

**Table S17: Protein coding genes in CNVs detected by aCGH in HAB/LAB mice.** The symbols, MGI IDs and genomic positions of the genes are shown. The last column includes the number of respective CNV (see chapter "Position of CNVs detected by aCGH") the gene is overlapping with. If more than one number is mentioned, the gene maps into the genomic position of multiple CNVs.

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| C130026I21Rik | 3612702 | 1   | 84,989,265  | 85,267,141  | 2       |
| A530032D15Rik | 3037746 | 1   | 85,084,714  | 85,106,428  | 2       |
| A530040E14Rik | 3612703 | 1   | 85,102,521  | 85,110,610  | 2       |
| Gm2397        | 3780565 | 1   | 85,107,922  | 85,115,098  | 2       |
| Gm11120       | 3779373 | 1   | 85,256,405  | 85,257,589  | 2       |
| Gm2619        | 3780787 | 1   | 85,310,071  | 85,323,971  | 2       |
| Gm2666        | 3780835 | 1   | 87,380,827  | 87,381,717  | 2       |
| Gm2427        | 3780593 | 1   | 87,386,276  | 87,411,814  | 2       |
| Gm7592        | 3644077 | 1   | 87,423,175  | 87,465,775  | 2       |
| Sp110         | 1923364 | 1   | 87,473,474  | 87,495,392  | 2       |
| Sp140         | 3702467 | 1   | 87,496,953  | 87,541,612  | 2       |
| Gm10552       | 3642083 | 1   | 87,500,660  | 87,547,257  | 2       |
| Gm9931        | 3642402 | 1   | 149,128,702 | 149,129,037 | 7       |
| BC003331      | 2385108 | 1   | 152,208,435 | 152,240,210 | 8       |
| Tpr           | 1922066 | 1   | 152,239,968 | 152,297,062 | 8       |
| Prg4          | 1891344 | 1   | 152,296,946 | 152,313,295 | 8       |
| Hmcn1         | 2685047 | 1   | 152,409,654 | 152,840,565 | 8       |
| Gm9690        | 3780098 | 1   | 153,029,696 | 153,031,375 | 8       |
| Gm8947        | 3648958 | 1   | 153,039,504 | 153,041,184 | 8       |
| Gm8951        | 3779826 | 1   | 153,045,534 | 153,047,211 | 8       |
| 3110040M04Rik | 1920426 | 1   | 153,051,249 | 153,052,926 | 8       |
| Gm4337        | 3782521 | 1   | 153,057,256 | 153,058,933 | 8       |
| Ivns1abp      | 2152389 | 1   | 153,191,628 | 153,211,575 | 8       |
| 1200016B10Rik | 1914125 | 1   | 153,214,829 | 153,275,585 | 8       |
| 1190005F20Rik | 1916185 | 1   | 153,275,778 | 153,305,289 | 8       |
| Rnf2          | 1101759 | 1   | 153,316,657 | 153,347,933 | 8       |
| Fam129a       | 2137237 | 1   | 153,418,316 | 153,569,069 | 8       |
| Edem3         | 1914217 | 1   | 153,602,504 | 153,669,181 | 8       |
| 1700025G04Rik | 1916649 | 1   | 153,737,978 | 153,853,897 | 8       |
| E330020D12Rik | 3761270 | 1   | 155,251,957 | 155,255,559 | 9       |
| 1700012A16Rik | 1919086 | 1   | 155,272,292 | 155,299,704 | 9       |
| Dhx9          | 108177  | 1   | 155,302,943 | 155,334,738 | 9       |
| Npl           | 1921341 | 1   | 155,350,146 | 155,396,844 | 9       |
| Rgs8          | 108408  | 1   | 155,500,155 | 155,544,797 | 9       |
| Rgs16         | 108407  | 1   | 155,587,479 | 155,592,598 | 9       |
| Rnasel        | 1098272 | 1   | 155,600,061 | 155,609,471 | 9       |
| 5830403L16Rik | 1923273 | 1   | 155,696,672 | 155,747,338 | 9       |
| Gm5531        | 3646829 | 1   | 155,721,475 | 155,724,001 | 9       |
| Teddm1        | 2668439 | 1   | 155,738,922 | 155,740,188 | 9       |
| Glul          | 95739   | 1   | 155,747,074 | 155,756,853 | 9       |
| Gm11074       | 3779301 | 1   | 155,752,801 | 155,764,441 | 9       |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Gm4387        | 3782572 | 1   | 155,874,493 | 155,881,431 | 9       |
| Zfp648        | 2685049 | 1   | 156,051,227 | 156,052,804 | 9       |
| Cacnb2        | 894644  | 2   | 14,525,933  | 14,909,535  | 10      |
| Nsun6         | 1921705 | 2   | 14,916,758  | 14,976,511  | 10      |
| Arl5b         | 1923119 | 2   | 14,971,022  | 15,004,083  | 10      |
| Gm1631        | 2686477 | 2   | 71,557,446  | 71,569,023  | 11      |
| Itga6         | 96605   | 2   | 71,583,673  | 71,696,473  | 11      |
| Pdk1          | 1926119 | 2   | 71,711,281  | 71,741,915  | 11      |
| Rapgef4       | 1917723 | 2   | 71,819,297  | 72,095,531  | 11      |
| Gm13634       | 3649714 | 2   | 71,935,660  | 71,986,853  | 11      |
| A530006G24Rik | 2685849 | 2   | 147,536,429 | 147,543,368 | 13      |
| a             | 87853   | 2   | 154,617,138 | 154,876,748 | 15      |
| Gm14226       | 3649244 | 2   | 154,844,002 | 154,852,840 | 15      |
| Ahcy          | 87968   | 2   | 154,885,046 | 154,900,233 | 15      |
| Itch          | 1202301 | 2   | 154,959,245 | 155,052,591 | 15      |
| Dynlrb1       | 1914318 | 2   | 155,062,269 | 155,076,013 | 15      |
| Map1lc3a      | 1915661 | 2   | 155,102,033 | 155,103,809 | 15      |
| Pigu          | 3039607 | 2   | 155,103,979 | 155,183,166 | 15      |
| Trp53inp2     | 1915978 | 2   | 155,206,795 | 155,215,586 | 15      |
| Ncoa6         | 1929915 | 2   | 155,216,401 | 155,299,630 | 15      |
| Ggt7          | 1913385 | 2   | 155,316,115 | 155,343,973 | 15      |
| Acss2         | 1890410 | 2   | 155,343,684 | 155,411,460 | 15      |
| Gss           | 95852   | 2   | 155,388,917 | 155,418,546 | 15      |
| Myh7b         | 3710243 | 2   | 155,436,948 | 155,460,043 | 15      |
| Trpc4ap       | 1930751 | 2   | 155,460,007 | 155,518,120 | 15      |
| Edem2         | 1915540 | 2   | 155,527,413 | 155,555,211 | 15      |
| Procr         | 104596  | 2   | 155,576,853 | 155,581,207 | 15      |
| Mmp24         | 1341867 | 2   | 155,601,078 | 155,644,102 | 15      |
| BC029722      | 3584273 | 2   | 155,643,466 | 155,645,162 | 15      |
| Eif6          | 1196288 | 2   | 155,645,568 | 155,652,661 | 15      |
| Fam83c        | 1918655 | 2   | 155,653,284 | 155,660,590 | 15      |
| Uqcc          | 1929472 | 2   | 155,672,630 | 155,756,046 | 15      |
| Gm15557       | 3783006 | 2   | 155,766,464 | 155,768,486 | 15      |
| Gdf5          | 95688   | 2   | 155,766,759 | 155,771,103 | 15      |
| Cep250        | 108084  | 2   | 155,782,194 | 155,824,636 | 15      |
| 6430550D23Rik | 2443361 | 2   | 155,799,015 | 155,833,713 | 15      |
| Ergic3        | 1913616 | 2   | 155,833,781 | 155,844,015 | 15      |
| Fer1l4        | 1921812 | 2   | 155,844,875 | 155,878,683 | 15      |
| Ndr3          | 1352499 | 2   | 156,753,081 | 156,817,792 | 16      |
| Dsn1          | 1914184 | 2   | 156,821,001 | 156,832,890 | 16      |
