	0,0006515	AT3G06500 AT3G06510	AT3G06500 AT3G06510
Chr5-251599.5 115,475391 1,5530977 0,4036568 5,96E-05 0,0006776 ATSG01670 ATSG01660 ATSG01670 ATSG01680 Chr5-2592525 115,81381 1,7560010 0,47540743 AT3G01650 ATSG01670 ATSG01680 AT3G047430 Chr5-2395254 115,81381 1,7560010 0,4754072 G,17E05 0,0006970 ATSG01950 ATSG9380 ATSG59380 ATSG59385 ATSG59380 Chr5-2395254 113,813 1,7560010 0,4754072 G,17E05 0,0006970 ATSG01950 ATSG01860 ATSG10960 ATSG01670 ATSG01680 Chr1-2013675.5 125,104689 1,4952433 0,38964037 6,21E05 0,0000978 ATSG01950 ATIG0580 ATIG00450 ATIG0480 Chr2-17591393 144,5407 1,7308748 0,4518005 6,31E05 0,0001372 ATG20450 ATG20400 ATG20450 ATG20460 Chr2-17591393 144,5407 1,7308748 0,451805 6,564E05 0,0001374 ATG20450 ATG20400 ATG20450 ATG20460 Chr2-1912715.5 142,902245 1,4685610 0,38814615 7,14E05 0,00082924 ATG20470 ATG206070	Chr1-268291	157,785976	1,35837216	0,3525452	5,83E-05	0,00066464	AT1G01715 AT1G04043 AT1G01720	AT1G01710 AT1G01715 AT1G04043 AT1G01720 AT1G01725 AT1G04047 AT1G01730
Chr3-17478840.5 105.996229 1,5892226 0,4134245 Chr3-17478840.5 Chr3-1747840 Chr3-1747840.7 Chr3-1747840 Chr3-1747846 Chr3-174784780 Chr3-174784780 Chr3-1747	Chr5-251599.5	115,475391	1.5530977	0.4036568	5,96F-05	0.00067765	AT5G01670	AT5G01660 AT5G01670 AT5G01680
Ans. Jack Strate Jobstract Jobstrat Jobstract Jobstract	Chr3-17/78840 F	105 006 220	1 58022260	0.41394365	6 155 05	0.00060637		AT3G47430
III0,12310 I, /594000 /474907/2 0, /17403 0, /17403 Al5G53370A15G53380 Al5G53380 Al5G53380 Al5G53390 Chr5-347360A 123,58052 1,531310 0, /1940740 /1505370 Al15G93380 Al5G53380 Al5G533930 Chr5-347360A 123,58052 1,531315 0,3494280 6,211605 0,00007592 Al15G55370 Al15G95380 Al15G59390 Chr1-2013675.5 125,10468 1,4552370 Al15G95385 0,31760062 6,211605 0,00007592 Al16G5500 Al11G04483 Al1G06570 Al1G06580 Al1G06590 Chr1-2013675.5 125,10468 1,21765593 0,31760062 6,316-05 0,00007592 Al16G5200 Al15G24200 Al1G09490 Al15G42210 Al1G0450 Chr2-3284051 98,638351 1,7651524 0,4609034 6,416-05 0,00007137 Al5G1450 Al5G10440 Al5G10450 Chr2-3284051 98,638351 1,7651524 0,4609034 6,416-05 0,00007372 Al5G04200 Al5G10440 Al5G10450 Chr2-388897 145,02825 1,380145 0,381145 7,486-05 0,0008149 Al7G23930 Al1G29390 Al1G29390 Al1G29395 Al1G29300 Al1G29395 Al1G29300 Al1G29395 Al1G29300 Al1G29395 Al1G29400 Chr1-10286667 10,3151	Char 22052251	110 1001	1.750.000	0.457400	0,130-05	0.00003037	ATE CE0370 ATE CE0380	
Chr:3-475004.5 123,5805/cb 124,5605/cb 124,5605/cb 124,5605/cb 121,5555/cb	cnr5-23952254	118,18318	1,7564001	0,45749072	6,17E-05	0,00069704	A15659370 A15659380	A15659370 A15659380 A15659385 A15659390
Chr.1 125,104689 1,4952433 0,38964037 6,21-05 0,00007897 NT1006550 AT1600550 AT1600580 AT1600580 Chr.1 398,577635 1,2750584 0,3150067 6,31605 0,0000783 AT1600450 AT1600540 AT1600483 AT1600540 Chr.2 398,577635 1,27505824 0,4510005 6,31605 0,00071337 AT36042220 AT2642200 AT2609340 AT2642210 AT2642220 AT2642220 Chr.2 398,57835 1,7551524 0,6409034 6,41605 0,00071337 AT3604200 AT360440AT360450 Chr.2 398,57835 1,5505020 0,33941615 7,14605 0,0007737 AT3602020 AT36042820 AT5602835 AT5642820 AT560385 AT564282 Chr.3 142,90245 1,4683640 0,4078572 7,15605 0,0007373 AT5602200 AT5602020 AT5602200 AT5602020 AT5604203 Chr.3 1,580712 1,5801041 0,421553 7,78605 0,0008734 AT4639900 AT4603880 AT4609080 AT4630970 Chr.3 1,980712 1,5145659 0,9004734 7,7	Chr5-3473604.5	123,580526	1,51321536	0,39428803	6,21E-05	0,0006978	A15G10980	A15G10965 AT5G10980
Ort-17088544.5 398,577635 1,21765554 0,1760052 6,316/05 0,00071952 ATIG2040 ATIG2040ATIG20450ATIG20460 Chr2-17591939 144,5407 1,73087436 0,451805 6,316/05 0,00071362 ATIG20420 ATIG2040ATIG20450ATIG20460 Chr2-17591939 144,5407 1,73087436 0,451805 6,416/05 0,00071397 ATIG42210 ATIG40240ATIG40230 ATIG40240ATIG40230 Chr2-3821879.5 235,522881 1,28089602 0,33494165 5,66105 0,00071397 ATIG20420ATIG60395 ATIG42820 ATIG60395 ATIG42820 ATIG60390 ATIG2395 ATIG42820 ATIG60390 ATIG23950 ATIG429300 ATIG23950 ATIG429300 ATIG429390 ATIG23950 ATIG429300 ATIG429300 ATIG429395 ATIG429400 Chr1-10288066 101,35127 1,60005336 7,786405 0,0008345 ATIG4040ATIG46440 ATIG46440 ATIG46450 Chr2-1050547 98,078458 1,580010 0,4105835 7,786405 0,0008374 ATIG43980 ATIG43980 ATIG4399070 ATIG40840ATIG46440 ATIG46450 Chr3-1560520 109,01172	Chr1-2013675.5	125,104689	1,49524353	0,38964037	6,21E-05	0,0006978	AT1G06570 AT1G06580	AT1G06560 AT1G04483 AT1G06570 AT1G06580 AT1G06590
Chr2-17591939 144,5407 1,7307746 0,4518605 6,39E-05 0,00071362 ATC642210 ATC642220 ATC642200 ATC602300 ATC642210 ATC642220 ATC642220 ATC642230 Chr5-3280519 9,6383519 1,7551524 0,4609034 6,5E-05 0,00071397 ATSG10440 ATSG10440 ATSG10450 Chr5-328079.5 235,52288 1,23090240 0,33841451 7,14E-05 0,00077397 ATSG02020 ATSG10440 ATSG12420 ATSG02395 ATSG42820 ATSG10440 Chr5-378877 142,002245 1,46856418 0,38814615 7,14E-05 0,00079377 ATSG02020 ATSG02020 ATSG02200 ATSG02020 ATSG02	Chr1-7088544.5	398,577635	1,21765954	0,31760062	6,31E-05	0,00070592	AT1G20450	AT1G20440 AT1G20450 AT1G20460
Chr5-3284051 98,6383519 1,75515224 0,4609034 6,411-0 0,00071397 ATSC 10450 ATSC 10440 ATSC 10450 Chr5-3284051 98,6383519 1,75515224 0,4609034 6,411-05 0,00071397 ATSC 10450 ATSC 10440 ATSC 10450 ATSC 10440 ATSC 10450 Chr5-32828051 23,522828 1,22089602 0,3394165 6,56-05 0,00071397 ATSC 4020 ATSG 60295 ATSG 2020 ATSG 02025 ATSC 202070 Chr5-17120155 142,026856 1,5494300 0,40789526 7,28-05 0,0008028 ATSG 2020	Chr2-17591939	144.5407	1.73087436	0.4518605	6.39F-05	0.00071362	AT2G42210 AT2G42220	AT2G42200 AT2G09340 AT2G42210 AT2G42220 AT2G42230
Chr.2 480128715 201/0000000 0.00000000 0.00000000000000000000000000000000000	Chr5-3284051	98 6393510	1 76515224	0.46090924	6 /1E-05	0.00071307	AT5G10450	AT5G10440 AT5G10450
Chr.S. 12202016/7:.3 253,522626 1,22009702 <	Chr2 9012870 5	225 522020	1 20000002	0.22404465	6.565.65	0.000733703	473630670	410000670
International Internat International International	CIII 2-89128/9.5	235,522828	1,28089602	0,33494165	0,56E-05	0,000/2/92	A12020070	A12020070
Chr.5-88897 145,02866 1,549430 0,4789526 7,328-05 0,00080285 AT5G02020 ATSG02025 AT5G02020 ATSG02025 Chr.1-0288066 10,35127 1,6005336 0,42151534 7,31E-05 0,00080285 AT5G02020 ATSG02025 AT1629390 ATIG29395 ATIG39395 ATIG39395 ATIG39395 ATIG39395 ATIG39365 ATIG30450 Chr.2-560555 307,386185 1,596538 0,2924825 8,976-05 0,0008376 ATIG27090 ATIG79120 Chr.2-1566565 180,48707 1,27992847 0,3416151 8,976-05 0,0009336 ATIG27090 ATIG27080 ATIG27090 Chr.2-1697044 126,71428 12,71428 0,4165158 9,116-05 0,0009336 ATIG27090 ATIG27080 ATIG27090 Chr.2-800265.5 109,969759 1,4738178 0,40057555 9,516-05 0,00193315 AT5G15640 ATIG5G15640 AT5G15640 Chr.2-8009895.5 109,969759 1,49381887 0,40057555 0,	Chr5-17172015.5	142,902245	1,46856418	0,38614615	7,14E-05	0,00079057	A15G42820 AT5G06395 AT5G42825	A15G42810 AT5G42820 AT5G06395 AT5G42825
Chr.1 0288066 101,35127 1,60005336 0,4215134 7,316.05 0,008045 AT1023930 AT1623930 AT162393	Chr5-388897	145,026856	1,5494306	0,40789526	7,28E-05	0,00080285	AT5G02020 AT5G02025	AT5G02010 AT5G02020 AT5G02025
Chr2-19065547 98,0784585 1,5800101 0,4165598 7,47E-05 0,00081949 AT2G46440 AT2G46450 AT2G46440 AT2G46450 Chr4-15067010.5 100,417837 1,60301444 0,42341282 7,66E-05 0,00083764 AT4G30960 AT4G08385 AT4G30960 AT4G30970 Chr3-560362.5 109,01721 1,514650 0,00084704 T/3G16440 AT3G16490 AT3G16480 AT3G16400 AT3G16480 AT3G164	Chr1-10288066	101,351217	1,60065336	0,42151534	7,31E-05	0,0008045	AT1G29390 AT1G29395	AT1G29380 AT1G29390 AT1G29395 AT1G29400
Chr4-Is067010.5 100,417837 1,6030144 0,4234128 7,66-05 0,00083764 AT4G30960 AT4G08385 AT4G30960 AT4G30970 Chr3-5605626 109,015712 1,5146509 0,40044237 7,766-05 0,00083764 AT4G30960 AT3G16480 AT4G30970 AT3G16480 AT4G30970 Chr3-5605626 109,015712 1,5146509 0,40044237 7,766-05 0,00083764 AT4G30960 AT3G16480 AT4G30970 AT3G16480 AT3G16490 Chr2-3650626 180,487007 1,2795283 0,2924528 8,976-05 0,00093736 AT2G27080 AT2G27090 AT2G27080 AT2G27090 Chr2-365067 126,714286 1,42484747 0,38071805 9,116-05 0,00093736 AT2G27080 AT2G27090 AT4G35880 AT4G35890 Chr2-3802067 77,6704112 1,76843416 0,470125 9,58605 0,00103315 AT4G3580 AT4G35880 AT4G35890 Chr2-3802067 77,6704112 1,7684316 0,470125 9,58605 0,00103315 AT4G35800 AT4G35880 AT4G35890 Chr2-3802067 77,6704112 1,76843145 0,470125 9,58605 0,00103315 AT5G15640<	Chr2-19065547	98.0784585	1.58001091	0.41665998	7.47F-05	0.00081949	AT2G46440 AT2G46450	AT2G46440 AT2G46450
Chr3-560326 109,015712 1,5164509 ATGGD300 ATGG16490 Chr3-560326.5 307,386185 1,0955938 0,20094707 7,76503 0,00084707 ATGG16480 AT3G164890 ATGG16480 AT3G164890 Chr3-500326.5 307,386185 1,0955938 0,29245825 8,97E05 0,00094733 & ATGG16480 AT3G164890 ATGG16480 AT3G164890 Chr3-1566569 180,487007 1,27993242 0,34165115 8,97E05 0,0009733 & ATGG27090 ATGG72080 ATZG27090 Chr3-1506560 180,487007 1,27993242 0,34165115 8,97E05 0,0009733 & ATGG27090 ATGG72080 ATZG27090 Chr3-6030265 76,7041112 1,76834316 0,4741232 9,58E05 0,00103315 ATGG15800 AT4G35890 Chr3-6030265 76,7041112 1,76834316 0,4741232 9,58E05 0,00103315 ATSG15640 ATSG15640 ATSG15650 Chr3-6030265 109,969759 1,49381387 0,40057555 9,61E05 0,00103315 ATSG15640 ATSG15650 Chr3-6030267 1,2013727 0,23111664400 ATG64900 ATG6490	Chr4-15067010 5	100.417837	1.60301444	0.42341282	7.665-05	0.00083764	AT4G30960	AT4G08385 AT4G30960 AT4G30970
Chr.29756026 100,012712 1,0140301 Unounderstand 1,0140301 Unounderstand Alfschekken Alfschekken Chr.29756026.5 307,386185 1,0956039 0,2924528 8,97405 0,00097336 Alfschekken Alfschekke	Chr2 5602626	100.015712	1 5140500	0.40044227	7 705 05	0.00004707	AT2C16480 AT2C16400	AT2C16480 AT2C16400
Untracyposub.s jugy.sbaiss	CIII 3-50U3020	109,015/12	1,5146509	0,40044237	7,76E-05	0,00084707	A15010480 A15010490	A15010400 A15010490
Chr2-15565659 180,487071 1,27992824 0,34165151 8,97E05 0,0009736 AT2627080 AT2627090 AT2627080 AT2627090 Chr4-16997044 126,71428 1,42484747 0,38071805 9,11E-05 0,00098351 AT4G35890 Chr2-380205.5 76,704112 1,7683416 0,474232 9,58E+05 0,001093315 AT4G35890 Chr2-380205.5 109,969759 1,49381887 0,40057555 9,61E+05 0,00103315 AT5G15640 AT5G15640 AT5G15650 Chr2-380205.5 109,969759 1,4938187 0,40057555 9,01E+05 0,00103315 AT5G15640 AT5G15640 AT5G15650 Chr2-380205.5 159,31544 13883727 0,331116 981676.5 0,00103315 AT5G15640 AT5G15650	cnr1-29765805.5	307,386185	1,0956938	0,29245825	8,97E-05	0,00097336	A11G79120	A11G/9120
Chr4-16997044 126,714286 1,42484747 0,38071805 9,11E-05 0,00098531 AT4G35890 AT4G35880 AT4G35880 Chr2-3080206.5 76,7041112 1,76834316 0,741232 9,58E-05 0,00103315 AT4G35880 AT4G35880 AT4G35880 Chr2-3090895.5 109,969759 1,49381987 0,40057555 0,91E-05 0,00103315 AT5G15640	Chr2-11566569	180,487007	1,27992824	0,34165151	8,97E-05	0,00097336	AT2G27080 AT2G27090	AT2G27080 AT2G27090
Chr2-380206.5 76,7041112 1,76834316 0,4741232 9,58E-05 0,00103315 Chr5-30090895.5 109,969759 1,49381887 0,40057555 9,61E-05 0,00103315 AT5G15640 AT5G15640 AT5G15650 Chr2-3103026 152,332727 0,331114 9,81E-05 0,00105216 AT16G0400 AT16G0500 AT16G0400 AT16G0500	Chr4-16997044	126,714286	1,42484747	0,38071805	9,11E-05	0,00098531	AT4G35890	AT4G35880 AT4G35890
Chr5-5090895.5 109,969759 1,49381987 0,40057555 9,61E-05 0,00103315 AT5G15640 AT5G15640 AT5G15650 Chr5-2010895 152,321544 13897872 0,3231144 9,81E-05 0,0010326 AT1669400 AT1669400 AT1669400	Chr2-380206.5	76,7041112	1,76834316	0,4741232	9,58E-05	0,00103315		
Christian 1 2010 0 1000 0 0 0 1000 0 000 0 000 0 0000 0 0000 0 0000 0 0	Chr5-5090895 5	109,969759	1.49381987	0.40057555	9.61F-05	0.00103315	AT5G15640	AT5G15640 AT5G15650
	Chr1-26123095	152,321544	1.38937877	0.3731104	9,81F-05	0.0010526	AT1G69490 AT1G69500	AT1G69490 AT1G69500