| 9830001H06Rik | 2444575 | 2   | 156,841,535 | 156,904,990 | 16      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Gm1332        | 2686178 | 2   | 156,914,189 | 156,922,218 | 16      |
| Samhd1        | 1927468 | 2   | 156,923,269 | 156,961,001 | 16      |
| Rbl1          | 103300  | 2   | 156,971,629 | 157,030,270 | 16      |
| 2610301H18Rik | 1919739 | 2   | 157,030,040 | 157,032,550 | 16      |
| 4922505G16Rik | 3603828 | 2   | 157,034,286 | 157,105,285 | 16      |
| Rpn2          | 98085   | 2   | 157,104,753 | 157,152,055 | 16      |
| Ghrh          | 95709   | 2   | 157,155,233 | 157,173,242 | 16      |
| Manbal        | 1916411 | 2   | 157,193,330 | 157,222,499 | 16      |
| Gm4584        | 3782767 | 2   | 157,193,333 | 157,194,339 | 16      |
| Src           | 98397   | 2   | 157,244,180 | 157,297,598 | 16      |
| Blcap         | 1858907 | 2   | 157,382,098 | 157,392,097 | 16      |
| Nnat          | 104716  | 2   | 157,385,846 | 157,388,258 | 16      |
| Ctnnbl1       | 1913892 | 2   | 157,563,137 | 157,717,350 | 16      |
| Vstm2l        | 2685537 | 2   | 157,740,389 | 157,770,455 | 16      |
| Tti1          | 1922675 | 2   | 157,807,539 | 157,854,169 | 16      |
| Rprd1b        | 1917720 | 2   | 157,854,233 | 157,958,033 | 16      |
| Tgm2          | 98731   | 2   | 157,942,138 | 157,972,172 | 16      |
| D630003M21Rik | 3606579 | 2   | 158,008,269 | 158,054,958 | 16      |
| 1700060C20Rik | 1920649 | 2   | 158,017,745 | 158,021,478 | 16      |
| Bpi           | 3045315 | 2   | 158,083,830 | 158,110,267 | 16      |
| Lbp           | 1098776 | 2   | 158,132,229 | 158,158,588 | 16      |
| 9430008C03Rik | 1915358 | 2   | 158,181,043 | 158,187,316 | 16      |
| Snhg11        | 2441845 | 2   | 158,201,374 | 158,211,881 | 16      |
| Ralgapb       | 2444531 | 2   | 158,235,584 | 158,324,989 | 16      |
| Adig          | 2675492 | 2   | 158,328,348 | 158,333,934 | 16      |
| Arhgap40      | 3649852 | 2   | 158,338,532 | 158,376,498 | 16      |
| Slc32a1       | 1194488 | 2   | 158,436,503 | 158,441,484 | 16      |
| Actr5         | 1924748 | 2   | 158,450,624 | 158,464,947 | 16      |
| Ppp1r16b      | 2151841 | 2   | 158,491,134 | 158,592,070 | 16      |
| Fam83d        | 1919128 | 2   | 158,593,829 | 158,612,373 | 16      |
| Dhx35         | 1918965 | 2   | 158,620,543 | 158,683,950 | 16      |
| Gm4713        | 3782893 | 2   | 158,682,832 | 158,683,965 | 16      |
| Sirpb1a       | 2444824 | 3   | 15,371,819  | 15,426,504  | 17      |
| Sirpb1b       | 3779828 | 3   | 15,495,754  | 15,575,065  | 17      |
| Sirpb1c       | 3807521 | 3   | 15,695,145  | 15,748,528  | 17      |
| Gm6639        | 3779620 | 3   | 35,518,546  | 35,565,048  | 20      |
| Dclk2         | 1918012 | 3   | 86,590,081  | 86,724,774  | 21      |
| Cd1d2         | 107675  | 3   | 86,790,508  | 86,793,455  | 21      |
| Cd1d1         | 107674  | 3   | 86,799,756  | 86,803,363  | 21      |
| Kirrel        | 1891396 | 3   | 86,882,515  | 86,978,622  | 21      |
| Fcrls         | 1933397 | 3   | 87,054,680  | 87,067,660  | 21      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Cd5l          | 1334419 | 3   | 87,161,897  | 87,174,995  | 21      |
| Fcrl1         | 2442862 | 3   | 87,180,370  | 87,196,055  | 21      |
| Fcrl5         | 3053558 | 3   | 87,239,704  | 87,271,446  | 21      |
| Etv3          | 1350926 | 3   | 87,329,329  | 87,344,078  | 21      |
| Arhgef11      | 2441869 | 3   | 87,421,481  | 87,541,956  | 21      |
| Gm6570        | 3644100 | 3   | 87,483,496  | 87,484,000  | 21      |
| Gm9418        | 3646900 | 3   | 143,239,578 | 143,252,134 | 22      |
| Gm6260        | 3645891 | 3   | 143,333,854 | 143,375,107 | 22      |
| Gm2514        | 3780681 | 3   | 143,767,461 | 143,795,994 | 22      |
| Lmo4          | 109360  | 3   | 143,851,494 | 143,868,184 | 22      |
| Gm6391        | 3779590 | 4   | 41,752,437  | 41,754,670  | 23      |
| Ccl21b        | 1349182 | 4   | 41,774,204  | 41,775,337  | 23      |
| Gm13308       | 3650431 | 4   | 41,812,314  | 41,813,866  | 23      |
| Gm13298       | 3701946 | 4   | 41,836,784  | 41,842,582  | 23      |
| Gm10598       | 3711244 | 4   | 41,902,019  | 41,906,852  | 23      |
| Gm10597       | 3641628 | 4   | 41,905,836  | 41,906,261  | 23      |
| Gm2438        | 3780605 | 4   | 41,924,280  | 41,938,942  | 23      |
| Gm3892        | 3782065 | 4   | 41,925,875  | 41,960,431  | 23      |
| Gm2442        | 3780609 | 4   | 41,941,854  | 41,943,487  | 23      |
| Gm10596       | 3836443 | 4   | 41,954,622  | 41,955,014  | 23      |
| Gm3893        | 3782066 | 4   | 41,961,930  | 41,963,010  | 23      |
| Gm13304       | 3710514 | 4   | 41,985,540  | 41,986,640  | 23      |
| Gm13306       | 3713752 | 4   | 42,024,159  | 42,029,562  | 23      |
| Gm13305       | 3801997 | 4   | 42,029,565  | 42,039,326  | 23      |
| 1700045l11Rik | 1920600 | 4   | 42,041,568  | 42,042,058  | 23      |
| Gm2478        | 3780645 | 4   | 42,087,631  | 42,090,601  | 23      |
| Gm10595       | 3641751 | 4   | 42,090,151  | 42,090,576  | 23      |
| Gm10931       | 3779142 | 4   | 42,215,271  | 42,215,822  | 23      |
| Gm1987        | 3780156 | 4   | 42,231,044  | 42,232,175  | 23      |
| Gm2023        | 3780192 | 4   | 42,248,431  | 42,250,498  | 23      |
| Gm2091        | 3780258 | 4   | 42,269,495  | 42,271,067  | 23      |
| Gm10930       | 3779141 | 4   | 42,289,139  | 42,289,564  | 23      |
| Gm2500        | 3780667 | 4   | 42,336,584  | 42,336,979  | 23      |
| Gm2002        | 3780172 | 4   | 42,339,260  | 42,349,021  | 23      |
| Gm2506        | 3780673 | 4   | 42,349,029  | 42,354,382  | 23      |
| Ccl21c        | 1891386 | 4   | 42,391,950  | 42,393,080  | 23      |
| Gm10929       | 3779140 | 4   | 42,423,572  | 42,424,498  | 23      |
| Gm2537        | 3780705 | 4   | 42,439,644  | 42,454,306  | 23      |
| Gm10594       | 3641750 | 4   | 42,472,325  | 42,472,750  | 23      |
| Gm2542        | 3780710 | 4   | 42,536,112  | 42,541,707  | 23      |
| Gm6389        | 3643815 | 4   | 42,564,415  | 42,579,081  | 23      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Gm10593       | 3710526 | 4   | 42,566,010  | 42,600,570  | 23      |
| Gm10592       | 3704230 | 4   | 42,594,761  | 42,595,153  | 23      |
| Gm2163        | 3780332 | 4   | 42,602,069  | 42,603,149  | 23      |
| Gm10591       | 3711256 | 4   | 42,625,653  | 42,626,784  | 23      |