	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr1-5981799	105,659512	1,5183815	0,40875808	0,00010175	0,0010884	AT1G17420 AT1G17430	AT1G17420 AT1G17430 AT1G17440
Chr4-6406579	84,6296713	1,63232659	0,44138593	0,00010857	0,00115812	AT4G10330	AT4G10320 AT4G10330 AT4G10340
Chr1-3759195	179 007654	1 36609111	0 37363907	0.000128	0.00136157	AT1611220	AT1611210 AT1611220
Chr2 19920604 5	162 56745	1,30086060	0.28085421	0.00012012	0.00127721	473650700	AT3GE0600 AT3GE0700
CIII 3-18839094.5	105,50745	1,35080005	0,38083421	0,00013013	0,00137731	A13630700	A15050050 A15050700
Chr1-9408243.5	233,100502	1,2323645	0,33746663	0,0001302	0,00137731	AI1G2/100	A11G27090 A11G27100
Chr2-15916991.5	121,143897	1,38366641	0,38214094	0,00014683	0,00154899	AT2G38025 AT2G38030 AT2G38040	AT2G38020 AT2G38025 AT2G38030 AT2G38040
Chr4-13015729.5	198,027671	1,43675224	0,39730986	0,00014948	0,0015726	AT4G25470	AT4G25450 AT4G25470 AT4G07385 AT4G25480
Chr3-22732494	180,919993	1,36879323	0,37947556	0,00015484	0,00162455	AT3G61420 AT3G61430	AT3G61420 AT3G61430
Chr2-8118317.5	178.12345	1.2437964	0.34596354	0.00016209	0.00169601	AT2G18730	AT2G18720 AT2G18721 AT2G18730
Cbr2-2524960 5	03 3006573	1 56122141	0.43527758	0.00016741	0.00174692	AT3G11280 AT3G11285 AT3G11200	AT2G11280 AT2G11285 AT2G11280
Ch-1 10275252	120 407500	1,30123141	0,43327738	0,00010741	0,001/4052	AT1 C20C70	ATSC11200 ATSC11200 ATSC11200
Chr1-103/5352	120,497508	1,36907637	0,38382028	0,00018056	0,0018/905	A11G29670	A11629600 A11629670 A11629680
Chr3-10434064.5	94,5478311	1,57790352	0,44366605	0,00018791	0,00195016	AT3G28040	AT3G28030 AT3G28040
Chr5-1518130.5	89,359259	1,52394642	0,42997681	0,00019686	0,00203762		AT5G05130 AT5G05140
Chr3-143704.5	127,425884	1,38154148	0,39006497	0,00019869	0,00205094	AT3G01370 AT3G01380	AT3G01370 AT3G01380
Chr3-2011925	150,364717	1,2830149	0,36283283	0,00020304	0,00209025	AT3G06500	AT3G06500
Chr1-5532132.5	93,9493481	1.51123635	0.42789371	0.00020637	0.00211886	AT1G16150	AT1G16150
ChrE 32670100 F	125.002087	1 27215541	0.28800720	0.00020715	0.00212122	ATECERECO	
cli 4 4000545 5	125,055087	1,57515541	0,50050755	0,00020715	0,00212122	A13636366	
Chr1-4230515.5	221,55022	1,14331832	0,32390991	0,00020798	0,00212408		A11G12420
Chr1-20763829.5	156,90407	1,2563826	0,35601525	0,00020856	0,00212428	AT1G55580	AT1G55580
Chr3-489343.5	187,842555	1,18107561	0,33497135	0,00021102	0,00214372	AT3G02380 AT3G02390 AT3G02400 AT3G02410	AT3G02370 AT3G02380 AT3G02390 AT3G02400 AT3G02410
Chr5-24478709.5	125,979346	1,33126278	0,37807452	0,00021483	0,00217662		AT5G60850
Chr1-27160466	175,850061	1,21243412	0,344708	0,000218	0,00220293	AT1G72175	AT1G72170 AT1G72175 AT1G72180
Chr2-13785035.5	124,978126	1.67774706	0.47746512	0.00022082	0.00222559	AT2G32460	AT2G32460 AT2G32470 AT2G08520
Chr1 10065527	104 206457	1 54476039	0.42091001	0.00033308	0.002222220		AT1 C 28 C 20 AT1 C 28 C 40
CIII 1=100033337	104,300437	1,34470928	0,43581001	0,00022208	0,00223239	171 073 073 171 073 000	AT1028050 AT1028040
Chr1-2//14031.5	142,648692	1,28440674	0,36620578	0,00022631	0,00225983	AI1G/368/ AI1G/3690	A11609865 A11673687 A11673690
Chr3-17182735.5	141,800535	1,3695357	0,39050364	0,00022651	0,00225983	AT3G46630 AT3G46640	AT3G46620 AT3G46630 AT3G46640 AT3G46650
Chr5-23673432	132,404194	1,43623515	0,40956189	0,0002268	0,00225983	AT5G58560 AT5G58570 AT5G08840 AT5G58575	AT5G58560 AT5G58570 AT5G08840 AT5G58575
Chr3-2757171	85,01878	1,60216318	0,45693355	0,00022716	0,00225983	AT3G09030 AT3G09032	AT3G09020 AT3G09030 AT3G09032 AT3G09035
Chr1-27048282.5	101,405217	1,62937391	0,46494622	0,00022879	0,00227015		
Chr5-18697573	128,890261	1.3953564	0.39849316	0.00023125	0.00228869	AT5G46110	AT5G46100 AT5G46110 AT5G46105
Chr2 662051575	20,70500231	1 40705 945	0.42840726	0.00023123	0.002220008	AT2C10184 AT2C10100	AT3C10180 AT3C10184 AT3C10100
CIII 3-0039515.5	69,7959072	1,49705815	0,42819726	0,00023598	0,00232945	A13013184 A13019190	A15015100 A15015184 A15019190
cnr4-1229573	216,800691	1,11493865	0,31902035	0,00023714	0,00233487	A14G02760 AT4G02770	A14G02760 A14G02770
Chr3-3621006.5	104,4508	1,85397847	0,53080114	0,000239	0,0023472	AT3G11490 AT3G02425 AT3G11500	AT3G11490 AT3G02425 AT3G11500 AT3G11505 AT3G11510
Chr4-13250086.5	126,141002	1,3859068	0,39723811	0,00024255	0,00237596	AT4G07535	AT4G26140 AT4G07535 AT4G07545 AT4G26150
Chr3-1730261.5	150,778245	1,24914572	0,35877488	0,00024912	0,00243418	AT3G01765 AT3G01775 AT3G05810	AT3G05800 AT3G01765 AT3G01775 AT3G05810 AT3G05820
Chr5-9793539 5	132 014376	1 3259824	0 3813807	0.00025372	0.00247283	AT5G27670 AT5G27680	AT5G27660 AT5G27670 AT5G27680
Chr1 0202497	126 274211	1 20119172	0 27450657	0.00035601	0.00249270	AT162704E AT16270E0	AT162704E AT16270E0 AT16270E0
Chr1-9393487	130,374211	1,30118173	0,37450657	0,00025601	0,00248879	A11G27045 A11G27050	A11G27045 A11G27050 A11G27060
Chr2-16473935.5	73,8563931	1,62195972	0,46855696	0,00026848	0,00260345	AT2G39450 AT2G39460	AT2G39445 AT2G39450 AT2G39460 AT2G39470
Chr4-12758002	100,252612	1,44638674	0,41873218	0,00027596	0,00266922	AT4G24740 AT4G24750	AT4G24740 AT4G24750
Chr5-162212	79,8572344	1,55463425	0,45028602	0,00027766	0,00267892	AT5G01390 AT5G01400	AT5G01390 AT5G01400
Chr5-690239	152,454148	1,43438125	0,41633185	0,00028523	0,00274507	AT5G02940 AT5G02950	AT5G02940 AT5G02950 AT5G02960
Chr4-15312891	103.970124	1.39213022	0.40521571	0.0002957	0.00283871	AT4G31590	AT4G31590 AT4G31600
Chr1-10225006	94 3220961	1 48487432	0.43316159	0.00030403	0.00291143	AT1651805	AT1651805 AT1651810
CIII 1=19223900	94,3220901	1,46467452	0,43310139	0,00030403	0,00291143	AT1051805	ATTO51605 ATT051610
Chr1-26331876.5	160,075667	1,26283758	0,36900834	0,00031053	0,00296625	A11G69910	A11669910 A11669920
Chr3-5119782.5	111,132762	1,41186862	0,41361045	0,00032064	0,00305527	AT3G15200	AT3G15190 AT3G03025 AT3G15200 AT3G15210
Chr5-14888449	125,350939	1,29367048	0,37930073	0,00032401	0,00307386	AT5G37490 AT5G37500	AT5G37480 AT5G37485 AT5G37490 AT5G37500
Chr3-23334375.5	122,19693	1,32410774	0,38824227	0,0003242	0,00307386	AT3G63160 AT3G63170	AT3G63150 AT3G63160 AT3G63170 AT3G63180
Chr1-27790809.5	76.6251354	1.56267219	0.458649	0.00032826	0.00310474	AT1G73910 AT1G73920	AT1G73890 AT1G73900 AT1G73910 AT1G73920
Chr2-9072650 5	90.0165943	1 51274242	0.44466688	0.00033177	0.00313022	AT3G24860 AT3G04825	AT3G24840 AT3G24850 AT3G24860 AT3G04825 AT3G24870 AT3G04835
Ch-4 171150C0 5	100 0013	1,51574245	0,44400000	0,00033177	0,00313022	ATAC24800 ATAC26170	ATAC2C1C0 ATAC2C120
Chr4-1/115069.5	109,8012	1,62035195	0,47615189	0,00033323	0,00313631	A14G36160 A14G36170	A14G36160 A14G36170
Chr5-5172942	99,2209241	1,46819469	0,43171681	0,00033591	0,00314652	AT5G15840 AT5G15843 AT5G15845	AT5G15833 AT5G15840 AT5G15843 AT5G15845
	63 13070//	1,83838441	0,54057555	0,00033596	0,00314652	AT1G09813 AT1G78470	AT1G78460 AT1G09813 AT1G78470 AT1G78476
Chr1-29521104	05,1557544		0.38767481	0,00034058	0,00318207	AT4G33465 AT4G33467 AT4G33470	AT4G33460 AT4G33465 AT4G33467 AT4G33470
Chr1-29521104 Chr4-16102359	116,66394	1,31695117				AT1C76100 AT1C76110	111035400111055405111055401111055410
Chr1-29521104 Chr4-16102359 Chr1-28554395.5	116,66394 413,218668	1,31695117 0,957335	0,28201362	0,00034359	0,00320242	A110/0100 A110/0110	AT1G76090 AT1G76100 AT1G76110
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5	116,66394 413,218668 105,335235	1,31695117 0,957335 1.46230708	0,28201362	0,00034359	0,00320242	A11370100 A11370110	AT1G76090 AT1G76100 AT1G76110 AT1G7090 AT1G70300
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-2826505	116,66394 413,218668 105,335235 83 1075378	1,31695117 0,957335 1,46230708	0,28201362	0,00034359 0,00034697 0,00035366	0,00320242 0,00322603 0.00328031	AT2622070 AT2622080	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-9386505 Chr2-13802057	116,66394 413,218668 105,335235 83,1075378	1,31695117 0,957335 1,46230708 1,4915242	0,28201362 0,43110907 0,44040282	0,00034359 0,00034697 0,00035366	0,00320242 0,00322603 0,00328031	AT2G22070 AT2G22080	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG70290 ATIG70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5	116,66394 413,218668 105,335235 83,1075378 104,200498	1,31695117 0,957335 1,46230708 1,4915242 1,41240353	0,28201362 0,43110907 0,44040282 0,41763052	0,00034359 0,00034697 0,00035366 0,00035987	0,00320242 0,00322603 0,00328031 0,00332991	ATG/0100 ATG/0110 AT2G22070 AT2G22080	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G70300 AT1G22070 AT1G70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G30220
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-3296373	116,66394 413,218668 105,335235 83,1075378 104,200498 113,50629	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297	ATG70100 ATG70110 AT2G22070 AT2G22080 AT1G10090 AT1G10095	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG770300 AT2G220070 AT2G22080 AT2G22090 AT2G22088 AT2G30220 ATIG10090 AT1G10095
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-3296373 Chr1-28170933	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00363823	AT2622070 AT2622080 AT1610090 AT1610095 AT1675010 AT1675020	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G70300 AT1G22070 AT1G70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G302020 AT1G10090 AT1G10095 AT1G51010 AT1G75020
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-3296373 Chr1-28170933 Chr5-2665679.5	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00363823 0,00368533	AT2G22070 AT2G22080 AT1G10090 AT1G10095 AT1G75020 AT5G08280 AT5G01545 AT5G08290	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G30220 ATIG10090 ATIG10095 ATIG75010 ATIG75020 ATIG508270 AT5G08280 AT5G01545 AT5G08290 AT5G08300
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr1-26476352.5 Chr2-29386505 Chr2-12893957.5 Chr1-3296373 Chr1-28170933 Chr5-2665679.5 Chr1-1705128	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209 0,00040212	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00368533 0,00368533	ATG/0100/ATG/02000 ATG/02000 ATG/00095 ATG/02010 ATG/0200 ATG/02820 ATSG01545 ATSG08290 ATG/05680	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G7300 AT1G22070 AT1G7300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G3020 AT1G20200 AT1G10090 AT1G10095 AT1G75010 AT1G75020 AT1G08270 AT5G08280 AT5G01545 AT5G08290 AT5G08300 AT1G09567 AT1G05580 AT1G05590
Chr1-29521104 Chr4-16102359 Chr1-28554395.5 Chr2-9386505 Chr2-1893957.5 Chr1-28170933 Chr1-28170933 Chr1-28170933 Chr1-1705128 Chr4-16167091	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209 0,00040212 0,00040716	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00368533 0,00368533 0,00372263	ATG0100 ATG02010 ATG222070 AT2G22080 ATIG10090 ATG10095 ATIG75010 ATG75020 ATG08280 ATG01545 AT5G08290 ATG085680 ATG03560 ATG033660	ATIG5090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG222070 AT2G22080 AT2G22090 AT2G22088 AT2G30220 ATIG10090 ATIG10905 ATIG5100 ATIG5020 AT5G08270 AT5G08280 AT5G0545 AT5G08290 AT5G08300 ATIG05575 ATIG03560 ATIG05690 ATIG03567 ATIG03560 ATIG05690
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-2854395.5 Chr2-283957.5 Chr2-283957.5 Chr2-283957.5 Chr2-28373 Chr2-28170933 Chr2-26579.5 Chr2-1705128 Chr2-16167091 Chr2-2647272	03,133734 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251081	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209 0,00040212 0,000401148	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,0036823 0,00368533 0,00368533 0,00372263	ATG/0010/ATG/0010 ATG/0000 ATG/0005 ATG/0010 ATG/0005 ATG/0010 ATG/0005 ATG/0010 ATG/001545 ATG/001000 ATG/00100 ATG/0000 ATG/	ATIG5699 ATIG576100 ATIG576110 ATIG70290 ATIG70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G30220 AT1G10090 ATIG10095 ATIG5010 ATIG50280 AT3G01545 AT5G08290 AT5G08300 AT1G05675 AT1G05680 ATIG05690 ATIG03560 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01320
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-3296373 Chr1-28170933 Chr1-28170933 Chr1-2656679.5 Chr4-16167091 Chr4-7647091 Chr4-76472370	03,135754 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 122,50455	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,33546006 1,37982991	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040219 0,00040212 0,00040716 0,00041148	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00368533 0,00368533 0,00368533 0,00372263 0,00375318	ATG/0010/ATG/0010 ATG/022070 ATG/0205 ATIG/0000 ATIG/0095 ATIG/0200 ATG/0220 ATG/02280 ATG/0145 ATG/0200 ATG/0280 ATG/0145 ATG/0200 ATG/0260 ATG/0200 ATG/02	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG22070 ATIG70300 ATIG202070 ATIG202080 ATG202090 AT2G22088 AT2G30220 ATIG10990 ATIG10995 ATIG75010 ATIG75020 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG05680 ATIG33660 ATIG05690 ATIG05680 ATIG33660 ATIG05690 ATIG05680 ATIG05680 ATIG05690
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-2926373 Chr1-28170933 Chr1-28170933 Chr5-2665679.5 Chr4-1705128 Chr4-16167091 Chr4-744233 Chr4-7475220	03,133734 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209 0,00040212 0,00040216 0,00041148 0,00041429	0,00320242 0,00322603 0,00328031 0,00361297 0,00363823 0,00368533 0,00368533 0,00375218 0,00375918	ATG/0010/ATG/0010 ATG/0000 ATG/0095 ATG/0000 ATG/0095 ATG/0020 ATG/0005 ATG/00200 ATG/0000 ATG/00200 ATG/00200 ATG/00100 ATG/0000 A	ATIG5609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 ATIG30220 ATIG10090 ATIG10095 ATIG75010 ATIG75020 ATIG75010 ATIG75020 ATIG05675 ATIG05680 ATIG05690 ATIG33650 ATIG03680 ATIG05690 ATIG33650 ATIG0360 ATIG33666 ATIG08815 ATIG33670 ATIG08825 ATIG01720 AT5G14680 AT5G14690 AT5G14680 AT5G14690
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-32870933 Chr3-265679.5 Chr1-1705128 Chr4-16167091 Chr4-744233 Chr5-473220 Chr5-473220 Chr5-47426705.5	116,66394 413,218668 105,335235 83,1075378 104,200498 103,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,3328443	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,40190437 0,44850235 0,44850235 0,44876696 0,41251091 0,38756631 0,39886702	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040212 0,00040212 0,00040716 0,00041148 0,00041652	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00368533 0,00368533 0,00372263 0,00375318 0,0037598 0,00378119	ATG/0100/ATG/0110 ATG/02000 ATG/0095 ATG/02010 ATG/0095 ATG/02820 ATSG00200 ATSG08280 ATSG01545 ATSG08290 ATG/05680 ATG/0560 ATG/0500 ATG/01720 ATSG14690 ATSG14690 ATSG13710	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG20200 ATIG70300 ATIG202008 ATIG202080 AT2G22090 AT2G22088 AT2G30220 ATIG10090 ATIG10095 ATIG75010 ATIG75020 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG03675 ATIG05680 ATIG3566 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G14690 AT5G13710 AT5G13720 AT5G13730
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr2-9386505 Chr2-9386505 Chr2-12893957.5 Chr2-12893957.5 Chr2-128170933 Chr2-26579.5 Chr2-1705128 Chr4-16167091 Chr4-744233 Chr5-4735220 Chr5-4426705.5 Chr2-16709586	03,133734 116,66394 413,218668 105,335235 83,1073378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,328443 1,58491252	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631 0,38756631 0,3886702 0,47509028	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00040209 0,00040212 0,00040716 0,00041148 0,00041429 0,00041652 0,00042493	0,00320242 0,00322603 0,00328031 0,00362297 0,00368233 0,00368533 0,00368533 0,00372263 0,00375318 0,0037698 0,00378119 0,00384842	ATG/0100 ATG/0100 ATG/0200 ATG/0095 ATG/5010 ATG/50095 ATG/5010 ATG/501545 AT5G08290 ATG/05860 ATG/03650 ATG/03660 ATG/03650 ATG/03660 ATG/0120 AT5G14200 ATG/014000	ATIG5609 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 ATIG3020 ATIG3009 ATIG70905 ATIG5001 ATIG75020 ATIG500 ATIG75020 ATIG50575 ATIG5580 ATIG55690 ATIG05575 ATIG05680 ATIG5690 ATIG33660 AT4G33666 AT4G3866 AT4G38670 AT4G08825 AT4G01720 AT5G14700 AT5G13710 AT5G13720 AT5G13730 ATIG44000
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr1-2879933 Chr5-265679.5 Chr1-2870933 Chr5-265679.5 Chr1-16167091 Chr4-16167091 Chr4-744232 Chr5-4735220 Chr5-4735220 Chr1-16709686 Chr1-899570	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 347,347972	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,3328443 1,58491252 0,97068109	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631 0,39886702 0,47509028 0,29125741	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00039509 0,00040209 0,00040212 0,00040716 0,00041429 0,00041652 0,00042493 0,00043	0,00320242 0,00322603 0,00328031 0,00361297 0,00368233 0,00368533 0,00376318 0,00375318 0,00375318 0,00378119 0,00378119	ATG00100 ATG00100 ATG022070 ATG2022080 ATG05010 ATG0095 ATG05010 ATG75020 ATG05680 ATG05680 ATG05680 ATG01560 ATG01720 ATSG14690 ATSG14690 ATSG1490 ATG614000 ATG01600	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G76100 AT1G76110 AT1G70290 AT1G70300 AT1G20270 AT1G202080 AT2G22090 AT2G22088 AT2G30220 AT1G0309 AT1G10905 AT1G5010 AT1G75020 AT1G50270 AT5G08280 AT5G01545 AT5G08290 AT5G08300 AT1G05275 AT1G0580 AT1G05690 AT4G33650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G13690 AT5G14580 AT5G14690 AT5G14580 AT5G13720 AT5G13730 AT1G44000 AT1G03590 AT1G03600 AT1G03610
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-9386505 Chr2-9393957.5 Chr1-32870933 Chr5-2665679.5 Chr1-28170933 Chr5-2665679.5 Chr4-16167091 Chr4-744233 Chr5-4735220 Chr5-4745705.5 Chr1-16709686 Chr1-899570 Chr1-899570	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 97,3943074 132,591262 146,544133 76,582418 347,347972 100,354362	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,328443 1,58491252 0,97068109 1,40777659	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631 0,39886702 0,47590028 0,29125741 0,42328457	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00040209 0,00040212 0,00040216 0,00041148 0,00041429 0,00041652 0,00042493 0,00042493	0,00320242 0,00322603 0,00328031 0,00332991 0,00361297 0,00368533 0,00368533 0,00375318 0,00375318 0,0037698 0,00378119 0,00384842 0,00384842 0,00386516	ATG/0100 ATG/0100 ATG/0200 ATG/0095 ATG/0200 ATG/0095 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/0200 ATG/027330	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG70290 ATIG70300 ATIG202070 ATG22080 ATG202090 ATG202088 ATIG30200 ATIG0900 ATIG70905 ATIG75010 ATIG70200 ATIG75010 ATIG70200 ATIG60575 ATIG05680 ATIG05690 ATIG60575 ATIG05680 ATIG05690 ATIG60575 ATIG05680 ATIG05690 ATIG61720 ATIG31720 ATIG61370 ATIG614680 AT5G14690 ATIG07300 ATIG03600 ATIG03610 ATIG03590 ATIG03600 ATIG03610 ATIG07200 ATIG2730 ATIG27340
Chr1:29521104 Chr4:16102359 Chr1:28554395.5 Chr1:26476352.5 Chr2:288505 Chr2:2893957.5 Chr1:2870933 Chr3:2870933 Chr3:2656579.5 Chr1:2705128 Chr4:16167091 Chr4:74232 Chr4:16167091 Chr5:4735220 Chr3:4426705.5 Chr1:46709686 Chr1:899570 Chr3:492825 Chr3:40942825	116,66394 413,218668 105,335235 83,1075378 104,200498 113,506229 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 347,347972 100,354362 121,257133	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,3228443 1,58491252 0,97068109 1,40777659 1,28149933	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631 0,39886702 0,47509028 0,29125741 0,42328457 0,38533992	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00040202 0,00040212 0,00040716 0,00041148 0,00041429 0,00041652 0,00042493 0,00044076	0,00320242 0,00322603 0,00328031 0,00361297 0,0036323 0,00368533 0,00375263 0,00375318 0,00375318 0,0037698 0,0037698 0,00385119 0,0038442 0,00388516 0,00396671	ATG/0100/ATG/0100 ATG/02000 ATG/00095 ATG/02000 ATG/00095 ATG/02000 ATG/00095 ATG/02000 ATG/0145 ATG/02000 ATG/01200 ATG/0100 ATG/01000 ATG/01000 ATG/01000 ATG/01000	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G76100 AT1G76110 AT1G70290 AT1G70300 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G3020 AT1G70200 AT1G20200 AT2G2088 AT4G30220 AT1G0200 AT1G0000 AT1G5010 AT1G75020 AT4G33650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G31720 AT4G33650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14680 AT5G13720 AT5G13730 AT1G44000 AT1G3590 AT1G03600 AT1G03610 AT1G03590 AT1G03600 AT1G27340 AT3G05605
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-28476352.5 Chr2-3286505 Chr2-3286505 Chr1-28170933 Chr5-2665679.5 Chr1-1705128 Chr4-16167091 Chr4-16167091 Chr4-7473220 Chr5-4746705.5 Chr1-18709686 Chr1-899570 Chr1-8949840.5 Chr3-949843.5	00,137,344 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,334307 146,544133 76,5824183 37,344307 100,354362 112,257133 106,147848 116,6147848	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34692318 1,50307899 1,43546006 1,37982991 1,2956612 1,33788433 1,5849125 0,97068109 1,4077659 1,2814933 1,38186724	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42876696 0,41251091 0,38756631 0,38856702 0,47509028 0,29125741 0,42328457 0,38533992 0,41571042	0,00034359 0,00034697 0,00035366 0,00035987 0,0003914 0,00040219 0,00040212 0,00040212 0,0004148 0,00041429 0,00041429 0,00041452 0,0004352	0,00320242 0,00322603 0,0033291 0,00361297 0,00361297 0,00368533 0,00368533 0,00372563 0,0037518 0,0037518 0,0037619 0,00384842 0,00384516 0,00396671 0,00396671	ATG/0100/ATG/0100 ATG/02000 ATG/0095 ATG/0100 ATG/0095 ATG/05010 ATG/01095 ATG/05010 ATG/01055 ATSG/08290 ATG/005800 ATG/0105600 ATG/010500 ATG/010	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG22070 ATIG70300 ATIG202070 ATIG202080 ATG202090 ATG202088 ATZG30202 ATIG0090 ATIG70905 ATIG0507 ATIG70280 ATG601545 ATG608290 AT5G08300 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG405680 ATIG05690 AT5G14710 AT5G13720 AT5G13730 ATIG44000 ATIG03590 ATIG03500 ATIG03610 ATIG27320 ATIG27330 ATIG27340 ATIG80830
Chr1:29521104 Chr4:16102359 Chr1:28554395.5 Chr1:26476352.5 Chr2:2893957.5 Chr2:2893957.5 Chr2:2893957.5 Chr2:2893937.3 Chr3:2655679.5 Chr1:29170933 Chr3:2655679.5 Chr1:2702128 Chr4:16167091 Chr3:4735220 Chr3:4735220 Chr3:47426705.5 Chr1:899570 Chr1:899570 Chr1:899570 Chr1:30276423.5 Chr3:03276423.5 Chr3:03276423.5	0,129,34 116,66394 413,218668 105,35235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 347,347972 100,354362 100,354562 100,355662 100,355662 100,355662	1,31695117 0,957335 1,46230708 1,46230708 1,4915242 1,41240353 1,42139411 1,37886039 1,34659318 1,345346006 1,37982991 1,2956612 1,3328443 1,58491252 0,97068109 1,28149933 1,38186281	0,28201362 0,43110907 0,44040282 0,44763052 0,44763052 0,44763052 0,44850235 0,44850235 0,44850235 0,44850235 0,44850235 0,4485023 0,38856702 0,38856702 0,39886702 0,4526457 0,38533992 0,4152741 0,462167	0,00034359 0,00035469 0,00035469 0,0003546 0,0003914 0,0004020 0,00040212 0,00040716 0,00041148 0,0004142 0,00041452 0,000443 0,00044352	0,00320242 0,00322603 0,00328031 0,00328031 0,0034297 0,00364297 0,00368533 0,00368533 0,00378263 0,00376819 0,00376819 0,00384842 0,00384516 0,0039671 0,0039732	ATG/00100/ATG/0010 ATG/00100/ATG/0095 ATG/00100 ATG/0095 ATG/00100 ATG/0095 ATG/00100 ATG/0095 ATG/00100 ATG/001200 ATG	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG20270 ATIG7262080 AT2G22090 AT2G22088 AT2G30270 ATIG20300 AT2G2090 AT2G22088 ATIG35010 ATIG75020 ATIG5050 ATIG50280 AT5G05290 AT5G08290 AT5G08300 ATIG3505 ATIG0580 ATIG05690 ATIG35650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G13720 AT5G13730 ATIG64560 AT5G13720 AT5G13730 ATIG64560 ATIG03600 ATIG03610 ATIG63590 ATIG03600 ATIG03610 ATIG60550 ATIG20550 ATIG20550 ATIG20550
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr2-12893957.5 Chr1-28170933 Chr5-2665679.5 Chr1-105128 Chr4-16167091 Chr4-16167091 Chr4-744233 Chr5-4735220 Chr1-1497570 Chr1-949825 Chr1-949825 Chr1-9498415.0.5 Chr1-30376423.5	0,129,134 116,66394 413,218668 105,35223 104,200498 113,506629 109,942646 105,857959 86,4303976 86,4303976 86,4303976 132,591262 146,544133 76,582418 347,347972 100,354362 121,257133 106,147348 122,473745 100,6147348	1,31695117 0,957335 1,46230708 1,415242 1,41240353 1,4213941 1,37886039 1,34692318 1,350378991 1,350378991 1,3598291 1,358491252 0,97068109 1,40777659 1,2814933 1,38186281	0,28201362 0,43110907 0,44040282 0,41763052 0,4318478 0,41083818 0,410848818 0,4108487 0,44850235 0,42876696 0,38876696 0,388756631 0,388756631 0,388756631 0,388756631 0,388756631 0,388756631 0,41251042 0,41510420 0,41510420 0,41510400000000000000000000000000000000	0,00034359 0,00035360 0,00035367 0,00035987 0,0003914 0,0004909 0,00040212 0,0004122 0,00041429 0,00041429 0,0004439 0,0004439 0,00044399	0,00320242 0,0032203 0,0032803 0,0032803 0,00368533 0,00368533 0,00368533 0,0037518 0,0037518 0,0037518 0,00378119 0,00384516 0,0038651 0,00396671 0,0039671 0,0039732	ATG0100 ATG02010 ATG02000 ATG02080 ATG02000 ATG01095 ATG08280 ATG01955 ATG08280 ATG01545 ATG608290 ATG005680 ATG03560 ATG03660 ATG01720 ATG01720 ATG014690 ATG01720 ATG014690 ATG01720 ATG014690 ATG01720 ATG014690 ATG0720 AT	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG7300 ATIG70290 ATIG70300 ATIG220208 ATIG20208 ATG22090 AT2G22088 AT2G30220 ATIG1099 ATIG70205 ATIG05607 ATIG75020 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG0560 ATIG33660 ATIG05690 ATIG0120 ATSG14680 AT5G14690 ATIG14680 AT5G14690 ATIG144000 ATIG0120 ATIG12720 ATSG13730 ATIG44000 ATIG2730 ATIG27330 ATIG27340 ATIG28730 ATIG27330 ATIG27340 ATIG80830 ATIG60850 ATIG2890 ATIG2860 AT3G06470 AT3G06480 AT3G06455 AT3G06460 AT3G06470 AT3G06480
Chr1:29521104 Chr1:20359 Chr1:26476352.5 Chr1:26476352.5 Chr2:29386505 Chr2:29386505 Chr2:29386505 Chr2:29370933 Chr3:2656579.5 Chr1:205128 Chr4:16167091 Chr4:744233 Chr4:744233 Chr5:4735220 Chr5:4735220 Chr5:4735220 Chr1:4909570 Chr1:499570 Chr1:4992825 Chr1:30376423.5 Chr3:304764575.5 Chr3:3047675.5	00,139734 116,66334 413,218668 105,335235 83,1075378 104,200498 81,3075378 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 347,347972 100,354362 121,257133 106,147848 122,473745 109,92643	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,42139411 1,37886039 1,34592318 1,3392439 1,2356612 1,3328443 1,3328433 1,328491252 0,97068109 1,28149933 1,3816281 1,34674804 1,34574804 1,34574804	0,28201362 0,43110907 0,44040282 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,448850235 0,41251091 0,38756631 0,38886702 0,43528457 0,38853992 0,41571042 0,4051827 4,40686118	0,00034359 0,00034567 0,00035366 0,00035987 0,0003914 0,0003909 0,00040209 0,00040120 0,00041148 0,00041429 0,00044252 0,0004430 0,00044352 0,00044352	0,00320242 0,0032203 0,0032803 0,0032803 0,0036323 0,00368533 0,00375318 0,00375318 0,00375318 0,00375318 0,0037698 0,00384842 0,00386510 0,0039671 0,00397372 0,00397372	ATG/0100/ATG/0110 ATG/0200/ATG/0200 ATG/0200/ATG/0200 ATG/0200 ATG	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G73000 AT1G70290 AT1G73000 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G3020 AT1G70300 AT1G10090 AT1G100950 AT1G3010 AT1G75020 AT1G05870 AT1G0580 AT1G05690 AT4G33500 AT4G33660 AT4G3866 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G13720 AT5G13730 AT5G14580 AT5G13720 AT3G13730 AT1G4000 AT1G03590 AT1G03600 AT1G03610 AT1G27320 AT1G27300 AT1G27340 AT3G04555 AT3G06460 AT3G06470 AT3G06480 AT1G38570 AT1G28580 AT1G28590
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476332.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr3-2665679.5 Chr1-1075128 Chr4-16167091 Chr4-744233 Chr5-4735200 Chr5-473220 Chr5-473220 Chr5-473220 Chr1-10492825 Chr3-10949840.5 Chr1-30376423.5 Chr3-1094585.5 Chr5-2921220	116,66394 116,66394 116,66394 116,66394 116,66394 116,63925 83,1075378 104,200498 113,506629 109,942646 105,857599 89,4489117 97,3943074 325,59126 347,347972 100,354362 121,257133 109,92643 91,9868645	1,31695117 0,957335 1,46230708 1,415242 1,41240353 1,4213941 1,37886039 1,43546006 1,3798299 1,43546006 1,3798299 1,43546006 1,3798299 1,4357850 1,25849125 0,97068109 1,40777659 1,28149933 1,38186281 1,35147806 1,51830338	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,41083818 0,41083818 0,41251091 0,38756631 0,38756631 0,38756631 0,4255012 0,4255012 0,4255012 0,4255012 0,44557012 0,40668118 0,4066811827	0,00034359 0,00034350 0,00035360 0,0003587 0,00035309 0,00040209 0,00040209 0,00040120 0,00041148 0,00041429 0,00041452 0,00044076 0,00044109 0,0004439 0,0004439 0,0004439 0,00044358	0,0032042 0,0032803 0,0032803 0,0038291 0,00361297 0,00361297 0,0036533 0,0037263 0,00375318 0,00375318 0,00376319 0,00386510 0,00386510 0,0039671 0,00397372 0,00397372 0,00397372	ATG0100 ATG02010 ATG02070 ATG202080 ATG02070 ATG02080 ATG075020 ATG075020 ATG075020 ATG075020 ATG075020 ATG075020 ATG075020 ATG07502 ATG075020 ATG07502 ATG07502 ATG07500 ATG0	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG73000 ATIG222070 ATIG73000 ATIG222070 ATIG222080 AT2G22090 AT2G22088 AT2G30220 ATIG0500 ATIG22080 ATSG01545 AT5G08290 AT5G08300 ATIG05675 ATIG05680 ATIG05690 ATIG05675 ATIG05680 ATIG05690 ATIG3150 ATIG3360 ATIG05690 AT5G14580 AT5G14590 AT5G14580 AT5G14590 AT5G13710 AT5G13720 AT5G13730 ATIG44000 ATIG03590 ATIG03600 ATIG03610 ATIG03590 ATIG03600 ATIG03610 ATIG0580 ATIG2320 ATIG27340 AT3G0565 ATIG08830 ATIG28570 ATIG28580 ATIG28590 AT5G09400 AT5G09410
Chr1:29521104 Chr1:205254395.5 Chr1:26476352.5 Chr1:285476352.5 Chr2:2386505 Chr2:2386505 Chr2:2893957.5 Chr1:3296373 Chr5:265679.5 Chr1:205128 Chr4:16167091 Chr4:744233 Chr5:4735220 Chr5:4735220 Chr5:4735220 Chr1:406866 Chr1:899570 Chr1:942825 Chr1:30376423.5 Chr1:30376423.5 Chr1:30376423.5 Chr1:10046585.5 Chr1:10046585.5 Chr1:10046585.5	b),139 Jan 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 89,4489117 97,3943074 132,591262 146,544133 76,582443 347,347972 100,354362 100,354362 100,354362 100,354362 100,354362 109,25643 109,25643 109,25643 109,26645 89,0807557 1,86866458 89,0807557 1,86066458 1,8006757 1,8005757	1,31695117 0,957335 1,46230708 1,4015242 1,41240353 1,41240353 1,41240353 1,42139411 1,37886039 1,34592314 1,3398249 1,3398249 1,3398493 1,3398493 1,3816281 1,34674805 1,34674805 1,51830388 1,45784325	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44856235 0,41251091 0,3878670 0,4287666 0,4287666 0,4287680 0,4388870 0,3888670 0,3888670 0,4388870 0,435833992 0,4051817 0,40058818 0,44009384	0,00034359 0,00035366 0,00035366 0,00035987 0,00035987 0,0003914 0,00040209 0,00040209 0,0004120 0,00041429 0,00041429 0,00041429 0,0004430 0,0004430 0,00044352 0,00044352 0,00044358	0,00320242 0,0032203 0,0032803 0,0032803 0,0036323 0,00368533 0,00375318 0,00375318 0,00375318 0,00375318 0,0037631 0,0037631 0,0038651 0,0039651 0,00396571 0,0039772 0,00397372 0,00401658	ATG/0100/ATG/0110 ATG/0100/ATG/0100 ATG/0000 ATG/00095 ATG/0010 ATG/00095 ATG/0010 ATG/00095 ATG/00100 ATG/0100 ATG/0000 ATG/0100 ATG/010	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG2622070 ATIG262080 AT2G22090 AT2G22088 AT2G30207 ATIG202080 AT2G22090 AT2G2088 ATIG30270 ATIG20280 AT3G0580 ATIG30270 ATIG0580 ATIG05690 ATIG33500 ATIG0580 ATIG05690 ATIG33500 ATIG0580 ATIG05690 ATIG3350 ATIG33600 ATIG05690 ATIG3350 ATIG33600 ATIG3510 ATIG31210 AT5G13720 ATSG13730 ATIG4000 ATIG03590 ATIG03600 ATIG03610 ATIG27320 ATIG27330 ATIG27400 ATIG27320 ATIG27330 ATIG27400 ATIG27320 ATIG27880 ATIG2550 ATIG26880 ATIG26880 ATIG268570 ATIG28580 ATIG28590 ATIG2690 ATIG269410 ATIG24550 ATIG24550 ATIG28590 ATIG26950 ATIG34555 ATIG24560
Chr1-29521104 Chr4-16102359 Chr1-26876352.5 Chr1-26476352.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-1289037 Chr2-2129037 Chr2-2129037 Chr2-2129037 Chr2-2129037 Chr2-10012 C	116,66394 116,66394 116,66394 116,538255 83,1075378 104,200498 113,506629 109,942666 105,857559 86,4303976 142,559136 142,559136 142,559136 142,559136 142,559136 146,544133 76,582418 347,347972 100,354362 121,257133 106,147848 122,473745 109,92643 91,8866645 89,0807557 171,263394	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,3286039 1,3368029 1,3368029 1,3368029 1,328443 1,58491252 0,97068109 1,4077659 1,28149933 1,38186280 1,35147806 1,51830388 1,4574824 1,43544205	0,28201362 0,43110907 0,44040282 0,414063052 0,42318478 0,41083818 0,41090437 0,44850235 0,42856696 0,41251091 0,38756631 0,38756631 0,38756631 0,4282457 0,38533902 0,41571042 0,405681182 0,445561297 0,44056812	0,00034359 0,00034350 0,00035867 0,0003587 0,0003587 0,0004209 0,00040209 0,00040209 0,0004128 0,0004142 0,00041452 0,0004452 0,00044352 0,00044358 0,00044558 0,00044521 0,00046221	0,0032042 0,0032803 0,0032803 0,0032803 0,00361297 0,00361297 0,00361293 0,0036533 0,0037518 0,0037518 0,0037619 0,0038610 0,0038651 0,0039671 0,0039772 0,00397372 0,00397372 0,00397372	ATG0100 ATG02010 ATG202070 AT2G22080 ATG0090 ATG01095 ATG08280 ATG075020 ATG08280 ATG01545 AT5G08290 ATG05680 ATG032650 ATG33660 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG027320 ATG07330 ATG08830 ATG0860 ATG06470 ATG02850 ATG28590 ATG09400 ATG09967 ATG09973	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG73000 ATIG22020 ATIG73000 ATIG220200 ATIG22090 AT2G22090 AT2G22088 ATZG30220 ATIG0090 ATIG10095 ATIG0500 ATIG075020 ATIG0567 ATIG05680 ATIG05690 ATIG0567 ATIG05680 ATIG05690 ATIG33650 ATIG33660 ATIG05660 ATSG14580 ATSG14690 ATSG14580 ATSG14690 ATSG14720 ATSG14720 ATIG44000 ATIG03590 ATIG03600 ATIG03610 ATIG2320 ATIG27300 ATIG27340 ATIG05605 ATIG08450 ATIG28580 ATIG28590 ATIG08450 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28585 ATIG28590 ATIG68450 ATIG68430 ATIG28550 ATIG28570 ATIG80430 ATIG0967 ATIG09973 ATIG80440
Chr1:29521104 Chr4:16102359 Chr1:28554395.5 Chr1:28554395.5 Chr2:28676352.5 Chr2:2893957.5 Chr2:2893957.5 Chr2:28170933 Chr5:265679.5 Chr1:205128 Chr4:744233 Chr5:475220 Chr5:475220 Chr5:475220 Chr5:495570 Chr1:9492825 Chr1:30376423.5 Chr3:30376423.5 Chr3:30376423.5 Chr3:30376423.5 Chr3:30376423.5 Chr3:20921200 Chr4:505664 Chr4:3023924.55 Chr3:22934635	b),129,144 116,66394 413,218668 105,335235 83,1075378 114,200498 113,50629 89,4489117 105,857959 80,4303976 89,4489117 105,857959 80,4303976 146,544133 76,582418 146,544133 106,147848 122,473745 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326435 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326455 109,326555 109,326555 109,326555 109,326555 109,326555 109,326555555 109,3265555555555555555555555555555555555	1,31695117 0,957335 1,46230708 1,4015242 1,41240353 1,41240353 1,41240353 1,41240353 1,37886039 1,3456231 1,37982991 1,37982991 1,37982991 1,37982991 1,37982991 1,325441 1,37982991 1,3824810 1,34574802 1,34674801 1,51830338 1,45784325 1,1345748108	0,28201362 0,43110907 0,44040282 0,41063052 0,41083818 0,40190437 0,44850235 0,4850235 0,4850235 0,48576691 0,38756631 0,38756631 0,47509028 0,41551042 0,455833992 0,41571042 0,4051817 0,4005184 0,44209384 0,44209384 0,44209384	0,00034359 0,00034359 0,00035367 0,00035387 0,00035387 0,00035397 0,00040209 0,00040209 0,00041429 0,00041429 0,00041429 0,00044352 0,00044352 0,00044352 0,00044521 0,00046521	0,0032042 0,0032203 0,00328031 0,00328031 0,00361297 0,0036823 0,0036823 0,0036853 0,0037518 0,0037518 0,0037618 0,0037618 0,00384516 0,0039671 0,0039737 0,0039737 0,0039737 0,0039737 0,0041825 0,0041825	ATG/0100/ATG/0110 ATG/0100/ATG/0095 ATIG/50010 ATIG/50020 ATIG/50010 ATIG/500126 ATG/05800 ATG/05800 ATG/015650 ATG/036600 ATG/01700 ATG/01700 ATG/014000 ATG/014000 ATIG/0100 ATIG/0100 ATIG/0100 ATIG/0100 ATIG/0100 ATG/0	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G7300 AT1G70290 AT1G73000 AT2G22070 AT2G22080 AT2G22090 AT2G22088 AT2G3020 AT1G20200 AT2G22090 AT2G22088 AT2G3020 AT1G20200 AT1G0900 AT1G100950 AT1G05675 AT1G0580 AT1G05690 AT4G33500 AT4G33660 AT4G3866 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G14690 AT5G14580 AT5G14590 AT5G14580 AT1G05600 AT1G03510 AT1G4000 AT1G03590 AT1G03600 AT1G03510 AT1G27320 AT1G27330 AT1G27340 AT3G05655 AT1G27320 AT1G28500 AT1G28590 AT5G09410 AT1G28570 AT1G28580 AT1G28590 AT5G09400 AT5G09410 AT1G36550 AT4G34555 AT1G34560 AT1G434550 AT1G809430 AT1G2957 AT1G80973 AT1G80440 AT3G61920 AT1661930 AT1G09973 AT1G80440 AT3G61920 AT1661930 AT1G09973 AT1G80440
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr3-26565679.5 Chr1-10705128 Chr4-16167091 Chr4-744233 Chr5-472520 Chr5-472520 Chr5-472520 Chr5-472570 Chr1-10705666 Chr1-30976423.5 Chr3-10376423.5 Chr3-10376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-032921420 Chr3-0376423.5 Chr3-032921420 Chr3-0376423.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-037643.5 Chr3-0376	0,129,144 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 132,591262 145,544133 105,147848 147,347972 100,354362 121,257133 106,147848 122,473745 109,92643 91,8686645 89,0807957 171,263394 141,86372 76,6441425	1,31695117 0,957335 1,46230708 1,41240353 1,41240353 1,4124035 1,37886039 1,37886039 1,37886039 1,3788603 1,3788039 1,378803 1,378805 1,295612 1,295612 1,295612 1,295612 1,2814933 1,35147806 1,51830338 1,4574824 1,31478108 1,2316474	0,28201362 0,43110907 0,44040282 0,41263052 0,42318478 0,41083818 0,41090437 0,44850235 0,44850235 0,44850235 0,44850235 0,447509028 0,47509028 0,47509028 0,47509028 0,44551042 0,40568118 0,45881297 0,44069384 0,4425149 0,4455149 0,445149 0,44551	0,00034359 0,00034350 0,00035867 0,0003587 0,00035987 0,00040209 0,00040209 0,00040209 0,0004120 0,00041420 0,00041452 0,00044350 0,00044350 0,00044350 0,00044350 0,00044352 0,00044352 0,00044521 0,00045588 0,00045588 0,00045588	0,0032042 0,0032603 0,0032803 0,0032803 0,00361291 0,00361292 0,00361293 0,0036853 0,0037263 0,00378119 0,00378119 0,00384816 0,00384816 0,0038671 0,0039671 0,00397372 0,00497372 0,00497372 0,00497372 0,00497372	ATIG00100 ATIG00110 ATIG02070 ATIG02080 ATIG0090 ATIG0095 ATIG05010 ATIG75020 ATIG05680 ATIG05680 ATIG03680 ATIG03660 ATIG01720 ATIG014690 ATIG014690 ATIG014000 ATIG014000 ATIG01720 ATIG014000 ATIG027320 ATIG07330 ATIG08830 ATIG08830 ATIG08400 ATIG07330 ATIG08400 ATIG0730 ATIG08400 ATIG09470 ATIG08400 ATIG09470 ATIG08400 ATIG09470 ATIG08400 ATIG09967 ATIG09973 ATIG08400 ATIG09967 ATIG09973 ATIG01400	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG20270 ATIG70300 ATIG20270 ATIG202080 AT2G22090 AT2G22088 ATZG30220 ATIG0950 ATIG20280 ATSG01545 AT5G08290 AT5G08300 ATIG9507 ATIG0580 ATIG05690 ATIG9507 ATIG0580 ATIG05690 ATIG31710 ATIG51320 ATIG05690 ATIG1480 AT5G14690 AT5G14580 AT5G14690 ATIG14000 ATIG14000 ATIG03509 ATIG03600 ATIG03610 ATIG2320 ATIG27330 ATIG27340 AT3G05605 ATIG80830 ATIG80830 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG80400 ATIG09400 ATIG09671 ATIG06480 ATIG2850 ATIG28580 ATIG28590 ATIG80830 ATIG80420 ATIG80430 ATIG2850 ATIG28590 ATIG80430 ATIG0957 ATIG80440 ATIG80420 ATIG693120 ATIG0957 ATIG80440 ATIG2320 ATIG693120 ATIG0957 ATIG0400 ATIG9340 ATIG73400
Chr1:29521104 Chr4:16102359 Chr1:26376355 Chr1:26476352.5 Chr2:2889395.5 Chr2:2889395.7 Chr2:2870933 Chr3:265679.5 Chr1:205128 Chr4:1705128 Chr4:1405128 Chr4:46167091 Chr4:744233 Chr4:744233 Chr4:744233 Chr4:7442705.5 Chr1:16709686 Chr1:899570 Chr1:9492825 Chr3:0376423.5 Chr3:0376423.5 Chr3:0376423.5 Chr3:0376423.5 Chr3:0376423.5 Chr3:0376423.5 Chr3:0239224.5 Chr3:023924.5 Chr3:023	b),129,134 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,394307 105,857959 86,4303976 89,4489117 97,394307 165,522418 347,347972 100,354362 122,473745 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,52643 109,5264 109,5264 109,5264 109,5264 109,5264 109,526 109	1,31695117 0,957335 1,46230708 1,4015242 1,41240353 1,41240353 1,41240353 1,37886039 1,37886039 1,37982991 1,37982991 1,37982991 1,37982991 1,37982991 1,37982991 1,3798491252 0,97068109 1,381486281 1,34674804 1,314778108 1,23154748108 1,23154741 1,23156474 1,231567474 1,231567474 1,231567474 1,231567474747474747474747	0.28201362 0.43110907 0.44040282 0.41063052 0.42318478 0.41083818 0.40190437 0.44850235 0.428576691 0.38756631 0.38756631 0.38756631 0.42528457 0.44550829 0.41551042 0.45581297 0.40568118 0.45781297 0.44009384 0.44209384 0.3427549 0.3421155 0.46190033	0,00034359 0,00035366 0,00035367 0,00035087 0,0003509 0,00040209 0,00040209 0,00041429 0,00041429 0,00041429 0,0004152 0,00044150 0,0004430 0,0004430 0,0004430 0,0004432 0,00044521 0,0004521 0,0004521 0,0004521	0,0032042 0,0032203 0,00328031 0,00332991 0,00361297 0,0036823 0,0036823 0,0036823 0,0037518 0,0037518 0,0037618 0,0037618 0,00384516 0,0039671 0,0039671 0,0039732 0,0039732 0,0039732 0,0039732 0,0041625 0,00412561 0,004132561 0,0043747	ATG/0100 ATG/0100 ATG/0200 ATG	AT1G76090 AT1G76100 AT1G76110 AT1G70290 AT1G7300 AT1G70290 AT1G7300 AT1G2622070 AT1G2622090 AT2G22090 AT2G22088 AT2G302070 AT1G262080 AT2G22090 AT2G22088 AT1G3090 AT1G10095 AT1G308270 AT1G0580 AT1G05690 AT1G05675 AT1G0580 AT1G05690 AT4G33500 AT4G33660 AT4G3866 AT4G08815 AT4G38670 AT4G08825 AT4G01720 AT5G14580 AT5G14690 AT5G14580 AT5G14590 AT1G41720 AT5G14580 AT1G05800 AT1G05610 AT1G27320 AT1G27330 AT1G27340 AT1G27320 AT1G27330 AT1G27340 AT1G27320 AT1G27330 AT1G27340 AT3G06455 AT1G28570 AT1G28580 AT1G28590 AT5G04400 AT5G09410 AT1G3555 AT4G34555 AT4G34560 AT1G434550 AT1G809430 AT1G09957 AT1G809440 AT1G361920 AT1G61930 AT1G29340 AT3G61920 AT1G61930 AT1G2940 AT1G27320 AT1G28517 AT1G23440 AT1G25570 AT1G285870 AT1G28540 AT1G27320 AT1G87830 AT1G29540 AT1G36450 AT4G34555 AT4G34560 AT1G43455 AT4G34555 AT4G34560 AT1G80420 AT1G61930 AT1G09957 AT1G80440 AT3G61920 AT1G61930 AT1G2840
Chr1-29521104 Chr4-16102359 Chr1-26476352.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr3-2656579.5 Chr1-1070128 Chr4-16167091 Chr4-744233 Chr5-4735220 Chr3-104942825 Chr1-1094585.5 Chr1-30376423.5 Chr3-0394840.5 Chr3-03976423.	0.,139,144 116,66334 116,66334 116,66334 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 142,591262 146,544133 76,582418 347,347972 100,354362 122,473374 109,92643 91,8686645 89,0807957 171,263394 141,86372 76,6414265 193,021001	1,31695117 0,957335 1,46230708 1,4124035 1,4124035 1,4124035 1,37886039 1,37886039 1,37886039 1,37886039 1,3788039 1,378803 1,378803 1,378805 1,28149125 2,097068109 1,40777659 1,28149033 1,35147806 1,5183038 1,45784325 1,13478108 1,2316474 1,23296786 1,232964425 1,232964425	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,41090437 0,44850235 0,44850235 0,44850235 0,44850235 0,44850235 0,44750908 0,47509080000000000000000000000000000000000	0,00034359 0,00034350 0,00035867 0,00035987 0,00039509 0,00040209 0,00040209 0,00041262 0,0004148 0,00041452 0,00044350 0,00044350 0,00044350 0,00044352 0,000443588 0,00045588 0,0004521 0,0004521	0,00322042 0,0032203 0,0032803 0,00361291 0,00361297 0,00361292 0,00368533 0,00378263 0,0037819 0,0037819 0,00388516 0,00388516 0,00398727 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00497451 0,00412561 0,00412561 0,00437787	ATIG00100 ATIG00110 ATIG02070 ATIG02080 ATIG0090 ATIG01095 ATIG05010 ATIG075020 ATIG05880 ATIG05880 ATIG01545 ATI5G08290 ATIG05680 ATIG03800 ATIG01720 ATIG04690 ATIG01720 ATIG04690 ATIG07320 ATIG07300 ATIG07320 ATIG0730 ATIG80830 ATIG08600 ATIG27320 ATIG0730 ATIG80830 ATIG80830 ATIG80840 ATIG06470 ATIG28590 ATIG08400 ATIG0957 ATIG09973 ATIG80420 ATIG0957 ATIG09973 ATIG03420 ATIG02400 ATIG02200	ATIG76090 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG22070 ATIG70300 ATIG20270 ATIG202080 AT2G22090 AT2G22088 ATG302270 ATIG0900 ATIG70200 ATIG09507 ATIG0580 ATIG05690 ATIG05675 ATIG0580 ATIG05690 ATIG05675 ATIG0580 ATIG05690 ATIG03608 ATIG05809 ATIG05809 ATIG05800 ATIG03509 ATIG0720 ATIG0460 ATIG04600 ATIG03610 ATIG16480 ATIG163600 ATIG03610 ATIG2320 ATIG27330 ATIG27340 ATIG80830 ATIG80830 ATIG28570 ATIG22580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG0460 ATIG09677 ATIG06480 ATIG28570 ATIG28580 ATIG28590 ATIG80830 ATIG80840 ATIG0460 ATIG0967 ATIG0973 ATIG80440 ATIG2870 ATIG05817 ATIG05847 ATIG0973 ATIG80440 ATIG2820 ATIG05817 ATIG05847 ATIG0978 ATIG80440 ATIG28580 ATIG05817 ATIG05847
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-28476352.5 Chr2-3286505 Chr2-12893957.5 Chr1-32170933 Chr5-2665679.5 Chr1-10933 Chr5-2665679.5 Chr1-10705128 Chr4-16167091 Chr4-46705.5 Chr1-10709128 Chr5-4735220 Chr1-1074233 Chr5-4735220 Chr1-10949840.5 Chr1-30949840.5 Chr1-30949840.5 Chr1-30949840.5 Chr1-3094845.5 Chr3-194423.5 Chr3-194423.5 Chr3-1945555 Chr3-204635 Chr3-2024635 Chr3-2024635 Chr3-2024635 Chr3-2024635 Chr3-20206711 Chr4-9255928.5	116,66394 116,66394 116,66394 116,66394 116,66394 116,63285 31,075378 104,200498 113,506629 109,942646 105,857999 86,4303976 89,4489117 97,3943074 125,951262 121,257133 106,147484 122,473745 19,8686645 89,0807957 112,44284 112,44249	1,31695117 0,957335 1,46230708 1,46230708 1,4124035 1,4124035 1,4124035 1,4124035 1,37886039 1,37886039 1,3469240 1,332843 1,3459419 1,332843 1,34544933 1,34674804 1,34674804 1,34674804 1,34674804 1,3454802 1,145748108 1,2435447 1,22315447 1,22315447 1,22315447	0,28201362 0,43110907 0,44040282 0,41763052 0,44201828 0,41083818 0,40190437 0,44850235 0,428576696 0,4425023 0,38756631 0,38756631 0,4759028 0,4152109 0,45581297 0,4058118 0,45781297 0,4459814 0,445781297 0,4459814 0,44578129 0,4459814 0,44578129 0,4459814 0,44578129 0,4459814 0,4457849 0,3421145 0,439104 0,342145 0,445000 0,342145 0,445000 0,345000 0,345000 0,3450000 0,3450000 0,34500000 0,34500000000000000000000000000000000000	0,00034359 0,00035366 0,00035367 0,0003509 0,0003509 0,0003509 0,0004020 0,0004016 0,00041429 0,00041429 0,0004162 0,0004162 0,00044169 0,00044352 0,00044352 0,00044521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521	0,0032042 0,0032603 0,00328031 0,00328031 0,00361297 0,0036823 0,0036853 0,0037698 0,0037698 0,0037698 0,0037698 0,0037619 0,0038410 0,00384510 0,00384510 0,00397372 0,00397372 0,00397372 0,00410352 0,004132561 0,00437747 0,00437747	ATG/0100 ATG/0110 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG	ATIG76090 ATIG76100 ATIG76110 ATIG70200 ATIG76100 ATIG76110 ATIG70200 ATIG70300 ATIG22070 ATIG70300 ATIG202070 ATIG202080 AT2G22090 AT2G22088 AT2G30202 ATIG0500 ATIG70200 ATIG0500 ATIG70200 ATIG0505 ATIG05800 ATIG05600 ATIG0550 ATIG05800 ATIG05600 ATIG0550 ATIG05800 ATIG05600 ATIG01200 ATSG14680 AT5G14690 ATIG01200
Chr1-29521104 Chr4-16102359 Chr1-24854395.5 Chr1-24876352.5 Chr2-3286505 Chr2-3286505 Chr2-3296373 Chr3-2870933 Chr3-2655679.5 Chr1-705128 Chr4-16167091 Chr4-744233 Chr3-4735220 Chr3-4735220 Chr3-4426705.5 Chr1-1705128 Chr3-492825 Chr1-30376423.5 Chr3-30949840.5 Chr3-3094985.5 Chr3-3094985.5 Chr3-3094985.5 Chr3-3094985.5 Chr3-3094983.5 Chr3-3094983.5 Chr3-3094983.5 Chr3-4949343 Chr3-4949343 Chr3-494934 Chr3-494943 Chr3-494944 Chr3-49494	116,66394 116,66394 116,66394 116,66394 116,66394 116,66394 116,65394 105,335235 83,1075378 104,200498 113,506629 105,857959 86,4303976 89,4489117 70,3482074 122,57132 106,343421 121,257133 105,147848 122,477345 109,92643 91,8686645 93,0807957 171,263944 141,86372 76,6414265 132,201001 112,442496 174,480736	1,31695117 0,957335 1,46230708 1,46230708 1,4124035 1,4124035 1,4124035 1,37886039 1,37886039 1,37886039 1,37886039 1,3788603 1,3788603 1,3788603 1,378805 1,378805 1,378805 1,378805 1,378805 1,3818405 1,3818405 1,3818405 1,3818425 1,38147805 1,3818425 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,38147805 1,3814805 1	0,28201362 0,43110907 0,44040282 0,44040282 0,4426382 0,42318478 0,4103838 0,42876696 0,41251091 0,3875661 0,3875661 0,3875661 0,3875692 0,4759028	0,00034359 0,00034350 0,00035360 0,0003587 0,00039509 0,00040209 0,00040209 0,0004120 0,00041420 0,00041420 0,0004152 0,00044350 0,00044350 0,00044350 0,00044352 0,00044352 0,00044521 0,00045518 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521	0,00322042 0,0032203 0,0032803 0,00361297 0,00361297 0,00361297 0,0036533 0,00375218 0,0037518 0,0037518 0,0037518 0,00378119 0,00384516 0,00384516 0,00397372	ATG/00100 ATG/0010 ATG/00100 ATG/0095 ATG/00100 ATG/0095 ATG/00200 ATG/0095 ATG/00200	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG73000 ATIG22020 ATIG202080 AT2G22090 AT2G22088 ATG30220 ATIG10090 ATIG70200 ATIG5010 ATIG75020 ATIG50270 ATIG60280 ATSG01545 AT5G08290 AT5G08300 ATIG5057 ATIG60580 ATIG05690 ATIG3560 ATIG60580 ATIG05690 ATIG514580 AT5G14590 ATIG14580 AT5G14590 ATIG14580 AT5G14590 ATIG3170 ATIG13720 AT5G13730 ATIG44000 ATIG3290 ATIG03600 ATIG03610 ATIG2320 ATIG27330 ATIG27340 ATIG80830 ATIG28590 ATIG2330 ATIG27340 ATIG28580 ATIG25590 ATIG28590 ATIG28580 ATIG28590 ATIG80830 ATIG28570 ATIG25880 ATIG28590 ATIG80420 ATIG60440 AT3G05470 AT3G05480 ATIG80420 ATIG80430 ATIG09967 ATIG09973 ATIG80440 ATIG2850 ATIG05817 ATIG23440 ATIG28580 ATIG05817 ATIG23400 ATIG28580 ATIG05817 ATIG23400 ATIG28420 ATIG69817 ATIG23400 ATIG28420 ATIG69817 ATIG23400 ATIG28420 ATIG69817 ATIG23400 ATIG28420 ATIG69817 ATIG23400 ATIG63400 ATIG65817 ATIG23400 ATIG63400 ATIG65817 ATIG23400 ATIG23420 ATIG65817 ATIG23400 ATIG2800 ATIG65817 ATIG23400 ATIG2800 ATIG65817 ATIG53400 ATIG2800 ATIG65817 ATIG23400 ATIG6380 ATIG65817 ATIG23400 ATIG6380 ATIG65817 ATIG23400 ATIG2800 ATIG65817 ATIG53400 ATIG2800 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG2900 ATIG5590 ATIG5390 ATIG5900 ATIG5900 ATIG5900 ATIG9000 ATIG5900 ATIG5900 ATIG90000 ATIG5900 ATIG5900 ATIG90000 ATIG5900 ATIG5900 ATIG9000000000000000000000000000000000000
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-1289393 Chr5-2665679.5 Chr2-109128 Chr4-16167091 Chr4-16167091 Chr4-1647091 Chr4-1647091 Chr4-1647091 Chr4-1647095 Chr2-10949840.5 Chr1-10949840.5 Chr1-10949840.5 Chr1-10949840.5 Chr1-10949840.5 Chr1-10949840.5 Chr1-1094585.5 Chr2-10949840.5 Chr1-1004585.5 Chr2-1094585.5 Chr2-2934635 Chr3-20606171 Chr4-0255928.5 Chr4-109488	b),129,134 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 89,4489117 97,394307 105,857999 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 37,347972 100,354362	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,41240353 1,34592318 1,34592316 1,34592316 1,3459231 1,3458431 1,3457480 1,3457480 1,3457480 1,3457480 1,3457480 1,3457480 1,3457480 1,3457480 1,24574	0,28201362 0,43110907 0,44040282 0,41763052 0,44201828 0,41083818 0,40190437 0,44850235 0,428576696 0,398576691 0,39857609 0,41551091 0,435583992 0,415571042 0,4055827 0,4058818 0,45781297 0,44509384 0,45781297 0,4409384 0,342749 0,342749 0,34958763 0,393970404 0,39397646 0,39395468 0,39585876	0,00034359 0,00035366 0,00035367 0,0003509 0,0003509 0,0003509 0,0004020 0,0004020 0,0004120 0,00041429 0,00041429 0,00041429 0,0004430 0,0004430 0,0004430 0,0004430 0,0004430 0,0004521 0,00045521 0,0004521 0,00045521 0,000555200 0,00055520000000000	0,0032042 0,0032203 0,0032203 0,00361297 0,0036823 0,0036823 0,0036833 0,0037588 0,0037698 0,0037618 0,0037618 0,0037619 0,0038410 0,0038410 0,0038510 0,0039671 0,0039671 0,0039671 0,0039732 0,0039732 0,0041250 0,0041251 0,0043747 0,0043747 0,0043747 0,00437478 0,004381	ATG/0100/ATG/0100 ATG/0000 ATG/0005 ATG/0000 ATG/0005 ATG/0000 ATG/0005 ATG/0000 ATG/0005 ATG/0000 ATG	ATIG76090 ATIG76100 ATIG76110 ATIG70200 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG220200 ATIG202000 AT2G22090 AT2G22088 AT2G30220 ATIG10090 ATIG70200 ATIG0500 ATIG70200 ATIG0500 ATIG70200 ATIG0500 ATIG70200 ATIG0500 ATIG70200 ATIG0500 ATIG70200 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG014000 ATIG27300 ATIG03600 ATIG03610 ATIG27300 ATIG03600 ATIG03610 ATIG27300 ATIG03600 ATIG0470 AT3G06480 ATIG28500 ATIG28580 ATIG28570 ATIG28580 ATIG04970 AT3G06480 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG09973 ATIG80440 AT3G61920 AT3G05450 ATIG80140 AT3G05505 ATIG180420 ATIG09570 ATIG09973 ATIG80440 AT3G61920 AT3G05505 ATIG18300 ATIG0580410 ATIG28120 ATIG55550 ATIG18900 AT3G05565 AT4G18380 ATIG55565 AT4G18380 ATIG55565 AT4G18380 ATIG55565 AT4G18380 ATIG55565 AT4G18380 ATIG55565 AT4G18380 ATIG5950 ATIG28190 AT3G55565 AT4G18390 AT4G29180 AT4G29190 AT5G64850 AT5G64850
Chr1:29521104 Chr4:16102359 Chr1:24554395.5 Chr1:24676352.5 Chr2:2893957.5 Chr2:3296373 Chr2:2893957.5 Chr2:3296373 Chr3:2656579.5 Chr1:705128 Chr4:16167091 Chr4:74232 Chr4:16167091 Chr4:74232 Chr4:16167091 Chr4:74232 Chr3:10949840.5 Chr1:30376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376423.5 Chr3:09376425.5 Chr3:0937645.5 Chr3:09476.5 Chr3:09476.5 Chr3:09476.5 Chr3	116,66394 116,66394 116,66394 116,66394 116,66394 116,65394 105,335235 83,1075378 104,200498 113,506629 105,857959 89,4489117 97,3943074 132,591262 146,544133 76,582418 107,552418 109,92643 91,8686645 193,0021001 112,472394 112,46732 176,6414265 193,021001 112,47364 112,47364 124,85737 83,08555747 83,026529	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,4124035 1,4124035 1,4124035 1,4124035 1,4124035 1,4124035 1,37886039 1,37886039 1,37886039 1,37886039 1,37886039 1,43540404 1,38147860 1,31547406 1,31547405 1,34574305 1,13478105 1,25096786 1,25045786 1,25045786 1,25045786 1,2505474 1,25056786 1,2505474 1,27052039 1,27052039 1,29494858 1,25048858 1,2705885 1,2705885 1,27055 1,27055 1,270585 1,27055	0,28201362 0,43110907 0,44040282 0,44040282 0,41263052 0,42318478 0,4103838 0,4190437 0,44850235 0,44850235 0,44850235 0,4485023 0,4455023 0,4455042 0,44500384 0,45581297 0,40568118 0,45581297 0,3425549 0,3427549 0,3427549 0,33900446 0,3390046 0,339	0,00034359 0,00034359 0,00035360 0,0003587 0,00035987 0,0003910 0,0004209 0,0004209 0,0004126 0,00041430 0,00041430 0,00044350 0,00044350 0,00044351 0,00044351 0,00044352 0,00044352 0,00044352 0,00044352 0,00044521 0,0004551 0,0004551 0,0004551 0,0004551 0,0004551 0,0004551 0,0004551 0,0004551 0,000551 0,0005517 0,0005517	0,0032042 0,0032803 0,0032803 0,00382991 0,00361297 0,00361297 0,00365823 0,00365833 0,0037263 0,00375819 0,00378119 0,00378119 0,00384516 0,00384516 0,00386516 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00412561 0,00412561 0,00412561 0,00412561 0,00447861 0,00447861 0,00447851	ATG/0100/ATG/0110 ATG/0100/ATG/0110 ATG/0200/ATG/0095 ATG/05010 ATG/50200 ATG/0501545 AT5G08290 ATG/05680 ATG/03650 ATG/03660 ATG/03650 ATG/03660 ATG/03710 ATG/01400 ATG/0100	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG73000 ATIG22020 ATIG202080 AT2G22090 AT2G22088 AT2G2200 ATIG202080 AT2G22090 AT2G22088 AT2G2200 ATIG20200 ATIG0090 ATIG9057 ATIG0580 ATIG05690 ATIG9507 ATIG0580 ATIG05690 ATIG9567 ATIG0580 ATIG05690 ATIG9567 ATIG0580 ATIG05690 ATIG1720 AT5G14680 AT5G14690 ATIG1720 ATIG1220 AT5G13730 ATIG03590 ATIG03600 ATIG03610 ATIG03590 ATIG03600 ATIG03610 ATIG03590 ATIG03600 ATIG03610 ATIG03590 ATIG0380 ATIG27340 AT3G05605 ATIG80830 AT3G06460 AT3G0460 AT3G06470 AT3G06480 ATIG2870 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG80420 ATIG80430 ATIG0967 ATIG09973 ATIG80440 AT3G41003 ATIG03810 ATIG05817 ATIG23440 ATIG2850 ATIG05817 ATIG2840 ATIG2850 ATIG05817 ATIG2840 ATIG28190 ATIG05817 ATIG2840 ATIG28190 ATIG05810 ATIG05817 ATIG2755 ATIG72760
Chr1-29521104 Chr4-16102359 Chr1-2654395.5 Chr1-26476352.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr3-2665679.5 Chr2-167091 Chr4-16167091 Chr4-16167091 Chr4-16167091 Chr4-1647091 Chr4-1647091 Chr4-1647091 Chr4-167095686 Chr3-10949840.5 Chr1-1004585.5 Chr1-1004585.5 Chr3-2056421.5 Chr3-220924.5 Chr3-22934635 Chr3-22934635 Chr3-22934635 Chr3-22934635 Chr3-22934635 Chr3-22934635 Chr3-2392468 Chr3-2392468 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-238324.5 Chr3-293468 Chr3-27383324.5 Chr3-293468 Chr3-27383324.5 Chr3-293468 Chr3-27383324.5 Chr3-293468 Chr3-27383324.5 Chr3-293468 Chr3-27383324.5 Chr3-294942	116,66394 116,66394 116,66394 116,66394 116,6394 116,6394 116,6394 116,6394 105,335235 31075378 104,200498 113,506629 105,87599 80,4403976 80,4403976 132,591262 146,544133 106,547848 100,354362 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,8686645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645 91,868645	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240435 1,37886039 1,37886039 1,34692318 1,34692318 1,3459206 1,3328443 1,5489252 0,97068109 1,331846211 1,34674804 1,35147806 1,35	0,28201362 0,43110907 0,44040282 0,412618478 0,41083818 0,41090437 0,44850235 0,42876696 0,41251091 0,38756613 0,38756613 0,38756613 0,38756613 0,425709028 0,3475709028 0,41571042 0,40568118 0,41571042 0,4157104 0,3427549 0,34	0,00034359 0,00034359 0,00035367 0,0003509 0,0003509 0,0003509 0,0004020 0,0004012 0,00041429 0,00041429 0,00041429 0,00041429 0,0004430 0,0004430 0,0004430 0,00044350 0,00044521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004551 0,0004551 0,0004551 0,0004555 0,00055552	0,0032403 0,0032403 0,0032403 0,0036129 0,0036129 0,0036823 0,0036853 0,0037518 0,0037518 0,0037518 0,0037618 0,0037618 0,0037618 0,0038419 0,0038611 0,0039671 0,0039671 0,0039772 0,0039772 0,0039732 0,0039732 0,0041852 0,0041852 0,0041852 0,0044748 0,00448472 0,00448472	ATG0100 ATG0100 ATG202070 ATG202080 ATG5002070 ATG202080 ATG500280 ATG5001545 AT5G08290 ATG508280 ATG35601545 AT5G08290 ATG05880 ATG36580 ATG33660 ATG3580 ATG33660 ATG51270 ATG613600 ATG7320 ATG27330 ATG60460 ATG06470 ATG60400 ATG027330 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG605470 ATG80480 ATG60480 ATG605470 ATG80480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG60480 ATG6740 ATG604850 ATG6740 ATG60480 ATG7740 ATG72750 ATG72755 ATG67470	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG220200 ATIG202000 AT2G22090 AT2G22088 AT2G30220 ATIG10090 ATIG10095 ATIG0500 ATIG70200 ATIG05675 ATIG05800 ATIG05690 ATIG05675 ATIG05800 ATIG05690 ATIG03500 ATIG33600 ATIG05690 ATIG014500 ATIG14590 ATSG14580 ATIG14590 ATSG14580 ATIG14590 ATIG03590 ATIG02300 ATIG03610 ATIG02500 ATIG2320 ATIG02300 ATIG0455 ATIG03600 ATIG03610 ATIG03590 ATIG02300 ATIG03610 ATIG03590 ATIG2320 ATIG27340 AT3G05605 ATIG28500 ATIG28580 ATIG02590 ATIG0455 ATIG28580 ATIG26590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG28120 ATIG28580 ATIG28590 ATIG80420 ATIG03555 ATIG2350 ATIG09420 ATIG05817 ATIG23400 ATIG0550 ATIG0420 ATIG05817 ATIG2340 ATIG28500 ATIG05817 ATIG2950 ATIG0420 ATIG05817 ATIG2850 ATIG2870 ATIG05810 ATIG28500 ATIG28120 ATIG25506 ATIG64820 ATIG55566 ATIG15820 ATIG152755 ATIG72755 ATIG72750 ATIG7400 ATIG74270 ATIG74420 ATIG72760 ATIG7400 ATIG74470 ATIG74470 ATIG7470A
Chr1:29521104 Chr4:16102359 Chr1:28554395.5 Chr1:26476352.5 Chr2:289395.7.5 Chr2:289395.7.5 Chr2:289395.7.5 Chr2:2803937 Chr3:2655679.5 Chr1:20128 Chr4:16167091 Chr4:74233 Chr4:16167091 Chr4:74233 Chr4:16167091 Chr4:74233 Chr4:16167091 Chr4:74233 Chr3:09570 Chr1:0426866 Chr1:899570 Chr1:0426866 Chr1:0426865 Chr3:03976423.5 Chr3:0397772.5 Chr3:039772.5 Chr3:037	b),139 Jac 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 89,4489117 97,3943074 132,591262 146,544133 76,582443 100,354362 100,354562 100,354562 100,354562 100,3545	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,4124035 1,4124035 1,4124035 1,4124035 1,43788009 1,37880299 1,3459218 1,3354291 1,3354430 1,3548430 1,35147806 1,5183038 1,35147806 1,5184781 1,231478108 1,231478108 1,231478108 1,2315474 1,230547474 1,2305474 1,2305474 1,2305474 1,230547474 1,2305474	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41039381 0,41039381 0,41251091 0,3875663 0,44850235 0,44850235 0,44850235 0,447509028 0,447509028 0,447509028 0,44509384 0,44509384 0,44009384 0,44009384 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,342555 0,39688763 0,39005468 0,38588763 0,38588763 0,3428769	0,00034359 0,00034359 0,00035360 0,0003587 0,00035987 0,0004209 0,0004209 0,0004120 0,00041429 0,00041429 0,00041429 0,00041432 0,00044352 0,00044352 0,00044352 0,00044352 0,00044521 0,00045518 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004522 0,0005512 0,0005522 0,0005555	0,00322042 0,0032203 0,0032803 0,0032803 0,00361297 0,0036823 0,0036853 0,0037698 0,0037698 0,0037698 0,0037698 0,0037698 0,00384516 0,0039671 0,0039671 0,0039671 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,0049738 0,0041852 0,0044852 0,0044872	ATG/0100 ATG/0110 ATG/0100 ATG/0095 ATIG/0100 ATG/0095 ATIG/0100 ATG/0095 ATG/0100 ATG/0105 ATG/0100 ATG/0105 ATG/0100 A	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG7300 ATIG70290 ATIG73000 ATIG220200 ATIG22090 AT2G22090 AT2G22088 AT2G2200 ATIG22080 AT2G22090 AT2G22088 AT2G32020 ATIG22080 AT2G2090 AT2G22088 ATIG5010 ATIG75020 ATIG5050 ATIG0580 ATIG05690 ATIG3505 ATIG0580 ATIG05690 ATIG3505 ATIG0580 ATIG05690 ATIG31710 ATIG51270 AT5G13730 ATIG40505 ATIG03600 ATIG03610 ATIG40700 ATIG03590 ATIG03600 ATIG03610 ATIG40550 ATIG2320 ATIG2730 ATIG27340 ATIG2350 ATIG2330 ATIG27340 ATIG2850 ATIG2330 ATIG27340 ATIG2850 ATIG2850 ATIG28590 ATIG3655 AT3G06460 AT3G06470 AT3G06480 ATIG2870 ATIG2850 ATIG28590 ATIG36550 ATIG2870 ATIG2850 ATIG28590 ATIG2870 ATIG2850 ATIG2850 ATIG2870 ATIG63817 ATIG2840 ATIG2420 ATIG05817 ATIG2840 ATIG2820 ATIG65817 ATIG2840 ATIG28120 ATIG67250 ATIG72755 ATIG72760 ATIG7270 ATIG7720 ATIG7755 ATIG7480 ATIG6850 ATIG768270
Chr1-29521104 Chr4-16102359 Chr1-2654395.5 Chr1-26476352.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr2-2665679.5 Chr2-10705128 Chr2-10705128 Chr2-10705128 Chr2-1070528 Chr2-1070528 Chr2-1070528 Chr2-1070528 Chr2-10705855.5 Chr2-10704585.5 Chr2-2921420 Chr2-10705855.5 Chr2-2921420 Chr2-2924635 Chr2-2924635 Chr2-2924635 Chr2-2924635 Chr2-2920468 Chr2-27817322.5 Chr2-2920468 Chr2-2781732.5 Chr2-278772	0.1.29 Jan 116,66394 413,218668 105,335235 83,1075378 104,200498 113,506629 109,942646 105,857959 86,4303976 89,4489117 97,3943074 132,591262 146,544133 76,582418 37,343074 100,354362 100,35436	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,37886039 1,37886039 1,3788603 1,37882991 1,2956612 1,3328433 1,5481252 0,97068109 1,4354706 1,331846211 1,34674804 1,35147806 1,2315474 1,5183038 1,45784325 1,23156474 1,5205475 1,22454425 1,2245445 1,224545 1,2245445 1,2245455 1,2245455 1,2245455 1	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,41090437 0,44850235 0,42876696 0,41251091 0,38756631 0,38756631 0,38756631 0,3875643 0,41571042 0,405681182 0,41571042 0,405681182 0,445781297 0,44056934 0,3427549 0,3425549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,3455549 0,34555490,3455549 0,3455549 0,34555490,4455549 0,44555565600000000000000000000000000000	0,00034359 0,00035366 0,00035367 0,00035367 0,00035367 0,0004209 0,00040209 0,0004128 0,0004128 0,0004148 0,0004152 0,0004429 0,0004452 0,00044358 0,0004452 0,0004452 0,0004558 0,0004558 0,0004570 0,0004570 0,0004570 0,0004570 0,0004570 0,0004570 0,0004570 0,0004558 0,0004570 0,0005592 0,0005552 0,0005552	0,0032042 0,0032203 0,0032203 0,0036129 0,0036129 0,0036823 0,0036853 0,0037518 0,0037518 0,0037518 0,0037518 0,0037618 0,0037618 0,0039671 0,0039671 0,0039772 0,0039772 0,0039772 0,0039772 0,0039772 0,00397372 0,00397372 0,0041252 0,0041232 0,0041323 0,0041323 0,00437747 0,0044318 0,00437747 0,0044381 0,0043853 0,00484872 0,00484872 0,00484872	ATG0100 ATG0100 ATG202070 ATG202080 ATG5002070 ATG20200 ATG500280 ATG601545 AT5G08290 ATG508280 ATG601545 AT5G08290 ATG035680 ATG601545 AT5G08290 ATG035680 ATG603660 ATG0120 ATG7120 ATG6140 ATG6120 ATG614000 ATG7120 ATG7230 ATG60450 ATG60470 ATG80450 ATG60470 ATG80450 ATG60470 ATG80450 ATG60470 ATG80420 ATG60967 ATG09973 ATG60400 AT5G09400 ATG60480 ATG60967 ATG09973 ATG661380 ATG66480 ATG60450 ATG66480 ATG60450 ATG66480 ATG60450 ATG66480 ATG60450 ATG66480 ATG60450 ATG66480 ATG60450 ATG66480 ATG60450 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG67470 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG664870 ATG67470 ATG664870 ATG664870 ATG67470 ATG664870 ATG67470 ATG664870 ATG67470 ATG67470 ATG67470 ATG6870 ATG67470 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG6870 ATG7870 ATG6870 ATG7870 A	ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG20200 ATIG70300 ATIG20200 ATIG202080 AT2G2090 AT2G2088 ATZG30220 ATIG10090 ATIG10095 ATIG0500 ATIG70200 ATIG0567 ATIG05680 ATIG05690 ATIG0560 ATIG05680 ATIG05690 ATIG0360 ATIG33600 ATIG03666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G14590 AT5G14580 AT5G14590 ATIG03590 ATIG03600 ATIG03610 ATIG02590 ATIG03600 ATIG03610 ATIG44000 ATIG02590 ATIG02300 ATIG03610 ATIG2820 ATIG22300 ATIG27340 AT3G05605 ATIG08400 AT5G09410 ATIG2850 ATIG2850 ATIG28590 AT5G09400 AT5G09410 ATIG2850 ATIG2850 ATIG28590 AT5G09400 AT5G09410 ATIG2820 ATIG0355566 ATIG180420 ATIG05817 ATIG29440 ATIG2850 ATIG05817 ATIG23400 ATIG2850 ATIG05817 ATIG23400 ATIG2850 ATIG29100 ATIG2420 ATIG05817 ATIG23440 ATIG255506 ATIG2740 ATIG7470 ATIG72755 ATIG72750 ATIG7400 ATIG7470 ATIG74270 ATIG72755 ATIG72760 ATIG7440 ATIG745810 ATIG58125
Chr1:29521104 Chr4:16102359 Chr1:28554395.5 Chr1:26476352.5 Chr1:2829395.7.5 Chr1:2829395.7.5 Chr1:2829395.7.5 Chr1:28209373 Chr3:28209373 Chr3:28202 Chr4:16167091 Chr4:74233 Chr4:16167091 Chr5:4735220 Chr5:4735220 Chr5:4735220 Chr5:4735220 Chr1:40205866 Chr1:899570 Chr1:402585.5 Chr3:10948840.5 Chr3:10948840.5 Chr3:10948840.5 Chr3:03076423.5 Chr3:03076423.5 Chr3:03076423.5 Chr3:03076423.5 Chr3:03076423.5 Chr3:03076423.5 Chr3:292120 Chr4:2505664 Chr1:40215924.5 Chr3:2924451.5 Chr3:2920468 Chr1:4321491.5 Chr3:2920468 Chr1:2738324.5 Chr1:252827.5 Chr1:252827	b), 139 Jan 116, 66334 116, 66334 116, 66334 116, 66334 116, 66334 105, 335235 83, 1075378 113, 506629 109, 942646 105, 857959 105, 857959 7, 3482074 122, 591262 124, 2591262 124, 2591262 124, 2591262 124, 257333 106, 147848 122, 473745 199, 92643 91, 86866455 199, 92643 191, 86866457 193, 921001 112, 44249 174, 8637257 134, 8637257 134, 8637257 134, 162532 135, 12532 134, 12532 134, 111066	1,31695117 0,957335 1,46230708 1,4915242 1,41240353 1,4124035 1,37886039 1,34692318 1,37886039 1,34584036 1,37882991 1,328443 1,58491252 0,97088109 1,40777659 1,43514786 1,5184386281 1,35147866 1,5183038 1,25145425 1,13478108 1,231478108 1,231478108 1,231478108 1,231478108 1,2314241 1,227052039 1,24944828 1,2349425 1,24944828 1,24949248 1,24949248 1,24949248 1,24949248 1,2494924 1,249494 1	0,28201362 0,43110907 0,44040282 0,41763052 0,42314248 0,42314248 0,42314248 0,44850235 0,44850235 0,44850235 0,44850235 0,43875696 0,43875696 0,43875697 0,44500384 0,457502 0,45181297 0,44009384 0,44009384 0,44207549 0,37211155 0,44009384 0,3427549 0,3970446 0,397041155 0,39005468 0,38652515 0,39688763 0,3985764 0,397285705 0,397285705 0,397285705 0,397285705 0,397285705 0,397285705 0,3	0,00034359 0,00035366 0,00035867 0,0003587 0,00035140 0,00035909 0,0004209 0,0004120 0,00041429 0,00041429 0,00041429 0,0004152 0,00044352 0,00044352 0,00044352 0,00044352 0,00044521 0,00045211 0,00045211 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,00045210 0,0005585 0,0005585 0,0005585 0,0005574	0,00322032 0,00322031 0,00328031 0,00332991 0,00361293 0,00361293 0,0036823 0,00368533 0,0037518 0,0037518 0,0037518 0,0037518 0,00384516 0,00396712 0,00396721 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00412561 0,00413787 0,00443785 0,00448872 0,00484872 0,00484872 0,00484872	ATG/0100 ATG/0110 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG20270 ATIG72000 ATIG20270 ATIG20280 ATZG22090 ATZG22088 AT2G30270 ATIG20280 ATZG2090 ATZG22088 ATIG35010 ATIG75020 ATIG30270 ATIG0580 ATIG05690 ATIG3560 ATIG0580 ATIG05690 ATIG3560 ATIG0580 ATIG05690 ATIG31710 ATIG13720 ATSG13730 ATIG41680 AT5G13720 ATSG13730 ATIG40505 ATIG40500 ATIG03590 ATIG03600 ATIG03610 ATIG40720 ATIG03590 ATIG03600 ATIG03610 ATIG40720 ATIG03590 ATIG03600 ATIG03610 ATIG2320 ATIG2730 ATIG27340 ATIG28500 ATIG28570 ATIG2380 ATIG26590 ATIG28570 ATIG28500 ATIG08640 ATIG28570 ATIG28500 ATIG09973 ATIG80440 ATIG28500 ATIG09817 ATIG2973 ATIG80440 ATIG2420 ATIG05817 ATIG2340 ATIG2420 ATIG05817 ATIG2340 ATIG2420 ATIG05817 ATIG2755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72820 ATIG686470
Chr1-29521104 Chr4-16102359 Chr1-26876332.5 Chr1-26876332.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr3-2665679.5 Chr2-167091 Chr4-16167091 Chr4-16167091 Chr4-16167091 Chr4-16167091 Chr4-16167091 Chr4-16167091 Chr4-1697860 Chr1-1004585.5 Chr3-1094840.5 Chr3-1094840.5 Chr3-1094885.5 Chr3-2921220 Chr4-189570 Chr3-204635.5 Chr3-2921420 Chr4-18055664 Chr3-209242.5 Chr3-2092463 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-293443.5 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-2934635 Chr3-293942 Chr3-25781732.5 Chr3-2182287 Chr3-1640836.5	116,66394 116,66394 116,66394 116,66394 116,65325 31075378 104,200498 113,506629 109,942646 105,857595 89,4489117 97,9343074 146,544133 76,582418 347,347972 100,354362 100,354362 19,858665 9,080757 76,6414265 193,021001 112,46342 128,55747 132,612522 131,612522 261,512184 111,1106 83,3838037	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,37886039 1,37886039 1,37886039 1,3788603 1,3788603 1,3788613 1,3454206 1,378842 1,34544206 1,34544206 1,34544206 1,34544206 1,3514400 1,35144000 1,3514400	0,28201362 0,43110907 0,44040282 0,41406325 0,42318478 0,41083818 0,41090437 0,44850235 0,44850235 0,44850235 0,44850235 0,4485042 0,447509028 0,447509028 0,447509028 0,447509028 0,447509028 0,44751042 0,40568118 0,44576038 0,4457409384 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3427549 0,3425542 0,3956763 0,3956763	0,00034359 0,00035360 0,00035367 0,00035987 0,00049209 0,00040209 0,00040209 0,0004128 0,0004148 0,0004149 0,00041452 0,0004439 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044521 0,00045588 0,00045588 0,00045588 0,00045581 0,00045582 0,00055327 0,00055327 0,0005527 0,0005527 0,0005527 0,0005527 0,0005527	0,0032042 0,0032803 0,0032803 0,0032803 0,00361291 0,00361291 0,00361293 0,0036533 0,0037263 0,0037518 0,0037518 0,00378119 0,0038482 0,00384816 0,0038671 0,0039671 0,0039671 0,00397372 0,00406168 0,00412561 0,00412561 0,0044787 0,00448353 0,00488562 0,00484562 0,00502529 0,00506159	ATG0100 ATG02010 ATG02070 ATG202080 ATG02070 ATG202080 ATG05020 ATG075020 ATG050280 ATG01545 AT5G08290 ATG05680 ATG03560 ATG03660 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG07070	ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG22020 ATIG70300 ATIG22020 ATIG202080 AT2G22090 AT2G22088 ATZG30220 ATIG10090 ATIG10095 ATIG5050 ATIG20280 ATSG01545 ATSG08290 AT5G08300 ATIG5057 ATIG05680 ATIG05690 ATIG3505 ATIG3560 ATIG05690 ATSG14580 ATSG14690 ATSG14580 ATSG14690 ATSG14580 ATIG13720 ATSG13730 ATIG44000 ATIG14290 ATIG03600 ATIG03610 ATIG2320 ATIG27300 ATIG27340 AT3G05605 ATIG2850 ATIG22300 ATIG2550 ATIG2850 ATIG22580 ATIG25590 ATIG2850 ATIG2850 ATIG25590 ATIG2850 ATIG28580 ATIG25590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG2973 ATIG80440 ATIG2850 ATIG28580 ATIG2973 ATIG9973 ATIG80440 ATIG2850 ATIG69817 ATIG23440 ATIG2850 ATIG69817 ATIG2940 ATIG2740 ATIG672750 ATIG72755 ATIG72760 ATIG7440 ATIG68210 ATIG74480 ATIG58200 ATIG68210 ATIG58215 ATIG95500 ATIG68510 ATIG95550 ATSG05560
Chr1:29521104 Chr1:205254395.5 Chr1:26476352.5 Chr1:26476352.5 Chr1:289395.7 Chr1:289395.7 Chr1:289395.7 Chr1:293093 Chr5:2656579.5 Chr1:20128 Chr4:16167091 Chr4:744233 Chr5:473220 Chr5:474237 Chr5:47426705.5 Chr1:470548 Chr1:899570 Chr1:4942820 Chr1:4042686 Chr1:899570 Chr1:4042820 Chr1:4042685.5 Chr3:2921220 Chr3:4042635 Chr1:30239224.5 Chr3:2921220 Chr3:42110.5 Chr3:2921220 Chr3:421491.5 Chr3:29224.5 Chr3:292122 Chr3:421491.5 Chr3:29228.5 Chr4:42570564 Chr1:30239224.5 Chr3:29290468 Chr1:3023924.5 Chr3:2920468 Chr1:3023924.5 Chr3:2929042 Chr3:253287 Chr3:55287 Chr3:104685.5 Chr1:2564120	116,66394 116,66394 116,66394 116,66394 116,66394 116,65394 116,6394 105,335235 3,1075378 113,506629 109,942646 105,857959 105,857959 80,4489117 97,3943074 12,591262 146,544133 76,582418 100,354362 109,326435 109,326435 109,326435 19,806457 19,82643 19,866645 19,8060757 112,44264 112,44264 124,855747 13,605259 13,612532 261,512144 11,1096 83,3838037 92,3524785	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,41240353 1,37886039 1,337886039 1,337886039 1,3328433 1,3328433 1,3328433 1,3328433 1,3328433 1,3328433 1,3328433 1,34574805 1,245744325 1,245744305 1,22457445 1,2245745 1,2245745 1,2245745 1,2245757 1,2245	0,28201362 0,43110907 0,44040282 0,41763052 0,4201428 0,41083818 0,40190437 0,44850235 0,44850235 0,44850235 0,44850235 0,44850235 0,447509028 0,4125101 0,43853492 0,4450938 0,451827 0,4668118 0,45781297 0,46068118 0,45781297 0,44009384 0,3427549 0,3905468 0,38968763 0,390598763 0,390598763 0,39285704 0,37285704 0,3728570570570570570570	0,00034359 0,00034359 0,00035360 0,00035387 0,00035387 0,00035387 0,0004209 0,0004209 0,0004120 0,00041429 0,00041429 0,00041429 0,0004152 0,0004437 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,0004521 0,0004521 0,0004521 0,0004521 0,0005528 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005527 0,0005527 0,0005527 0,0005527	0,0032203 0,0032203 0,0032203 0,0032203 0,0036123 0,0036123 0,0036533 0,00375218 0,0037698 0,0037618 0,0037618 0,0037618 0,00384516 0,0039671 0,0039671 0,0039671 0,0039732 0,0039732 0,00401825 0,0041325 0,0041325 0,00443727 0,00443727 0,00443727 0,00443727 0,00443727 0,00443726 0,00448472 0,00448472 0,00484872 0,00484872 0,00453240 0,00453240 0,00453240 0,00453240 0,00453240 0,00453240 0,0053240 0,00513240	ATG90100 ATG90100 ATG90100 ATG90095 ATG90100 ATG90095 ATG90200 ATG90095 ATG90200 ATG90095 ATG90200 ATG900000000000000000	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG220200 ATIG22090 AT2G22090 AT2G22088 AT2G30200 ATIG22080 AT2G22090 AT2G22088 AT2G30200 ATIG22080 AT2G2090 AT2G2088 ATG30220 ATIG2080 ATIG05690 ATIG30500 ATIG05800 ATIG05690 ATIG33500 ATIG05800 ATIG05690 ATIG33500 ATIG05800 ATIG05690 ATIG33500 ATIG05800 ATIG03610 ATIG33500 ATIG03600 ATIG03610 ATIG4000 ATIG03590 ATIG03600 ATIG03610 ATIG27320 ATIG27300 ATIG27340 AT3G04555 ATIG08030 ATIG28570 ATIG28580 ATIG25590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG28570 ATIG28580 ATIG28590 ATIG2820 ATIG63817 ATIG23440 ATIG2420 ATIG68173 ATIG23440 ATIG2420 ATIG6817 ATIG2755 ATIG72750 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72840 ATIG68450 ATIG28200 ATIG68450 ATIG28200 ATIG68450 ATIG28200 ATIG68450 ATIG28200 ATIG68450 ATIG27200 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72750 ATIG72750 ATIG72740 ATIG72750 ATIG72750 ATIG72740 ATIG72750 ATIG72750 ATIG7270 ATIG72700 ATIG72750 ATIG72750 ATIG7270 ATIG72700 ATIG72750 ATIG72750 ATIG7270 ATIG72700 ATIG72700 ATIG72700 ATIG72700 ATIG72700 ATIG
Chr1-29521104 Chr4-16102359 Chr1-2854395.5 Chr1-26476352.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr5-265679.5 Chr1-10705128 Chr4-16167091 Chr4-74223 Chr5-47220 Chr5-47220 Chr5-47220 Chr5-47220 Chr5-47220 Chr3-0949840.5 Chr1-30976423.5 Chr3-0949840.5 Chr1-30976423.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-0949840.5 Chr3-20592120 Chr4-16505664 Chr3-205921425 Chr3-205921425 Chr3-2054051.5 Chr3-206171 Chr4-255928.5 Chr3-2054041.5 Chr3-2059042 Chr1-2798042 Chr3-1640836.5 Chr3-2784723.5 Chr3-1640836.5 Chr3-2644120 Chr3-2644120 Chr3-2644120 Chr3-2644120 Chr3-2644120 Chr3-284100	116,66394 116,66394 116,66394 116,66394 116,66394 116,6325 31075378 104,200498 113,506629 109,942646 105,857595 89,4489117 77,943074 146,544133 76,582418 347,347972 100,354362 100,354362 100,354362 100,354362 109,92643 19,826665 19,02001 171,263394 141,86372 76,6414265 193,021001 112,427366 12,855747 131,612522 131,612522 131,612522 131,612522 131,612522 131,612522 131,612522 131,612522 131,612522 131,612522 131,612523 134,612523 109,725131 109,775131	1,31695117 0,957335 1,46230708 1,41240353 1,41240353 1,41240353 1,41240353 1,37886039 1,37886039 1,3788603 1,3788603 1,3788603 1,378804 1,378804 1,378804 1,378474 1,3818628 1,35147806 1,5183038 1,4574804 1,35147806 1,5183038 1,4574804 1,2505478 1,25054786 1,2505478	0,28201362 0,43110907 0,44040282 0,41263052 0,42318478 0,41083818 0,41090437 0,41852835 0,42876696 0,41251091 0,3875661 0,3875661 0,3875661 0,3875661 0,4275092 0,47509028 0,47509028 0,47509028 0,47509028 0,4751042 0,4658713 0,3425749 0,39370404 0,39370404 0,39370404 0,39356245 0,39356245 0,39356245 0,39356245 0,39392044 0,3735674 0,3735674 0,3735674 0,3935024 0,40654712 0,40655733 0,40656733	0,00034359 0,00034359 0,00035360 0,00035987 0,00039509 0,0004209 0,0004209 0,0004128 0,0004128 0,0004148 0,0004152 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,00045588 0,00045512 0,00045512 0,00045512 0,00045512 0,0005527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055527 0,00055555 0,00055527 0,00055555 0,00055555 0,00055555 0,00055	0,0032042 0,0032803 0,0032803 0,0032803 0,00361291 0,00361291 0,00361293 0,0036853 0,0037263 0,0037819 0,0037819 0,00384510 0,00384510 0,00384510 0,00384510 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,0041785 0,00412561 0,00412561 0,0044780 0,0044780 0,0044784 0,00448353 0,00448472 0,004562 0,0052420 0,0052420 0,0052420 0,0052420	ATG0100 ATG02010 ATG02070 ATG202080 ATG02070 ATG0205 ATG508280 ATG01045 ATG08280 ATG01045 ATG08280 ATG01545 AT5G08290 ATG05680 ATG03505 ATG33660 ATG01720 ATG03605 ATG33660 ATG01720 ATG014000 ATG01720 ATG014000 ATG01720 ATG01720 ATG01720 ATG01720 ATG01720 ATG02850 ATG02800 ATG02850 ATG02800 ATG02850 ATG02800 ATG02850 ATG02800 ATG02850 ATG02800 ATG02850 ATG02800 ATG7470 ATG69800 ATG69800 ATG02850 ATG02850 ATG02820 ATG02850 ATG02820 ATG02850 ATG02820 A	ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG20270 ATIG70300 ATIG20270 ATIG202080 AT2G2090 AT2G2088 ATZG30220 ATIG10095 ATIG70200 ATIG0507 ATIG0580 ATIG05600 ATIG0507 ATIG0580 ATIG05600 ATIG0567 ATIG0580 ATIG05600 ATIG03509 ATIG05800 ATIG05600 ATIG1720 AT5G14680 AT5G14690 ATIG1720 ATIG1720 AT5G13730 ATIG44000 ATIG1720 ATIG103600 ATIG03610 ATIG2320 ATIG2730 ATIG27340 ATIG4000 ATIG2320 ATIG2730 ATIG27340 ATIG80830 ATIG80830 ATIG05455 ATIG06460 ATIG06480 ATIG28570 ATIG28580 ATIG28590 ATIG80830 ATIG80450 ATIG05817 ATIG2850 ATIG80400 ATIG09817 ATIG06480 ATIG8050 ATIG09817 ATIG2840 ATIG8050 ATIG09817 ATIG2840 ATIG80400 ATIG09817 ATIG2840 ATIG80400 ATIG09817 ATIG2970 ATIG9720 ATIG72750 ATIG72755 ATIG72750 ATIG7270 ATIG72750 ATIG72755 ATIG72750 ATIG7270 ATIG68210 ATIG82150 ATIG7270 ATIG68210 ATIG8250 ATIG72750 ATIG68210 ATIG8250 ATIG72750 ATIG68210 ATIG72750 ATIG72750 ATIG68210 ATIG8250 ATIG72750 ATIG6850 ATIG850 ATIG6850 ATIG5850 ATIG6850 ATIG5850 ATIG6850 ATIG5850 ATIG6850 ATIG8850 ATIG6850 ATIG5850 ATIG6850 ATIG5850 ATIG6850 ATIG5820 ATIG6850 ATIG5850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG6850 ATIG7850 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7880 ATIG7850 ATIG7850 ATIG7850 ATIG9850 ATIG9850 ATIG9850 ATIG9850 ATIG9850 ATIG9850 ATIG7850 ATIG7850 ATIG7850 ATIG880 ATIG7850 ATIG880 ATIG7850 ATIG880 ATIG7850 ATIG7850 ATIG7850 ATIG9850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG7850 ATIG9850 ATIG9850 ATIG7850 ATIG
Chr1:29521104 Chr1:201239 Chr1:26476352.5 Chr1:26476352.5 Chr1:289395.5 Chr1:289395.7 Chr1:289395.7 Chr1:289395.7 Chr1:280393 Chr5:265679.5 Chr1:20128 Chr4:16167091 Chr4:744233 Chr5:473220 Chr5:473220 Chr5:473220 Chr5:473220 Chr5:473220 Chr5:499570 Chr1:4004686 Chr1:899570 Chr1:4004686 Chr1:899570 Chr1:404686 Chr1:80376423.5 Chr3:094840.5 Chr1:30376423.5 Chr3:0942825 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094840.5 Chr3:094843.5 Chr3:292424.5 Chr3:292428.5 Chr4:2552825.5 Chr4:2552827 Chr3:255287 Chr3:264120 Chr3:2683.5 Chr3:298140.5 Chr3	116,66394 116,66394 116,66394 116,66394 116,66394 116,63925 105,335255 31,075378 104,200498 113,506629 109,942646 105,857999 105,857999 86,4303976 89,4489117 97,3943074 125,91262 146,544133 76,522418 100,354362 122,473745 109,32643 19,8686635 19,8686635 19,3021001 112,44264 112,457474 83,2085259 13,612532 261,512144 111,1096 83,338037 83,388037 109,775131 109,375431 109,3254751	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,41240353 1,34592318 1,34592316 1,3459230 1,3459240 1,332843 1,34544933 1,34674804 1,34674804 1,34674804 1,3414806 1,245144804 1,24514804 1,245	0,28201362 0,43110907 0,44040282 0,41763052 0,42314278 0,41083818 0,40190437 0,44850235 0,42850235 0,44850235 0,44850235 0,447509028 0,41751042 0,4759028 0,45171042 0,4051827 0,4051827 0,4050844 0,427549 0,3905466 0,38959876 0,39059466 0,39598763 0,39598763 0,39598763 0,39598763 0,39587674 0,37281522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,37285773 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,39587674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,395987674 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3958774 0,3728522 0,3959876 0,3728522 0,3959774 0,3728522 0,3959876 0,3728522 0,3959876 0,3728522 0,3959876 0,3958876 0,49598766 0,495987	0,00034359 0,00035367 0,00035367 0,00035387 0,00035387 0,00035387 0,0004209 0,0004209 0,0004120 0,00041429 0,00041429 0,0004152 0,0004152 0,0004437 0,00044352 0,00044352 0,00044352 0,00044352 0,00044352 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0005585 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005577 0,0005787 0,0005787	0,0032042 0,0032203 0,0032203 0,0032291 0,00361297 0,0036823 0,0036823 0,0036823 0,0037518 0,0037698 0,0037819 0,0037819 0,0037819 0,00384516 0,0039671 0,0039671 0,0039671 0,0039732 0,0039732 0,00412561 0,0041325 0,0041325 0,00443747 0,00443747 0,004437478 0,00448472 0,0048472	ATG90100 ATG90100 ATG90100 ATG90095 ATG90100 ATG90095 ATG90200 ATG90095 ATG90200 ATG90095 ATG90200 ATG90095 ATG90200 ATG90000 ATG90200 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG900 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG900 ATG9000 ATG900 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG9000 ATG90000 ATG9000 ATG9000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG9000 ATG90000 ATG90000 ATG90000 ATG90000 ATG90000000 ATG90000000 ATG90000000 ATG9000000000 ATG9000000000000000000000000000000000000	ATIG76090 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG220200 ATIG22090 AT2G22090 AT2G22088 AT2G2200 ATIG22080 AT2G22090 AT2G22088 AT2G30200 ATIG22080 AT2G2090 AT2G2088 ATG30220 ATIG2080 ATG05690 ATIG30500 ATIG05800 ATIG05690 ATIG3350 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14680 AT5G14220 AT5G13730 AT5G14680 AT5G13720 AT5G13730 ATIG3590 ATIG03600 ATIG03610 ATIG3590 ATIG03600 ATIG03610 ATIG27320 ATIG27300 ATIG27340 AT3G05650 ATIG28570 ATIG28580 ATIG25590 ATIG28570 ATIG28580 ATIG2550 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG28590 ATIG2850 ATIG28580 ATIG29570 ATIG09973 ATIG80440 ATIG23420 ATIG05817 ATIG29440 ATIG23420 ATIG05817 ATIG2755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG72750 ATIG72755 ATIG72760 ATIG72740 ATIG68450 ATIG28500 ATIG68450 ATIG72740 ATIG678450 ATIG28500 ATIG68570 ATIG58500 ATIG68570 ATIG78860 ATIG68500 ATIG68570 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78850 ATIG88500 ATIG88500 ATIG88500 ATIG68570 ATIG78860 ATIG78860 ATIG78860 ATIG78860 ATIG78850 ATIG780 ATIG780 ATIG780 ATIG780 ATIG780 ATIG780 ATIG8850 ATIG
Chr1-29521104 Chr4-16102359 Chr1-26476352.5 Chr1-26476352.5 Chr2-9386505 Chr2-12893957.5 Chr2-12893957.5 Chr2-12893957.5 Chr2-12870933 Chr5-265679.5 Chr1-1705128 Chr4-16167091 Chr4-16167091 Chr4-1428702 Chr5-4735220 Chr5-4735220 Chr5-4735220 Chr1-1004585.5 Chr1-3094840.5 Chr1-3094840.5 Chr1-3094840.5 Chr1-3094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-094840.5 Chr3-2094840.5 Chr3-2094840.5 Chr3-2094840.5 Chr3-2094840.5 Chr3-209482.5 Chr3-209402 Chr3-258224.5 Chr3-2682324.5 Chr3-27837324.5 Chr3-26824120 Chr3-26824120 Chr3-2684120 Chr3-2684120 Chr3-2684120 Chr3-2684120 Chr3-2684420	Day, 129 year Day, 129 year Dis, 259 year Dis, 250 year	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,3286039 1,34692318 1,5030789 1,34692318 1,5030789 1,3786039 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,35147806 1,5183038 1,4574804 1,35147806 1,5183038 1,4574804 1,25050786 1,25	0.28201362 0.43110907 0.44040282 0.41763052 0.42318478 0.41083818 0.40190437 0.41083818 0.42876696 0.41251091 0.38756631 0.38756631 0.382562 0.41571042 0.47590028 0.41571042 0.43853892 0.41571042 0.40658118 0.3427549 0.3427549 0.327549 0.327549 0.327549 0.3282525 0.3888763 0.3937044 0.3938764 0.3938764 0.39356764 0.37956704 0.37	0,00034359 0,00034359 0,00035360 0,00035987 0,00039509 0,0004209 0,0004120 0,0004120 0,0004120 0,0004142 0,0004152 0,0004430 0,0004430 0,0004430 0,0004430 0,0004432 0,0004432 0,0004432 0,000443588 0,00045588 0,00045588 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,00045510 0,0005517 0,0005527 0,0005527 0,0005527 0,0005578 0,0005778 0,0005778 0,0005778	0,0032042 0,0032803 0,0032803 0,0032803 0,00361297 0,00361297 0,00361297 0,0036853 0,0037813 0,0037819 0,0037819 0,0037812 0,00384516 0,00384516 0,00397372 0,00384516 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00397372 0,00412561 0,00412561 0,00413281 0,0044787 0,0044787 0,00448353 0,00448353 0,00524520 0,00524524 0,00524524	ATG0100 ATG02010 ATG02070 ATG202080 ATG02070 ATG02080 ATG05020 ATG075020 ATG058080 ATG01545 ATG608290 ATG058680 ATG03850 ATG33660 ATG01720 ATG14630 ATG33660 ATG01720 ATG14690 ATG01720 ATG16370 ATG60700 ATG7320 ATG2730 ATG608400 ATG0730 ATG608400 ATG09400 ATG2850 ATG609400 ATG09967 ATG09973 ATG609400 ATG09967 ATG09973 ATG609400 ATG09967 ATG09973 ATG609400 ATG60950 ATG672750 ATG7750 ATG72755 ATG67240 ATG72750 ATG72755 ATG7470 ATG68800 ATG68800 ATG69850 ATG68520 ATG69850 ATG60557 ATG67850 ATG09557 ATG678570 ATG75450 ATG05957 ATG67840 ATG69570 ATG678570 ATG678570 ATG76450 ATG09557 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG678570 ATG67870 ATG67870 ATG67870 ATG678570 ATG67870 ATG678570 ATG67870 ATG678570 ATG67870 ATG67870 ATG678570 ATG678570 ATG67870 ATG67870 ATG678570 ATG67870 ATG678570 ATG67870 ATG67870 ATG67870 ATG67870 ATG67870 ATG67870 ATG67870 ATG67870 ATG67870 ATG78400	ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG20200 ATIG70300 ATIG20200 ATIG202080 AT2G2090 AT2G2088 ATG30220 ATIG10095 ATIG70200 ATIG09057 ATIG0580 ATIG05690 ATIG05057 ATIG0580 ATIG05690 ATIG0567 ATIG0580 ATIG05690 ATIG31710 ATIG7100580 ATIG05690 ATIG31710 ATIG7100580 ATIG05690 ATIG14680 ATIG05800 ATIG14680 ATIG14690 ATIG1720 ATIG14680 ATIG14600 ATIG1720 ATIG03600 ATIG03610 ATIG1720 ATIG07300 ATIG03610 ATIG27320 ATIG27330 ATIG27340 ATIG80830 ATIG80830 ATIG80830 ATIG80830 ATIG28570 ATIG27330 ATIG27340 ATIG28580 ATIG25590 ATIG80830 ATIG80830 ATIG28570 ATIG28580 ATIG25590 ATIG80400 ATIG09400 ATG09410 ATIG2550 ATIG05817 ATIG2580 ATIG80840 ATIG05810 ATIG09817 ATIG09973 ATIG80440 ATIG28520 ATIG05817 ATIG27440 ATIG2720 ATIG72550 ATIG72755 ATIG72760 ATIG7240 ATIG67230 ATIG58215 ATIG78400 ATIG68210 ATIG58215 ATIG7850 ATIG6820 ATIG58510 ATIG7850 ATIG68520 ATIG5950 ATIG7850 ATIG68520 ATIG5950 ATIG7850 ATIG68520 ATIG7860 ATIG7850 ATIG7860 ATIG7850 ATIG7860 ATIG7860 ATIG7850 ATIG7850 ATIG7840 ATIG7850 ATIG7860 ATIG7860 ATIG68527 ATIG7860 ATIG69572 ATIG69807 ATIG69605 ATIG690 ATIG7700
Chr1:29521104 Chr1:2052921104 Chr1:2052921104 Chr1:205292955 Chr1:28554395.5 Chr1:2893957.5 Chr1:2893957.5 Chr1:2893957.5 Chr1:293033 Chr5:2656579.5 Chr1:20128 Chr4:16167091 Chr5:473220 Chr5:4426705.5 Chr1:20128 Chr4:1670986 Chr1:399570 Chr1:9492825 Chr1:30376423.5 Chr1:2738324.5 Chr1:2738324.5 Chr1:255287 Chr1:255287 Chr1:2644120 Chr1:27819071 Chr1:261660 Chr1:709261.5 Chr1:2781197 Chr1:261660 Chr1:709261.5 Chr2:26147.5	116,66394 116,66394 116,66394 116,66394 116,66394 116,66394 116,6394 116,6394 105,335235 31,075378 109,942464 105,857999 86,4303976 89,4489117 97,3943074 76,522418 37,347972 100,354362 100,354362 122,473745 109,32643 19,3686645 19,3626645 19,3021001 112,44249 112,44249 112,455374 83,3880375 13,65252 13,395259 13,65252 13,384837 13,39435259 13,383037 13,384837 9,3394333 109,775131 109,375431 109,375431 111,445175	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,41240353 1,37886039 1,37886039 1,34786039 1,34786039 1,3478603 1,3478603 1,3458403 1,3458403 1,3458403 1,3458403 1,3458403 1,3458403 1,3458403 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,2459428 1,3455427 1,3554537 1,355557 1,355557 1,355577 1,355577 1,355577 1,355577 1,355577 1,355577 1,355577 1,355577 1,355577 1,355577 1,3555777 1,3555777 1,3555777 1,35557777777777777777777777777777777777	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41083818 0,40190437 0,44850235 0,42857656 0,44850235 0,44850235 0,44850235 0,447509028 0,447509028 0,447509028 0,4450938 0,4450938 0,4450938 0,3420145 0,44009384 0,3420145 0,34507439 0,3905466 0,385655 0,4450938 0,39598763 0,3958764 0,3728552 0,4450733 0,455773 0,4256773 0,463975674 0,43095713 0,4256773 0,4265773 0,4309574	0,00034359 0,00034359 0,00035360 0,00035387 0,0003530 0,0003509 0,0004020 0,0004120 0,00041429 0,00041429 0,00041429 0,00041429 0,00044320 0,00044109 0,0004430 0,0004430 0,0004430 0,0004430 0,0004430 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0004521 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005552 0,0005574 0,0005774 0,000578 0,000578 0,000578	0,0032042 0,0032203 0,0032203 0,0032203 0,0036129 0,0036129 0,0036823 0,0036823 0,0037518 0,0037618 0,0037618 0,0037618 0,0037618 0,0038410 0,00384510 0,0039671 0,0039671 0,0039671 0,0039671 0,0039732 0,0039732 0,0039732 0,0039732 0,0039732 0,0039732 0,0041325 0,0041325 0,0041325 0,0044872 0,0044872 0,0048872 0,0054872 0,005	ATG/0100 ATG/0110 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/0095 ATG/0100 ATG/01095 ATG/0100 ATG/0100 ATG/0100 ATG	ATIG7609 ATIG76100 ATIG76110 ATIG70290 ATIG73000 ATIG70290 ATIG73000 ATIG220200 ATIG22090 AT2G22090 AT2G22088 AT2G2200 ATIG22080 AT2G22090 AT2G22088 AT2G30200 ATIG22080 AT2G22090 AT2G088300 ATIG30270 ATG608280 AT3G05690 ATIG33500 ATIG505690 ATIG33500 ATIG05800 ATIG05690 ATIG3350 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14880 AT5G13220 AT5G13730 ATIG3120 AT5G13220 AT3G13730 ATIG3120 AT5G13220 ATIG27300 ATIG3290 ATIG03600 ATIG03610 ATIG27320 ATIG27300 ATIG03610 ATIG27320 ATIG27300 ATIG27400 AT3G05605 ATIG80830 ATIG28570 ATIG2880 ATIG28590 AT5G09400 AT5G09410 ATIG23550 ATIG2880 ATIG28590 ATIG29300 ATIG0950 ATIG09967 ATIG09973 ATIG80440 ATIG23420 ATIG05817 ATIG2940 ATIG23420 ATIG05817 ATIG2940 ATIG23420 ATIG05817 ATIG2956 ATIG9755 ATIG80440 ATIG23420 ATIG69430 ATIG23420 ATIG69430 ATIG23420 ATIG7440 ATIG72755 ATIG72756 ATIG72740 ATIG742750 ATIG72755 ATIG72760 ATIG72740 ATIG74850 ATIG72740 ATIG78800 ATIG7850 ATIG68570 ATIG7850 ATIG68570 ATIG7850 ATIG68570 ATIG7850 ATIG68570 ATIG7850 ATIG69557 ATIG6950 ATIG69570 ATIG69570 ATIG05557 ATIG6950 ATIG69570 ATIG69570 ATIG09575 ATIG05750 ATIG69570 ATIG05550 ATIG69570 ATIG69570 ATIG05557 ATIG69570 ATIG75570 ATIG75570 ATIG75570 ATIG75570 ATIG75570 ATIG75700 ATIG7570 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG75700 ATIG7570 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG75700 ATIG7570 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG7570 ATIG7570 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG75700 ATIG7570 ATIG7550 ATIG7550 ATIG7550 ATIG7550 ATIG75700 ATIG7570 ATIG7550 ATIG75700 ATIG7550 ATIG75700 ATIG7570 ATIG7570 ATIG75700 ATIG7550 ATIG7570
Chr1-29521104 Chr4-16102359 Chr1-245476352.5 Chr1-245476352.5 Chr2-3986505 Chr2-12893957.5 Chr2-3286505 Chr2-32865079.5 Chr1-20128 Chr4-16167091 Chr4-744233 Chr4-16167091 Chr4-744233 Chr5-4735220 Chr5-4735220 Chr5-4735220 Chr1-1004585.5 Chr1-309376423.5 Chr1-309376423.5 Chr1-309376423.5 Chr1-309376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-0376423.5 Chr3-2934635 Chr1-29384150.5 Chr3-2934635 Chr1-23781732.5 Chr3-2781742.5 Chr3-2781742.5 Chr3-25827 Chr3-264686 Chr3-238324.5 Chr3-25827 Chr3-264686 Chr3-26421420 Chr3-264686 Chr3-2781725.5 Chr3-296171 Chr3-264686 Chr3-2781725.5 Chr3-2781725.5 Chr3-296171 Chr3-264686 Chr3-2781725.5 Chr3-2781725.5 Chr3-2781725.5 Chr3-29645147.5 Chr3-2645147.5 Chr3-2781725.5 Chr3-278	b), 150, 393 116, 66394 116, 66394 116, 66394 116, 66394 116, 66394 116, 5, 335235 31, 075378 104, 200498 113, 506629 109, 942646 105, 857595 89, 4489117 97, 3943007 132, 591262 146, 544133 165, 82418 347, 347927 100, 344362 120, 25733 106, 147484 121, 257133 106, 147484 109, 26433 91, 3686663 199, 22403 112, 42634 112, 42634 114, 86372 76, 6414255 139, 021001 114, 86372 83, 20852592 131, 612525 131, 612525 131, 612525 131, 612525 131, 612525 131, 612525 131, 612525 131, 612525 131, 612525 133, 3433037 <td>1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,3786039 1,3786039 1,3786039 1,3786039 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,2956142 1,2814933 1,35147806 1,2814933 1,35147806 1,2814933 1,35147806 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2192714 1,2971822 1,2192714 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1</td> <td>0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41090437 0,44850235 0,42876696 0,41251091 0,3875661 0,3875661 0,3875661 0,3875671 0,4292082 0,41571042 0,47590028 0,47590028 0,47590028 0,47590028 0,47590028 0,4759012 0,46190003 0,3987630 0,39005466 0,39005466 0,39905470 0,37956704 0,37956704 0,37956704 0,37956704 0,37956704 0,37956704 0,37956703 0,3995713 0,40055713 0,40055713 0,40055713</td> <td>0,00034359 0,00034359 0,00035360 0,00035387 0,00035387 0,00035387 0,00035387 0,0004209 0,0004120 0,0004132 0,0004132 0,0004132 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,00045327 0,00055127 0,00055127 0,00055127 0,0005578 0,0005578 0,000578 0,000578 0,000578</td> <td>0,0032042 0,0032803 0,0032803 0,00361291 0,00361291 0,00361291 0,00361293 0,0036833 0,0037263 0,00378119 0,00378119 0,00378119 0,0038816 0,0038816 0,00388516 0,00388516 0,00397372 0,00412561 0,0044872 0,00484872 0,00484872 0,00484872 0,00484872 0,00521240 0,00512440 0,0051240 0,00512564 0,0052564</td> <td>ATG0100 ATG0200 ATG202070 AT2G22080 ATG01090 ATG01095 ATG08280 ATG01545 AT5G08290 ATG05880 ATG05880 ATG03645 AT5G08290 ATG05880 ATG03805 ATG33660 ATG01720 ATG64800 ATG01720 ATG64800 ATG01720 ATG64800 ATG01720 ATG64800 ATG0720 ATG69400 ATG27320 ATG27330 ATG80830 ATG69400 ATG0730 ATG69400 ATG27320 ATG2730 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG67400 ATG7740 ATG7740 ATG7740 ATG68570 ATG68800 ATG67850 ATG67840 ATG68570 ATG68800 ATG67840 ATG68570 ATG68570 ATG68570 ATG68400 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG78400 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68600 ATG67800 ATG67800 ATG67800 ATG68570 ATG68600 ATG78600 ATG78600 ATG78600 ATG78600 ATG78600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68000 ATG7870 ATG6800 ATG7870 ATG6800 ATG7870</td> <td>ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG22020 ATIG202080 AT2G22090 AT2G22088 ATG30220 ATIG10090 ATIG70200 ATIG0907 ATIG20280 ATSG01545 AT5G08290 AT5G08300 ATIG5010 ATIG75020 ATIG05807 ATIG0580 ATIG05690 ATIG33650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G14690 AT5G14580 AT5G14690 ATIG3270 ATIG7230 ATG13730 ATIG44000 ATIG3230 ATIG03600 ATIG03610 ATIG2320 ATIG27330 ATIG27340 AT3G05605 ATIG80830 ATIG80830 ATIG28570 ATIG22330 ATIG27340 AT3G05605 ATIG80830 ATIG80830 ATIG28570 ATIG25580 ATG25590 ATIG80420 ATIG80430 ATIG25590 ATIG80420 ATIG80430 ATIG0967 ATIG0973 ATIG80440 AT3G4555 AT3G04460 ATIG2540 ATIG28580 ATIG52340 ATIG28580 ATIG58210 ATIG28420 ATIG68430 ATIG2740 ATIG28420 ATIG80430 ATIG2740 ATIG80420 ATIG80430 ATIG2740 ATIG80420 ATIG80430 ATIG2750 ATIG80420 ATIG83230 ATIG2850 ATIG68420 ATIG72750 ATIG2740 ATIG7440 ATIG68420 ATIG72750 ATIG2740 ATIG7440 ATIG68420 ATIG72750 ATIG72755 ATIG72760 ATIG74460 ATIG7850 ATIG72550 ATIG72755 ATIG72760 ATIG7840 ATIG68510 ATIG78510 ATIG7840 ATIG685210 ATIG7840 ATIG685210 ATIG7840 ATIG685210 ATIG7840 ATIG7850 ATIG7850 ATIG68520 ATIG7850 ATIG68520 ATIG7850 ATIG69557 ATIG69570 ATIG85210 ATIG69570 ATIG7440 ATIG69570 ATIG78500 ATIG6950 ATIG69500 ATIG69500 ATIG7500 ATIG7700 ATIG64500 ATIG69500 ATIG69500 ATIG6900 ATIG6700 ATIG69700 ATIG74009757 ATIG9900 ATIG6900 ATIG6900 ATIG7700 ATIG67400 ATIG6910 ATIG6910 ATIG6900 ATIG6900 ATIG6900 ATIG7700 ATIG6400 ATIG64100 ATIG6900 ATIG7800 ATIG7800 ATIG69500 ATIG6900 ATIG7700 ATIG7800 ATIG69500 ATIG6900 A</td>	1,31695117 0,957335 1,46230708 1,46230708 1,41240353 1,41240353 1,41240353 1,3786039 1,3786039 1,3786039 1,3786039 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,378603 1,2956142 1,2814933 1,35147806 1,2814933 1,35147806 1,2814933 1,35147806 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2814933 1,29561425 1,2192714 1,2971822 1,2192714 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1,21927214 1,2971982 1	0,28201362 0,43110907 0,44040282 0,41763052 0,42318478 0,41090437 0,44850235 0,42876696 0,41251091 0,3875661 0,3875661 0,3875661 0,3875671 0,4292082 0,41571042 0,47590028 0,47590028 0,47590028 0,47590028 0,47590028 0,4759012 0,46190003 0,3987630 0,39005466 0,39005466 0,39905470 0,37956704 0,37956704 0,37956704 0,37956704 0,37956704 0,37956704 0,37956703 0,3995713 0,40055713 0,40055713 0,40055713	0,00034359 0,00034359 0,00035360 0,00035387 0,00035387 0,00035387 0,00035387 0,0004209 0,0004120 0,0004132 0,0004132 0,0004132 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,0004432 0,00045327 0,00055127 0,00055127 0,00055127 0,0005578 0,0005578 0,000578 0,000578 0,000578	0,0032042 0,0032803 0,0032803 0,00361291 0,00361291 0,00361291 0,00361293 0,0036833 0,0037263 0,00378119 0,00378119 0,00378119 0,0038816 0,0038816 0,00388516 0,00388516 0,00397372 0,00412561 0,0044872 0,00484872 0,00484872 0,00484872 0,00484872 0,00521240 0,00512440 0,0051240 0,00512564 0,0052564	ATG0100 ATG0200 ATG202070 AT2G22080 ATG01090 ATG01095 ATG08280 ATG01545 AT5G08290 ATG05880 ATG05880 ATG03645 AT5G08290 ATG05880 ATG03805 ATG33660 ATG01720 ATG64800 ATG01720 ATG64800 ATG01720 ATG64800 ATG01720 ATG64800 ATG0720 ATG69400 ATG27320 ATG27330 ATG80830 ATG69400 ATG0730 ATG69400 ATG27320 ATG2730 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG69400 ATG67400 ATG7740 ATG7740 ATG7740 ATG68570 ATG68800 ATG67850 ATG67840 ATG68570 ATG68800 ATG67840 ATG68570 ATG68570 ATG68570 ATG68400 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG78400 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68570 ATG68600 ATG67800 ATG67800 ATG67800 ATG68570 ATG68600 ATG78600 ATG78600 ATG78600 ATG78600 ATG78600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68600 ATG7870 ATG68000 ATG7870 ATG6800 ATG7870 ATG6800 ATG7870	ATIG7609 ATIG76100 ATIG76110 ATIG7090 ATIG76100 ATIG76110 ATIG70290 ATIG70300 ATIG22020 ATIG202080 AT2G22090 AT2G22088 ATG30220 ATIG10090 ATIG70200 ATIG0907 ATIG20280 ATSG01545 AT5G08290 AT5G08300 ATIG5010 ATIG75020 ATIG05807 ATIG0580 ATIG05690 ATIG33650 AT4G33660 AT4G33666 AT4G08815 AT4G33670 AT4G08825 AT4G01720 AT5G14580 AT5G14690 AT5G14580 AT5G14690 ATIG3270 ATIG7230 ATG13730 ATIG44000 ATIG3230 ATIG03600 ATIG03610 ATIG2320 ATIG27330 ATIG27340 AT3G05605 ATIG80830 ATIG80830 ATIG28570 ATIG22330 ATIG27340 AT3G05605 ATIG80830 ATIG80830 ATIG28570 ATIG25580 ATG25590 ATIG80420 ATIG80430 ATIG25590 ATIG80420 ATIG80430 ATIG0967 ATIG0973 ATIG80440 AT3G4555 AT3G04460 ATIG2540 ATIG28580 ATIG52340 ATIG28580 ATIG58210 ATIG28420 ATIG68430 ATIG2740 ATIG28420 ATIG80430 ATIG2740 ATIG80420 ATIG80430 ATIG2740 ATIG80420 ATIG80430 ATIG2750 ATIG80420 ATIG83230 ATIG2850 ATIG68420 ATIG72750 ATIG2740 ATIG7440 ATIG68420 ATIG72750 ATIG2740 ATIG7440 ATIG68420 ATIG72750 ATIG72755 ATIG72760 ATIG74460 ATIG7850 ATIG72550 ATIG72755 ATIG72760 ATIG7840 ATIG68510 ATIG78510 ATIG7840 ATIG685210 ATIG7840 ATIG685210 ATIG7840 ATIG685210 ATIG7840 ATIG7850 ATIG7850 ATIG68520 ATIG7850 ATIG68520 ATIG7850 ATIG69557 ATIG69570 ATIG85210 ATIG69570 ATIG7440 ATIG69570 ATIG78500 ATIG6950 ATIG69500 ATIG69500 ATIG7500 ATIG7700 ATIG64500 ATIG69500 ATIG69500 ATIG6900 ATIG6700 ATIG69700 ATIG74009757 ATIG9900 ATIG6900 ATIG6900 ATIG7700 ATIG67400 ATIG6910 ATIG6910 ATIG6900 ATIG6900 ATIG6900 ATIG7700 ATIG6400 ATIG64100 ATIG6900 ATIG7800 ATIG7800 ATIG69500 ATIG6900 ATIG7700 ATIG7800 ATIG69500 ATIG6900 A

Postion	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr4-485100	185,698774	1,08942122	0,33783013	0,00063039	0,00535213	AT4G01120 AT4G01130	AT4G01120 AT4G01130
Chr3-21303489	118.129445	1.23544946	0.38324783	0.00063288	0.00535213	AT3G57540	AT3G57540
Chr4 17200088 5	110,120445	1 20276969	0,00024703	0.00063208	0,00535213	ATAC25570	AT4C26660 AT4C26670 AT4C26680
CIII4-17290088.5	118,380473	1,29270808	0,40103907	0,00003308	0,00333213	A14030070	A14050000 A14050070 A14050080
Chr5-7266230	110,466964	1,27470115	0,39548928	0,00063406	0,00535213	A15G21280	AT5G21970 AT5G21280
Chr1-24898519.5	145,060458	1,42872747	0,44328458	0,00063417	0,00535213		AT1G66750
Chr2-14267974.5	117,921231	1,23376796	0,38289108	0,00063596	0,00535543	AT2G33730 AT2G33735	AT2G33720 AT2G33730 AT2G33735 AT2G33740
Chr1-1953941	139,530937	1,2592033	0,3912955	0,00064536	0,00542269	AT1G04453 AT1G06410	AT1G06400 AT1G04453 AT1G06410
Chr3-23186010	174.379809	1,22250888	0.3801618	0.0006505	0.00545397	AT3G62690 AT3G62695	AT3G62680 AT3G62690 AT3G62695
Chr4-10578477 5	86 3182072	1 41063535	0.43991167	0.00065297	0.00546275	AT4G19395 AT4G06880	AT4G19390 AT4G19395 AT4G06880 AT4G19400 AT4G19410
ch 4 40000400.5	424 005 622	1,41003333	0,43051107	0,00003237	0,00540275	A14015555 A14000880	
Chr1-18322102.5	131,885622	1,21807883	0,37951887	0,00066475	0,00554922	A11G49500	A11649490 A11649500
Chr4-12869937	97,8636506	1,3439055	0,41886194	0,00066722	0,00555774	AT4G25040 AT4G25050	AT4G25040 AT4G25050 AT4G25070
Chr2-10105276.5	82,5606185	1,4927216	0,46643019	0,0006864	0,00570512		AT2G23740 AT2G23755 AT2G23760
Chr5-24574299	65,934137	1,69894716	0,53172697	0,00069879	0,0057956	AT5G61070 AT5G61090	AT5G61070 AT5G61090
Chr5-6791874.5	125.494667	1.20865268	0.37848238	0.00070299	0.00581789	AT5G20110	AT5G20100 AT5G20110
Chr1-2866722	128 09038	1 23514496	0 3869327	0.0007061	0.00583105	AT1G04683 AT1G08920	AT1 G04677 AT1 G04683 AT1 G08920
Ch-1 2020722	07.07103	1,2002149007	0,00000021	0.00071042	0,00505103	111004005111000520	AT1 C23570
CIII 1=7373230.3	87,07102	1,402/100/	0,43507108	0,00071043	0,00383422		A11022370
Chr5-2140/140	115,609187	1,30165736	0,40891729	0,00072834	0,00598888		A15652820
Chr4-9250420	137,40136	1,18697182	0,37307607	0,00073237	0,00600917	AT4G16370	AT4G16370 AT4G06390
Chr1-13126661.5	102,582029	1,36400473	0,42891959	0,00073614	0,00602721		AT1G35580
Chr1-6822854.5	145,863261	1,26991613	0,39985542	0,00074676	0,00608911	AT1G19720 AT1G19730	AT1G19720 AT1G19730 AT1G19740
Chr3-508807	188.218509	1.06401999	0.33505738	0.00074754	0.00608911	AT3G02460 AT3G02470	AT3G02460 AT3G02470
Chr2-10836000	140 721971	1 21618791	0 38304204	0.00074898	0.00608911	AT2G25460	AT2G25460 AT2G25470
Ch-5 (04(100	60,4005.01	1,210107.51	0,50504204	0,00075004	0,00000011	112020400	112025400112025470
Chr5-6046190	69,400501	1,49960484	0,47236582	0,00075004	0,00608911		
Chr3-5081632.5	102,344283	1,35802997	0,42957412	0,00078522	0,00636131	AT3G15095	AT3G15090 AT3G15095 AT3G15110
Chr4-11638924	82,4678387	1,41323112	0,44780555	0,00080001	0,00646272	AT4G21926 AT4G21930	AT4G21920 AT4G21926 AT4G21930 AT4G21940
Chr3-1423778.5	91,3356994	1,3457878	0,42648916	0,00080111	0,00646272	AT3G05090 AT3G05100	AT3G05090 AT3G05100 AT3G05110
Chr4-9254347.5	113,675711	1,28498562	0,40796975	0,00081717	0,00657846	AT4G16380	AT4G06390 AT4G16380
Chr1-30187158	127.354801	1.21779268	0.38685683	0.0008222	0.00660509	AT1G80280 AT1G80290	AT1G80280 AT1G80290
Chr5-8732099 5	102 122525	1 27702120	0.40608114	0.00083116	0.00666316		
Ch-4 470000000	112 05225	1.251702139	0.200107114	0,00003110	0,00000310	AT4C00705 AT4C30470	AT4C204C0 AT4C00705 AT4C20470
cm4-1/998832	112,853357	1,25173049	0,39819746	0,00083473	0,00666407	A14609/05 A146384/0	A14038400 A14009/05 A140384/0
Chr1-18307215.5	80,924562	1,58742451	0,50498869	0,00083474	0,00666407	AI1G49450	A11G49450 AT1G49460
Chr4-10604843	63,634104	1,72419797	0,54923224	0,0008468	0,00674626	AT4G19440 AT4G06895	AT4G19440 AT4G06895 AT4G19450
Chr3-7503769.5	120,075828	1,2506818	0,39850315	0,00084922	0,00675158		AT3G21320
Chr5-16894529.5	78.9724765	1.60245196	0.51226787	0.00087954	0.00697821	AT5G42250	AT5G42242 AT5G42250
Chr4-5189697	51 6652688	1 74830714	0 55893301	0.00088019	NA	AT4608230	AT4608230
Chr4-5185057	101 72220	1,74030714	0,558555501	0,00080015	0.0000000	AT4 C0 C2 C0	AT1 C0C220 AT1 C0C200 AT1 C0C200
Chr1-1922186	101,72328	1,26536579	0,40468135	0,00088354	0,00699545	A11G06290	A11G06270 A11G06280 A11G06290
Chr2-12205797.5	76,0056577	1,44069527	0,46085388	0,00088558	0,00699714		
Chr1-29890343.5	97,2564529	1,37125139	0,43908883	0,00089525	0,00705904	AT1G79450 AT1G79460	AT1G79440 AT1G79450 AT1G79460
Chr1-25775687	90,4074697	1,4190296	0,45542954	0,00091722	0,00721428	AT1G68650	AT1G68650 AT1G68660
Chr5-2578247.5	127,164346	1,17969593	0,37867439	0,00091869	0,00721428	AT5G08040 AT5G08050	AT5G08030 AT5G08040 AT5G08050 AT5G08055 AT5G08060
Chr3-20330670	92 6966056	1 31019444	0 42141512	0.0009385	0.00735475	AT3G54860 AT3G54870	AT3G54860 AT3G54870
Ch-1 20440005 5	122,0500050	1,010101444	0,45000643	0,00005140	0,0074413	474 65 4820	AT1 CE 4830 AT1 CE 4830
Chr1-20448885.5	123,144628	1,42480142	0,45889643	0,00095148	0,0074413	A11G54820	A11654820 A11654830
Chr4-2718003.5	99,0658057	1,39380484	0,45007968	0,00097812	0,00763413	AT4G05320	AT4G05310 AT4G05320 AT4G05330
Chr5-19241587	146,620629	1,12372963	0,36296798	0,00098093	0,00764049	AT5G47430 AT5G47435	AT5G47430 AT5G47435 AT5G47440
Chr5-24973059.5	102,055628	1,26775369	0,41032579	0,00100204	0,00778914	AT5G62170	AT5G62170
Chr1-20772	122.074644	1.1819392	0.38314321	0.00101828	0.00789935		AT1G01040 AT1G03993
Chr2-6639585 5	66 2721278	1 56922783	0 50918505	0.00102862	0.00796351	AT2G15270 AT2G15280	AT2G15270 AT2G15280 AT2G15290
Ch-5 7096579	20 5125246	1,00022700	0,50510505	0,00105306	0,00014030	ATECODERO ATECODESE ATECODESE	
CIII 5-/9805/8	/9,51/5/40	1,42471301	0,46337894	0,00105386	0,00814036	A15G23080 A15G03035 A15G23090	A15G23070 A15G23080 A15G03035 A15G23090
Chr2-11810432	135,995521	1,23657016	0,40225473	0,0010557	0,00814036	A12G27690	AT2G27690 AT2G00840
Chr2-11978139.5	90,8487669	1,29704836	0,4221827	0,00106228	0,00817465	AT2G28105 AT2G28110	AT2G28100 AT2G28105 AT2G28110
Chr5-18589312	203,617402	1,09630659	0,35696251	0,00106597	0,00818664	AT5G45820 AT5G45830	AT5G45810 AT5G45820 AT5G45830
Chr1-17892583	81.7731386	1.36376854	0.444266	0.00107133	0.00821137	AT1G48410	AT1G48410
Chr3-18629310	100.711203	1,2888453	0.41996727	0.00107418	0.00821681	AT3G50240 AT3G50250	AT3G50240 AT3G50250
Chr5-25876630 5	91 5401217	1 45934296	0.47564642	0.00107703	0.00821745		AT5G64730 AT5G64735
Chr3-23670030.5	121 520075	1,45554250	0,47304042	0,001077054	0,00021745	472661150	AT3664736 AT3664735
Chr3-22634186.5	121,539875	1,20337421	0,39227155	0,00107854	0,00821745	A13G61150	A13G61150 A13G61160
Chr2-8550096.5	93,3250124	1,36089766	0,44450646	0,00110081	0,0083685	AT2G19810	AT2G19810
Chr1-813061.5	109,59195	1,2621959	0,41233767	0,00110272	0,0083685	AT1G03290 AT1G03300 AT1G03310	AT1G03290 AT1G03300 AT1G03310
Chr5-25423172	268,961624	0,92244081	0,30152817	0,00110957	0,0084031	AT5G63490 AT5G09165 AT5G63500 AT5G63510	AT5G63490 AT5G09160 AT5G09165 AT5G63500 AT5G63510 AT5G63520
Chr3-18873143.5	69,2431836	1,60245519	0,5239082	0,00111166	0,0084031	AT3G50770	AT3G50770 AT3G50780
Chr4-6879944.5	59,9538142	1.61329808	0.52841533	0.0011325	0.00854382		AT4G05865 AT4G05870
Chr5-4535325 5	87 29/1770	1 33075797	0.43636729	0.00114562	0.00862149	AT5G14050 AT5G14060	AT5G14040 AT5G14050 AT5G14060
Ciii 3***3333333.3	120 255	1,000/0/8/	0,45030728	0,00114502	0,00002148	A13014030 A13014000	AT1 C100C0 AT1 C10070
CHF1-6512951	120,963363	1,15469442	U,37868855	0,00114729	0,00862148		A11G18800 A11G18870
Chr3-1617500	96,477703	1,42076296	0,46676575	0,00116787	0,00875906	A13G05570 AT3G05580	AT3G05560 AT3G05570 AT3G05580
Chr5-24906776	156,774966	1,21431389	0,39911543	0,00117306	0,00878079	AT5G09035	AT5G09035 AT5G61997 AT5G09040 AT5G09045
Chr2-17489888.5	103,687231	1,21879338	0,40100568	0,00118548	0,00885649	AT2G41900	AT2G41900
Chr5-4542713.5	101,572498	1,2946526	0,4262625	0,00119386	0,00890179	AT5G14070 AT5G14080	AT5G02145 AT5G14070 AT5G14080
Chr3-5297744	108,930168	1,23190809	0,40588478	0,00120221	0,00894667	AT3G15620 AT3G15630 AT3G15635	AT3G15620 AT3G15630 AT3G15635 AT3G15640
Chr5-25704503	241.519002	1.09702072	0.36161919	0.00120813	0.00897336	AT5G64260	AT5G64260 AT5G64270
Chr1-10806609	132 340864	1 26867604	0.41837697	0.00121319	0.00800340	AT1G30500 AT1G30510	AT1606343 AT1630500 AT1630510 AT1630515
Ch-2 14000009	110 10017	1,2000/004	0,7100/08/	0,00121318	0,00033348	AT2C24770	ATTC: 472 0 473 0 473 0 000 ATTC: 472 0 473 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Cnr 2-14665654.5	119,189136	1,16/83121	0,38/10434	0,00127713	0,00944929	A12G34//U	A12G34/30 A12G34/70 A12G08680 A12G34780
Chr1-26663164.5	86,9239677	1,3649262	0,45267562	0,00128387	0,00948092	AT1G70710	AT1G70710
Chr1-29117557	111,817729	1,28634573	0,42687274	0,00129162	0,00951979	AT1G77480 AT1G77490	AT1G77480 AT1G77490
Chr1-4394489	83,0001545	1,31841155	0,4381462	0,00131025	0,0096267	AT1G12900 AT1G12910	AT1G04983 AT1G12890 AT1G12900 AT1G12910 AT1G12920
Chr5-24417434.5	69,185605	1,47866773	0,49143736	0,00131114	0,0096267	AT5G08970 AT5G60720	AT5G60710 AT5G08970 AT5G60720
Chr1-2152402	112 506815	1 16160831	0.38790220	0.0013704	0.01004400	AT1607000 AT1607010	AT1G06990 AT1G07000 AT1G07010 AT1G04537 AT1G07020
Chr2 150522403	207 462570	1 1 1 5 5 0 1 0 0	0.29646464	0,00130454	0.01010077	AT2C44260	AT3C443E0 AT3C443E0 AT3C443E1 AT3C443E5
CIII 3-15952317	207,463579	1,15550199	0,38010104	0,00138451	0,010126/1	A13044200	A13044200 A13044200 A13044201 A13044205
cnr2-14253274.5	111,728887	1,185921	0,3979492	0,00144086	U,U1U51882	A12G33685 AT2G33690 AT2G33700	A12G33680 AT2G33685 AT2G33690 AT2G33700 AT2G33705
Chr3-23276671	141,22359	1,10539015	0,37134116	0,0014566	0,01061358	AT3G62980	AT3G62980
Chr1-8010829	86,7591319	1,40389793	0,47341717	0,00151117	0,01099034		AT1G22650
Chr5-26933195	86,0247174	1,27969979	0,43272327	0,00155165	0,01126336	AT5G67480 AT5G67488 AT5G67490	AT5G67470 AT5G67480 AT5G67488 AT5G67490 AT5G67500
Chr5-24829728.5	125,240316	1.31216126	0.44477638	0.00158805	0.01150587	AT5G61790 AT5G61800	AT5G61780 AT5G61790 AT5G61800 AT5G61810
Chr2-2545501	80 0766100	1 27002262	0.46753640	0.00150117	0.0115057	AT3G11320	AT3611210 AT3611220
Ciii 3*3343391	03,3700199	1,3/302303	0,40/03048	0,0015911/	0,011500/6	AT1 C0 4000	AT1 CO2000 AT1 CO4000 AT1 CO4010
cnr1-1028662	161,538103	1,04043794	U,35318102	0,00161005	U,U1162144	A11G04000	A11G03990 A11G04000 A11G04010
Chr3-1634793	139,845051	1,09189472	0,37083494	0,00161779	0,01165537	AT3G05625 AT3G05630	AT3G05620 AT3G05625 AT3G05630
Chr2-15099824	185,45948	1,08343047	0,36810263	0,00162375	0,01167643		
Chr3-23289575.5	158,754426	1,0519903	0,35755222	0,00162944	0,01169545	AT3G63010	AT3G63010
Chr4-14442959	165.044007	1.04652046	0.35686335	0.00168094	0.01204256		AT4G29330
Chr4-17522740 5	91 2117194	1 33353943	0.45656649	0.00174569	0.01249209		AT4G37235 AT4G37240
Ch-2 14702007	01 040010	1,333333043	0.47050048	0.00174308	0.0125705-	473635070	47367670
CIII 2-14/8260/	51,0496196	1,3/320819	0,4705928	0,001/612	0,0125/065	A120550/0	
cnr2-10684178.5	84,5628397	1,31955805	U,45309309	0,0017937	0,01277886	A12G25110	A12G25100 AT2G25110
Chr5-1711462	97,924392	1,23769918	0,42538049	0,00180929	0,01286608		AT5G05700
Chr5-20943211.5	119,89364	1,11115206	0,38241976	0,00183285	0,01298951		AT5G51550 AT5G51560