| Gm2564        | 3708691 | 4   | 42,643,230  | 42,645,246  | 23      |
| Ccl27b        | 1891389 | 4   | 42,664,172  | 42,669,525  | 23      |
| Il11ra2       | 109123  | 4   | 42,669,533  | 42,679,294  | 23      |
| Gm9969        | 3710519 | 4   | 42,681,536  | 42,682,026  | 23      |
| Gm10590       | 3641654 | 4   | 42,728,990  | 42,729,415  | 23      |
| Skint4        | 2444425 | 4   | 111,744,621 | 111,840,681 | 24      |
| Skint3        | 3045331 | 4   | 111,904,850 | 111,973,073 | 24      |
| Skint9        | 3045341 | 4   | 112,058,574 | 112,106,590 | 24      |
| Skint2        | 3649629 | 4   | 112,286,202 | 112,320,445 | 24      |
| Skint10       | 2685416 | 4   | 112,383,752 | 112,447,471 | 24      |
| Skint6        | 3649262 | 4   | 112,908,844 | 112,959,568 | 24      |
| Skint5        | 3650151 | 4   | 113,613,249 | 113,672,102 | 24      |
| Skint11       | 2685415 | 4   | 113,835,989 | 113,917,633 | 24      |
| Rundc3b       | 2685286 | 5   | 8,490,334   | 8,622,952   | 25      |
| Abcb1a        | 97570   | 5   | 8,660,077   | 8,748,575   | 25      |
| Abcb1b        | 97568   | 5   | 8,798,186   | 8,866,308   | 25      |
| Abcb4         | 97569   | 5   | 8,893,717   | 8,959,225   | 25      |
| Crot          | 1921364 | 5   | 8,966,033   | 8,997,324   | 25      |
| 4930420K17Rik | 3606159 | 5   | 9,100,737   | 9,118,983   | 25      |
| Dmtf1         | 1344415 | 5   | 9,118,841   | 9,161,718   | 25      |
| 9330182L06Rik | 2443264 | 5   | 9,266,118   | 9,481,825   | 25      |
| Grm3          | 1351340 | 5   | 9,485,236   | 9,725,352   | 25      |
| Gm10482       | 3644444 | 5   | 10,187,866  | 10,237,890  | 25      |
| Gm6603        | 3647750 | 5   | 10,499,117  | 10,502,405  | 25      |
| Gm4047        | 3782222 | 5   | 11,190,195  | 11,222,015  | 26      |
| Gm4072        | 3782247 | 5   | 11,476,315  | 11,478,494  | 26      |
| Gm6460        | 3644247 | 5   | 11,594,956  | 11,599,480  | 26      |
| Gm16427       | 3704103 | 5   | 93,910,849  | 93,914,418  | 27      |
| C87414        | 2141341 | 5   | 94,064,019  | 94,100,577  | 27      |
| Gm7792        | 3704104 | 5   | 94,281,097  | 94,284,656  | 27      |
| Gm16429       | 3704105 | 5   | 94,353,803  | 94,358,078  | 27      |
| Gm6346        | 3644199 | 5   | 94,365,781  | 94,368,514  | 27      |
| BC061212      | 2681870 | 5   | 94,495,177  | 94,499,571  | 27      |
| Gm6351        | 3647817 | 5   | 94,505,411  | 94,510,023  | 27      |
| Gm3106        | 3781282 | 5   | 94,647,020  | 94,650,562  | 27      |
| Gm16522       | 4360987 | 5   | 94,731,544  | 94,735,821  | 27      |
| Gm6502        | 3779601 | 5   | 94,743,494  | 94,746,227  | 27      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| AA792892      | 2140789 | 5   | 94,810,361  | 94,814,104  | 27      |
| Gm7682        | 3779756 | 5   | 94,874,843  | 94,877,576  | 27      |
| Gm3139        | 3781318 | 5   | 94,955,309  | 94,968,473  | 27      |
| Gm3147        | 3781326 | 5   | 95,041,094  | 95,045,367  | 27      |
| Gm6509        | 3779602 | 5   | 95,053,038  | 95,055,771  | 27      |
| Gm6523        | 3779604 | 5   | 95,206,896  | 95,210,006  | 27      |
| Gm3183        | 3781362 | 5   | 95,294,521  | 95,307,501  | 27      |
| Gm7942        | 3646599 | 5   | 95,537,068  | 95,540,177  | 27      |
| Gm16513       | 2141041 | 5   | 95,611,623  | 95,624,586  | 27      |
| Gm10424       | 3704250 | 5   | 95,697,512  | 95,701,787  | 27      |
| Gm6468        | 3646666 | 5   | 95,709,481  | 95,711,989  | 27      |
| Gm3259        | 3781437 | 5   | 95,734,834  | 95,772,936  | 27      |
| Gm7963        | 3643214 | 5   | 95,854,546  | 95,857,656  | 27      |
| D5Ertd577e    | 1261918 | 5   | 95,885,825  | 95,914,583  | 27      |
| Gm3286        | 3781464 | 5   | 95,947,694  | 95,950,987  | 27      |
| Zfp33b        | 1916873 | 5   | 105,000,731 | 105,012,344 | 28      |
| C230055K05Rik | 2441896 | 5   | 105,242,188 | 105,288,830 | 28      |
| Gm16637       | 4439561 | 6   | 68,581,957  | 68,582,424  | 30      |
| Lmo3          | 102810  | 6   | 138,311,439 | 138,530,489 | 31      |
| Igbp1b        | 1354380 | 6   | 138,605,934 | 138,606,965 | 31      |
| Rergl         | 3642998 | 6   | 139,441,735 | 139,450,395 | 31      |
| Zfp772        | 2385265 | 7   | 7,154,833   | 7,162,709   | 32      |
| Vmn2r29       | 1923479 | 7   | 7,166,473   | 7,192,861   | 32      |
| Clcn4-2       | 104571  | 7   | 7,235,027   | 7,252,222   | 32      |
| Vmn2r30       | 1316729 | 7   | 7,264,434   | 7,290,242   | 32      |
| Gm3554        | 3781731 | 7   | 7,312,678   | 7,315,071   | 32      |
| Gm3912        | 3782085 | 7   | 7,315,609   | 7,327,335   | 32      |
| Vmn2r31       | 3757688 | 7   | 7,336,741   | 7,349,472   | 32      |
| Vmn2r32       | 1316696 | 7   | 7,415,738   | 7,432,800   | 32      |
| Vmn2r33       | 3757694 | 7   | 7,503,402   | 7,519,537   | 32      |
| Vmn2r34       | 3757700 | 7   | 7,623,988   | 7,642,224   | 32      |
| Vmn2r35       | 3646200 | 7   | 7,738,588   | 7,772,618   | 32      |
| Vmn2r36       | 3757866 | 7   | 7,828,805   | 7,855,288   | 32      |
| Gm3956        | 3782130 | 7   | 8,062,819   | 8,089,272   | 32      |
| Gm3962        | 3782136 | 7   | 8,134,906   | 8,150,983   | 32      |
| Gm10302       | 3704281 | 7   | 8,246,140   | 8,271,350   | 32      |
| Gm3972        | 3782146 | 7   | 8,317,009   | 8,339,820   | 32      |
| Gm3991        | 3782165 | 7   | 8,557,157   | 8,583,640   | 32      |
| Gm3607        | 3781784 | 7   | 8,639,868   | 8,670,523   | 32      |
| Vmn2r37       | 1316711 | 7   | 8,954,257   | 8,972,355   | 32      |
| Gm5583        | 3646061 | 7   | 9,046,767   | 9,061,104   | 32      |

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|----------------|---------|-----|------------|------------|---------|
| Vmn2r38        | 3757869 | 7   | 9,079,992  | 9,103,276  | 32      |
| Vmn2r39        | 3704108 | 7   | 9,147,119  | 9,163,358  | 32      |
| Vmn2r40        | 3757872 | 7   | 9,246,337  | 9,270,665  | 32      |
| Gm3644         | 3781820 | 7   | 9,327,233  | 9,329,627  | 32      |
| Gm4033         | 3782207 | 7   | 9,422,918  | 9,438,995  | 32      |
| Vmn2r45        | 3757883 | 7   | 9,638,195  | 9,656,739  | 32      |
| Vmn2r44        | 3643088 | 7   | 9,744,040  | 9,760,130  | 32      |
| Gm7696         | 3649133 | 7   | 9,769,212  | 9,776,255  | 32      |
| Gm10303        | 3642900 | 7   | 9,774,107  | 9,820,158  | 32      |
| Gm3654         | 3781830 | 7   | 9,835,626  | 9,844,689  | 32      |
| Vmn2r43        | 3037819 | 7   | 9,866,727  | 9,882,979  | 32      |
| Vmn2r42        | 1316666 | 7   | 9,927,007  | 9,944,065  | 32      |
| Vmn2r41        | 3757876 | 7   | 9,965,677  | 9,989,982  | 32      |
| Gm4082         | 3782257 | 7   | 10,034,293 | 10,041,283 | 32      |
| Gm3670         | 3781846 | 7   | 10,046,523 | 10,048,914 | 32      |
| Gm3680         | 3781856 | 7   | 10,162,947 | 10,223,709 | 32      |
| Vmn2r46        | 3757899 | 7   | 10,333,109 | 10,355,920 | 32      |
| Vmn2r47        | 3757929 | 7   | 10,401,183 | 10,426,790 | 32      |
| 2810047C21Rik1 | 1919966 | 7   | 10,455,317 | 10,462,312 | 32      |
| Vmn2r48        | 3647749 | 7   | 10,512,973 | 10,538,925 | 32      |
| Vmn2r49        | 3757933 | 7   | 10,560,652 | 10,577,604 | 32      |
| Vmn2r50        | 3643086 | 7   | 10,622,317 | 10,635,663 | 32      |
| Gm10991        | 3779207 | 7   | 11,494,168 | 11,494,649 | 33      |
| Zscan4c        | 2685243 | 7   | 11,591,071 | 11,595,896 | 33      |
| Zscan4d        | 3645954 | 7   | 11,746,722 | 11,751,531 | 33      |
| Zscan4e        | 3643613 | 7   | 11,891,727 | 11,896,031 | 33      |
| Zscan4f        | 3708485 | 7   | 11,983,264 | 11,988,090 | 33      |
| Gm3804         | 3781977 | 7   | 12,063,250 | 12,072,819 | 33      |
| Gm4186         | 3782362 | 7   | 12,194,634 | 12,199,462 | 34      |
| Vmn1r72        | 2182256 | 7   | 12,254,948 | 12,255,868 | 34      |
| Vmn1r73        | 2159641 | 7   | 12,341,606 | 12,342,517 | 34      |
| Vmn1r74        | 2159644 | 7   | 12,432,124 | 12,433,038 | 34      |
| Vmn1r75        | 2159645 | 7   | 12,465,692 | 12,466,609 | 34      |
| Vmn1r76        | 2159643 | 7   | 12,515,660 | 12,516,634 | 34      |
| Vmn1r77        | 3779641 | 7   | 12,626,648 | 12,627,568 | 34      |
| Vmn1r78        | 2159646 | 7   | 12,737,813 | 12,738,754 | 34      |
| Gm8040         | 3647077 | 7   | 15,385,143 | 15,396,199 | 35      |
| Gm9545         | 3779955 | 7   | 15,550,579 | 15,572,398 | 35      |
| Gm3959         | 3782133 | 7   | 15,591,759 | 15,593,370 | 35      |
| Gm8072         | 3643193 | 7   | 15,641,545 | 15,643,153 | 35      |
| Gm3968         | 3782142 | 7   | 15,709,499 | 15,715,462 | 35      |



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|-------------|---------|-----|------------|------------|---------|
| Gm3977      | 3782150 | 7   | 15,724,895 | 15,726,833 | 35      |
| Gm3980      | 3782153 | 7   | 15,736,263 | 15,738,201 | 35      |
| Gm3981      | 3782154 | 7   | 15,747,593 | 15,749,531 | 35      |
| Gm3984      | 3782157 | 7   | 15,758,674 | 15,760,612 | 35      |
| Gm3987      | 3782160 | 7   | 15,770,015 | 15,771,953 | 35      |
| Gm3989      | 3782163 | 7   | 15,781,328 | 15,783,224 | 35      |
| Gm3994      | 3782168 | 7   | 15,792,659 | 15,794,597 | 35      |
| Gm3996      | 3782170 | 7   | 15,803,989 | 15,805,927 | 35      |
| Gm3998      | 3782172 | 7   | 15,815,293 | 15,817,231 | 35      |
| Gm4001      | 3782175 | 7   | 15,826,621 | 15,828,559 | 35      |
| Gm4003      | 3782177 | 7   | 15,837,960 | 15,839,898 | 35      |
| Obox2       | 2149033 | 7   | 15,982,194 | 15,983,380 | 35      |
| Gm4016      | 3782190 | 7   | 16,076,788 | 16,088,118 | 35      |
| Obox1       | 1918718 | 7   | 16,132,606 | 16,142,195 | 35      |
| Obox3       | 2149032 | 7   | 16,210,740 | 16,213,211 | 35      |
| Vmn1r107    | 3780017 | 7   | 21,253,034 | 21,255,190 | 37      |
| Gm4144      | 3782320 | 7   | 21,287,648 | 21,290,505 | 37      |
| Gm5156      | 3648210 | 7   | 21,309,861 | 21,312,330 | 37      |
| Vmn1r109    | 3782702 | 7   | 21,336,572 | 21,358,986 | 37      |
| Vmn1r110    | 3782704 | 7   | 21,452,703 | 21,454,859 | 37      |
| Vmn1r111    | 3645811 | 7   | 21,487,315 | 21,490,172 | 37      |
| Gm10668     | 3642587 | 7   | 21,509,544 | 21,512,013 | 37      |
| Vmn1r112    | 3649076 | 7   | 21,554,842 | 21,557,259 | 37      |
| Vmn1r121    | 3648662 | 7   | 21,882,495 | 21,884,610 | 38      |
| Vmn1r122    | 3647341 | 7   | 21,918,230 | 21,920,358 | 38      |
| Vmn1r123    | 2686292 | 7   | 21,945,268 | 21,948,127 | 38      |
| Vmn1r124    | 3779910 | 7   | 22,044,713 | 22,045,636 | 38      |
| Vmn1r125    | 3704112 | 7   | 22,057,198 | 22,058,121 | 38      |
| Vmn1r126    | 3782346 | 7   | 22,085,521 | 22,087,648 | 38      |
| Vmn1r127    | 3779578 | 7   | 22,103,963 | 22,104,880 | 38      |
| Vmn1r128    | 3643535 | 7   | 22,133,033 | 22,135,478 | 38      |
| Vmn1r129    | 3645471 | 7   | 22,145,387 | 22,146,310 | 38      |
| Gm6882      | 3645601 | 7   | 22,210,877 | 22,214,131 | 38      |
| Vmn1r130    | 3782726 | 7   | 22,295,568 | 22,297,722 | 38      |
| Gm4172      | 3782348 | 7   | 22,330,189 | 22,331,109 | 38      |
| Vmn1r132    | 3647009 | 7   | 22,379,150 | 22,400,150 | 38      |
| Gm4175      | 3782351 | 7   | 22,545,550 | 22,546,494 | 38      |
| Gm4177      | 3782353 | 7   | 22,580,830 | 22,581,747 | 38      |
| Vmn1r135    | 3648167 | 7   | 22,616,009 | 22,618,456 | 38      |
| Gm5725      | 3644396 | 7   | 22,628,363 | 22,629,286 | 38      |
| Gm5891      | 3649014 | 7   | 22,694,453 | 22,706,310 | 38      |

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|-------------|---------|-----|-------------|-------------|---------|
| Vmn1r137    | 3782735 | 7   | 22,779,606  | 22,780,529  | 38      |
| Gm4179      | 3782355 | 7   | 22,812,996  | 22,813,916  | 38      |
| Gm6176      | 3644439 | 7   | 22,835,224  | 22,837,694  | 38      |
| Vmn1r139    | 3644494 | 7   | 22,880,539  | 22,882,941  | 38      |
| Gm10666     | 3704285 | 7   | 22,918,795  | 22,919,760  | 38      |
| Vmn1r142    | 3644264 | 7   | 22,921,033  | 22,949,054  | 38      |
| Vmn1r143    | 3644289 | 7   | 22,973,034  | 22,975,482  | 38      |
| Gm8653      | 3647206 | 7   | 22,985,360  | 22,986,283  | 38      |
| Gm8453      | 3644807 | 7   | 23,013,583  | 23,016,408  | 38      |
| Gm4557      | 3782741 | 7   | 23,041,055  | 23,053,029  | 38      |
| Gm4187      | 3782363 | 7   | 23,113,813  | 23,115,951  | 38      |
| Gm4562      | 3782746 | 7   | 23,149,347  | 23,150,697  | 38      |
| Gm8660      | 3645692 | 7   | 23,155,411  | 23,156,058  | 38      |
| Vmn1r148    | 3033483 | 7   | 23,198,602  | 23,199,525  | 38      |