Postion	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr3-3443074.5	213,358586	0,93891806	0,32315351	0,00183342	0,01298951	AT3G10985	AT3G10980 AT3G10985 AT3G10986
Chr5-1308470.5	97,4157367	1,23783406	0,42698184	0,00187158	0,0132355	AT5G04560	AT5G04550 AT5G04560
Chr5-14594472.5	105,261929	1,33523737	0,46146494	0,00190502	0,01344721	AT5G36940 AT5G36950	AT5G36940 AT5G36950
Chr5-973934.5	146.299509	1.02589815	0.35468341	0.00191135	0.01346713	AT5G03720 AT5G03730	AT5G03710 AT5G03720 AT5G03730
Chr3-2529015.5	63.4095334	1.4361833	0.49679514	0.00192072	0.01350838	AT3G07930 AT3G07940	AT3G07920 AT3G07930 AT3G07940 AT3G07950
Chr3-4976129	81,2246219	1,28016554	0.44326094	0.00193811	0.01360575	AT3G03005	AT3G14810 AT3G03005 AT3G14820
Chr2-18859522.5	101,969996	1,17547503	0.40751486	0.0019602	0.01373573	AT2G45800 AT2G09665 AT2G45810	AT2G45790 AT2G45800 AT2G09665 AT2G45810
Chr2-17472899 5	153 375864	1 05103718	0 36464508	0.00197356	0.01380416	AT2G41870	AT2G41850 AT2G41870 AT2G41880
Chr4-4073685	65 9159435	1 4697849	0 51053671	0.00199531	0.01393092	AT4606746	AT4606744 AT4606746
Chr1-28315820	108 58827	1 14033531	0 39627181	0.00200319	0.01395751	AT1675440 AT1675450	AT1 G75440 AT1 G00553 AT1 G75450 AT1 G00557
Chr2 14021557 5	00 5620105	1,20006122	0,455027101	0,00200313	0,01305751	AT3C25550 AT3C25555	
Chr4 9605065 5	144 777246	1,30900132	0,43302274	0,00200792	0,01393731	AT4C02045 AT4C15226	ATAC15333 ATAC03045 ATAC15335
Chil4-6055505.5	144,777240	1,12104707	0,38992329	0,00201003	0,01393731	AT4G02545 A14G15250	AT3C008C0 AT3C33EC0 AT3C33E00 AT3C33E00
Chr2-13820305	144,443922	1,04007151	0,3625938	0,00206263	0,01429696	A12G32500	A12G00800 A12G32300 A12G32380 A12G32390
Chil4=17560276	207,108019	0,93037047	0,33428093	0,00210792	0,01438434	473630360	ATACO05555 ATAC00500
Chr2-12603804	96,055756	1,28137639	0,44841119	0,00213434	0,01474078	A12G29380	A12G29550 A12G29560 A12G29570
Chr1-30194868	110,727123	1,18917712	0,41652706	0,00215197	0,01483289	ATTG80300 ATTG80325 ATTG80310 ATTG80315	ATTG50000 ATTG50000 ATTG50000
Chr1-19513039	102,411133	1,32697188	0,46487431	0,0021554	0,01483289	A11G52390	A11652380 A11652390 A11652400
Chr1-30380458.5	85,5005613	1,33199732	0,46678088	0,00216147	0,01484803		
Chr2-1026/2/3.5	142,472362	1,16537219	0,40851276	0,00216735	0,0148618	A12G24150	
Chr3-10256204.5	208,445312	1,15021401	0,40328175	0,0021/133	0,0148626	A13G27680 A13G27690 A13G27700	A13G27670 A13G27680 A13G27690 A13G27700
Chr2-6400395	102,539255	1,16634214	0,40965594	0,00220579	0,01507162	AT2G14890	A12G14890
Chr1-24915648.5	84,4818941	1,37388454	0,48319719	0,00223231	0,01522568		AT1G08847 AT1G66783
Chr1-2437239.5	123,496728	1,10294359	0,38810155	0,00224232	0,01526685	AT1G07885 AT1G07890	AT1G07880 AT1G07885 AT1G07890
Chr1-25752603.5	103,813545	1,17036535	0,41207071	0,00225423	0,01532076	AT1G08997 AT1G68580	AT1G68570 AT1G08997 AT1G68580
Chr3-9756104.5	79,0500374	1,27746286	0,4499112	0,00226016	0,01533394	AT3G26570	AT3G26560 AT3G26570 AT3G26580
Chr4-14990318.5	76,0404543	1,33246152	0,47059149	0,00231679	0,01566517	AT4G30780	AT4G30780 AT4G30790
Chr1-6687189.5	100,871343	1,14527997	0,40449056	0,00231714	0,01566517	AT1G19340	AT1G19340 AT1G19350
Chr1-8337154	217,649036	0,89139861	0,31568345	0,00237356	0,01601843	AT1G23480 AT1G23490	AT1G23480 AT1G23490 AT1G23500
Chr5-8707835	72,5845959	1,32263345	0,46869648	0,0023867	0,01605877	AT5G25190	AT5G25190
Chr2-18866944	122,218664	1,11063282	0,39359317	0,00238791	0,01605877	AT2G45830	AT2G45820 AT2G45830 AT2G45840
Chr1-23126385	84,8762181	1,24088741	0,44007599	0,00240334	0,01613432		AT1G62480
Chr5-1073512.5	103,78882	1,29239457	0,45857517	0,00241406	0,01617801	AT5G03970 AT5G03980	AT5G03970 AT5G03980 AT5G03990
Chr5-13902705.5	136,665016	1,35625026	0,48139066	0,00242102	0,01619637	AT5G35735	AT5G35735
Chr1-9202407	33,7476191	1,93465418	0,68785136	0,0024571	NA		AT1G26620
Chr5-22400932.5	69,7651401	1,38733806	0,49451243	0,00251219	0,01677706	AT5G55220 AT5G55230	AT5G55220 AT5G55230
Chr1-29365779.5	342,510743	0,83934318	0,29946345	0,00253287	0,0168858	AT1G78080	AT1G78080
Chr3-3919379.5	126,87434	1,07007645	0,38207979	0,00254989	0,01696982	AT3G12280 AT3G12290	AT3G12280 AT3G12290 AT3G12300
Chr3-4184673	68.1390702	1.44164226	0.51767369	0.00267765	0.0177892	AT3G13060 AT3G13061 AT3G13062	AT3G13060 AT3G13061 AT3G13062 AT3G13065
Chr1-8987883	73,3931889	1,44508667	0.51902929	0.00268291	0.01779341		
Chr1-1504877	50.2792645	1.52896668	0.54940178	0.00269322	NA	AT1G05200	AT1G05180 AT1G05190 AT1G05200
Chr3-2348777	129.16123	1.04244686	0.37485076	0.00270988	0.01794126	AT3G07350	AT3G00240 AT3G01965 AT3G07350 AT3G01975 AT3G01985
Chr1-7884610 5	97 1941898	1 17797877	0.42381776	0.00272258	0.0179791	AT1622310 AT1622320	AT1622310 AT1622320 AT1622330
Chr3-22337715 5	95 897748	1 17297227	0.42205953	0.00272496	0.0179791	AT3G60420 AT3G60440	AT3660415 AT3660420 AT3660440 AT3609395
Chr5-21052620.5	68 9557967	1 44118151	0,51920333	0.00272450	0.01913747	A13000420 A13000440	AT5651800 AT5651810
Chr3 1004711 5	70 2661 240	1,44118131	0,31920341	0,00273308	0,01813747	AT2C02580 AT2C02500	AT3C03580 AT3C03500 AT3C03600
ChrE 9777E41 E	70,3001349	1,33778008	0,48323143	0,00281740	0,01852373	ATE C 25 280 ATE CO2055	ATE C2E280 ATE C020EE ATE C2E200 ATE C2E200
Chr2 22010808	01 5054727	1,21193102	0,43732103	0,00282471	0,01854107	A13023280 A13003333	AT3023280 AT3033333 AT3023230 AT3023300
Chr3-22910808	91,5054737	1,20078049	0,43430992	0,00284788	0,01806186	471 674 670	A13001880
Chr1-28052401.5	83,9157806	1,26915739	0,46109108	0,00295703	0,01933759	AT1G/40/0	A110/40/0 A110/40/5
Chr4-7284434.5	56,9602815	1,46381682	0,53189826	0,00296107	0,01933759	A14G12220 A14G12230	A14G12210 A14G12220 A14G12230
Chr1-12059689	74,6650217	1,29404747	0,47068564	0,0029863	0,01946926	AT1G33250	AT1G33250
Chr3-3863504.5	114,514143	1,12583858	0,41020872	0,00302969	0,01971866	AT3G12120 AT3G12130	AI3G12120 AI3G12130
Chr5-828942.5	105,170485	1,11167545	0,40613217	0,00309799	0,02012906		AT5G03370
Chr5-21095469	159,973866	0,99956095	0,36542349	0,0031157	0,02020997	AI5G51910 AI5G51915	AT5G51900 AT5G51910 AT5G51915 AT5G51920
Chr2-621094.5	107,044604	1,09542526	0,4007874	0,00313627	0,0203091	AT2G02360 AT2G02370	AT2G02350 AT2G02360 AT2G02370
Chr4-12556201.5	89,0354913	1,20271796	0,44037224	0,00315579	0,02040106	AT4G24190 AT4G24200	A14G24190 A14G24200
Chr3-6958801	139,415185	0,97962319	0,35882762	0,00316608	0,02043319	AT3G19970	AT3G19960 AT3G19970 AT3G19980
Chr1-564515.5	89,3364562	1,1768411	0,43239495	0,00324754	0,02092375	AT1G02640	AT1G02630 AT1G02640
Chr5-25087192	86,8694615	1,2648596	0,46485119	0,00325425	0,02093185		AT5G62480 AT5G62490
Chr4-12760886	80,5019698	1,20776197	0,44400747	0,00326273	0,02095128	AT4G24750 AT4G24760	AT4G24750 AT4G24760
Chr1-4535188.5	76,2615024	1,47540217	0,54318077	0,00330153	0,02114203		AT1G05003
Chr1-26513014	180,820309	0,94164652	0,34669891	0,00330344	0,02114203	AT1G70370	AT1G70370
Chr3-11384153	81,657082	1,2276413	0,45250645	0,00333405	0,0212699	AT3G29575	AT3G29575
Chr5-21619776.5	109,806673	1,1824727	0,43586459	0,0033345	0,0212699	AT5G53290	AT5G53290
Chr4-14884634.5	96,7633041	1,11260199	0,41056974	0,0033652	0,02143012		AT4G30440 AT4G30450
Chr3-19449061.5	73,0207983	1,28409173	0,47488045	0,00342519	0,02177604		AT3G52460 AT3G52470 AT3G52480
Chr3-18499065.5	44,2328405	1,54166096	0,5703384	0,00343518	NA	AT3G49880 AT3G49890	AT3G49880 AT3G49890 AT3G49900
Chr5-26507795.5	98,5696636	1,19513621	0,44302801	0,0034915	0,02216093	AT5G66350 AT5G09605 AT5G09615	AT5G66350 AT5G09605 AT5G09615 AT5G66360
Chr3-21760306.5	80,976231	1,29165184	0,48031661	0,00358152	0,0226948	AT3G58850	AT3G58840 AT3G58850
Chr2-8900135.5					0.0000000		
Chr4-9453371.5	73,1080182	1,54891166	0,57820724	0,00369413	0,0233698	AT2G20630 AT2G20635	AT2G20625 AT2G20630 AT2G20635
Chr4-15486478	73,1080182 106,799808	1,54891166 1,11654838	0,57820724 0,4181458	0,00369413 0,00378989	0,0233698	AT2G20630 AT2G20635 AT4G16790	AT2G20625 AT2G20630 AT2G20635 AT4G16780 AT4G16790 AT4G16800
	73,1080182 106,799808 187,536277	1,54891166 1,11654838 0,89851091	0,57820724 0,4181458 0,33666821	0,00369413 0,00378989 0,00380578	0,0233698 0,02393612 0,02399701	AT2G20630 AT2G20635 AT4G16790	AT2G20625 AT2G20630 AT2G20635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020
Chr5-26229483	73,1080182 106,799808 187,536277 249,382229	1,54891166 1,11654838 0,89851091 0,85308598	0,57820724 0,4181458 0,33666821 0,3197689	0,00369413 0,00378989 0,00380578 0,00381725	0,0233698 0,02393612 0,02399701 0,02402992	AT2G20630 AT2G20635 AT4G16790 AT5G65630 AT5G09405	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65630 AT5G09405
Chr5-26229483 Chr5-26499000	73,1080182 106,799808 187,536277 249,382229 114,042645	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217	AT2G20630 AT2G20635 AT4G16790 AT5G65630 AT5G09405 AT5G66320 AT5G00725	AT2G20625 AT2G20630 AT2G20635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65630 AT5G09405 AT5G66330 AT5G09725 AT5G66330 AT5G66335
Chr5-26229483 Chr5-26499000 Chr1-2165354	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336	AT2620630 AT2620635 AT4G16790 AT566530 AT5609405 AT5665320 AT5600725 AT1607050 AT1607051 AT1607060	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G65320 AT5G09725 AT5G66330 AT5G66335 AT1607040 AT1G07050 AT1G07051 AT1G07060 AT1G04557
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885 0,00392533	0,0233698 0,02393612 0,02399701 0,02402992 0,02446336 0,02458936	AT2620630 AT2620635 AT4G16790 AT566580 AT5609405 AT5665320 AT5600725 AT1607050 AT1607051 AT1607060 AT3645010	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65630 AT5G09405 AT5G656320 AT5G09405 AT5G656320 AT5G00725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885 0,00392533 0,00395019	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,02470478	AT2620630 AT2620635 AT4G16790 AT5G65500 AT5G09405 AT5G65200 AT5G00725 AT1607050 AT1G07051 AT1G07060 AT3G45010 AT2643010	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT5609405 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr1-7267564	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885 0,00392533 0,00395019 0,00401416	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,02470478 0,025064	AT2620630 AT2620635 AT4G16790 AT566530 AT5609405 AT5665320 AT5600725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT1620890	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G65320 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010 AT2G09410 AT2G43010 AT1G20880 AT1G20890
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr1-7267564 Chr3-17532593.5	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54683837	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389855 0,00392533 0,00392533 0,00395019 0,00401416 0,00404593	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,02470478 0,025064 NA	AT2620630 AT2620635 AT4616790 AT5665630 AT5609405 AT5666320 AT5600725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT1620890 AT3647580 AT3607785	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT56092405 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010 AT2609410 AT2643010 AT1620880 AT1620880 AT1620880 AT1620880
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr1-7267564 Chr3-17532593.5 Chr3-3923560	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,11739332	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54683837 0,42298778	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885 0,00392533 0,00395019 0,00404593 0,00404593	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,02470478 0,025064 NA 0,02571393	AT2620630 AT2620635 AT4G16790 AT5G65630 AT5G09405 AT3G6530 AT5G09725 AT1G07050 AT1G07051 AT1G07060 AT3G45010 AT3G43010 AT1G20890 AT3G47580 AT3G07785 AT3G12300 AT3G12320	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65630 AT5G09405 AT5G6520 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G455101 AT36209410 AT2643010 AT1620880 AT1620890 AT3647570 AT3G47580 AT3G07785 AT3G12290 AT3G12300 AT3G12320 AT3G12340
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr1-7267564 Chr3-17532593.5 Chr3-3923560 Chr2-19622436	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,14739322 0,94063518	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54638387 0,42298778 0,35661061	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00392533 0,00395019 0,00401416 0,00404593 0,00412494 0,0041734	0,0235698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,02470478 0,025064 NA 0,02571393 0,02597385	AT2620630 AT2620635 AT4G16790 AT566530 AT5609405 AT566530 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT3645010 AT1620890 AT1620890 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT3647940	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G6530 AT5G09405 AT5G6530 AT1G07060 AT1G07051 AT1G0760 AT1G04557 AT3G45010 AT2G09410 AT2G43010 AT1G20880 AT1G20890 AT3G47570 AT3G47580 AT3G07785 AT3G12290 AT3G12300 AT3G12320 AT3G12340 AT2G47940 AT2G01000 AT2G47950
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr1-7267564 Chr3-17532593.5 Chr3-3923560 Chr2-19622436 Chr3-919865	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553	1,54891166 1,11654838 0,89851091 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,11739322 0,94063518 1,3964537	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54683837 0,42298778 0,35661061 0,53081481	0,00369413 0,00378989 0,00378989 0,00381725 0,00387638 0,00389585 0,00392533 0,00395019 0,00401416 0,00404593 0,0041734 0,00425954	0,0235698 0,02393612 0,02402992 0,02436217 0,02446336 0,02446336 0,02470478 0,025064 NA 0,02571393 0,02597385 0,02646702	AT2620630 AT2620635 AT4616790 AT5665500 AT5609405 AT5665520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT3647940 AT3605055	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT5609405 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010 AT1620880 AT1620890 AT3647570 AT3647580 AT3607785 AT3612290 AT3612300 AT3612320 AT3612340 AT2647940 AT2601000 AT2647950 AT3605045 AT3605055 AT3626520
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-16465186 Chr2-17886142 Chr3-17267564 Chr3-17267564 Chr3-923560 Chr3-923560 Chr3-923560 Chr3-9719865 Chr3-9719865	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553 106,903771	1,54891166 1,11654838 0,859851091 0,85308598 1,07758036 1,36769028 1,36769028 1,36769028 1,22946486 1,22946486 1,04213507 1,44814427 1,11739332 0,94063518 1,3964537	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,540328 0,46284904 0,39312846 0,54683837 0,42298778 0,35661061 0,53081481 0,39443273	0,00369413 0,00378889 0,00380578 0,00381725 0,00387638 0,00389885 0,00392533 0,00395019 0,00401416 0,00404593 0,00412494 0,004125954 0,00427745	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02446336 0,02446336 0,02470478 0,025064 NA 0,02571393 0,02597385 0,02646702 0,02635339	AT2620630 AT2620635 AT4G16790 AT566530 AT5609405 AT366630 AT5600725 AT1607050 AT1607051 AT1607060 AT3645010 AT3645010 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3605045 AT3605055	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G6530 AT5G09405 AT5G6530 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010 AT3C699410 AT2C43010 AT3G47940 AT2C43010 AT3G47940 AT2G01200 AT3G12320 AT3G12340 AT3G47940 AT2G01100 AT2G47950 AT3G63710 AT2G37180 AT3G0520 AT3G3120 AT2G37180 AT3G0520
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-1645186 Chr2-17886142 Chr3-167564 Chr3-1752593.5 Chr3-3923500 Chr2-19522436 Chr2-9719865 Chr2-15616265 Chr2-1561625	73,1080182 106,799808 187,536277 249,382229 114,042645 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553 106,903771 192,811444	1,54891166 1,11654838 0,89851091 0,85308598 1,07758036 1,36769028 1,327620926 1,22946486 1,04213507 1,44814427 1,11739332 0,94063518 1,3964537 1,03710056 0,85281131	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54638387 0,42298778 0,35661061 0,53081481 0,39443273 0,32444086	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00389885 0,00395019 0,00401416 0,00404593 0,0041734 0,0041734 0,00425954 0,0042874	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02436217 0,0243628936 0,02470478 0,025064 NA 0,02571393 0,02597385 0,02646702 0,02653539	AT2620630 AT2620635 AT4616790 AT5665530 AT5609405 AT5665530 AT5600725 AT1607050 AT1607051 AT1607060 AT2643010 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4616790 AT4616800 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT3645010 AT2643010 AT1620880 AT1620890 AT3609410 AT2643010 AT3647570 AT3647580 AT3607785 AT3612290 AT3647580 AT3612340 AT2647940 AT2601000 AT2647950 AT3605055 AT3620520 AT2637170 AT2637180 AT2637190 AT2645804 AT26456580 AT2645690
Chr5-26229483 Chr5-26499000 Chr1-2163554 Chr2-175854 Chr2-17582642 Chr2-17886142 Chr2-17886142 Chr3-3923560 Chr2-3923560 Chr2-19622436 Chr2-9719865 Chr2-19822410.5 Chr2-15612625	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553 106,903771 192,811444 67,6059191	1,54891166 1,11654838 0,89851091 0,85308598 1,37670028 1,36769028 1,22946486 1,04213507 1,44814427 1,11739332 0,94063518 1,3964537 1,03710056 0,85281131	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,54683837 0,42298778 0,35661061 0,53081481 0,33443273 0,32444086 0,4869038	0,00369413 0,00378989 0,00380578 0,00381725 0,00387638 0,00392533 0,00395019 0,00401416 0,00404593 0,00412494 0,0041234 0,00427345 0,00422745	0,0233698 0,02393612 0,02399701 0,02402992 0,02436217 0,02436217 0,02436217 0,024363836 0,02470478 0,025064 NA 0,02571393 0,02597385 0,02646702 0,02653539 0,02654103	AT2620630 AT2620635 AT4G16790 AT5G65630 AT5G09405 AT5G6520 AT5G09725 AT1607050 AT1607051 AT1607060 AT3G45010 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT1629730	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G6530 AT5G0925 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010 AT2643010 AT36209410 AT2643010 AT36209410 AT2643010 AT3620940 AT2647580 AT3G0785 AT3G47570 AT3G47580 AT3G0785 AT3G12290 AT3G12300 AT3G12320 AT3G12340 AT2647940 AT2601000 AT2G47950 AT3G05045 AT3060505 AT3G2520 AT2G37170 AT2G37180 AT2G37190 AT264580 AT2G45858 AT2G45690 AT1629720 AT3G1229730
Chr5-26229483 Chr5-26499000 Chr1-216354 Chr3-1645186 Chr3-17886142 Chr3-17532593.5 Chr3-3923560 Chr3-3923560 Chr3-3912865 Chr3-3912865 Chr2-162625 Chr2-18822410.5 Chr2-10400472.5 Chr1-20400472.5	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553 106,903771 192,811444 67,6059191 109,19406	1,54891166 1,11654838 0,88531091 0,85308598 1,07758036 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,11739322 0,94063518 1,3964537 1,03710056 0,85281131 1,27966972 1,18356056	0,57820724 0,4181458 0,33666821 0,3197689 0,40470191 0,5140328 0,51767829 0,46284904 0,39312846 0,546383837 0,42298778 0,35661061 0,53081481 0,39443273 0,32444086 0,4869038	0,00369413 0,00369413 0,00380578 0,00380578 0,00387538 0,00392533 0,00395019 0,00401416 0,00404593 0,00412494 0,00412394 0,00425954 0,00427745 0,0042874 0,00429218	0,0233698 0,02393612 0,0239701 0,02402992 0,02440292 0,02446336 0,02470478 0,025064 0,02507478 0,02507485 0,02654703 0,02654103 0,02654103	AT2620630 AT2620635 AT4616790 AT4616790 AT5665630 AT5609405 AT5666320 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT3647500 AT3647500 AT3602890 AT3602890 AT3602890 AT3602800 AT3605045 AT3607785 AT3612300 AT3607785 AT3612300 AT3607785 AT3645680 AT3607785 AT3645680 AT366580 AT2645685 AT2645690 AT1669780 AT1669485	AT2620625 AT2620630 AT2620635 AT4G15780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65320 AT5G09405 AT5G65320 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G0760 AT1G04557 AT3G45910 AT2G49100 AT3G47570 AT3G47580 AT3G0785 AT3G47570 AT3G47580 AT3G07785 AT3G42940 AT2G01000 AT2G47950 AT3G47940 AT2G01000 AT2G47950 AT3G47940 AT2G37180 AT3G2520 AT3G45750 AT3G585 AT3G2580 AT2G3710 AT2G37180 AT2G37190 AT2G47940 AT2G37180 AT2G37190 AT2G45680 AT2G3785 AT2G5590 AT2G45780 AT3G9785 AT3G585 AT2G45690 AT1G69480 AT2G64985
Chr5-26229483 Chr5-26499000 Chr1-2163534 Chr3-1645186 Chr2-17886142 Chr3-167564 Chr3-17532593.5 Chr2-19522436 Chr2-19522436 Chr2-19516265 Chr2-15616265 Chr2-15616265 Chr2-185165 Chr2-16110400472.5 Chr1-26118156	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,508894 154,018208 56,124553 106,903771 192,811444 67,6059191 109,19406 68,480933	1,54891166 1,11654838 0,8855108 0,8855108 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,41739322 0,94063518 1,39406371 0,03710056 0,85281131 1,29766972 1,18356056 1,299161	0,57820724 0,4181458 0,33666821 0,33666821 0,5140328 0,51470328 0,5147828 0,54683837 0,35661061 0,53681481 0,39443273 0,3244406 0,459661905 0,45561905	0,00369413 0,00386978 0,00380578 0,00381725 0,00387638 0,00392533 0,00392533 0,00404593 0,00404593 0,00412494 0,0041294 0,00427945 0,00425954 0,0042874 0,0042874	0,0233658 0,02399701 0,02402992 0,02446217 0,024636217 0,0246386 0,02458936 0,024571393 0,025571393 0,025571393 0,02554103 0,02654103 0,02654103	AT2620630 AT2620635 AT4616790 AT5665500 AT5609405 AT5665520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT1629730 AT1669480 AT1669485 AT5665510	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT5609405 AT566530 AT560925 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010 AT2609410 AT2643010 AT2609410 AT2643010 AT1620880 AT1620890 AT3647570 AT3647580 AT3607785 AT3612290 AT3612300 AT3612320 AT3612340 AT2647940 AT2601000 AT2647950 AT3605905 AT360555 AT362520 AT363170 AT2637180 AT2637190 AT2645880 AT2645885 AT2645690 AT1629720 AT1629730 AT1669480 AT1669485 AT3665550 AT5665510
Chr5-26229483 Chr5-26499000 Chr1-216354 Chr3-1645186 Chr2-17886142 Chr3-7564 Chr3-7564 Chr3-923560 Chr2-19622436 Chr2-19612436 Chr2-1961265 Chr2-1961265 Chr2-19822410.5 Chr1-0400472.5 Chr1-0418166 Chr5-2611875	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 115,088401 107,2668 49,445329 92,508894 154,012508894 154,012508894 154,012508894 154,012508894 154,012508894 154,012508894 109,19406 68,8409333 109,19406 68,8409333	1,54891166 1,11654838 0,89551091 0,89551091 1,36769028 1,37620926 1,22946486 1,22946486 1,204218507 1,44814427 1,11739332 0,94063518 1,3964537 1,3964537 1,27966972 1,18356056 1,2991611 0,9444134	0,57820724 0,4181458 0,33666821 0,33666821 0,5140328 0,5140328 0,5140328 0,39312846 0,39312846 0,39312846 0,39443273 0,329448273 0,329448273 0,32944986 0,35084184 0,39443273 0,32944986 0,4560595041 0,4560595041	0,00369413 0,00378989 0,00380576 0,003805763 0,003985763 0,00399553 0,00399553 0,004012494 0,004012494 0,00402795 0,00427745 0,00427745 0,00427745 0,00427745 0,00427745 0,00427745	0,0233658 0,02339612 0,02399701 0,02402992 0,02436217 0,0246362 0,0246362 0,02463936 0,02463936 0,025671393 0,025671393 0,025671393 0,026564103 0,026564103 0,026564103 0,026564103	AT2620630 AT2620635 AT4G16790 AT566520 AT5609405 AT566520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT3643010 AT3643010 AT3643580 AT3607785 AT3647580 AT3607785 AT3612300 AT3612320 AT3647940 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT1629730 AT1669480 AT1669485 AT5605510 AT5606320 AT5601255	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G6530 AT5G09405 AT5G6530 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010 AT2643010 AT36209410 AT2643010 AT36209410 AT2643010 AT3620940 AT2643010 AT3647570 AT3647580 AT3607785 AT3612290 AT3627300 AT3612320 AT3612340 AT2647940 AT2601000 AT2647950 AT3605045 AT3605055 AT3626520 AT363720 AT12637180 AT2637190 AT2647940 AT264580 AT2645690 AT1629720 AT12637180 AT264580 AT2645685 AT2645690 AT1629720 AT1629730 AT1669480 AT1669485 AT5665500 AT5665510 AT5605510 AT5606320 AT560525 AT560530
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-1645186 Chr2-17886142 Chr3-175864 Chr3-17532593.5 Chr3-3923560 Chr2-19522436 Chr3-19522436 Chr2-15616265 Chr2-161255 Chr2-161255 Chr2-161156 Chr3-26118756 Chr3-26118755 Chr3-26118755	73,1080182 106,799808 187,536277 243,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,50884 154,018208 56,124553 154,018208 56,124553 154,018208 56,124553 154,018208 56,124553 169,371647 57,00991	1,54891166 1,11564838 0,89851091 0,89851091 0,85308598 1,37620926 1,327620926 1,327620926 1,22946486 1,3264537 0,94063518 1,3964537 0,94063518 1,29966972 1,2856056 1,2991611 0,94443191 1,32917473	0,57820724 0,4181458 0,3366821 0,3197689 0,40470191 0,5140328 0,5140328 0,46284904 0,54683837 0,42298778 0,35661061 0,53081481 0,33644026 0,3464293 0,32444086 0,4869038 0,45061905 0,4550541 0,3568417 0,3568417	0,00369413 0,00378989 0,003881725 0,003881725 0,003881725 0,00387039 0,00387039 0,00395019 0,00401244 0,0041734 0,0041734 0,0042795 0,0042874 0,004874 0,004874 0,004874 0,004874 0,004874 0,004874 0,00000000000000000000000000000000000	0,0233658 0,02393612 0,02399701 0,02402392 0,02436217 0,02446336 0,02458936 0,025571393 0,025571393 0,025571393 0,025571393 0,02554103 0,02654103 0,02654103 0,02654103 0,02654103 0,02654103 0,02654103 0,02654103	AT2620630 AT2620635 AT4616790 AT5665530 AT5609405 AT5665530 AT5609405 AT1607050 AT1607051 AT1607060 AT2643010 AT2643010 AT2643010 AT3645200 AT360580 AT3607785 AT3612300 AT3612320 AT3605045 AT3605055 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT1629730 AT1669480 AT1669485 AT3665510 AT5665310 AT5606320 AT560520 AT5601255 AT1674940 AT3674950	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4616790 AT4616800 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010 AT2609410 AT2643010 AT2609410 AT2643010 AT260940 AT260980 AT260940 AT2601000 AT3607785 AT3612290 AT3647580 AT3612340 AT2647940 AT2601000 AT2647950 AT3605045 AT3605055 AT3625520 AT2637170 AT2637180 AT2637190 AT2645804 AT36658510 AT16694805 AT16694805 AT5665500 AT5665510 AT5605310 AT560520 AT5601255 AT5606330 AT1674930 AT3674950
Chr5-26229483 Chr5-26499000 Chr1-2163534 Chr3-16465186 Chr2-1758254 Chr3-17582593.5 Chr3-971886142 Chr3-9718865 Chr3-9718865 Chr3-9718852 Chr3-971885 Chr3-9718852 Chr3-0472.5 Chr1-26118156 Chr5-981115.5 Chr5-26118758 Chr5-981115.5	73,1080182 106,799808 187,536277 249,382229 114,042645 69,349488 64,9200642 115,089401 107,2668 49,445329 92,508894 15,018208 56,124553 106,903771 192,811444 67,655919 109,19406 68,4809333 162,371647 57,009911	1,54891166 1,11654838 0,89551091 0,89551091 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,1173932 0,94063518 1,3964537 1,03710056 0,85281131 1,27966972 1,18356056 1,2991641 0,94443191 1,32917473 0,81397100	0,57820724 0,4181458 0,3366821 0,3366821 0,5140328 0,51476829 0,45248904 0,5463837 0,42298778 0,39312846 0,35661051 0,32444086 0,4869038 0,45661905 0,48560197 0,4850192 0,5086177	0,0369413 0,0037892 0,0037892 0,0038725 0,0038725 0,0038763 0,0038763 0,0039503 0,004055 0,0041244 0,0041734 0,0042745 0,00422745 0,00422745 0,0042275 0,0042725 0,0044275 0,0044275	0,0233658 0,02339612 0,02399701 0,02402992 0,02436217 0,02446336 0,02458936 0,024571393 0,02571393 0,025571393 0,025571393 0,0255410000000000000000000000000000000000	AT2620630 AT2620635 AT4616790 AT566520 AT5609405 AT566520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT1620890 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3647580 AT3605055 AT36456045 AT3605055 AT36456045 AT3645685 AT2645690 AT1629720 AT1629730 AT1629720 AT1629730 AT1669480 AT1669485 AT5605510 AT5605510 AT5606320 AT5601255 AT1674940 AT1674950 AT2645960 AT2645950	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT5609405 AT566530 AT560925 AT5666330 AT5666335 AT1607040 AT1607050 AT1607050 AT1607060 AT1604557 AT3645010 AT36209410 AT2643010 AT36209410 AT2643010 AT3620940 AT3620800 AT3627570 AT3647580 AT3607785 AT3612290 AT3612300 AT3612320 AT3612340 AT3647590 AT3612300 AT3612320 AT3612340 AT3647590 AT360505 AT362520 AT3637170 AT2637180 AT2637190 AT2645800 AT3665510 AT1629720 AT3665510 AT5665500 AT5665510 AT5606310 AT5609320 AT5601255 AT5606330 AT1674930 AT1674930 AT1674930 AT1674950
Chr5-26229483 Chr5-26499000 Chr1-216354 Chr3-1645186 Chr3-17886142 Chr3-17532593.5 Chr3-3923560 Chr3-3923560 Chr3-3923560 Chr3-19242436 Chr3-9719865 Chr2-18822410.5 Chr2-18822410.5 Chr2-181265 Chr3-10400472.5 Chr3-10400472.5 Chr3-10400472.5 Chr3-1041155 Chr3-1931115.5 Chr3-1931115.5 Chr3-1931185.5	73,1080182 106,799808 187,536277 243,382229 114,042645 69,3449489 64,9200642 115,089401 107,2668 49,445329 92,50884 154,018208 56,124553 106,90371 192,811444 67,6059191 109,19406 68,4809333 162,371647 25,009911 23,021921 23,021921	1,54891166 1,11654838 0,89851091 0,85308598 1,37620926 1,37620926 1,37620926 1,3229426 1,07258036 1,3229426 1,07258036 1,229448427 1,1739332 0,94063518 1,29766972 1,2856056 1,2991611 0,94443191 1,3291473 0,81397109	0,57820724 0,4181458 0,3466821 0,3197689 0,40470191 0,5140328 0,5167829 0,46284904 0,39312846 0,54683837 0,32641051 0,46284904 0,39348273 0,32444086 0,48664905 0,485664905 0,4855641 0,36130922 0,50860177 0,31180372 0,4277642	0,00369413 0,00378989 0,00380578 0,00381725 0,00387253 0,00397533 0,00401416 0,00401416 0,0041734 0,0041734 0,0042754 0,0042745 0,0042874 0,0042874 0,00432955 0,0042874 0,0042875 0,0042874 0,004275 0,0042874 0,004275 0,0042874 0,004275 0,0042874 0,004275 0,0042874 0,004275 0,0042874 0,004275 0,0042874 0,004275 0,004275 0,0042874 0,004275 0,00425 0,00425 0,00425 0,00425 0,00425 0,00425 0,0045 0,005	0,0233658 0,02339612 0,02399701 0,02436217 0,02446336 0,02458936 0,02571393 0,02571393 0,02557385 0,02564103 0,02554103 0,02554103 0,025654103 0,025764103 0,02754016 0,0275400000000000000000000000000000000000	AT2620630 AT2620635 AT4616790 AT5665530 AT5609405 AT36665320 AT5609725 AT1607050 AT1607051 AT1607060 AT2643010 AT2643010 AT3645010 AT3647500 AT3605045 AT3607785 AT3612300 AT3617285 AT3612300 AT3617285 AT3647580 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT169485 AT3665510 AT3665510 AT366450 AT264585 AT5665510 AT3645960 AT2645970 AT3660150 AT3601505 AT2645960 AT2645970 AT3660150 AT360150	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G6530 AT5G09405 AT5G6530 AT5G09405 AT5G6530 AT5G0925 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07051 AT1G07060 AT1G04557 AT3G45010 AT3C69410 AT2C43010 AT3C69410 AT2C43010 AT3C69410 AT2C43010 AT3G47570 AT3G2780 AT3G07785 AT3G12290 AT1G20800 AT3G47940 AT2C430100 AT2G47950 AT3G05045 AT3G05055 AT3C62520 AT3G05045 AT3G05055 AT3C64550 AT3G3720 AT1G29730 AT1G29720 AT1G29730 AT1G69480 AT1C69485 AT5G65500 AT5G65510 AT5G05310 AT5G06320 AT5G01555 AT5G06330 AT1G74930 AT2C43705 AT3C4390 AT1C4940 AT1G74950 AT3C4390 AT2C45970 AT3C4390 AT2C45970 AT3C43950 AT2C45970 AT3C43950 AT2C45970 AT2C43950 AT2C45970
Chr5-26229483 Chr5-26499000 Chr1-2165354 Chr3-1645186 Chr2-17886142 Chr3-167564 Chr3-17532593.5 Chr3-3923560 Chr2-19522436 Chr3-9719865 Chr2-15616265 Chr2-15616265 Chr2-18522410.5 Chr1-26118156 Chr5-26182785 Chr3-26118156 Chr5-26182785 Chr3-2817931115.5 Chr1-281147973.5 Chr2-18921851 Chr2-1892626	73,1080182 106,799808 187,536277 249,382229 114,042645 69,3449489 64,9200642 150,089401 107,2668 49,445329 92,508894 154,018208 56,124535 106,903771 192,811444 56,124535 106,903771 192,811444 56,420531 163,371647 57,009911 232,021921 41,970615 43,75047	1,54891166 1,11654838 0,89851091 0,83308598 1,36769028 1,36769028 1,37620926 1,22946486 1,04213507 1,44814427 1,11739322 0,94063518 1,33664351 1,3761056 0,85281131 0,9444191 1,29966972 1,18356056 1,2991617 1,2991617 1,29917473 0,81397109 1,11407344	0,57820724 0,4181458 0,3466821 0,3197689 0,40470191 0,5140328 0,5140328 0,5140328 0,46284904 0,39312846 0,35468387 0,46284904 0,35468437 0,32444086 0,45604905 0,456061905 0,456061905 0,465604905 0,465804905 0,4955044277 0,475704277455 0,5904777645 0,5904777645 0,5904777645	0,00369413 0,0037898 0,003880578 0,00388725 0,0038725 0,00387638 0,00389885 0,00395233 0,00412494 0,0041734 0,00425745 0,0042745 0,0042745 0,004255 0,004550 0,004255 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,00455 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550 0,004550000000000	0,0233628 0,02339620 0,0239621 0,02402992 0,0246217 0,02446336 0,02456346 0,02456346 0,02456346 0,02456346 0,025671393 0,02654103 0,02754016 0,02777750000000000000000000000000000000	AT2620630 AT2620635 AT4616790 AT566520 AT5609405 AT566520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT2643010 AT1620890 AT3647580 AT3607785 AT3612300 AT3612320 AT2647940 AT3605045 AT3605055 AT2645680 AT2645685 AT2645690 AT1629720 AT1629730 AT1665480 AT360520 AT3601255 AT3665510 AT560510 AT5605510 AT5605510 AT560550	AT2620625 AT2620630 AT2620635 AT4616780 AT4616790 AT4616800 AT4616780 AT4616790 AT4616800 AT4632010 AT4632020 AT566530 AT5609725 AT5666330 AT5666335 AT1607040 AT1607050 AT1607051 AT1607060 AT1604557 AT3645010 AT2609410 AT2643010 AT1620880 AT1620890 AT3647570 AT3647580 AT3607785 AT3612290 AT3612300 AT3612320 AT3612340 AT2647940 AT2601000 AT2647950 AT3605905 AT360555 AT3605785 AT3605905 AT360555 AT365250 AT3637170 AT2637180 AT2637190 AT2645880 AT1669485 AT1629720 AT1629730 AT1629720 AT1629730 AT1669480 AT165065510 AT5605500 AT3665510 AT560530 AT5605520 AT5601525 AT5606330 AT1674930 AT1674940 AT1674950 AT2645960 AT1674950 AT2645960 AT1674950 AT3645950 AT2645970 AT3645950 AT2645970 AT560550 AT5601520 AT5601530 AT560510 AT5601520 AT5601530
Chr5-26229483 Chr5-26499000 Chr1-216354 Chr2-17886142 Chr2-17886142 Chr2-17886142 Chr2-17886142 Chr2-17864 Chr2-17564 Chr2-19622436 Chr2-1961265 Chr2-1961265 Chr2-1961265 Chr2-191155 Chr1-26118156 Chr5-20115.5 Chr2-18912851 Chr5-202485 Chr2-26385 Chr2-26385 Chr2-26187973.5 Chr2-28147973.5 Chr2-28147973.5 Chr2-28147973.5 Chr2-28147973.5	73,1080182 106,799808 187,536277 249,382229 114,042665 69,349489 64,9200642 115,088401 107,2668 49,445329 92,50884 154,018208 55,124553 106,903771 192,811444 67,6059191 109,19406 68,440933 123,2012921 94,1970615 43,7599973 64,427526	1,54891166 1,11654838 0,89851091 0,85308598 1,30758036 1,30760928 1,37620926 1,22946486 1,04213507 1,44814427 1,1173932 0,94063518 1,3964537 1,03710056 0,85281131 1,3964537 1,370056 0,85281131 1,3291611 0,94443191 1,32917473 0,81397109 1,11407344 1,54281076	0,57820724 0,4181458 0,3166821 0,3197689 0,5140328 0,5140328 0,5167829 0,46284904 0,39312846 0,54683837 0,35061061 0,35081481 0,35048127 0,35045041 0,36130922 0,50860177 0,31180372 0,4277645 0,527247093	0,00369413 0,00378989 0,00378989 0,0038775 0,0038783 0,0038783 0,00389885 0,0039503 0,00395019 0,00401416 0,0041246 0,0041734 0,00425745 0,0042745 0,0042874 0,00423745 0,0042874 0,00423131 0,00431313 0,00437208 0,00448245 0,00448245 0,00448245 0,00448245 0,0046676 0,00466676	0.0233658 0.02339612 0.02399701 0.02439622 0.02439621 0.02458926 0.02458926 0.025470478 0.02557085 0.02645702 0.02557085 0.02654703 0.0255410000000000000000000000000000000000	AT2620630 AT2620635 AT4G16790 AT566520 AT5609405 AT566520 AT5609725 AT1607050 AT1607051 AT1607060 AT3645010 AT2643010 AT2643010 AT2643010 AT362730 AT362730 AT3612300 AT3612320 AT3647580 AT3605055 AT2645680 AT2645685 AT2645690 AT1659740 AT3605055 AT1669480 AT1669485 AT5605510 AT360520 AT5601255 AT1669490 AT1674950 AT2645960 AT2645970 AT5601310 AT500520 AT4613405 AT560510 AT560520	AT2620625 AT2620630 AT2620635 AT4G16780 AT4G16790 AT4G16800 AT4G32010 AT4G32020 AT5G65630 AT5G09405 AT5G65630 AT5G09405 AT3G65630 AT5G09725 AT5G66330 AT5G66335 AT1G07040 AT1G07050 AT1G07050 AT1G07060 AT1G04557 AT3G45010 AT26G9410 AT2643010 AT3G4520 AT3G07280 AT3G47580 AT3G0785 AT3G47580 AT3G0785 AT3G47580 AT3G0785 AT3G47580 AT3G0785 AT3G47590 AT3G47580 AT3G0785 AT3G12290 AT3G12300 AT3G12320 AT3G12340 AT2647940 AT2C01000 AT2647950 AT3G650505 AT3G26520 AT3G31120 AT2G3180 AT2G3190 AT2G47940 AT2G1785 AT3G4580 AT2G45885 AT2G45890 AT1629720 AT3G69485 AT3G6940 AT1G59485 AT5G65500 AT5G69520 AT5G01255 AT5G06330 AT1649480 AT1G74940 AT1G74950 AT3G4590 AT2G45970 AT5G60510 AT5G01520 AT5G01530 AT4G1301 AT5G0120 AT5G01530 AT4G13015