| Vmn1r149    | 3782370 | 7   | 23,222,325  | 23,224,770  | 38      |
| Gm10665     | 3642415 | 7   | 23,248,129  | 23,249,094  | 38      |
| Vmn1r151    | 3644394 | 7   | 23,283,780  | 23,284,697  | 38      |
| Vmn1r152    | 3643438 | 7   | 23,304,677  | 23,308,909  | 38      |
| Gm8677      | 3646576 | 7   | 23,318,983  | 23,319,906  | 38      |
| Gm4201      | 3782378 | 7   | 23,349,442  | 23,352,258  | 38      |
| Vmn1r155    | 3646821 | 7   | 23,441,804  | 23,443,960  | 38      |
| Gm8693      | 3642968 | 7   | 23,476,416  | 23,479,273  | 38      |
| Gm4567      | 3809658 | 7   | 23,498,630  | 23,501,099  | 38      |
| Vmn1r157    | 3646139 | 7   | 23,545,352  | 23,547,771  | 38      |
| Gm4569      | 3782752 | 7   | 23,558,213  | 23,560,407  | 38      |
| Vmn1r158    | 3646143 | 7   | 23,574,878  | 23,577,983  | 38      |
| Vmn1r159    | 3642763 | 7   | 23,627,707  | 23,628,624  | 38      |
| Vmn1r160    | 3779564 | 7   | 23,654,307  | 23,657,166  | 38      |
| Gm4214      | 3782390 | 7   | 23,768,748  | 23,770,864  | 38      |
| Gm4216      | 3782392 | 7   | 23,804,025  | 23,806,166  | 38      |
| Vmn1r163    | 3644349 | 7   | 23,839,198  | 23,841,645  | 38      |
| Gm8720      | 3647550 | 7   | 23,851,552  | 23,852,475  | 38      |
| Gm6605      | 3644762 | 7   | 39,231,315  | 39,237,190  | 39      |
| Gm5591      | 3648692 | 7   | 39,303,158  | 39,313,212  | 39      |
| Gm4454      | 3782638 | 7   | 39,351,859  | 39,356,187  | 39      |
| Gm1988      | 3780157 | 7   | 46,425,170  | 46,435,208  | 39      |
| Gm6124      | 3779556 | 7   | 46,474,468  | 46,480,344  | 39      |
| Gm16387     | 3646111 | 7   | 46,511,994  | 46,519,904  | 39      |
| Gm6833      | 3645553 | 7   | 46,562,898  | 46,572,951  | 39      |
| Gm9271      | 3646449 | 7   | 46,617,645  | 46,623,502  | 39      |
| Stim1       | 107476  | 7   | 109,416,338 | 109,585,374 | 40      |

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|-------------|---------|-----|-------------|-------------|---------|
| Rrm1        | 98180   | 7   | 109,590,381 | 109,617,440 | 40      |
| Olfr543     | 3030377 | 7   | 109,625,372 | 109,626,382 | 40      |
| Olfr544     | 3030378 | 7   | 109,632,628 | 109,633,632 | 40      |
| Olfr545     | 3030379 | 7   | 109,642,337 | 109,643,287 | 40      |
| Olfr547     | 3030381 | 7   | 109,683,263 | 109,684,202 | 40      |
| Olfr549     | 3030383 | 7   | 109,702,800 | 109,703,750 | 40      |
| Trim21      | 106657  | 7   | 109,706,436 | 109,713,983 | 40      |
| Olfr550     | 3030384 | 7   | 109,727,011 | 109,727,961 | 40      |
| Olfr551     | 3030385 | 7   | 109,736,308 | 109,737,255 | 40      |
| Olfr552     | 3030386 | 7   | 109,752,870 | 109,753,823 | 40      |
| Olfr553     | 3030387 | 7   | 109,762,521 | 109,763,501 | 40      |
| Olfr554     | 3030388 | 7   | 109,788,762 | 109,789,715 | 40      |
| Olfr555     | 3030389 | 7   | 109,807,337 | 109,808,284 | 40      |
| Olfr556     | 3030390 | 7   | 109,818,436 | 109,819,410 | 40      |
| Trim68      | 2142077 | 7   | 109,826,096 | 109,835,768 | 40      |
| Olfr557     | 3030391 | 7   | 109,846,754 | 109,847,722 | 40      |
| Olfr558     | 3030392 | 7   | 109,850,845 | 109,860,568 | 40      |
| Olfr33      | 109302  | 7   | 109,861,969 | 109,862,925 | 40      |
| Olfr559     | 3030393 | 7   | 109,872,046 | 109,873,002 | 40      |
| Olfr78      | 2157548 | 7   | 109,889,265 | 109,907,909 | 40      |
| Olfr560     | 3030394 | 7   | 109,901,497 | 109,902,441 | 40      |
| Olfr561     | 3030395 | 7   | 109,923,040 | 109,923,984 | 40      |
| Olfr564     | 3030398 | 7   | 109,951,994 | 109,952,987 | 40      |
| Olfr566     | 3030400 | 7   | 110,004,835 | 110,005,785 | 40      |
| Olfr568     | 3030402 | 7   | 110,025,636 | 110,026,577 | 40      |
| Olfr569     | 3030403 | 7   | 110,035,721 | 110,036,665 | 40      |
| Olfr570     | 3030404 | 7   | 110,048,883 | 110,049,821 | 40      |
| Olfr571     | 3030405 | 7   | 110,057,383 | 110,058,351 | 40      |
| Olfr572     | 3030406 | 7   | 110,076,144 | 110,077,100 | 40      |
| Olfr574     | 3030408 | 7   | 110,096,981 | 110,098,021 | 40      |
| Olfr575     | 3030409 | 7   | 110,103,178 | 110,104,134 | 40      |
| Olfr576     | 3030410 | 7   | 110,113,616 | 110,114,554 | 40      |
| Olfr577     | 3030411 | 7   | 110,121,566 | 110,122,504 | 40      |
| Olfr578     | 3030412 | 7   | 110,132,735 | 110,133,676 | 40      |
| Olfr582     | 3030416 | 7   | 110,189,995 | 110,190,954 | 40      |
| Olfr583     | 3030417 | 7   | 110,199,814 | 110,200,773 | 40      |
| Olfr584     | 3030418 | 7   | 110,234,034 | 110,234,993 | 40      |
| Olfr585     | 3030419 | 7   | 110,246,257 | 110,247,213 | 40      |
| Olfr586     | 3030420 | 7   | 110,270,343 | 110,271,296 | 40      |
| Olfr589     | 3030423 | 7   | 110,303,306 | 110,304,259 | 40      |
| Olfr591     | 3030425 | 7   | 110,321,205 | 110,322,149 | 40      |

| Gene symbol | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|-------------|---------|-----|-------------|-------------|---------|
| Olfr592     | 3030426 | 7   | 110,333,317 | 110,336,055 | 40      |
| Olfr593     | 3030427 | 7   | 110,360,376 | 110,361,359 | 40      |
| Olfr594     | 3030428 | 7   | 110,368,234 | 110,369,169 | 40      |
| Dub2a       | 3051372 | 7   | 110,398,251 | 110,401,019 | 40      |
| Olfr596     | 3030430 | 7   | 110,458,237 | 110,459,175 | 40      |
| Olfr597     | 3030431 | 7   | 110,468,915 | 110,469,874 | 40      |
| Olfr598     | 3030432 | 7   | 110,477,002 | 110,477,961 | 40      |
| Olfr599     | 3030433 | 7   | 110,486,570 | 110,487,517 | 40      |
| Olfr600     | 3030434 | 7   | 110,494,496 | 110,495,440 | 40      |
| Olfr601     | 3030435 | 7   | 110,506,762 | 110,507,706 | 40      |
| Olfr603     | 3030437 | 7   | 110,531,576 | 110,532,514 | 40      |
| Usp17l5     | 107698  | 7   | 110,563,586 | 110,568,394 | 40      |
| Olfr605     | 3030439 | 7   | 110,590,691 | 110,591,635 | 40      |
| Olfr609     | 3030443 | 7   | 110,640,431 | 110,641,390 | 41      |
| Olfr610     | 3030444 | 7   | 110,654,511 | 110,655,458 | 41      |
| Olfr611     | 3030445 | 7   | 110,665,925 | 110,666,896 | 41      |
| Olfr612     | 3030446 | 7   | 110,686,775 | 110,687,746 | 41      |
| Olfr613     | 3030447 | 7   | 110,698,882 | 110,704,018 | 41      |
| Olfr615     | 3030449 | 7   | 110,708,993 | 110,709,934 | 41      |
| Olfr616     | 3030450 | 7   | 110,712,838 | 110,713,791 | 41      |
| Gm3705      | 3781881 | 7   | 110,728,969 | 110,729,689 | 41      |
| Olfr617     | 3030451 | 7   | 110,732,538 | 110,733,494 | 41      |
| Olfr618     | 3030452 | 7   | 110,745,832 | 110,746,788 | 41      |
| Olfr619     | 3030453 | 7   | 110,752,170 | 110,753,132 | 41      |
| Olfr620     | 3030454 | 7   | 110,759,924 | 110,760,865 | 41      |
| Olfr622     | 3030456 | 7   | 110,787,699 | 110,788,652 | 41      |
| Olfr623     | 3030457 | 7   | 110,808,809 | 110,809,762 | 41      |
| Olfr624     | 3030458 | 7   | 110,818,617 | 110,819,543 | 41      |
| Olfr243     | 3030077 | 7   | 110,865,110 | 110,866,060 | 41      |
| Olfr628     | 3030462 | 7   | 110,880,442 | 110,881,392 | 41      |
| Olfr629     | 3030463 | 7   | 110,888,808 | 110,889,752 | 41      |
| Olfr630     | 3030464 | 7   | 110,903,101 | 110,904,166 | 41      |
| Olfr69      | 1341789 | 7   | 110,915,959 | 110,916,909 | 41      |
| Olfr68      | 1341790 | 7   | 110,925,910 | 110,926,857 | 41      |
| Olfr67      | 1341911 | 7   | 110,935,827 | 110,936,789 | 41      |
| Hbb-b1      | 96021   | 7   | 110,961,038 | 110,962,510 | 41      |
| Hbb-b2      | 96022   | 7   | 110,975,048 | 110,976,610 | 41      |
| Gm5736      | 3645277 | 7   | 110,987,659 | 110,988,941 | 41      |
| Hbb-bh1     | 96024   | 7   | 110,990,150 | 110,991,678 | 41      |
| Hbb-y       | 96027   | 7   | 111,000,259 | 111,001,754 | 41      |
| Olfr66      | 1341906 | 7   | 111,029,820 | 111,030,755 | 41      |

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|---------------|---------|-----|-------------|-------------|---------|
| Olfr64        | 1341900 | 7   | 111,041,324 | 111,042,247 | 41      |
| Olfr65        | 1341910 | 7   | 111,054,955 | 111,055,902 | 41      |
| Olfr635       | 3030469 | 7   | 111,127,690 | 111,128,655 | 42      |
| Olfr638       | 3030472 | 7   | 111,151,773 | 111,152,738 | 42      |
| Olfr639       | 3030473 | 7   | 111,160,264 | 111,161,214 | 42      |
| Olfr640       | 3030474 | 7   | 111,169,886 | 111,170,830 | 42      |
| Olfr641       | 3030475 | 7   | 111,188,312 | 111,189,250 | 42      |
| Olfr642       | 3030476 | 7   | 111,197,922 | 111,198,866 | 42      |
| Olfr643       | 3030477 | 7   | 111,207,170 | 111,208,114 | 42      |
| Olfr644       | 3030478 | 7   | 111,216,599 | 111,217,543 | 42      |
| Olfr645       | 3030479 | 7   | 111,232,645 | 111,233,592 | 42      |
| Olfr646       | 3030480 | 7   | 111,254,795 | 111,255,733 | 42      |
| 4931431F19Rik | 1918230 | 7   | 111,276,426 | 111,278,340 | 42      |
| Ubqln3        | 3045291 | 7   | 111,289,137 | 111,291,793 | 42      |
| Ubqlnl        | 2685336 | 7   | 111,296,773 | 111,299,070 | 42      |
| E030002O03Rik | 2443346 | 7   | 111,301,527 | 111,313,345 | 42      |
| Olfr648       | 3030482 | 7   | 111,327,970 | 111,328,920 | 42      |
| Olfr649       | 3030483 | 7   | 111,337,780 | 111,344,474 | 42      |
| Trim6         | 2137352 | 7   | 111,367,307 | 111,383,666 | 42      |
| Trim34-1      | 2137359 | 7   | 111,392,973 | 111,489,207 | 42      |
| Trim5         | 3646853 | 7   | 111,411,900 | 111,436,608 | 42      |
| Trim12        | 1923931 | 7   | 111,448,408 | 111,463,980 | 42      |
| Gm15134       | 3805550 | 7   | 111,448,744 | 111,485,423 | 42      |
| Trim12-2      | 4821183 | 7   | 111,487,268 | 111,501,876 | 42      |
| Trim30-1      | 4821256 | 7   | 111,503,896 | 111,518,398 | 42      |
| Trim30-2      | 4821257 | 7   | 111,530,579 | 111,539,100 | 42      |
| Trim30        | 98178   | 7   | 111,557,539 | 111,613,707 | 42      |
| Trim79        | 3035181 | 7   | 111,618,528 | 111,656,363 | 43      |
| Olfr653       | 3030487 | 7   | 111,728,138 | 111,729,183 | 44      |
| Olfr654       | 3030488 | 7   | 111,736,269 | 111,737,294 | 44      |
| Olfr655       | 3030489 | 7   | 111,744,767 | 111,745,693 | 44      |
| Olfr656       | 3030490 | 7   | 111,766,171 | 111,767,161 | 44      |
| Olfr657       | 3030491 | 7   | 111,784,190 | 111,785,150 | 44      |
| Olfr658       | 3030492 | 7   | 111,791,394 | 111,795,819 | 44      |
| Olfr659       | 3030493 | 7   | 111,819,218 | 111,820,186 | 44      |
| Olfr661       | 3030495 | 7   | 111,836,531 | 111,837,490 | 44      |
| Olfr663       | 3030497 | 7   | 111,852,083 | 111,853,041 | 44      |
| Olfr664       | 3030498 | 7   | 111,881,956 | 111,882,876 | 44      |
| Dub3          | 107697  | 7   | 111,916,674 | 111,921,467 | 44      |
| Gm3930        | 3782104 | 7   | 111,933,768 | 111,937,282 | 44      |
| Dub1a         | 3051498 | 7   | 111,988,826 | 111,991,018 | 44      |

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|-------------|---------|-----|-------------|-------------|---------|
| Dub1        | 107699  | 7   | 112,005,523 | 112,011,181 | 44      |
| Olfr665     | 3030499 | 7   | 112,029,223 | 112,030,173 | 44      |
| Olfr666     | 3030500 | 7   | 112,041,184 | 112,042,140 | 44      |
| Olfr667     | 3030501 | 7   | 112,064,828 | 112,065,808 | 44      |
| Olfr668     | 3030502 | 7   | 112,073,320 | 112,074,276 | 44      |
| Olfr669     | 3030503 | 7   | 112,087,042 | 112,087,995 | 44      |
| Gm10962     | 3779173 | 7   | 112,099,258 | 112,100,793 | 44      |
| Olfr670     | 3030504 | 7   | 112,108,306 | 112,109,244 | 44      |
| Olfr671     | 3030505 | 7   | 112,123,556 | 112,124,497 | 44      |
| Olfr672     | 3030506 | 7   | 112,144,478 | 112,145,416 | 44      |
| Olfr675     | 3030509 | 7   | 112,172,539 | 112,173,480 | 44      |
| Olfr676     | 3030510 | 7   | 112,183,714 | 112,184,667 | 44      |
| Olfr677     | 3030511 | 7   | 112,204,762 | 112,205,700 | 44      |
| Olfr678     | 3030512 | 7   | 112,217,983 | 112,218,924 | 44      |
| Olfr679     | 3030513 | 7   | 112,234,232 | 112,235,179 | 44      |
| Olfr681     | 3030515 | 7   | 112,269,973 | 112,270,920 | 44      |
| Olfr683     | 3030517 | 7   | 112,291,864 | 112,292,823 | 44      |
| Olfr684     | 3030518 | 7   | 112,305,256 | 112,306,194 | 44      |
| Olfr685     | 3030519 | 7   | 112,328,875 | 112,329,825 | 44      |
| Olfr686     | 3030520 | 7   | 112,351,902 | 112,352,855 | 44      |
| Olfr687     | 3030521 | 7   | 112,424,010 | 112,424,975 | 44      |
| Olfr688     | 3030522 | 7   | 112,436,609 | 112,437,574 | 44      |
| Olfr689     | 3030523 | 7   | 112,462,520 | 112,463,482 | 44      |