Postion	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr4-6044593.5	91.2436892	1.0909905	0.41917922	0.00462488	0.02823454	AT4G09560	AT4G09560
Chr5-26635084 5	96 3384714	1 12622956	0.43359438	0.00469626	0.02862482	AT5666700	AT5G66700 AT5G66710
cli 4 247220035084.5	00,0004714	1,12022550	0,433333430	0,00403020	0,02002402	A15000700	
Chr1-24/323/7.5	92,5487608	1,09/19066	0,42384379	0,0048174	0,02931669	A11G66330	A11G66330 A11G66340
Chr5-8161507.5	54,2959139	1,37618219	0,53235337	0,00486766	0,02956318	AT5G24130	AT5G24120 AT5G24130 AT5G24140
Chr3-22291650	105,088439	1,02173093	0,39538064	0,00488068	0,02956318	AT3G60310 AT3G60320	AT3G60310 AT3G60320
Chr2-7056389.5	70,8844419	1,23927628	0,47956875	0,004881	0,02956318		AT2G06605 AT2G16290
Chr4-15490177	520,233868	0.80973187	0.3135027	0.00489933	0.02961273	AT4G32020 AT4G32030	AT4G32020 AT4G32030
Chr2 12660440 5	106 140208	1 05 466594	0.40920215	0.00400461	0.02061273	AT3C321E0	AT3G231E0 AT3G231E0
Chr2-13660440.5	106,149308	1,05400584	0,40839215	0,00490461	0,02961273	A12G32150	A12G32150 A12G32160
Chr2-14150313.5	72,9007287	1,28453857	0,49775394	0,00493044	0,02972197	AT2G33385 AT2G33390	AT2G33385 AT2G33390 AT2G08575 AT2G33400
Chr4-10649812	140,696501	0,94769181	0,3673942	0,00494723	0,02973084		AT4G19520 AT4G19530
Chr5-872581	132,769491	1,10046654	0,4266227	0,0049474	0,02973084	AT5G03490 AT5G03495	AT5G03480 AT5G03490 AT5G03495
Chr4-18232047	68 2411799	1 22858433	0 47815941	0.00509369	0.03056215	AT4G39140	AT4G39140 AT4G39150
cli 5 co1244 c 5	00,2411755	1,22050455	0,47013341	0,00505505	0,03030215	A14635140	
Chr5-6812416.5	111,572637	1,02855906	0,40054199	0,00511556	0,0306315	A15G20180	A15G20170 A15G20180 A15G20190
Chr1-25877612	70,1601774	1,22215455	0,47600284	0,0051212	0,0306315		AT1G68830 AT1G68840
Chr3-17442369	102,806437	1,36715822	0,532618	0,00513114	0,03064317	AT3G47340 AT3G47341	AT3G47340 AT3G47341 AT3G07715
Chr2-10165487	49.4918205	1.38034172	0.53781565	0.00513549	NA		
Chr5-5696272.5	69 4350116	1 22474225	0 47762493	0.00517018	0.02070542	AT5G17310	AT5G17210
Ch-4 11425021	05,4330110	1,22474255	0,47702433	0,00517018	0,03070542		
Chr4-11425931	90,4310328	1,07730504	0,42017831	0,00517267	0,03079542	A14G21445 A14G21450	A14G21445 A14G21450 A14G21460
Chr4-8373274	49,4559854	1,42735904	0,55725669	0,00521252	NA		AT4G06205 AT4G14590
Chr5-26002734	92,8450617	1,28162074	0,50136778	0,00529037	0,03138832	AT5G65080	AT5G65080 AT5G65090
Chr2-17734019	90,8341877	1,23969982	0,48498499	0,0052917	0,03138832	AT2G42590 AT2G42600	AT2G42580 AT2G42590 AT2G42600
Chr1-2225264	209 928841	0 91730749	0 3589082	0.00529678	0.03138832	AT1607240 AT1607250	AT1G07230 AT1G07240 AT1G07250 AT1G07260
Ch-F 8501006 F	57 3503003	1 51 41 2 2 7 7	0.5034375.6	0,00525070	0,03130052	41100/240/11100/250	ATE C2 4770
CH12-8201996.2	57,2583883	1,51412277	0,59343750	0,00536388	0,031/3090	A15G24770	A15G24770
Chr3-21121135.5	77,4322776	1,13186533	0,4440213	0,0053997	0,03189974	AT3G57060 AT3G57062	AT3G57060 AT3G57062 AT3G08835 AT3G57070
Chr3-8640099.5	78,2977925	1,12898068	0,44320764	0,00542808	0,03201816	AT3G23910	AT3G23910 AT3G23920
Chr3-7177996	85.5078235	1.12226123	0.44087672	0.00545573	0.03213191	AT3G20550 AT3G20555	AT3G20550 AT3G20555 AT3G20557
Chr5-9799160	66 1525004	1 2224422	0.4802752	0.00546756	0.03215220	AT5G27680	AT5G27680
Ch-2 5 6 45 6 5 0	110 72105-	1,2224423	0,40000700	0,00540730	0,03213229	AT3C4 (5 70 AT3C033 AF	
Chr3-5645950	116,721955	1,08070454	0,42481518	0,00548049	0,03217901	AT3G16570 AT3G03345	AT3G16570 AT3G03345 AT3G16580
Chr2-17793210	70,0266991	1,22519329	0,48189415	0,00550387	0,03226695	AT2G42740 AT2G42750	AT2G42730 AT2G42740 AT2G42750 AT2G42760
Chr5-22179154	40,4478074	1,50886676	0,59467923	0,0055859	NA	AT5G54590	AT5G54585 AT5G54590
Chr1-30190327	108.045619	1.02949987	0.40599229	0.00561016	0.03283993	AT1680290	AT1G80290 AT1G80300
Chr1 21221002 5	00 4470047	1 20527262	0.475056230	0.0050501010	0.02200450		AT1056650
CIII 1-21231093.5	08,44/8017	1,2052/312	0,47585628	0,00565695	0,03299159		A100000
Chr3-22436179.5	216,472867	0,81495652	0,32175498	0,005657	0,03299159	AT3G60690	AT3G60690 AT3G60700
Chr4-10081944.5	63,880711	1,28408239	0,50703175	0,00566184	0,03299159	AT4G18230 AT4G18240	AT4G18215 AT4G18220 AT4G18230 AT4G18240
Chr2-12819745.5	186.761762	0.85876368	0.3393756	0.00569626	0.03307531	AT2G08360	AT2G08360 AT2G30040
Chr1-6946552.5	112 224849	1 01007/32	0.40310932	0.00569878	0.02207521	AT1G20030	AT1G20020 AT1G20030 AT1G20040 AT1G20050
cli 1 0340352.5	112,224045	1,01557452	0,40310332	0,00505070	0,03307531	AT1020050	A11020020 A11020030 A11020040 A11020030
Chr1-2/3/2155	87,2585853	1,11268159	0,43978353	0,00570205	0,03307531	A11G/2/00 A11G/2/10	A11G72700 A11G72710
Chr5-5211900	68,5918027	1,21550762	0,48063067	0,00571965	0,03312739	AT5G15970	AT5G15960 AT5G15970 AT5G15980
Chr1-22822768.5	90,0526646	1,12425501	0,44487505	0,00575002	0,03325314		AT1G61795 AT1G61800
Chr1-1713531.5	58.9062223	1.26910709	0.50282492	0.00580215	0.03350415	AT1G05700 AT1G04407	AT1G05700 AT1G04407 AT1G05710
Chr3 17120425 F	82 2070726	1 00356341	0.42249104	0.00586030	0.02275445	AT3C41050 AT3C41070 AT3C00315	AT3C41060 AT3C41070 AT3C00315 AT3C41080
Chr2-1/130435.5	82,30/9/30	1,09250341	0,43348104	0,00586039	0,03375445	A12G41060 A12G41070 A12G09215	A12G41060 A12G41070 A12G09215 A12G41080
Chr1-27759799.5	62,4621191	1,35578061	0,53794843	0,00586308	0,03375445	AT1G73830	AT1G73820 AT1G73830 AT1G09417
Chr5-3784841	253,124083	0,79074868	0,31399602	0,00589548	0,03389016	AT5G11740 AT5G00375	AT5G11730 AT5G11740 AT5G00375 AT5G01885 AT5G11750
Chr3-18000790	46,7775994	1,39667318	0,55550105	0,00596415	NA	AT3G48560	AT3G48560
Chr4-17281766	331 399862	0 72329387	0 28775484	0.00597569	0.03429992	AT4G36648	AT4G36640 AT4G36648 AT4G36650
Ch-2 1257562 5	61 5070333	1,24220020	0,20775464	0,00557505	0,03425552	AT3C04C30 AT3C04C30	
Chr3-1257563.5	01,5070322	1,24320839	0,49490051	0,00600183	0,03439852	A13G04620 A13G04630	A13G04010 A13G04020 A13G04030
Chr1-6627323	165,228249	0,89282681	0,35563469	0,00602773	0,03449552	AT1G19210 AT1G19220	AT1G19190 AT1G19200 AT1G19210 AT1G19220
Chr3-2564784	416,408468	0,78039947	0,31097971	0,00604534	0,03454478	AT3G08030	AT3G08020 AT3G08030 AT3G08040
Chr1-6754211.5	89,5615779	1,05268282	0,41986849	0,00608506	0,03472011	AT1G19490 AT1G19500	AT1G19485 AT1G19490 AT1G19500 AT1G19510
Chr1-6464636.5	312 106497	1 00642006	0.4016001	0.00610484	0.03477647	AT1G18740 AT1G18745	AT1G18730 AT1G18735 AT1G18740 AT1G18745 AT1G05417 AT1G05423 AT1G05427 /
Ch-1 20205107 5	112,100457	1,00042000	0,4010001	0,00010484	0,03477647	A11018/40 A11018/45	AT1010/30 A11010/35 A11010/40 A11010/45 A1100541/ A11005425 A1100542/
Chr1-28285197.5	113,590001	1,00334498	0,40052069	0,00612081	0,03477647		A11G/5380
Chr4-14165847	80,3333655	1,15925784	0,46277264	0,00612211	0,03477647	AT4G28703	AT4G28700 AT4G28703 AT4G28706
Chr1-6515911	115,755924	1,06618134	0,42584265	0,00614515	0,03485578	AT1G18870	AT1G18870
Chr5-5205544.5	72,720962	1,16078486	0,46385318	0,00616627	0,03492401	AT5G15940 AT5G15950	AT5G15940 AT5G15950
Chr1-20010432	74 8530889	1 25225214	0 50083445	0.00620386	0.03508515	AT1607917 AT1653620	AT1G09615 AT1G07913 AT1G53610 AT1G07917 AT1G53620
Ch-4 0440056 5	60.2454422	1,25225214	0,47007046	0,00020500	0,035000513	///////////////////////////////////////	
Chr4-9440856.5	08,2454432	1,1/03/508	0,47087946	0,00624037	0,03523972		
Chr2-8324169.5	70,4089012	1,15287114	0,46231818	0,00632142	0,035645	AT2G19180	AT2G19180 AT2G19190
Chr5-23742364	58,9389532	1,30088656	0,52206301	0,00635454	0,03572691	AT5G58784 AT5G58787	AT5G58782 AT5G58784 AT5G58787 AT5G58790
Chr5-5007307.5	108.64707	0.98443499	0.39506693	0.00635455	0.03572691	AT5G15410 AT5G15420	AT5G15410 AT5G15420 AT5G15430
Chr3-536538	124 533777	0.94000887	0.37750643	0.0063863	0.03585294	AT3G02540 AT3G02550	AT3G02540 AT3G02550
Chr1-4540840 5	127 004550	1 08222220	0.43471353	0.00620597	0.0359543		AT1612260
CIII 1** 3*0849.5	127,004558	1,00222358	0,454/1252	0,0003958/	0,0558542	175.045340	
cnr5-4939023.5	82,8943761	1,16463806	0,46798364	0,00641182	0,03589124	AI5G15210	A15G15200 A15G15210 A15G15220
Chr5-736658.5	60,4815808	1,28333021	0,51593707	0,00643444	0,03596543	AT5G03130 AT5G03140	AT5G03120 AT5G03130 AT5G03140
Chr2-12435674.5	67,5721064	1,20691103	0,48601048	0,00650852	0,03632665		AT2G28950 AT2G28960
Chr1-5979570	75,7340897	1.18165226	0.47629902	0.00655248	0.03651889	AT1G17420	AT1G17420 AT1G17430
Chr3-21828024 5	126 508004	1 05861716	0.42705289	0.00658950	0.03667253	AT3G59050 AT3G59060	AT3G59050 AT3G59060
Chir 3*21020024.3	120,508094	1,03001/10	0,42705288	0,00058959	0,0300/253	ATE C10000 ATE C10000	
Chr5-5444630	96,634819	1,15/18075	0,46699117	0,00660698	0,03671609	A15G10920 A15G10930	A12010310 A12010320 A12010330
Chr1-25464346	66,1218203	1,21871252	0,49259024	0,0066788	0,03701027	A11G67900	A11G67890 AT1G67900
Chr4-16431393.5	89,3609747	1,10888332	0,44820228	0,0066792	0,03701027	AT4G34350 AT4G34360	AT4G34350 AT4G34360 AT4G34370
Chr4-10940305	102,176283	1,00109699	0,40485019	0,00670372	0,0370831	AT4G20250 AT4G20260	AT4G20250 AT4G20260
Chr5-7008414 5	70.9396743	1.15559465	0.46740994	0.00671166	0.0370821	AT5G20700	AT5G20700 AT5G20710
Chr2 22420225 5	145 437475	0.97917607	0.255400000	0.00673777	0.0274722	AT2C62450 AT2C62460	AT2CC24E0 AT2CC24E0
CIII 3-23430335.5	145,42/1/6	0,8/81/607	0,35540003	0,000/3//1	0,03/1/36	A15005450 A15005400	A1303430 A1303400
Chr3-8594204.5	134,848311	0,91402244	0,3700016	0,00674961	0,03718579		
Chr1-634999	94,6839844	1,18632699	0,48102277	0,00682662	0,03755618	AT1G02860	AT1G02850 AT1G02860 AT1G04147 AT1G02870 AT1G04153
Chr5-13672542	78,8683139	1,21257236	0,49210393	0,0068687	0,03773366	AT5G35460	AT5G35450 AT5G35460
Chr2-15193191	202 793799	0.82221769	0.33421701	0.00694444	0.03809522	AT2G36220 AT2G08780 AT2G36230	AT2G36220 AT2G08780 AT2G36230 AT2G36240
Chr1-22220522	71 805 370 3	1 17752010	0 4700 405 0	0.00609444	0.02821717	AT1662960	AT1662950 AT1662960 AT1662970
CIII 1-23320522	/1,0053/93	1,1//03018	0,47904858	0,00098449	0,03821/17	A11002200	A11002500 A11002500 A11002570
Chr4-13920658.5	146,608716	0,91749778	0,37327721	0,00698658	0,03821717	A14G27970 AT4G27980	A14G27970 AT4G27980 AT4G27990
Chr3-22538431	79,38169	1,1796371	0,48033112	0,00702694	0,0383833	AT3G60960	AT3G60960 AT3G09515 AT3G60961
Chr1-22977631.5	77,2814941	1,13070864	0,46066109	0,00705335	0,03847283	AT1G62180	AT1G62170 AT1G62180 AT1G08477
Chr2-259072.5	48 8547742	1 33991100	0.5460604	0.00707257	NA	AT2G04015	AT2G01570 AT2G04015
CIII 2-2350/2.5	+0,0347742	1,33381188	0,3400094	0,00707257		A12004013	
Cnr4-9376639	88,9525513	1,04910897	0,42787614	0,00710523	0,03870084	A14G16650 A14G16660	A14616650 A14G16660
Chr1-11929073.5	244,278734	0,75258303	0,30766217	0,00721986	0,03926948	AT1G06627 AT1G06633 AT1G32920	AT1G32910 AT1G06627 AT1G06633 AT1G32920 AT1G32928 AT1G32930
Chr4-12536992.5	80,0005785	1,07974098	0,44226826	0,0073158	0,03973506	AT4G24150	AT4G24150 AT4G24160
Chr3-6538438.5	95.0710595	1.06558423	0.43662574	0.00733351	0.03977499	AT3G18950	AT3G18950 AT3G18952
Chr1-7002027 5	55 1049014	1 28/20240	0.5265597	0.00725040	0.03095054		AT1622620 AT1622610
CIII 1-/ 33232/.3	55,1548011	1,20439318	0,320358/	0,00735948	0,03585951	1750 17510 1750 1750	
cnr5-19302097	69,3927909	1,13857098	0,4684053	0,00753403	0,04072661	A15G47610 A15G47620	A15G47590 A15G47600 A15G47610 A15G47620
Chr3-22303954	56,6339946	1,2299883	0,50608174	0,00754079	0,04072661	AT3G60330 AT3G60340	AT3G60330 AT3G60340 AT3G60350
Chr3-1121045	53,8834926	1,26582353	0,52211161	0,0076662	0,0413458	AT3G04240 AT3G04250	AT3G04240 AT3G04250 AT3G04260
Chr2-12359310	47,8595551	1.31862727	0.54411484	0.00768724	NA	AT2G28800	AT2G28800
Char 7359500	42,0000	1,01002/2/	0.5722545	0.00777755		475 0222000	ATE C22200 ATE C222240 ATE C22220
CIII 5-7358599	43,81425	1,38443622	0,57225453	0,00777592	NA	A15622210	A15622200 A156222210 A15622220
cnr4-17601191	b5,1503746	1,15897316	0,47927796	0,0077995	U,U4198974	A14637435 AT4G37440	A14G37432 AT4G37430 AT4G37435 AT4G37440 AT4G37445