| Olfr690     | 3030524 | 7   | 112,477,757 | 112,478,719 | 44      |
| Olfr691     | 3030525 | 7   | 112,485,260 | 112,486,228 | 44      |
| Olfr692     | 3030526 | 7   | 112,516,842 | 112,517,831 | 44      |
| Gm5901      | 3643909 | 7   | 112,523,612 | 112,526,801 | 44      |
| Fam160a2    | 1921599 | 7   | 112,527,124 | 112,548,568 | 44      |
| Cnga4       | 2664099 | 7   | 112,553,082 | 112,557,252 | 44      |
| Cckbr       | 99479   | 7   | 112,574,334 | 112,584,852 | 44      |
| Prkcdbp     | 1923422 | 7   | 112,629,130 | 112,630,711 | 44      |
| Smpd1       | 98325   | 7   | 112,702,939 | 112,706,901 | 44      |
| Apbb1       | 107765  | 7   | 112,707,000 | 112,729,735 | 44      |
| Hpx         | 105112  | 7   | 112,740,125 | 112,748,610 | 44      |
| Trim3       | 1860040 | 7   | 112,752,977 | 112,782,085 | 44      |
| Arfip2      | 1924182 | 7   | 112,782,717 | 112,788,930 | 44      |
| Fxc1        | 1315196 | 7   | 112,788,570 | 112,804,262 | 44      |
| Dnhd1       | 1924755 | 7   | 112,789,076 | 112,843,322 | 44      |
| Gm9571      | 3779981 | 7   | 112,861,819 | 112,870,313 | 44      |
| Rrp8        | 1914251 | 7   | 112,880,721 | 112,885,890 | 44      |
| Ilk         | 1195267 | 7   | 112,885,106 | 112,891,439 | 44      |

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|-------------|---------|-----|-------------|-------------|---------|
| Taf10       | 1346320 | 7   | 112,887,907 | 112,892,875 | 44      |
| Tpp1        | 1336194 | 7   | 112,893,532 | 112,900,743 | 44      |
| Dchs1       | 2685011 | 7   | 112,901,504 | 112,936,168 | 44      |
| Mrpl17      | 1351608 | 7   | 112,955,172 | 112,959,613 | 44      |
| Gm4070      | 3782245 | 7   | 113,043,632 | 113,102,484 | 44      |
| Gvin1       | 1921808 | 7   | 113,300,049 | 113,358,854 | 44      |
| Gm9572      | 3779982 | 7   | 113,329,255 | 113,330,833 | 44      |
| Ppfibp2     | 894649  | 7   | 114,738,780 | 114,888,399 | 45      |
| Cyb5r2      | 2444415 | 7   | 114,891,969 | 114,901,510 | 45      |
| Ovch2       | 3045251 | 7   | 114,925,058 | 114,944,722 | 45      |
| Olfr467     | 3030301 | 7   | 114,958,100 | 114,959,020 | 45      |
| Olfr469     | 3030303 | 7   | 114,966,037 | 114,966,981 | 45      |
| Olfr470     | 3030304 | 7   | 114,988,301 | 114,989,245 | 45      |
| Olfr471     | 3030305 | 7   | 115,004,566 | 115,005,492 | 45      |
| Olfr472     | 3030306 | 7   | 115,046,233 | 115,047,165 | 45      |
| Olfr473     | 3030307 | 7   | 115,077,036 | 115,077,968 | 45      |
| Olfr474     | 3030308 | 7   | 115,098,157 | 115,099,089 | 45      |
| Olfr476     | 3030310 | 7   | 115,110,913 | 115,111,845 | 45      |
| Olfr477     | 3030311 | 7   | 115,133,881 | 115,134,813 | 45      |
| Olfr478     | 3030312 | 7   | 115,174,911 | 115,175,855 | 45      |
| Olfr479     | 3030313 | 7   | 115,198,498 | 115,199,481 | 45      |
| Olfr480     | 3030314 | 7   | 115,209,282 | 115,210,310 | 45      |
| Olfr481     | 3030315 | 7   | 115,224,310 | 115,225,248 | 45      |
| Gm4199      | 3782376 | 7   | 115,236,698 | 115,238,099 | 45      |
| Olfr482     | 3030316 | 7   | 115,238,111 | 115,239,082 | 45      |
| Olfr483     | 3030317 | 7   | 115,246,825 | 115,247,772 | 45      |
| Olfr484     | 3030318 | 7   | 115,267,810 | 115,268,775 | 45      |
| Olfr485     | 3030319 | 7   | 115,302,432 | 115,303,375 | 45      |
| Olfr486     | 3030320 | 7   | 115,315,312 | 115,316,256 | 45      |
| Olfr487     | 3030321 | 7   | 115,355,097 | 115,356,041 | 45      |
| Olfr488     | 3030322 | 7   | 115,398,706 | 115,399,650 | 45      |
| Olfr490     | 3030324 | 7   | 115,429,694 | 115,430,638 | 45      |
| Olfr491     | 3030325 | 7   | 115,460,410 | 115,461,342 | 45      |
| Olfr492     | 3030326 | 7   | 115,466,244 | 115,467,188 | 45      |
| Olfr493     | 3030327 | 7   | 115,489,549 | 115,490,493 | 45      |
| Olfr494     | 3030328 | 7   | 115,511,006 | 115,511,950 | 45      |
| Olfr495     | 3030329 | 7   | 115,538,636 | 115,539,628 | 45      |
| Olfr497     | 3030331 | 7   | 115,566,087 | 115,567,031 | 45      |
| Olfr498     | 3030332 | 7   | 115,608,840 | 115,609,832 | 45      |
| Olfr502     | 3030336 | 7   | 115,666,518 | 115,667,462 | 45      |
| Olfr503     | 3030337 | 7   | 115,688,041 | 115,689,012 | 45      |

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|---------------|---------|-----|-------------|-------------|---------|
| Olfr504       | 3030338 | 7   | 115,708,351 | 115,709,307 | 45      |
| Olfr506       | 3030340 | 7   | 115,755,823 | 115,756,767 | 45      |
| Olfr507       | 3030341 | 7   | 115,765,328 | 115,766,278 | 45      |
| Olfr508       | 3030342 | 7   | 115,773,508 | 115,774,440 | 45      |
| Olfr509       | 3030343 | 7   | 115,789,123 | 115,790,088 | 45      |
| Olfr510       | 3030344 | 7   | 115,810,932 | 115,811,876 | 45      |
| Olfr512       | 3030346 | 7   | 115,856,869 | 115,857,849 | 45      |
| Olfr513       | 3030347 | 7   | 115,898,372 | 115,899,301 | 45      |
| Olfr514       | 3030348 | 7   | 115,968,579 | 115,969,511 | 45      |
| Olfr516       | 3030350 | 7   | 115,988,578 | 115,989,522 | 45      |
| Olfr517       | 3030351 | 7   | 116,011,722 | 116,012,666 | 45      |
| Olfr518       | 3030352 | 7   | 116,024,117 | 116,025,118 | 45      |
| Olfr519       | 3030353 | 7   | 116,036,975 | 116,037,919 | 45      |
| Nlrp10        | 2444084 | 7   | 116,065,374 | 116,073,672 | 45      |
| Eif3f         | 1913335 | 7   | 116,077,931 | 116,086,465 | 45      |
| BC049265      | 3041253 | 7   | 116,094,171 | 116,095,323 | 45      |
| Tub           | 2651573 | 7   | 116,154,339 | 116,177,974 | 45      |
| Ric3          | 2443887 | 7   | 116,177,826 | 116,226,845 | 45      |
| Lmo1          | 102812  | 7   | 116,282,085 | 116,314,027 | 45      |
| Stk33         | 2152419 | 7   | 116,422,737 | 116,582,595 | 45      |
| 1700095J03Rik | 1921543 | 7   | 116,582,132 | 116,588,407 | 45      |
| Trim66        | 2152406 | 7   | 116,592,520 | 116,651,648 | 45      |
| Rpl27a        | 1347076 | 7   | 116,662,661 | 116,665,881 | 45      |
| St5           | 108517  | 7   | 116,667,425 | 116,760,661 | 45      |
| Gm3915        | 3782089 | 7   | 116,843,045 | 116,847,122 | 45      |
| D930014E17Rik | 3041226 | 7   | 116,847,204 | 116,855,703 | 45      |
| BC051019      | 1928824 | 7   | 116,855,695 | 116,867,364 | 45      |
| Ascl3         | 1928820 | 7   | 116,870,979 | 116,875,246 | 45      |