Postion	baseMean	log2(FC)	IfcSE	p-value	p-adj	gene 1 kb upstream to 1 kb downstream	gene 3 kb upstream to 3 kb downstream
Chr2-14546643.5	170,158716	0,90604459	0,37474026	0,00780747	0,04198974	AT2G34510	AT2G34510 AT2G34520 AT2G34530
Chr5-5939194	172,947249	0,81879015	0,33917039	0,00788714	0,04235888	AT5G17920 AT5G17930	AT5G17920 AT5G17930
Chr5-15378489.5	66,2196591	1,14567945	0,47511424	0,00794621	0,04261655	AT5G38410	AT5G38400 AT5G38410 AT5G05745 AT5G05725 AT5G38420
Chr5-24834069.5	54,2614314	1,23705609	0,51367286	0,00801445	0,04292259	AT5G61810 AT5G61820	AT5G61800 AT5G61810 AT5G61820 AT5G61830
Chr4-12687268	250.435686	0.96580587	0.401366	0.00805757	0.04309344	AT4G24570 AT4G24580	AT4G24560 AT4G24565 AT4G24570 AT4G24580
Chr5-23501249	126.371275	0.92987519	0.38705346	0.00814291	0.0434593	AT5G58060 AT5G58070 AT5G58080	AT5G58060 AT5G58070 AT5G58080
Chr1-7160719	69.5049322	1,12881644	0.46997016	0.00815531	0.0434593	AT1G20650	AT1G20640 AT1G20650
Chr3-19166506.5	83.8782165	1.03246422	0.42989351	0.00816012	0.0434593		AT3G51660 AT3G51670
Chr4-18558954.5	92,8472705	0.99229594	0.41325428	0.00817125	0.0434593	AT4G40040 AT4G40042 AT4G40045	AT4G40030 AT4G40040 AT4G40042 AT4G40045 AT4G40050
Chr5-8775060.5	373,270182	0.70722159	0.2950763	0.0082708	0.04392788	AT5G25280	AT5G25280 AT5G03955
Chr1-21036936.5	116.394304	0.91763565	0.38311867	0.00830625	0.04399984	AT1G56210	AT1656210
Chr5-24543378.5	81,1837972	1.05947661	0.44234638	0.00830726	0.04399984	AT5G60980	AT5G08985 AT5G60980 AT5G60990
Chr1-25559191	68 937688	1 12159047	0.46857805	0.00834187	0.04407091	AT1668185 AT1668190	AT1668185 AT1668190 AT1668200
Chr4-12612590 5	126 799731	0.9601516	0.40114514	0.00834363	0.04407091	AT4G24370 AT4G07260 AT4G24380 AT4G24390	AT4G24350 AT4G07255 AT4G24370 AT4G07260 AT4G24380 AT4G24390
Chr1-6034313	74.2814159	1.08628299	0.45420974	0.00838781	0.04424339	AT1G17545 AT1G17550	AT1617540 AT1617545 AT1617550
Chr3-22086435	81 8448409	1 07220184	0 44856774	0.0084178	0.04434067	AT3659770 AT3659780	AT3G59770 AT3G59780
Chr1-11774314	63 5530452	1 14519901	0 479737	0.00849003	0.04461328	AT1G32550 AT1G32560	AT1G32550 AT1G32560 AT1G32570
Chr3-9375815 5	83 382413	1,05546775	0 44216967	0.00849279	0.04461328	AT3G25717	AT3G25716 AT3G25717 AT3G04935 AT3G04955
Chr1-25403374	97 /150966	1 15109139	0,44210507	0,00851511	0.04461928	AT1667750	AT1667750 AT1667760
Chr2-1822604 5	103 352887	0 78242979	0 22796221	0.00852276	0.04464858	413605080	AT3606070 AT3606080
Chr2 11050060	70.0208182	1 24219770	0.5213613	0,00852270	0,04404050	AT3C3E030 AT3C0813E	AT3G26070 AT3G26020 AT3G26020
Chr1-26600458 5	68 7750022	1,24318779	0,3213012	0,008533108	0,04473392	AT1G70700	AT1609197 AT1670790
ChrE 10265100	59 6177491	1,132/398/	0,48407012	0,00809308	0,04537065	A11070750	ATEC/17020
Chr1 6020565 5	53,0177481	1,19203880	0,30122040	0,00803004	0,04537003	4T1C20010	AT1 C10000 AT1 C20000 AT1 C20010 AT1 C20015 AT1 C05517
Chr1 4154001 5	84 8242000	1,14148997	0,48144091	0,00887103	0,04622092	AT1G20010	ATIG13350 ATIG20000 ATIG20010 ATIG20013 ATIG03317
Chi 1-4134501.5	64,6343335	1,20984133	0,511407	0,00833773	0,04081748	A11012240	A11012240 A11012244
Chr2-8542578	59,7813455	1,1942674	0,50551206	0,00907631	0,04711021	171 01 5300	
Chr1-5265211.5	98,6919756	1,038/25/5	0,43969097	0,00907853	0,04711021	A11G15290	AT1G15290
Chr1-11931540	124,724135	0,93895877	0,39806717	0,0091672	0,04750612	AT1G32928 AT1G32930	ATT CC00C2 ATT CC0070 ATT CC0072 ATT CC0077 ATT CC0077 ATT C00017
Chir 1-23850333	76 0012442	1,01091243	0,43137843	0,00922991	0,04707841	ATECCE110 ATECCE120	ATEGE 110 ATEGE 120 ATEGE 120
Chr5-22309052.5	76,8012443	1,09093313	0,46299873	0,00923065	0,04767841	A15G55110 A15G55120	A15G55110 A15G55120 A15G55125
Chr 1-2505/954	09,7175894	1,14396492	0,4855641	0,00923769	0,04767841	ATE C122C0 ATE C12220	ATE C127C0 ATE C12720 ATE C12700
Chr5-4445117.5	104,974551	0,93028258	0,39503009	0,00926219	0,04774069	AT5G13760 AT5G13770	ATSG13760 ATSG13770 ATSG13780
Chr5-20069600	80,7131144	1,0398004	0,44185497	0,00930476	0,04783819	A15G49470 A15G49480	
Chr5-25291096.5	206,455952	0,82487777	0,35053279	0,00930602	0,04783819	A15G63040 A15G09125 A15G09130	AISG03040 AISG09125 AISG09130 AISG03050 AISG09135
Chr5-19896392	144,688197	0,83901421	0,35672606	0,00933677	0,0479321	A15G49100	AT3CF03C0 AT3CF0370 AT3CF0380
Chr3-18035457	142,521454	0,84053446	0,35751492	0,00936033	0,04798887	A13G50260 A13G50270	A13G50260 A13G50270 A13G50280
Chr1-288/6326.5	87,1049724	1,08219466	0,46067571	0,00940825	0,04817026	A11G76890	A11G/6890 A11G/6892
Chr1-2283086.5	60,6884451	1,24811849	0,53170684	0,00945296	0,0483347	A11G07430	A11G07420 A11G07430
Chr3-822/43.5	56,8048356	1,25265173	0,53409247	0,00950376	0,04840199	A13G03460	A13G03450 A13G03460 A13G03470
Chr1-260/9944.5	/4,/83/139	1,091/249/	0,46547887	0,00950384	0,04840199	A11G69370	A11Gb9370 A11Gb9380
CNr5-61/0037	169,770844	0,90087681	0,38410751	0,00950393	0,04840199	171010700	AI5G18570
Chr4-10291783.5	115,117295	0,90351113	0,38543531	0,00953572	0,04849955	A14G18700	A14G18700
Chr3-51/5/68	72,0213309	1,163/4121	0,49675714	0,00957299	0,04862472	A13G15356 A13G15351	AI3G15354 AI3G15359 AI3G15356 AI3G15351 AI3G15358
Chr2-17379315	92,3668326	0,97124623	0,4151073	0,00964839	0,04893482	AT2G41680	AT2G41680 AT2G41690
Chr1-22814161.5	95,1433581	1,10333611	0,47164892	0,00965953	0,04893482	AT1G61780 AT1G61790	AI1G61770 AI1G61780 AI1G61790
Chr3-1644435.5	110,163912	0,91717868	0,39248414	0,00972335	0,04919324	AT3G01665 AT3G05650 AT3G01675	AT3G05640 AT3G01665 AT3G05650 AT3G01675
Chr5-7179537.5	79,0686162	1,10388118	0,47257474	0,00974857	0,04925592		AI5G21105 AI5G21120
Chr4-6799936	69,3080429	1,10251747	0,4721261	0,00976601	0,04927922	A14G11150	AI4G11150 AI4G11160
Chr3-18530105.5	65,731148	1,14860679	0,49222232	0,00981064	0,04933007	AT3G49970 AT3G49980	AT3G49970 AT3G49980 AT3G49990
Chr3-17778378	75,1167248	1,1990842	0,51386389	0,00981184	0,04933007	AT3G48140	AT3G48131 AT3G48140 AT3G48150
Chr4-14545889.5	67,057822	1,10729141	0,47467772	0,00983136	0,04933007	AT4G29700 AT4G08205 AT4G29710	AT4G08195 AT4G29700 AT4G08205 AT4G29710
Chr2-17504732	76,7618308	1,05169344	0,45085605	0,00983302	0,04933007	AT2G09320	AT2G41930 AT2G09320 AT2G41940
Chr2-17709961.5	78,2876254	1,11567039	0,47833962	0,00984032	0,04933007	AT2G42520 AT2G42530 AT2G42540	AT2G42520 AT2G42530 AT2G42540
Chr1-6622114	255,513124	0,71058288	0,30517283	0,00994383	0,04968552	AT1G19180	AT1G08925 AT1G05473 AT1G19180 AT1G19190 AT1G19200
Chr5-4193546.5	103,453256	0,98978957	0,42508726	0,00994441	0,04968552		AT5G00390 AT5G13180
Chr3-8213688.5	55,4603843	1,18923224	0,51078892	0,00995004	0,04968552	AT3G23090	AT3G23090

Table S2. Genes whose transcript levels were significantly changed in 3-day-old etiolated *bbx14-1* seedlings compared to Col-0.

	adj.pval	log2FC											
	bbx14 dark-	bbx14 dark-		All Gene				bbx14 dark.b	bbx14 dark.b	bbx14 dark.b	glk1glk2 dark	glk1glk2 dark	glk1glk2 dark
target	Col_dark	Col_dark	Gene Model Type	Symbols	Col_dark.brep1	Col_dark.brep2	Col_dark.brep3	rep1	rep2	rep3	.brep1	.brep2	.brep3
AT5G35935	8,32E-05	-3,28174727	transposable_element_gene	(21,67238	23,1827	18,34258	2,886879	2,158264	1,526182	1,992514	0,845762	1,235804
				RESPONSE REGULATOR 7									
AT1G19050	0,0236877	-2,41972181	protein_coding	(ARR7)	14,860644	21,100677	25,696069	3,792968	3,869425	3,561901	4,707734	5,921548	3,86554
AT4G08093	0,0236877	5,74868025	pseudogene		0,435084	0	0	7,300874	7,907234	7,878611	0,563972	0,699016	0,480411
AT5G26270	0,01112168	-1,29586323	protein_coding	(61,659025	61,223475	84,543191	31,564524	28,985508	23,935153	24,918605	29,148114	32,673958
AT4G04223	0,00077126	2,38742634	other_rna	(18,184059	21,605697	28,509125	119,230816	102,931929	139,177523	13,551214	8,725097	5,85488
AT5G43500	0,02018059	-1,20121838	protein_coding	ACTIN- RELATED PROTEIN 9 (ATARP9);ACT N-RELATED PROTEIN 9 (ARP9)	30,70714	34,368455	25,619634	12,457122	13,574492	13,4853	8,868059	9,060376	10,151346
AT1G77870	0,0236877	-1,14321792	protein_coding	MEMBRANE- ANCHORED UBIQUITIN- FOLD PROTEIN 5 PRECURSOR (MUB5)	32,671947	38,035992	38,949317	15,772003	15,664028	18,869606	16,188171	20,544858	18,014208
				QUA-QUINE									
AT3G30720	5,99E-05	6,41170449	protein_coding	STARCH (QQS)	2,410026	2,434022	3,947105	234,846939	230,127136	309,29721	0,24011	0,462585	0,705425
AT2G01422	0,03662701	4,29779935	other_rna	0	0 0	0,331422	0,325694	5,470839	4,112089	5,490648	0	0	0
AT2G01010	0,00383827	1,59227802	ribosomal_rna	0	226,494944	222,719814	201,449459	655,175181	776,031582	563,24936	783,524336	734,088637	790,902885
AT1G67105	0,0236877	1,84864829	other_rna	0	2,838764	5,255271	3,831474	15,342455	13,263554	14,670843	19,423588	21,34152	17,643313
AT3G29633	0,00329186	7,43993473	protein_coding	0	0 0	0	0,108841	17,903482	12,08179	13,748028	0	0	0

Table S3. Genes whose transcript levels were significantly changed in etiolated *bbx14-1* seedlings that were shifted to light for 1 day.

Locus	Raco moan	log2(EC)	StdErr	n value	n odi	Locus	Gene Model Primary Gene	Col_DL_1	Col_DL_2	Col_DL_3	<i>bbx14</i> _DL_1	bbx14_DL_2	bbx14_DL_3
AT5G46915	5,12976011	-3,67215745	0,90283106	4,75E-05	0,0045098	AT5G46915	transcriptional.	5,04591946	10,0485621	8,06860315	0	0	0
AT2G42530	9,9554942	-3,63042362	0,63416089	1,04E-08	3,63E-06	AT2G42530	Encodes COR1: COLD REGULA	29,4345302	16,3289134	42,3601666	1,59907859	2,14941828	2,00077889
AT4G36700 AT1G28870	4,21734901	-3,46951518 -3,46160364	0,99744487	0,00050441	0,02556878	AT4G36700	RmIC-like cupi . tRNA-Pro (antij	20,1836778	10,0485621	16,1372063	0	2,14941828	0
AT2G17040	7,12046594	-3,1850184	0,98419687	0,0012115	0,01403425	AT2G17040	Member of the NAC DOMAIN	15,1377584	2,51214052	4,03430158	0	0	0
AT1G07050	37,6474198	-3,15993484	0,39988054	2,74E-15	3,19E-12	AT1G07050	CCT motif fami .	141,285745	102,997761	151,286309	11,1935501	19,3447646	12,0046734
AT4G01525 AT3G05955	5,20040274	-3,01367043	0,78323836	0,00011923 9.71F-06	0,00890232	AT4G01525	Member of Sad SADHU NON-C	8,40986577 19.3426913	12,5607026	6,05145237	1,59907859	2.14941828	0
AT5G42900	82,2739475	-2,67896269	0,44032668	1,17E-09	5,29E-07	AT5G42900	cold regulated COLD REGULA	338,91759	208,507663	279,375384	45,5737397	38,6895291	36,0140201
AT5G05200	944,014295	-2,6100464	0,17396767	7,01E-51	1,55E-46	AT5G05200	Protein kinase .	2048,6433	1994,63957	2183,56573	369,387154	364,326399	274,106708
AT2G43620	11,8328027	-2,54921914	0,7560453	0.00074684	0,03438/23	AT2G43620	CACIA-like trar . Chitinase famil	35,3214362	20,0971242	40,3430158	6,39631435	4.29883657	6,00233668
AT3G48280	15,9745755	-2,48949494	0,57851814	1,68E-05	0,00196837	AT3G48280	putative cytoc CYTOCHROME	25,2295973	35,1699673	14,1200555	4,79723576	4,29883657	2,00077889
AT4G12480	55,7145763	-2,47170458	0,7044997	0,00045072	0,02349376	AT4G12480	Encodes a puta EARLY ARABID	23,5476242	20,0971242	20,1715079	0	6,44825485	2,00077889
AT4G05130	40,997746	-2,35390633	0,72817857	0,00029444	0,01721555	AT4G05130	Encodes a 12S CRUCIFERIN 3	275,843597	70,3399346	58,4973729	23,9861788	19,3447646	22,0085678
AT1G04587	4,53530161	-2,22407487	0,68474675	0,00116209	0,04644362			7,56887919	11,3046323	8,06860315	2,39861788	1,07470914	1,00038945
AT2G40130	26,1867128	-2,11375839	0,54433923	0,00010311	0,00791232	AT2G40130	Encodes a men SMAX1-LIKE 8 Encodes EKE1 ELAVIN-BINDI	72,3248456	32,6578268	32,2744126	7,99539294	12,8965097	8,00311557
AT5G63530	26,2614689	-2,00377505	0,55098148	0,00027611	0,01640423	AT5G63530	Farnesylated p FARNESYLATE	11,7738121	15,0728431	34,2915634	3,19815717	2,14941828	8,00311557
AT2G23110	5,01715786	-2,00059508	0,61818012	0,00121105	0,04781296	AT2G23110	Late embryoge .	13,4557852	7,53642157	12,1029047	3,19815717	2,14941828	2,00077889
AT1G06693	18,4537881 94,83619	-1,92693744 -1 91769971	0,48727192	7,67E-05 9.45E-13	0,0062763 6 73E-10	AT4G33980	 FUNCTIONS IN: COLD-REGULA	27,752557	17,5849837	19,1629325	8,79493223	3,22412743	3,00116834
AT2G33380	38,0037425	-1,81095023	0,45124565	5,99E-05	0,00531621	AT2G33380	Encodes a calci RESPONSIVE T	15,1377584	26,3774755	17,1457817	7,99539294	4,29883657	2,00077889
AT1G22490	56,5974994	-1,80523906	0,40855164	9,93E-06	0,00130778	AT1G22490	basic helix-loo (BHLH094)	134,557852	178,361977	129,09765	40,776504	30,091856	50,0194723
AT5G46500 AT1G57820	14,3124876	-1,78361757	0,54660595	0,00110209 3 76F-05	0,04499758	AT5G46500	BEST Arabidop: . Encodes a 645- VARIANT IN M	10,0918389 62,2330067	17,5849837	17,1457817	1,59907859	4,29883657	6,00233668
AT2G40080	8,43817723	-1,73369716	0,51769544	0,0008114	0,03667264	AT2G40080	Encodes a nove EARLY FLOWE	18,5017047	27,6335457	32,2744126	6,39631435	6,44825485	10,0038945
AT5G66400	89,3801011	-1,68177762	0,302034	2,57E-08	8,37E-06	AT5G66400	Belongs to the RESPONSIVE T	134,557852	160,776993	119,011897	51,1705148	25,7930194	48,0186934
AT5G24470	1438,41844	-1,67972444	0,22116286	3,08E-14	2,84E-11	AT5G24470	Encodes a pseu PSEUDO-RESP member of CYE CYTOCHROME	4459,75182	3622,50663	4376,20864	1090,5716	1464,82856	1289,502
AT3G47380	19,5137695	-1,65347486	0,45023198	0,00024019	0,01465429	AT3G47380	Plant invertase (ATPMEI11)	18,5017047	45,2185294	44,3773173	9,59447152	12,8965097	10,0038945
AT1G11210	109,543576	-1,61743708	0,39644788	4,51E-05	0,00434975	AT1G11210	Protein of unkr .	222,020456	150,728431	157,337761	38,3778861	64,4825485	64,0249246
AT5G48250 AT1G62260	172,612143	-1,59404894	0,18444571	5,51E-18 0.00016494	1,01E-14 0.01118185	AT5G48250 AT1G62260	B-box type zinc B-BOX DOMAI Encodes MITO(MITOCHONDE	434,79006	405,710694	373,172896 28,240111	105,539187	154,758116	141,054912
AT5G43500	395,114121	-1,55024018	0,13909353	7,55E-29	3,34E-25	AT5G43500	encodes a prot ACTIN-RELATE	635,785852	525,037369	599,093784	193,488509	228,913047	178,069321
AT3G28660	18,5669881	-1,49886443	0,43724818	0,00060816	0,02909295	AT3G28660	Tetratricopept .	23,5476242	28,889616	18,1543571	7,99539294	9,67238228	6,00233668
AT4G11900	87,8419296 85.7339836	-1,40701918	0,25464316	3,29E-08 1.10E-05	0.00142392	AT3G26230 AT4G11900	S-locus lectin c .	112.692201	85,412////	114.977595	35,1797289 31.9815717	23,6436011	42.01635678
AT5G52310	506,502621	-1,40287936	0,20735307	1,33E-11	8,63E-09	AT5G52310	cold regulated LOW-TEMPER	1359,87529	1258,5824	1323,25092	393,373332	612,584211	474,184597
AT1G03790	105,662589	-1,38674727	0,40290536	0,00057771	0,02806152	AT1G03790	Encodes SOMN SOMNUS (SOM	1 306,119114	231,116928	252,143849	103,140569	70,9308034	118,045955
AT5G35935	182,51907	-1,33361576	0,27918214	3,13E-06	0,04394155	AT5G35935	copia-like retro.	220,338483	222,324436	201,715079	87,9493223	109,620332	60,0233668
AT4G15490	174,154122	-1,28654964	0,19963505	1,16E-10	5,96E-08	AT4G15490	Encodes a prot (UGT84A3)	289,299382	346,675392	300,555467	119,930894	128,965097	132,051407
AT3G24420	357,271862	-1,27070596	0,29554843	1,71E-05	0,00199137	AT3G24420	alpha/beta-Hyr (DLK2)	719,88451	1193,26675	1029,75548	473,327262	361,102272	365,142148
AT1G01390	69,8828432	-1,2671267	0,38905597	0,00112626	0,04542223	AT1G01390	UDP-Glycosylti .	75,6887919	110,534183	72,6174284	15,9907859	42,9883657	46,0179145
AT4G16146	77,8759818	-1,25187673	0,25567053	9,76E-07	0,00019787	AT4G16146	cAMP-regulate .	124,466013	128,119167	133,131952	67,1613007	55,8848754	36,0140201
AT2G17730	176,560618	-1,24150182	0,12644058	9,34E-23	3,44E-19	AT2G17730	Intrinsic thylak NEP-INTERACT	1 364,988174	374,308938	380,232924	159,907859	156,907535	155,060364
AT4G34060	27,4636622	-1,18964665	0,30057045	7,56E-05	0,0062763	AT4G12250	Encodes a prot DEMETER-LIKE	37,0034094	55,2670915	40,3430158	19,188943	19,3447646	18,00701
AT2G29090	144,40683	-1,18107576	0,1624666	3,60E-13	2,75E-10	AT2G29090	Encodes a prot CYTOCHROME	226,225389	219,812296	201,715079	86,3502437	106,396205	93,0362185
AT5G46050 AT2G16660	160,782645	-1,16514118	0,21504438	6,02E-08	1,73E-05 0.01987603	AT5G46050 AT2G16660	Encodes a di- a NRT1/ PTR FA	380,966919	365,516446	349,975662	193,488509 41,5760433	171,953463	119,046344 62.0241457
AT5G61380	945,399515	-1,09554428	0,11590698	3,33E-21	8,29E-18	AT5G61380	Pseudo respon TIMING OF CA	2207,58976	2017,24884	2082,70819	992,228263	925,324571	1028,40035
AT5G15970	315,901048	-1,09489497	0,25066518	1,25E-05	0,00155717	AT5G15970	Encodes a gene (KIN2)	366,670148	330,346479	538,579261	215,875609	176,252299	180,0701
AT1G17100	24,1975448	-1,08817338	0,32296912	3,43E-05	0,003462303	AT1G17100	SOUL heme-bir HAEM-BINDIN	333,030684	363,004305	365,104293	132,723523	177,327008	199,0775
AT5G50450	227,067057	-1,03683166	0,28097306	0,00022413	0,01395321	AT5G50450	HCP-like super .	433,108087	580,304461	465,961832	206,281138	232,137175	274,106708
AT2G16365	765,300447	-1,02137378	0,15694787	7,63E-11	4,44E-08	AT2G16365	PCH1 binds an PHOTOPERIO	1702,99782	1652,98846	1539,08605	839,516258	849,020222	714,278065
AT5G20630	2303,28654	-1,01280248	0,11908311	1,86E-17	2,74E-14	AT5G20630	Encodes a gern GERMIN 3 (GE	F 4541,32751	435,024391 4692,6785	5259,72068	2333,05566	2194,55607	2642,02853
AT1G27410	81,558683	-1,0018551	0,29918403	0,00081214	0,03667264	AT1G27410	DNA repair me'.	57,1870872	59,0353023	82,7031823	39,1774254	27,9424377	30,0116834
AT4G28230	68,7840565	1,00197773	0,29184046	0,00059627	0,02877317	AT4G28230	unknown prot(. Disease resistar	31,9574899	22,6092647	24,2058095	55,9677506	37,61482	68,0264823
AT5G10800	55,2354781	1,00767583	0,26241789	0,00012305	0,00906519	AT5G10800	RNA recognitic .	35,3214362	18,8410539	26,2229602	56,7672898	51,5860388	59,0229773
AT1G45201	333,494115	1,01476506	0,29011232	0,00046905	0,02422079	AT1G45201	Target of AtGRI TRIACYLGLYCE	179,971127	256,238333	227,938039	378,182086	598,612992	381,148379
AT2G36050	368.182705	1,01829652	0,27155942	1.33E-05	0.00162371	AT2G36050	ovate family pr OVATE FAMILY	203.518752	231.116928	203.73223	471.728183	315.964488	518.201733
AT1G08990	32,6559385	1,02440354	0,30891238	0,00091263	0,03939631	AT1G08990	plant glycogen PLANT GLYCO	40,3673557	35,1699673	48,4116189	102,34103	67,7066759	84,0327135
AT2G22810	69,5089299	1,03446679	0,31813312	0,00114725	0,04604037	AT2G22810	key regulatory 1-AMINOCYCL	55,5051141	37,6821078	30,2572618	75,1566936	107,470914	77,0299874
AT4G22490 AT4G37770	423,045777	1,03957079	0,22950485	2,55E-05	0,00090083	AT4G22490 AT4G37770	Encodes an aux 1-AMINO-CYC	132,875879	82,9006372	102,87469	236,663631	197,746482	232,090352
AT1G55200	54,5715467	1,0450845	0,31803648	0,00101602	0,04252858	AT1G55200	Protein kinase .	33,6394631	33,913897	46,3944681	95,9447152	94,5744045	48,0186934
AT2G34620	700,709908	1,09083242	0,14044035	8,02E-15	8,06E-12	AT2G34620	Mitochondrial .	558,415087	589,096952	595,059483	1204,10618	1257,4097	1260,4907
AT4G13500	319,737767	1,11088975	0,19597481	1,44E-08	4,90E-06	AT4G13500	unknown prot .	228,748349	233,629069	294,504015	583,663684	569,595845	491,191218
AT3G23730	816,013734	1,11327058	0,1911162	5,71E-09	2,18E-06	AT3G23730	xyloglucan end XYLOGLUCAN	544,959302	698,375065	508,321999	1349,62233	1126,29518	1330,51796
AT3G55240	350,893219	1,11672797	0,31915363	0,00046695	0,02422079	AT3G55240	Overexpression .	40,3673557	30,1456863	56,4802221	86,3502437	117,143296	80,0311557
AT4G33610	108,216884	1,13030549	0,33815107	0,00082996	0,03705643	AT4G33610	glycine-rich pr .	121,102067	168,313415	110,943293	259,050731	247,183103	382,148768
AT4G13575	512,693687	1,13435437	0,18878423	1,87E-09	7,80E-07	AT4G13575	unknown prot .	79,0527382	80,3884967	111,951869	194,288048	210,642992	196,076331
AT1G01060	319,072792	1,13535874	0,26063142	1,32E-05	0,00162371	AT1G55990	LHY encodes a LATE ELONGA	74,0068188	108,022042	112,960444	161,506937	279,424377	214,083341
AT1G26330	28,2637144	1,13677495	0,33001209	0,00057181	0,02783592	AT1G26330	DNA binding; F .	16,8197315	12,5607026	20,1715079	31,9815717	42,9883657	38,014799
AT3G21330	835,760024	1,14837425	0,13480135	1,61E-17	2,54E-14	AT3G21330	basic helix-loo .	287,617409	241,16549	280,38396	577,26737	580,342937	648,252361
A14G39510 AT2G35290	95,864351 42,8439927	1,14993422	0.344385	1,90E-05	0.03667264	A14G39510 AT2G35290	member of CYF CYTOCHROME	45,4132751	32,6578268	38,325865	/4,3571543	98,8732411	92,035829
AT1G60060	96,2945439	1,15587906	0,323211	0,00034858	0,01955299	AT1G60060	Serine/threoni .	45,4132751	55,2670915	28,240111	108,737344	90,2755679	92,035829
AT3G29370	149,645791	1,17850014	0,22052233	9,09E-08	2,45E-05	AT3G29370	Encodes a atyp P1R3 (P1R3)	37,0034094	30,1456863	32,2744126	68,7603792	66,6319668	95,0369974
AT1G21270	220,059188	1,1922/33	0,1551949	0,00040857	0,0217062	AT1G00100 AT1G21270	cytoplasmic se WALL-ASSOCI	40,3673557	45,2185294	26,2229602	63,9631435	103,172078	96,0373868

InstructImageJunctpulse <th>Locus</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Locus</th> <th>Gene Model</th> <th>Primary Gene</th> <th>Col DL 1</th> <th></th> <th></th> <th>bby14 DL 1</th> <th>hhv14 DL 2</th> <th>bby14 DL 2</th>	Locus						Locus	Gene Model	Primary Gene	Col DL 1			bby14 DL 1	hhv14 DL 2	bby14 DL 2
ATTGUTO 1 19,214331 20,304532 0.3045320 0.305520	Identifier	Base mean	log2(FC)	StdErr	p-value	p-adj	Identifier	Description	Symbol	COI_DL_1	COI_DL_2	COI_DL_3	DDX14_DL_1	DDX14_DL_2	DDX14_DL_3
Integrad Spinispi Longwards Constant Spinispi	AT2G20750	39,8214353	1,20545524	0,36961206	0,00110861	0,04499758	AT2G20750	member of BET	EXPANSIN B1 (I	16,8197315	22,6092647	20,1715079	51,9700541	58,0342937	30,0116834
AFSC13300 S5,799221 C.2270521 C.3302060 C.5304272 C.5304272 <thc.530572< th=""> <thc.530572< th=""> <thc.5< td=""><td>AT1G63230</td><td>35.5113591</td><td>1.20947406</td><td>0.33931448</td><td>0.0003646</td><td>0.02009489</td><td>AT1G63230</td><td>Tetratricopept</td><td></td><td>9.25085235</td><td>20.0971242</td><td>12.1029047</td><td>28.7834146</td><td>38.6895291</td><td>28.0109045</td></thc.5<></thc.530572<></thc.530572<>	AT1G63230	35.5113591	1.20947406	0.33931448	0.0003646	0.02009489	AT1G63230	Tetratricopept		9.25085235	20.0971242	12.1029047	28.7834146	38.6895291	28.0109045
ATGGS 00 29,150076 1,2422107 0,3002347 2023342 27,12023 10,085733 10,055733 10,0577333 10,0577333 10,057733 10,057733 10,057733 10,057733 10,057733 10,057733 10,057733 10,057733 10,057733 10,0577333 10,0577333 <t< td=""><td>AT5G13580</td><td>56,7994923</td><td>1,23709512</td><td>0,30610804</td><td>5,31E-05</td><td>0,00487326</td><td>AT5G13580</td><td>Belongs to a cl</td><td>ATP-BINDING C</td><td>63,9149798</td><td>57,779232</td><td>64,5488252</td><td>143,917073</td><td>155,832826</td><td>146,056859</td></t<>	AT5G13580	56,7994923	1,23709512	0,30610804	5,31E-05	0,00487326	AT5G13580	Belongs to a cl	ATP-BINDING C	63,9149798	57,779232	64,5488252	143,917073	155,832826	146,056859
Art Gold 200 25,84400 1,2570500 <	AT3G53650	29.1560676	1.24821047	0.35086986	0.00037444	0.02053462	AT3G53650	Histone superf		25.2295973	15.0728431	10.0857539	39.9769647	47.2872022	38.014799
An103310 40,778003 L/273003 L/2730033 <thl 27300<="" th=""> <thl 273003<="" th=""></thl></thl>	AT4G03210	738,644908	1,25705902	0.15969222	3.50F-15	3.86F-12	AT4G03210	encodes a men	XYLOGI UCAN F	264.069785	246.189771	274.332507	665.216692	576.0441	644,250803
AT364740 1035.4291 LO298113 0.1402898 4.516.71 6.216.14 AT54470 Terratrooper: 54.27218 0.078388 10.65288 10.65528 10.555278 10.55528 10.55528	AT1605310	40 7736013	1 27529052	0 36560699	0.00048638	0.02491483	AT1605310	Pertin lyase-lik		20 1836778	32 6578268	22 1886587	60 7649863	45 137784	78 0303768
ATIG 100.79.4090 1.2455032 0.00211041 ATIG Attendes Control 65.01398 0.0521043 33.08807 20.310987 30.119997 ATIG ATIG <t< td=""><td>AT2G47440</td><td>1335 8291</td><td>1 29361134</td><td>0 15402398</td><td>4 51F-17</td><td>6 23F-14</td><td>AT2G47440</td><td>Tetratriconent</td><td></td><td>543 277329</td><td>507 452385</td><td>432 678844</td><td>1106 56238</td><td>1098 35274</td><td>1450 5647</td></t<>	AT2G47440	1335 8291	1 29361134	0 15402398	4 51F-17	6 23F-14	AT2G47440	Tetratriconent		543 277329	507 452385	432 678844	1106 56238	1098 35274	1450 5647
AT101860 47.P83397 J.298272 J.998272 J.998272 J.998274 J.998274 J.998274 J.998274 J.998274 J.972640 ST656565 G.732641 J.12756 O.000243 O.012739 MCG00450 D.9712440 J.902424 J.902424 J.902424 J.902424 J.912460 J.912440 J.9124404 J.9124404 J.9124404 J.9124404 J.91244044 J.91244044 J.9124404	AT3G14210	1029 36991	1 29550322	0 3023072	1.82E-05	0.00211084	AT3G14210	A semidomina	EPITHIOSPECIE	166 515342	95 4613398	108 926143	331 808807	292 320887	308 119949
Application Application Application Application Application Application Application Application Application Application App	AT1G13650	46 7843957	1 20632720	0 3010103	0.00094061	0.04028753	AT1G13650	REST Arabidon	21111100312011	25 2205073	25 1214052	12 1029047	70 3594578	47 2872022	40.0155778
ArtGorden 59,7389035 1.4772000 0.5420385 0.4001454 0.0001435 <	AT5G45650	67 5230441	1 3112565	0.28116441	3 115-06	0,00053629	AT5G45650	subtilase famil		26 0115705	10 1942484	36 3087142	60 7649863	94 5744045	104 040502
NAME NAME <th< td=""><td>AT4G04610</td><td>E9 7290025</td><td>1 24720507</td><td>0.26420282</td><td>0.00021642</td><td>0,00055025</td><td>AT4C04610</td><td>Encodor a prot</td><td>ADC DEDUCTAS</td><td>20,5115705</td><td>15 0738421</td><td>34 305 8005</td><td>44 7742004</td><td>66 6210669</td><td>56 021900</td></th<>	AT4G04610	E9 7290025	1 24720507	0.26420282	0.00021642	0,00055025	AT4C04610	Encodor a prot	ADC DEDUCTAS	20,5115705	15 0738421	34 305 8005	44 7742004	66 6210669	56 021900
ATGAGACO Liston TASGAG Diston TASGAG Diston TASGAG Diston Diston <thdiston< th=""> <thdiston< th=""> <thdiston< <="" td=""><td>AT4G04010</td><td>105 514404</td><td>1,34720307</td><td>0,30420383</td><td>0,00021042</td><td>0,01338803</td><td>AT4G04010</td><td>Encoues a prot</td><td>SMALL AUVINU</td><td>15 1277594</td><td>25 1214052</td><td>24,2038033</td><td>44,7742004</td><td>E2 72E4E71</td><td>97.0229919</td></thdiston<></thdiston<></thdiston<>	AT4G04010	105 514404	1,34720307	0,30420383	0,00021042	0,01338803	AT4G04010	Encoues a prot	SMALL AUVINU	15 1277594	25 1214052	24,2038033	44,7742004	E2 72E4E71	97.0229919
Answers Lisberge Lisberge <thlisberge< th=""> <thlisberge< th=""> <t< td=""><td>ATEC46600</td><td>100,314494</td><td>1,33232228</td><td>0,308333940</td><td>2,275,00</td><td>1 355 00</td><td>ATEC 4000</td><td>SAUK-IIKE duxi</td><td>DETA LULU DDO</td><td>13,1377384</td><td>43 7063880</td><td>32,2744120</td><td>45,3714302</td><td>120 712100</td><td>159.001533</td></t<></thlisberge<></thlisberge<>	ATEC46600	100,314494	1,33232228	0,308333940	2,275,00	1 355 00	ATEC 4000	SAUK-IIKE duxi	DETA LULU DDO	13,1377384	43 7063880	32,2744120	45,3714302	120 712100	159.001533
Allos220 24.244es 1,4221es 5,971941 1,4221es 5,971941 1,4211es 5,971941 5,275939 1,4221es 5,971945 1,421195 5,271949 1,4221es 5,5771 6,4421455 5,271194 5,27171 6,4421455 5,271195 5,27172 6,4421455 5,271119 5,12717 6,4421455 5,5771 6,4421455 5,5771 6,4421455 5,5771 6,4421455 5,5771 6,4421455 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,4421457 5,5771 6,442157 7,55811 6,412157 7,57811 6,412157 7,57811 6,412157 7,57811 6,4215711 6,4215711 6,4215711 6,4215711 6,57111 6,4215711 6,57111 6,4215711 7,574111 4,42164 7,57111	A15G46690	180,176454	1,30741905	0,2312/532	3,37E-09	1,352-00	A15G46690	Deta HLH prote	BETA HLH PRO	61,3920201	42,7063889	00,505970	151,912466	159,712188	158,001532
Alkolizio 64,297881 1,4849844 0,4022933 0,0023853 Alkolizio 1,778401 2,880335 2,718489 7,6,5772 6,442548 5,602113 1,778482 3,68521 2,718489 7,6,5772 6,442548 5,602113 1,778482 3,68521 2,718487 3,68521 2,718487 3,68521 2,7842877 4,71817 3,68568 2,7842877 4,71817 3,68568 2,7842877 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71817 4,71818	AT1G62280	22,4524657	1,42216065	0,391/5441	0,00028316	0,01677798	A11G62280	Encodes a prot	SLACI HOMOL	20,1836778	20,0971242	30,2572618	55,9677506	75,2296399	62,0241457
ATL666000 3-400980 1-49804988 0.4184476 0.00031685 0.00242975 ATL666000 0.00242975 ATL676400 T.7748121 1.50728431 1.2.102907 49.5714840 38.8895.291 40.00155778 ATGC4707 24,7160100 1.5484772 0.43790576 0.00238295 ATGC4707 1.848164 1.5686431 1.5284721 42.0011684 43.175120 61.187119 40.00153978 ATGC40000 1.55854567 0.3686408 1.25654 ATGC401008 1.5584306 1.52804231 1.2328475 1.4044397 ATGC40000 1.558430 0.5283518 0.4523413 0.0003827 0.0038387 0.0038387 0.0038874 0.01219505 0.0038387 0.03388744 0.0121979 0.0338874 0.0121979 0.0338874 0.01219797 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.0038877 0.00388778 0.00388778 0.00388778 0.00388787 0.00388778 0	A12G21200	65,2579819	1,46349834	0,42022933	0,00049654	0,02528557	A12G21200	SAUR-like auxi	SMALL AUXIN (19,3426913	23,865335	25,2143849	/6,/55//22	64,4825485	55,0214195
AlsG1/200 JU,34/0199 JU,348/138 U,0285/13 U,0285/13 U,0285/13 U,0286/13 JU,348/138 U,0088/13 JU,348/138 JU,348/138 <td>A11G66080</td> <td>35,4202985</td> <td>1,49860938</td> <td>0,43164376</td> <td>0,00051685</td> <td>0,02607988</td> <td>A11G66080</td> <td>unknown prot</td> <td></td> <td>11,//38121</td> <td>15,0728431</td> <td>12,1029047</td> <td>49,5714362</td> <td>38,6895291</td> <td>26,0101256</td>	A11G66080	35,4202985	1,49860938	0,43164376	0,00051685	0,02607988	A11G66080	unknown prot		11,//38121	15,0728431	12,1029047	49,5714362	38,6895291	26,0101256
AFSG4270 Z, Z, Holing 1, 5, 47, 50 3, 44, 50 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	AI3G1/660	30,5740199	1,50847937	0,438/1358	0,00058513	0,0282975	AI3G17660	A member of A	ARF-GAP DOM	10,0918389	10,0485621	8,06860315	17,5898645	27,9424377	40,0155778
AT503280 62,0664238 1,554557 0,3366580 0,396663 AT564380 Encode a YUCY MCRN (WCS 26,351281 187,247241 79,22475 114,044397 AT400890 1236,32076 1,58002655 0,9155023 1,58456 71,586471 1,52493 122,64776 12,47213 79,22475 114,044397 AT400890 1236,32076 1,58002655 0,9155023 1,58456 71,66210 82,3594611 0,0045521 12,729742 313,4102,4231 32,445011 32,454011 32,454011 32,445011 32,445011 30,384942 32,345011 30,384942 32,124623 31,214643 31,214643 31,214643 31,7153461 31,7456434 14,717312 1,7153411 31,3456431 33,84942 33,138931 30,384942 33,138931 30,384942 33,384942 33,384942 31,364051 31,445641 31,456431 32,44601<	AT5G24770	24,7160104	1,54347092	0,34790576	9,14E-06	0,00123995	AT5G24770	Has acid phosp	VEGETATIVE ST	16,8197315	17,5849837	16,1372063	43,1751219	60,1837119	48,0186934
AT200100 3555,2186 1,5260 AT2001008 FUNCTIONS IN: 1528,07261 1958,21354 1087,2427 509,87154 528,85183 4795,86701 AT4060850 158,30761 1,509,0755 0,1513445 0,0004572 0,238434 AT1664210 1,38850781 1,20027072 1,40717381 1,21534837 1,1200377 2,345430 3,0004572 0,2385443 AT1664210 1,3783121 1,758121 1,51783121 2,51240837 1,0120047 2,347164 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,01274497 1,0127497 1,1127497 1,0127497 1	AT5G43890	62,0664258	1,5545567	0,33668508	3,89E-06	0,00063663	AT5G43890	Encodes a YUC	YUCCA5 (YUC5	28,5935436	35,1699673	42,3601666	124,72813	79,5284765	114,044397
ArtGospo 1226,2207 1,58002655 0,1950329 1,587-64 2,057-13 ArtGospo 3,6339631 0,0458013 0,425415 0,0045821 2,0247766 ArtGoS201 0,30993441 0,00993441 0,00993441 0,00993441 0,0045821 1,01045501 1,01045501 1,01045501 1,01045501 1,01045501 1,01045501 1,01045501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0104501 1,0045501 1,0104501 1,0045501 1,0104501 1,0045501 1,0145501 1,0104501 <td< td=""><td>AT2G01008</td><td>3555,21896</td><td>1,56066853</td><td>0,2853549</td><td>4,52E-08</td><td>1,35E-05</td><td>AT2G01008</td><td>FUNCTIONS IN</td><td></td><td>1528,07261</td><td>1958,21354</td><td>1087,24427</td><td>3693,87154</td><td>5258,55183</td><td>4795,86701</td></td<>	AT2G01008	3555,21896	1,56066853	0,2853549	4,52E-08	1,35E-05	AT2G01008	FUNCTIONS IN		1528,07261	1958,21354	1087,24427	3693,87154	5258,55183	4795,86701
AT1664210 13,9850781 1,94890138 0,045821 2,3470102 4,341342 2,3480143 2,3490143	AT4G08950	1236,32076	1,58002655	0,19150329	1,58E-16	2,05E-13	AT4G08950	EXORDIUM (EX	EXORDIUM (EX	343,122523	472,282418	340,898483	1237,68683	1014,52543	1226,47746
AT564910 67.202072 1,64707391 0,0393484 1,07707 2,22263 AT564720 1,07738121 17,738121 17,738121 1,2120855 41,5760433 40,8380474 56,022100 AT1674440 2,2727501 1,67795522 0,6681397 0,0003383 0,00127428 AT1674400 Protein of unix 11,7738121 2,5121052 10,085753 3,578464 2,3089577 3,58465 2,0009733 54,810162 7,578464 2,388557 0,019723 AT364264 5,660711 1,8056931 0,4371787 3,58465 0,00035525 AT1611070 8,6498577 1,5484937 1,64,81364 2,656031 4,3770593 3,841012 5,6025879 AT2644910 162,046524 1,4855894 0,195236 3,384621 8,327475 18,154370 5,463071 11,10100 20,956228 20,077889 AT2644910 162,846571 1,485580 0,256718 4,99144 4,416414 0,0104223 Unknow mere 5,880906 6,803131 6,071828 2,3586402 2,77,74991 1,005552 2,98,6483 1,0065523 2,007788 2,77,74991 1,0055232 2,77,74991	AT1G64210	13,9850781	1,58490138	0,4523415	0,00045872	0,02385443	AT1G64210	Leucine-rich re		3,36394631	10,0485621	12,1029047	22,3871002	23,6436011	32,0124623
AT5G48740 L6,0663895 L,6095481 0,00981244 0,0030288 AT5G48740 Leurienrein 6,7278261 5,0242810 2,0217507 1,188943 1,193463 1,20046734 AT1G47440 2,2775501 1,6795520 ,6481797 0,0035733 0,0137242 AT3G4294 1,64197311 1,5124021 1,5134371 9,3540937 3,319988 2,0085737 AT3G4294 2,5020212 1,7306398 0,3042633 1,2356 0,0356525 AT161107 8,0995577 1,7549371 8,0566031 4,15760433 2,364501 5,0225878 AT264580 1,8455584 0,357578 3,38521 8,29518 AT2644910 Encode anm HOME080XE 7,35402157 2,1715078 4,545907 5,465071 1,587641 9,098528 10,007812 8,1719318 7,35402157 2,1715078 7,5984513 7,272495 2,461013 1,0054521 10,017507 7,2789504 4,019174 1,0054521 10,017507 7,35842157 0,1715078 7,998528 10,007514 1,0054514 1,0105501 1,0105513 1,511414	AT5G54190	67,2020752	1,64707391	0,30993484	1,07E-07	2,82E-05	AT5G54190	light-depender	PROTOCHLORC	11,7738121	17,5849837	14,1200555	41,5760433	40,8389474	56,021809
ATIG7440 22,727501 I,6779532 0,6083739 0,00192742 ATG74400 Fortenrolk 11,778121 2,121402 10,085739 0,038739 0,038739 0,0192742 ATG41500 S-shenoyl-tr 16,1197131 10,445651 10,045739 0,345031 2,428665 5,0019473 ATG25964 52,6202212 1,7306898 0,0426313 1,2360 A,24E-06 ATG269644 Potential natu SHORTOPEN 21,865651 26,3774755 18,154371 9,356097 54,801062 50,022879 ATG64506 152,465621 1,8455839 0,3907763 2,31166 0,0004287 ATG64100 Encodes ahom HOME0B0K-LE 57,187072 6,4647313 17,101403 2,045628 20,0077889 ATG60423 116,81264 1,9355846 0,2567186 0,9004279 A7G164023 Unknown per 58,8690604 6,2405111 68,81786 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 7,548937 <	AT5G48740	16,0663895	1,66963441	0,49961988	0,00083234	0,03708788	AT5G48740	Leucine-rich re		6,72789261	5,02428104	2,01715079	19,188943	17,1953463	12,0046734
AT362190 34,731331 1,7306582 0,4089532 0,24089335 3,85607 9,05565 5467021 10,085729 37,753468 4,9883657 50,0194723 AT362644 7,7306589 0,4026131 1,2466 A126466 AT3620444 Pontial natu SM07TPEN 1,58651 26,77775 15,153717 3,560031 41,570433 2,3643601 58,0225879 AT261586 42,550879 1,48615539 0,9907763 2,3166 0,0024297 A1264297 46,474599 54,630713 71,101409 0,956828 20,007788 AT1601250 16,2847671 1,8755846 0,5265718 4,9147141 114001250 encode men 1,6319715 7,3642157 2,0115079 7,584665 0,7479014 14,005522 AT1601250 10,947389 1,96147471 0,5298367 0,0023529 0,0043295 0,0148713 AT1667105 0,1839785 2,0115079 7,584645 0,7479048 3,166553 1,007759 2,384784 2,015079 9,5947152 2,5586569 0,007249 0,0033295 0,0043295 0,0043295 0,0043295 0,0043295 0,005628 1,0101101 0,60060407 <td< td=""><td>AT1G74440</td><td>22,7275501</td><td>1,67795522</td><td>0,46817975</td><td>0,00033837</td><td>0,01927428</td><td>AT1G74440</td><td>Protein of unk</td><td></td><td>11,7738121</td><td>2,51214052</td><td>10,0857539</td><td>30,3824932</td><td>33,3159834</td><td>23,0089573</td></td<>	AT1G74440	22,7275501	1,67795522	0,46817975	0,00033837	0,01927428	AT1G74440	Protein of unk		11,7738121	2,51214052	10,0857539	30,3824932	33,3159834	23,0089573
AT3C26441 S2,6202212 1,73306889 0,90426313 1,24C08 4,24C06 AT3C256440 Potentianau ORTOTOPR 2,186551 26,3774755 18,154371 93,540073 54,810162 75,0292085 AT1G11070 37,5507011 1,8065904 0,4045133 3,38620 0,0032652 AT1201400 Encode a hort Ad474597 54,640713 171,10109 209,56283 200,077889 AT2616566 425,666879 1,84615539 0,3907763 2,316-06 0,0004279 AT261656 encode a hort HOMD00X-LE 57,1870872 54,630713 171,10109 209,56283 200,077889 AT1601223 116,18264 1,9355846 0,2569718 4,941514 414114 AT4604223 unknow merc 58,869004 62,8035131 6,5831268 23,864029 27,274959 22,08404 AT1667102 64,919809 2,2314403 0,6404389 0,0002341 0,014511 0,0404037 AT5635490 16,0187315 5,3634612 2,01715079 5,9447152 22,56882 20,0077889 AT1645616 9,5712981 2,3864509 0,640715 0,0003240 0,011411 1,0456174 </td <td>AT3G21950</td> <td>34,7331393</td> <td>1,73045323</td> <td>0,34089535</td> <td>3,85E-07</td> <td>9,05E-05</td> <td>AT3G21950</td> <td>S-adenosyl-L-m</td> <td></td> <td>16,8197315</td> <td>10,0485621</td> <td>10,0857539</td> <td>37,5783468</td> <td>42,9883657</td> <td>50,0194723</td>	AT3G21950	34,7331393	1,73045323	0,34089535	3,85E-07	9,05E-05	AT3G21950	S-adenosyl-L-m		16,8197315	10,0485621	10,0857539	37,5783468	42,9883657	50,0194723
AT1G1070 37,5607011 1,80659044 0,4371137 3,88-21 8,2025879 AT2G44910 162,046528 1,84559643 0,952936 3,388-21 8,2025879 1,75498877 17,5849837 5,0668013 11,710409 20,955828 200,077889 AT2G15586 425,606879 1,84559643 0,3907763 2,31646 0,00042879 AT2G16586 unknown prot 1,46,31664 2,556225 9,840386 48,14733 70,965928 10,7470914 1,40,05522 AT1G01250 16,2847671 1,87858810 0,52667187 0,21715079 9,5584125 2,568402 27,7274995 22,088404 AT1G67105 40,590807 1,96478396 0,60413809 0,0002393 - 0,01489718 2,1214052 1,41200555 60,7649863 9,6749853 9,5947152 2,258802 2,0007789 AT1G65105 6,9751025 2,3194403 0,6649273 0,0304393 - 0,0189521 0,0085313 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513 6,8203513	AT3G29644	52,6202212	1,73306898	0,30426313	1,23E-08	4,24E-06	AT3G29644	Potential natu	SHORT OPEN R	21,865651	26,3774755	18,1543571	93,5460973	54,8101662	75,0292085
AT2G44910 162,046528 1,8455964 0,1952936 3,38E-21 8,29E-18 AT2G44910 Encodes a hom HOME0BOX-LE 57,1870872 46,4745997 54,4630713 171,101409 209,568283 200,077889 AT2G16586 425,606879 1,8451531 0,300743 2,01034295 0,00034295 0,00134244 AT1G16250 encodes a mer. 1,68197315 7,53642157 2,01135079 1,75898451 0,7470914 1,4005522 AT4G04223 116,182641 1,93558469 0,25697186 4,99544 4,41511 AT4G04223 0,1836778 52,1214052 66,7649863 98,8732411 9,2395829 3,0052392 0,0148713 AT1667105 other RNA 2,01386778 52,1214052 1,0057539 23,981788 31,1665561 1,005028 AT4605120 64,918905 2,23914403 0,65498503 0,0002393 . . 0,84099658 1,00857539 23,981788 31,1665561 1,0050328 1,005028 1,00857539 2,9891788 31,1665561 1,00053714 0,0151425 AT1465167 5,75342125 0 4,9474519 4,9474519 4,9481457 1,00857539 2,9891788 31,1665561	AT1G11070	37,5607011	1,80659044	0,43711787	3,58E-05	0,00356525	AT1G11070	BEST Arabidop		8,40986577	17,5849837	8,06860315	41,5760433	23,6436011	58,0225879
AT2G16586 425,606879 1,8451539 0,3907763 2,31E-06 0,00042879 AT2G16586 unknown prot. 146,331664 218,556225 98,8403886 438,147533 790,985928 510,198618 AT1601250 16,284771 1,8755640 0,25697186 4,995144 A11601250 16,8197315 7,5364157 2,01715079 17,888645 10,7470914 14,004522 AT1667105 40,5900807 1,9661747 0,53293867 0,00023232 0,0144311 AT1667105 0,018611 0,0014511 0,04600437 A11667105 0,0485621 1,0085758 2,114055 60,7649863 98,8732411 9,0338294 AT4606120 64,9198059 2,23914403 0,65498503 0,0006294 0,0304393 - 0,84098658 10,0485621 1,00857539 2,39861788 31,1665651 13,0050628 AT1645616 9,57121301 2,3807461 0,66346207 0,0003340 0,04191257 - 1,68197315 1,0851735 0,3994678 31,1665651 13,0050628 AT1645616 9,571214032 2,478748332 0,76187533 0,00194314 ATG456550 No11942475 1,54197315	AT2G44910	162.046528	1.84559643	0.1952936	3.38E-21	8.29E-18	AT2G44910	Encodes a hom	HOMEOBOX-LE	57.1870872	46.4745997	54,4630713	171.101409	209.568283	200.077889
AT1601250 16,2847671 1,8785681 0,25697186 0,0034295 0,01943444 AT1601250 encodes a men 1,68197315 7,3542157 2,01715079 17,5898645 10,7470914 14,0054222 AT1662105 0,55908367 0,0032532 0,00023532 0,00023532 0,0002374 0,002448713 AT1667105 other NN 20,1885778 25,1214002 14,0054522 27,774959 27,78495 27,074959 27,78495 27,074959 27,088044 20,1885778 2,131071079 9,59447152 22,588892 20,0077889 AT4606120 64,9198059 2,23914403 0,65498503 0,0002503 0,00151425 AT1645616 receptor like p RECEPTOR LIK 1,88197315 7,3542157 0 14,3910737 16,1003713 12,20085784 AT1645616 9,57129391 2,44753322 0,0010341 0,01912337 1,86197315 7,35642157 0,108344 1,20085784 <td>AT2G16586</td> <td>425,606879</td> <td>1.84615539</td> <td>0.3907763</td> <td>2.31E-06</td> <td>0.00042879</td> <td>AT2G16586</td> <td>unknown prot</td> <td></td> <td>146.331664</td> <td>218.556225</td> <td>98.8403886</td> <td>438,147533</td> <td>790.985928</td> <td>510,198618</td>	AT2G16586	425,606879	1.84615539	0.3907763	2.31E-06	0.00042879	AT2G16586	unknown prot		146.331664	218.556225	98.8403886	438,147533	790.985928	510,198618
AT4G04223 116,182664 1,93558469 0,25697186 4,99E+14 A,11E+11 AT4G04223 Unknown gene 58,8690604 62,8035131 66,5831268 235,864092 277,274959 227,088404 AT1G67105 40,5900807 1,96016747 0,53289367 0,00014511 O,04604037 AT5G53490 chcodes MRU1 MT0 1 RESP03,36394631 2,6031513 0,0171579 9,59447152 22,568829 20,007789 AT4G06120 64,9198059 2,23914403 0,65498503 0,0002503 0,0111412 AT1645161 9,57129391 2,3586369 0,64047215 0,0003250 0,0111412 AT1645161 9,5712937 7,35854212 0,6584907 8,00316578 AT166670 351,714073 2,41763332 0,72167762 0,0003814 0,0462518 AT167550 Encodes a Prot 0 2,51214052 0 7,9538294 4,2988657 3,0016834 AT1675050 8,0149323 2,67821236 0,67832907 0,00012701 0,00926749 - - 0,84098658 2,51214052 0 1,9492831 2,04795573 4,2988367 2,0007189 AT5G507500 5,34608511 2,87947242	AT1G01250	16.2847671	1.8785681	0.52466729	0.00034295	0.01943444	AT1G01250	encodes a men		1.68197315	7.53642157	2.01715079	17.5898645	10.7470914	14.0054522
AT1667105 40,5900807 1,96016747 0,53298367 0,00023332 0,01448713 AT1667105 other RNA . 20,1836778 25,1214052 14,1200555 60,7649863 98,8732411 92,035829 AT5G35400 16,5182931 1,96478396 0,664918009 0,0001243 Discover All Attraction and and and and and and and and and an	AT4G04223	116.182664	1,93558469	0.25697186	4.99E-14	4.41E-11	AT4G04223	Unknown gene		58.8690604	62.8035131	68.5831268	235.864092	277.274959	227.088404
AT5G33490 16,518231 1,96478396 0,6041380 0,0011451 0,0460407 AT5G35490 Encodes MRU1 MTO 1 RESPON 3,6334631 6,2035131 2,01715079 9,59447152 22,568892 20,0077889 AT4G6120 64,9198059 2,3981403 0,66407315 0,000254 0,001514125 AT1645616 1,00857539 23,9861788 31,1665651 13,0050628 AT2G0761 6,9570126 2,38074612 0,66407215 0,000334 0,01511425 AT1645616 - 1,68197315 1,25607026 1,00857539 7,1958364 1,286007 8,00311557 AT3G16670 351,714073 2,41763332 0,72167762 0,0008086 0,03667141 AT3G16670 5,1214052 0,1715079 9,59447152 1,0479218 1,0049298 10,003845 AT1673550 8,07249512 2,48974688 0,76187389 0,00018311 0,0112431 AT5G1670 1,68197315 0 2,01715079 9,59447152 1,0479914 1,60062311 AT5G07505 8,07249512 2,48974880 0,00012085 0,0322604 AT5G53486	AT1667105	40 5900807	1 96016747	0 53298367	0.00023532	0.01448713	AT1667105	other RNA		20 1836778	25 1214052	14 1200555	60 7649863	98 8732411	92 035829
ArtGobio Experiors Experiors <th< td=""><td>AT5G35490</td><td>16 5182931</td><td>1 96478396</td><td>0 60413809</td><td>0.00114511</td><td>0.04604037</td><td>AT5G35490</td><td>Encodes MRU1</td><td>MTO 1 RESPON</td><td>3 36394631</td><td>6 28035131</td><td>2 01715079</td><td>9 59447152</td><td>22 568892</td><td>20.0077889</td></th<>	AT5G35490	16 5182931	1 96478396	0 60413809	0.00114511	0.04604037	AT5G35490	Encodes MRU1	MTO 1 RESPON	3 36394631	6 28035131	2 01715079	9 59447152	22 568892	20.0077889
ATG45610 0.4713033 1.2350330 0.001313 1.001331 1.0003331 1.00013311 1.00033131 <th< td=""><td>AT4606120</td><td>64 9198059</td><td>2 23914403</td><td>0.65498503</td><td>0.0006294</td><td>0.03004393</td><td>115655450</td><td>Lincodes millor</td><td></td><td>0.84098658</td><td>10.0485621</td><td>1 00857530</td><td>23 0861788</td><td>31 1665651</td><td>13 0050628</td></th<>	AT4606120	64 9198059	2 23914403	0.65498503	0.0006294	0.03004393	115655450	Lincodes millor		0.84098658	10.0485621	1 00857530	23 0861788	31 1665651	13 0050628
ATSG0300 5,947012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 6,9675012 7,958736 1,950720 1,0887539 7,958736 1,2500702 1,0887539 7,9953824 4,2888567 3,0116384 AT3G16670 351,714073 2,41767352 0,7018738 0,00108341 0,01445208 ATG73555 Encodes a Prot 0 2,51214052 2,01715079 9,59447152 15,045928 10,0038945 AT5G07025 8,10149323 2,67821236 0,69887397 0,00012701 0,0026749 . 0,84098658 2,51214052 0 3,3181571 8,0041557 AT5G5070 5,34608511 2,98921891 0,85707508 0,00027208 0,03262764 AT5G5570 Core21-branc 0 0 0 3,3181571 8,0702356 4,29888657 2,0007788 AT5G52570 9,7994512 0,247770 0,00081431 0,03262764 AT5G5576 Core21-branc 0 0 0 3,981571 <td< td=""><td>AT1645616</td><td>9 57129391</td><td>2,25514405</td><td>0,03430305</td><td>0.0002503</td><td>0.01511425</td><td>AT1G45616</td><td>recentor like n</td><td>RECERTOR LIKE</td><td>1 68197315</td><td>7 53642157</td><td>1,00057555</td><td>14 3917073</td><td>16 1206371</td><td>22.0085678</td></td<>	AT1645616	9 57129391	2,25514405	0,03430305	0.0002503	0.01511425	AT1G45616	recentor like n	RECERTOR LIKE	1 68197315	7 53642157	1,00057555	14 3917073	16 1206371	22.0085678
ATSG16703 D, JOSTICE J, JOSTICE	AT2607661	6 96750126	2,3303030303	0.66364207	0.0002303	0,01011425	A11045010	receptor like p	NECEI TON EIKE	1 68107315	1 25607026	1 00857530	7 10585364	12 8965097	8 00311557
ATSG10010 3JJ, 110/3 2,1110/3 0,710/3<	AT2G07001	251 714072	2,30074012	0,00304207	0,000334	0.02667141	AT2C16670	Bollon Ola e 1 :		1,00107015	2 51214052	1,00037333	7,00520204	4 20992657	20.0116924
AT5G1503 0,0743312 2,9374080 0,0743320 0,0013331 0,0013331 0,0120438 1,01013341 0,0120438 1,01013341 0,0120438 1,01013341 0,0120448 1,01013341 0,0120448 1,01013341 0,0120448 1,01013341 0,0120448 1,0101341 1,01013341 0,0120448 1,0101341 1,01001341 1,0101341 1,017137	AT1G72550	8 07240512	2,41703332	0,72107702	0,00080800	0,03007141	AT1C72550	Forrent Ore e 1 a		1,08197313	2,51214052	2 01715070	0 50447152	4,25885037	10.0028045
ATSGD1023 40,7435323 2,5230002 0,67439209 0,00025749 1,002511 0,0025749 1,0047014 1,0040014 <td>ATE C1 (022</td> <td>40 7455522</td> <td>2,48374088</td> <td>0,70187338</td> <td>0,00108341</td> <td>0,04432308</td> <td>ATE C1 (022)</td> <td>Encodes a Plot</td> <td></td> <td>1 (0107315</td> <td>2,51214032</td> <td>2,01715079</td> <td>9,39447132</td> <td>10 7470014</td> <td>10,0038943</td>	ATE C1 (022	40 7455522	2,48374088	0,70187338	0,00108341	0,04432308	ATE C1 (022)	Encodes a Plot		1 (0107315	2,51214032	2,01715079	9,39447132	10 7470014	10,0038943
AlSGO7105 8,10149323 2,51214052 0 01,3940108 10,7470914 8,0031155 AlSGO7105 8,20149323 2,51214052 0 01,3940108 10,7470914 8,0031155 AlSGO7506 5,34608511 2,89821891 0,85707508 0,00021285 0,03326004 AlTSGO7560 Lipid-binding (GLVINE-RICH 1,68197315 0 0 3,19815717 6,7323228 1,60023328 AlTSGO7560 6,21792176 0,89809551 0,90085143 0,00085144 0,00323224 1,60197315 0 0 0 7,9953294 4,29883657 2,00077889 AlTSGO7560 6,21792176 0,99319813 0,00695144 0,00323224 13614550 Encodes parci GRANVIGERA 0 0 1,0087578 6,39631435 4,29883657 2,00077889 AlTSG15800 2,03108903 2,99379813 0,6853486 1,255-05 0,00155717 AlTSG15800 Encodes parci GRANVIGERA 0 0 1,0987598 5,9767314 8,00311557 AlTSG15810 2,78345191 3,25314958 0,9967149 0,0042021 0,0232177 AlTSG15800 Proten knase 0 0 <td>A15G16023</td> <td>40,7455523</td> <td>2,52306002</td> <td>0,67439209</td> <td>0,00018312</td> <td>0,01204488</td> <td>A15G16023</td> <td>Encodes a plan</td> <td>ROTUNDIFULIA</td> <td>1,68197315</td> <td>0</td> <td>2,01/150/9</td> <td>9,59447152</td> <td>10,7470914</td> <td>16,0062311</td>	A15G16023	40,7455523	2,52306002	0,67439209	0,00018312	0,01204488	A15G16023	Encodes a plan	ROTUNDIFULIA	1,68197315	0	2,01/150/9	9,59447152	10,7470914	16,0062311
Al5G0750 5,34008511 2,89281891 0,89707089 0,0002085 0,003220004 Al5G07507 Core2,1/eranc 0 0 1,9915717 9,67238228 16,0002311 Al5G25970 9,7594551 2,9249211 0,8370377 0,00361724 0,03667264 Al5G255970 Core2,1/eranc 0 0 0 7,9532324 4,29883657 2,00077889 Al75G25970 2,0310803 2,9399813 2,9099551 0,89015431 0,0006914 0,03627264 Al75G255970 Core2,1/eranc 0 0 0 4,79723576 4,29883657 2,00077889 Al73G14550 6,21792176 2,9547516 0,8731431 1,251029 0,0155717 1,7172G15800 transpossible 1,68197315 0 0 0,0437301818 2,3870102 1,9144746 2,00077389 Al73G52160 6,3977422 3,17107596 0,89259738 0,0015517 Al73G52600 transpossible 1,68197315 0 0 0 3,91815717 8,59767314 8,00311557 Al73G52510 2,73841913 3,2512813 0,592183936 0,90115836 0,946148 1,21E-05 Al72G151510 <td>A15G07105</td> <td>8,10149323</td> <td>2,07821230</td> <td>0,09887397</td> <td>0,00012701</td> <td>0,00926749</td> <td></td> <td></td> <td></td> <td>0,84098658</td> <td>2,51214052</td> <td>0</td> <td>10,3940108</td> <td>10,7470914</td> <td>8,00311557</td>	A15G07105	8,10149323	2,07821230	0,09887397	0,00012701	0,00926749				0,84098658	2,51214052	0	10,3940108	10,7470914	8,00311557
Al5c25970 9,7994551 2,9249421 0,873057 0,00018475 0,0365726 Al5c25970 0 0 0 0 7,99532924 A,2988367 2,0007/889 Al5c53486 8,30795313 0,89015431 0,0005544 Al5c53486 unknown prot. 0 0 0 4,7923276 4,2988367 6,200323668 Al35c53486 6,21792176 2,9547516 0,89105431 0,0005541 0,04052313 Al35c53486 unknown prot. 0 0 4,7972376 4,29883657 6,20037664 Al35c5146 6,31792176 2,95479161 0,890056918 0,0155717 Al35c5160 Encodes a prot GERANYLGERA 0 0 1,0857539 6,39631435 4,29883657 6,20037642 Al35c5160 6,37974222 3,17107596 0,89907164 0,00042021 0,02221774 Al3652160 Encodes XC5153-KETOACYLCC 0,84098658 0 0 3,944764 2,00077839 Al35c5160 5,4928373 0,00118383 0,046373454 Al3655450 Protein kinase 0 0 1,59907859 8,9767314 1,006206 Al3606955 1,3411933	A15G07560	5,34608511	2,89821891	0,85707508	0,00072085	0,03326004	A15G07560	Lipid-binding	GLYCINE-RICH	1,68197315	0	0	3,19815/1/	9,67238228	16,0062311
AT5G53486 8,30795313 2,94099551 0,89055143 0,00069514 0,00159516 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159514 0,00159515 3,580503 4,2988657 5,0007514 8,0031555 AT3G14503 1,9324514 3,2514954 5,0097544 5,011888 . . 3,36394631 0 0 1,5997858 5,0475345 3,0089573	A15G25970	9,7594551	2,9249421	0,87370577	0,00081473	0,03667264	A15G25970	Core-2/I-brand		0	0	0	7,99539294	4,29883657	2,00077889
AT3G14550 6,2179176 2,9547516 0,87133089 0,00069618 0,0133222 AT3G14550 Encodes a prot GERAWINCERA 0 0 1,00857539 6,39631435 4,29488657 12,0046734 AT3G52160 6,37972422 3,17107596 0,88907164 0,0015571 AT3G52160 Encodes a prot GERAWINCERA 0 0 3,19815717 8,59767314 17,0066206 AT3G52160 6,37972422 3,17107596 0,98907164 0,00042021 0,02221774 AT3G52160 Encodes KCS15 3.KETOACYL-CC 0,84098658 0 0 3,19815717 8,59767314 17,0066206 AT3G15500 3,4221035 3,19215913 0,0014534 JA73G14515 D/0457315 10,047515 0 0 1,5990789 8,59767314 8,00311557 AT3G1630 10,9274018 3,25159813 0,6594364 5,484-07 0,0011888 - - 3,36394631 0 0 13,592168 17,1953463 2,3008573 ATMG0240 3,36579701 0,9011457 0,0017976 0,01185917 AT3G14630 putative cytoc CVTOCHROME 0 0 13,592168 1,9934	AT5G53486	8,30795313	2,94099551	0,89015431	0,00095344	0,04052313	AT5G53486	unknown prot		0	0	0	4,79723576	4,29883657	6,00233668
AT2G15800 20,310903 2,9397813 0,68393486 1,25E-05 0,00155717 AT2G15800 1,68197315 0 4,03430158 22,3871002 19,344766 25,0097362 AT3G52160 6,37972422 3,17107596 0,89907164 0,00040201 0,0212174 AT3G52160 Encodes KCS15 3,KETOACYL-CC 0,84098658 0 0 3,19815717 8,59767314 8,0061503 AT3G52560 3,49221035 3,12939926 0,98259738 0,00115836 0,04637854 AT3G53560 Protein kinase 0 0 1,59907859 8,59767314 8,006503 AT3G165810 27,845191 3,29152813 0,56594346 5,43E-07 0,0011888 - - 3,6307631 0 0 1,59907859 8,2988657 5,2020512 AT3G16430 10,9274018 3,37559007 0,90114576 0,0001788 - 3,36394631 0 0 1,59927859 6,442545 2,0007789 AT3G16430 10,9274018 3,75539007 0,90114576 0,001185917 AT3G06240 Gag-Pol-relate(ORF111A) 0 0 1,939355 2,4494182 12,0046734	AT3G14550	6,21792176	2,95475166	0,87133089	0,00069618	0,0323922	AT3G14550	Encodes a prot	GERANYLGERA	0	0	1,00857539	6,39631435	4,29883657	12,0046734
AT3G52160 6,37972422 3,17107596 0.89907164 0.0022021 0.0221774 AT3G52160 Encodex KCS133-KETOACVL-CC 0.84098558 0 0 3,19815717 8,59767314 1,70066206 AT5G35960 3,49221035 3,1923926 0,98259738 0.00115836 0,04637534 AT5G35960 Protein kinase 0 0 0 1,59907859 8,59767314 1,70066206 AT3G63560 27,8345191 3,2514958 0,59218396 3,944-08 1,21E-05 AT2G15810 Mutach-like tr/ 1,68197315 10,0485621 0 3,556030 2,988657 5,2002512 AT3G61630 10,9274018 3,3755907 0,9011457 0,00017976 0,01185817 a,36394631 0 13,592168 1,71953463 2,00097893 AT3G61630 10,9274018 3,3755907 0,9011451 5,544-05 0,00017976 AT3G14630 putativecytoc (VTOCHROME 0 0 11,93953612 2,4048188 12,0046734 ATMG00240 3,86677515 3,78731811 0,93941451 5,544-05 0,00497765 <td>AI2G15800</td> <td>20,3108903</td> <td>2,99379813</td> <td>0,6853486</td> <td>1,25E-05</td> <td>0,00155717</td> <td>AI2G15800</td> <td>transposablee</td> <td></td> <td>1,68197315</td> <td>0</td> <td>4,03430158</td> <td>22,3871002</td> <td>19,3447646</td> <td>25,0097362</td>	AI2G15800	20,3108903	2,99379813	0,6853486	1,25E-05	0,00155717	AI2G15800	transposablee		1,68197315	0	4,03430158	22,3871002	19,3447646	25,0097362
AT5G35960 3,4221035 3,1239926 0,98259738 0,0015376 AT5G35960 Protein kinase 0 0 0 1,59907859 8,59767314 8,003115571 AT5G15810 27,8345191 3,2514584 0,59218396 1,21E05 AT3G15810 Mutator-liketr 1,6187315 0,0485621 0 3,3563063 42,988457 5,2021571 AT3G06955 17,3411933 3,29152813 0,56594364 5,43E-07 0,0011888 .<	AT3G52160	6,37972422	3,17107596	0,89907164	0,00042021	0,02221774	AT3G52160	Encodes KCS15	3-KETOACYL-CO	0,84098658	0	0	3,19815717	8,59767314	17,0066206
AT2G15810 27,8345191 3,2514958 0,59248396 3,94E-08 1,21E-05 AT2G15810 Mutator-like tr 1,68197315 10,0485621 0 3,3505053 4,9883657 5,20202121 AT3G06955 17,341133 3,29152813 0,65694346 5,43E-07 0,0011888 - - 3,36304631 0 0 13,592168 1,71953463 23,0089573 AT3G16430 10,9274018 3,7555907 0,90114557 0,0017876 0,01185917 AT3G14630 putative-cytoc CYTOCHROME 0 0 15,9927859 6,4425485 2,007789 AT3G063170 18,5015043 5,9841071 0,83065587 5,56E-13 4,14E-10 AT3G0720 QOS isan orph (QUA-QUINEST) 0 0 0 3,281114 4,2124931 45,0175251 AT3G29633 16,346171 6,7509237 0,47220189 1,05E+64 1,16E+22 AT3G0720 QOS isan orph (QUA-QUINEST) 1,68197315 0 0 32,851114 4,0343018 88,576097 27,976122 26,0101256 AT3G29633 16,346171 6,7509237 0,47210189 1,05E+64 1,16E+22 AT3G29263	AT5G35960	3,49221035	3,19239926	0,98259738	0,00115836	0,04637854	AT5G35960	Protein kinase		0	0	0	1,59907859	8,59767314	8,00311557
AT3G06955 17,3411933 3,29152813 0,65694364 5,48-07 0,0011888 - - 3,36394631 0 0 13,592168 17,1953463 23,0089573 AT3G14630 10,9274018 3,37559007 0,90114576 0,0017976 0,01185917 AT3G14630 putative cytoc CYTOCHROME 0 0 15,9907859 6,44825485 2,0007789 AT3G05170 3,86677515 3,78731811 0,93941451 5,544-50 0,00497765 AT3G00240 Gag+0-1-elatet (OR111A) 0 0 0 11,9395501 2,444828 12,0046734 AT3G05170 18,5015043 5,9841071 0,8305587 5,681-13 4,144-10 AT3G03720 Phosphoglycer 0 0 3,2781111 4,2124931 45,0175251 AT3G29533 16,1546171 6,77509237 0,47210189 1,055-46 1,16422433 unknown prot 6,72789261 0 0 32,851102 28,0172521 AT3G29533 16,1546171 6,77509237 0,47210189 1,055-46 1,16422433 unknown prot 6,72789261 0 0 32,612102 36,85692921	AT2G15810	27,8345191	3,25314958	0,59218396	3,94E-08	1,21E-05	AT2G15810	Mutator-like tr		1,68197315	10,0485621	0	33,5806503	42,9883657	52,0202512
AT3G14630 10,9274018 3,37559007 0,90114576 0,00017976 0,0118591 AT3G14630 putativecytoc CVTOCHROME 0 0 0 15,9907859 6,44825485 2,00077899 ATMG00240 3,8677515 3,78731811 0,93941451 5,545405 0,00497765 ATMG00240 Gag+O-Irelate' (ORF111A) 0 0 0 11,935501 2,14941828 12,0046734 AT3G05170 18,5015043 5,98841071 0,83065587 5,651-33 4,14E-10 AT3G05170 Phosphoglycer 0 0 0 32,78111 46,2124931 45,0175251 AT3G20633 161,546171 6,7509237 0,5422552 5,67E-29 3,13E-25 AT3G29633 unknown prot 6,72789261 0 0 32,621202 38,685291 39,0151884	AT3G06955	17,3411933	3,29152813	0,65694364	5,43E-07	0,00011888				3,36394631	0	0	13,592168	17,1953463	23,0089573
ATMG00240 3,86677515 3,78731811 0,93941451 5,54E-05 0,00497765 ATMG00240 Gag-Pol-relate((ORF111A) 0 0 0 1,1935501 2,14941828 12,0046734 AT3G05170 18,5015043 5,98841071 0,83065587 5,63E-13 4,14E-10 AT3G0720 Phosphoglycer 0 0 0 3,2,781111 4,2124931 4,50175251 AT3G30720 290,545355 6,50390455 5,67E-29 3,13E-25 AT3G30720 QQS is an orph (QUA-QUINEST) 1,68197315 0 4,0343018 88,57609 722,976122 26,0101256 AT3G29633 16,1546171 6,77599237 0,47210189 1,05E+46 1,16E42 AT3G29633 unknown prot. 6,72789261 0 0 26,212032 38,655291 39,0151884	AT3G14630	10,9274018	3,37559007	0,90114576	0,00017976	0,01185917	AT3G14630	putative cytoc	CYTOCHROME	0	0	0	15,9907859	6,44825485	2,00077889
AT3G05170 18,5015043 5,98841071 0.83065587 5,63E-13 4,14E-10 AT3G0170 Phosphoglycer. 0 0 0 3,2781111 4,6,2124931 45,0175251 AT3G30720 290,545355 6,50390455 5,67E-29 3,13E-25 AT3G30720 QQG/sian orph QUA-QUINEST 1,68197315 0 4,0343018 388,576097 272,976122 260,010256 AT3G29633 161,546171 6,77509237 0,47210189 1,05E+46 1,16E+24 AT3G295633 unknown prot. 6,72789261 0 0 232,611202 386,895291 390,151884	ATMG00240	3,86677515	3,78731811	0,93941451	5,54E-05	0,00497765	ATMG00240	Gag-Pol-relate	(ORF111A)	0	0	0	11,1935501	2,14941828	12,0046734
AT3G30720 290,545355 6,50390455 0,58222952 5,67E-29 3,13E-25 AT3G30720 QQS is an orph QUA-QUINEST 1,68197315 0 4,03430158 388,576097 272,976122 260,101256 AT3G29633 161,546171 6,77509237 0,47210189 1,05E-46 1,16E-42 AT3G29633 unknown prot 6,72789261 0 0 326,212032 386,895291 390,151884	AT3G05170	18,5015043	5,98841071	0,83065587	5,63E-13	4,14E-10	AT3G05170	Phosphoglycer		0	0	0	32,781111	46,2124931	45,0175251
AT3G29633 161,546171 6,77509237 0,47210189 1,05E46 1,16E42 AT3G29633 unknown prot . 6,72789261 0 0 326,212032 386,895291 390,151884	AT3G30720	290,545355	6,50390455	0,58222952	5,67E-29	3,13E-25	AT3G30720	QQS is an orph	QUA-QUINE ST	1,68197315	0	4,03430158	388,576097	272,976122	260,101256
	AT3G29633	161,546171	6,77509237	0,47210189	1,05E-46	1,16E-42	AT3G29633	unknown prot		6,72789261	0	0	326,212032	386,895291	390,151884

Table S4. Primers used in this study.

Atg number	Description	Primer sequence (from 5' to 3')		
Genotyping				
	SAIL-LB	GCATCTGAATTTCATAACCAATCTCGATACAC		
AT1G68520	SAIL_1221_D02-LP	GTGTTGCCAAATTACTGCTGC		
AT1G68520	SAIL_1221_D02-RP	TTTTTATCAATGGACCGCAAC		
AT1G68520	AT1G68520_LP_check	GAATGAGATGAGTGGTGGGATT		
AT1G68520	AT1G68520_RP_check	GAAACAAACCATGTCGAGGTCT		
Overexpression of BBX14				
	BBX14-CDS-F	CACCATGATGAAAAGTTTGGCTAGTG		
	BBX14-CDS-R	GCAACACCAATTGAAGATCTC		
CRISPR/Cas				
	68520-CRISPR-F	ATTGGGGAGGCCAAGGGATCCCA		
	68520-CRISPR-R	AAACTGGGATCCCTTGGCCTCCC		
RT-qPCR				
ATAC36800	"Ileucolecce in c" con a DCE 1	CTGTTCACGGAACCCAATTC		
A14030800	Housekeeping gene Kell	GGAAAAAGGTCTGACCGACA		
471 C 200 10	LHCB1.2	CCGTGAGCTAGAAGTTATCC		
AII029910		GTTTCCCAAGTAATCGAGTCC		
	LHCB2.1	CTCCGCAAGGTTGGTGTATC		
		CGGTTAGGTAGGACGGTGTAT		
173627600	LHCB2.4	CACTTCAGCAATCCAACACTC		
115027070		GTACCAGATGCTCTGAGGAG		
AT3G01500	CA1	GAGAAATACGAAACCAACCCT		
A15001500		ACATAAGCCCTTTGATCCCA		
AT1G67090	RBCS1A	ACAACGACATTACTTCCATCAC		
		GTAGTCAACTTCCTTAGCCA		
AT3G16140	PSAH-1	AATCCATCCGGGGCTAATGGT		
		CGCTGACATAAGTAAGCAAAGAG		
AT2G28605	PSBP	TCCTACAGACAAGAAATCCATCAC		
		ATCAAACCCTCCCTCAGAGG		
AT3G21055	PSBTn	CTTAAACACATTCCCATCACCT		
		CTACCTTAGCCAAAGAACAAACC		
	BBX14	CATACCATGGGTGAAAGTGGA		
		GAGATCTTCAATTGGTGTTGCT		
	BBX15	TTTCCATGGTGGAGAATGGAG		
		CGAATCTTCCTTTCATTCGTGG		

8. Acknowledgement

My first thanks goes to my supervisor, PD Dr. Tatjana Kleine, for her constant guidance throughout my work and her excellent advice on thesis-related issues, as well as lab work.

I'd like to thank Prof. Dr. Dario Leister for giving me the opportunity to pursue PhD in his research group.

I'm also really thankful for the funding provided by the SFB TRR175 towards my PhD and for the successful collaboration with colleagues from HU Berlin.

I'd like to thank Dr. Duorong Xu for teaching me lab skills and methods. He's always been so helpful and approachable, as well as patient with me through all my failed experiments. He's also given me some really thoughtful feedback and improvement tips.

I'm really grateful to Ramona Kandler for her excellent technical assistance throughout my time in the lab. Thanks also to all the gardeners, especially Albert, who took such good care of my plants.

I'd also like to thank all the lovely people I've met at AG Leister for their expertise and help.

I'd also like to thank Prof. Dr. Thomas Nägele for his constant support and advice from the very beginning of my PhD to the very end.

I'd also like to thank my friends Nastya, Louis, and Sabrina for their positive contributions to my work, helpful tips, and for always being there for me, sharing drinks and food as well as for all the wonderful memories and experiences we shared both at work and outside.

And finally, I'd like to thank my family for their love, unwavering support, and for always encouraging me to keep going and never give up.

9. Permission for republishing

Permission for the Open Access article according to CC BY 4.0 for the article: Atanasov, V., Schumacher, J., Muiño, J. M., Larasati, C., Wang, L., Kaufmann, K., Leister, D., & Kleine, T. (2024). Arabidopsis BBX14 is involved in high light acclimation and seedling development. *The Plant journal : for cell and molecular biology*, *118*(1), 141–158.



Arabidopsis BBX14 is involved in high light acclimation and seedling development Author: Jose M. Muiño, Catharina Larasati, Liangsheng Wang, et al Publication: Plant Journal Publisher: John Wiley and Sons Date: Dec 21, 2023

© 2023 The Authors. The Plant Journal published by Society for Experimental Biology and John Wiley & Sons Ltd.

Open Access Article

This is an open access article distributed under the terms of the Creative Commons CC BY license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

You are not required to obtain permission to reuse this article.

For an understanding of what is meant by the terms of the Creative Commons License, please refer to Wiley's Open Access Terms and Conditions.

Permission is not required for this type of reuse.

Wiley offers a professional reprint service for high quality reproduction of articles from over 1400 scientific and medical journals. Wiley's reprint service offers:

Peer reviewed research or reviews

Tailored collections of articles

- A professional high quality finish
- Glossy journal style color covers
- Company or brand customisation
- Language translations

· Prompt turnaround times and delivery directly to your office, warehouse or congress.

Please contact our Reprints department for a quotation. Email corporatesaleseurope@wiley.com or corporatesalesusa@wiley.com or corporatesalesDE@wiley.com.

CCC Marketplace

This is a License Agreement between Vasil Atanasov ("User") and Copyright Clearance Center, Inc. ("CCC") on behalf of the Rightsholder identified in the order details below. The license consists of the order details, the Marketplace Permissions General Terms and Conditions below, and any Rightsholder Terms and Conditions which are included below.

All payments must be made in full to CCC in accordance with the Marketplace Permissions General Terms and Conditions below.

Order Date	15-May-2024	Type of Use	Republish in a
Order License ID	1484094-1		thesis/dissertation
ISSN	1365-313X	Publisher	BLACKWELL PUBLISHING
		Portion	Chapter/article
LICENSED CONT	ENT		

Publication Title The Plant journal **Publication Type** e-Journal Article Title Arabidopsis BBX14 is Start Page 141 involved in high light 158 **End Page** acclimation and seedling Issue 1 development Volume 118 Author/Editor Society for Experimental Biology (Great Britain) URL http://onlinelibrary.wiley.c om/journal/10.1111/(ISSN) 01/01/1991 Date 1365-313X English Language Country United Kingdom of Great Britain and Northern Ireland Rightsholder John Wiley & Sons - Books

REQUEST DETAILS

Portion Type	Chapter/article	Rights Requested	Main product
Page Range(s)	1-18	Distribution	Worldwide
Total Number of Pages	18	Translation	Original language of
Format (select all that	Print Electronic		publication
apply)		Copies for the Disabled?	No
Who Will Republish the	Academic institution	Minor Editing Privileges?	Yes
Content?		Incidental Promotional	No
Duration of Use	Life of current edition	Use?	
Lifetime Unit Quantity	Up to 499	Currency	EUR

NEW WORK DETAILS

Title

Role of the Arabidopsis thaliana transcription factor BBX14 in retrograde and stress acclimation signaling pathways Institution Name Expected Presentation Date LMU München 2024-07-31 Instructor Name

Vasil Atanasov

ADDITIONAL DETAILS

The Requesting Person / Organization to Appear on the License

Vasil Atanasov

REQUESTED CONTENT DETAILS

Title, Description or Numeric Reference of the Portion(s)	BBX14 Permission	Title of the Article / Chapter the Portion Is From	Arabidopsis BBX14 is involved in high light acclimation and seedling development
Editor of Portion(s)	Atanasov, Vasil;		
Schumacher, Julia; Muiño, Jose M.; Larasati, Catharina; Wang, Liangsheng; Kaufmann, Kerstin; Leister, Dario; Kleine, Tatjana		Author of Portion(s)	Atanasov, Vasil; Schumacher, Julia; Muiño, Jose M.; Larasati, Catharina; Wang, Liangsheng; Kaufmann, Kerstin; Leister, Dario; Kleine Tatiana
Volume / Edition 118			Rieme, ragana
Page or Page Range of Portion	141-158	Publication Date of Portion	2024-04-01

124