| Tmem9b        | 1915254 | 7   | 116,879,348 | 116,896,389 | 45      |
| 4930431P19Rik | 1921136 | 7   | 116,895,834 | 116,898,792 | 45      |
| Nrip3         | 1925843 | 7   | 116,901,569 | 116,925,539 | 45      |
| Scube2        | 1928765 | 7   | 116,942,204 | 117,009,193 | 45      |
| Phxr5         | 104521  | 7   | 116,988,530 | 116,990,548 | 45      |
| Dennd5a       | 1201681 | 7   | 117,037,294 | 117,103,984 | 45      |
| Tmem41b       | 1289225 | 7   | 117,115,701 | 117,130,443 | 45      |
| lpo7          | 2152414 | 7   | 117,161,939 | 117,198,628 | 45      |
| AA474408      | 3034216 | 7   | 117,204,405 | 117,204,818 | 45      |
| Zfp143        | 1277969 | 7   | 117,205,216 | 117,238,906 | 45      |
| Wee1          | 103075  | 7   | 117,265,570 | 117,286,798 | 45      |
| Swap70        | 1298390 | 7   | 117,365,275 | 117,427,017 | 45      |
| Sbf2          | 1921831 | 7   | 117,452,860 | 117,758,436 | 45      |



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|---------------|---------|-----|-------------|-------------|---------|
| Adm           | 108058  | 7   | 117,771,183 | 117,773,333 | 45      |
| Zfp703        | 2662729 | 8   | 28,087,826  | 28,091,938  | 46      |
| Erlin2        | 2387215 | 8   | 28,134,331  | 28,149,896  | 46      |
| Prosc         | 1891207 | 8   | 28,153,075  | 28,165,038  | 46      |
| Gpr124        | 1925810 | 8   | 28,196,313  | 28,233,890  | 46      |
| Brf2          | 1913903 | 8   | 28,234,304  | 28,239,104  | 46      |
| Rab11fip1     | 1923017 | 8   | 28,249,245  | 28,285,120  | 46      |
| Got1l1        | 1923865 | 8   | 28,307,932  | 28,313,019  | 46      |
| Adrb3         | 87939   | 8   | 28,336,248  | 28,340,060  | 46      |
| Eif4ebp1      | 103267  | 8   | 28,370,850  | 28,385,985  | 46      |
| Tex24         | 1921539 | 8   | 28,454,866  | 28,459,659  | 46      |
| Chrn3         | 106212  | 8   | 28,479,183  | 28,510,201  | 46      |
| Chrna6        | 106213  | 8   | 28,513,686  | 28,524,356  | 46      |
| Poteg         | 1918202 | 8   | 28,558,142  | 28,574,584  | 46      |
| Gm1698        | 2686544 | 8   | 28,714,823  | 28,730,924  | 46      |
| Gm3985        | 3782158 | 8   | 33,998,977  | 34,060,498  | 47      |
| Gm6876        | 3647691 | 8   | 34,125,161  | 34,182,427  | 47      |
| Wrn           | 109635  | 8   | 34,346,172  | 34,495,969  | 47      |
| Purg          | 1922279 | 8   | 34,496,797  | 34,497,860  | 47      |
| 5930422O12Rik | 2442538 | 8   | 34,539,268  | 34,542,471  | 47      |
| Tex15         | 1934816 | 8   | 34,627,210  | 34,696,054  | 47      |
| Ppp2cb        | 1321161 | 8   | 34,710,097  | 34,730,266  | 47      |
| Ubxn8         | 1337129 | 8   | 34,731,481  | 34,752,431  | 47      |
| Gsr           | 95804   | 8   | 34,762,995  | 34,808,635  | 47      |
| 1700104B16Rik | 1925886 | 8   | 34,841,021  | 34,841,344  | 47      |
| Gtf2e2        | 1915403 | 8   | 34,842,574  | 34,887,041  | 47      |
| Rbpms         | 1334446 | 8   | 34,893,116  | 35,040,313  | 47      |
| Gm4021        | 3782195 | 8   | 35,028,904  | 35,032,416  | 47      |
| Gm9951        | 3641827 | 8   | 35,112,316  | 35,120,100  | 47      |
| Dctn6         | 1343154 | 8   | 35,153,474  | 35,171,850  | 47      |
| Mboat4        | 2685017 | 8   | 35,186,798  | 35,187,772  | 47      |
| Leprotl1      | 1915442 | 8   | 35,198,626  | 35,210,087  | 47      |
| Tmem66        | 1915137 | 8   | 35,217,642  | 35,233,738  | 47      |
| Dusp4         | 2442191 | 8   | 35,870,351  | 35,882,948  | 47      |
| Gm9648        | 3780055 | 8   | 35,872,588  | 35,873,463  | 47      |
| Tnks          | 1341087 | 8   | 35,892,233  | 36,028,744  | 47      |
| Gm9892        | 3701610 | 8   | 53,281,117  | 53,282,553  | 48      |
| Npsr1         | 2441738 | 9   | 23,902,440  | 24,120,842  | 52      |
| Gm10701       | 3642532 | 9   | 24,146,101  | 24,223,153  | 52      |
| Dpy19l1       | 1915685 | 9   | 24,216,220  | 24,307,584  | 52      |
| Dpy19l2       | 2444662 | 9   | 24,361,497  | 24,500,737  | 52      |

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|---------------|---------|-----|-------------|-------------|---------|
| Cypt4         | 1916573 | 9   | 24,429,629  | 24,430,271  | 52      |
| Tbx20         | 1888496 | 9   | 24,527,648  | 24,578,746  | 52      |
| Gm2073        | 3780240 | 9   | 83,236,152  | 83,238,699  | 53      |
| Lca5          | 1923032 | 9   | 83,283,900  | 83,334,734  | 53      |
| Sh3bgrl2      | 1915350 | 9   | 83,441,945  | 83,493,899  | 53      |
| Gm2109        | 3780277 | 9   | 83,578,731  | 83,586,854  | 53      |
| Osbpl10       | 1921736 | 9   | 114,976,397 | 115,141,341 | 54      |
| Stt3b         | 1915542 | 9   | 115,152,921 | 115,219,586 | 54      |
| Gm9757        | 3704346 | 9   | 115,218,957 | 115,219,733 | 54      |
| Gm2315        | 3780486 | 9   | 115,256,593 | 115,303,644 | 54      |
| Gm5921        | 3648968 | 9   | 115,346,818 | 115,347,699 | 54      |
| 4930444G20Rik | 2149738 | 10  | 21,786,398  | 21,787,885  | 55      |
| E030030I06Rik | 2442914 | 10  | 21,833,938  | 21,868,629  | 55      |
| Raet1c        | 109431  | 10  | 21,878,375  | 22,093,945  | 55, 56  |
| Gm2555        | 3780723 | 10  | 21,936,313  | 21,938,830  | 56      |
| H60b          | 3649078 | 10  | 21,993,152  | 22,008,655  | 56      |
| Raet1d        | 1861032 | 10  | 22,082,077  | 22,093,945  | 56      |
| Gm6763        | 3643573 | 10  | 103,605,569 | 103,608,038 | 57      |
| Gm8764        | 3643666 | 10  | 103,614,079 | 103,616,547 | 57      |
| Gm8766        | 3643661 | 10  | 103,622,588 | 103,625,055 | 57      |
| Gm4340        | 3782524 | 10  | 103,631,097 | 103,633,576 | 57      |
| Gm3813        | 3781985 | 10  | 104,432,415 | 104,441,921 | 57      |
| Tmtc2         | 1914057 | 10  | 104,624,719 | 105,011,507 | 57      |
| Gm6770        | 3648469 | 10  | 104,981,881 | 104,987,559 | 57      |
| Iltifb        | 2151139 | 10  | 117,726,685 | 117,732,094 | 58      |
| Llgl1         | 102682  | 11  | 60,513,225  | 60,527,688  | 60      |
| Flii          | 1342286 | 11  | 60,527,625  | 60,540,765  | 60      |
| Smcr7         | 2144199 | 11  | 60,541,900  | 60,546,453  | 60      |
| Top3a         | 1197527 | 11  | 60,553,560  | 60,590,867  | 60      |
| Gm3881        | 3782054 | 11  | 60,579,847  | 60,583,296  | 60      |
| Smcr8         | 2444720 | 11  | 60,591,026  | 60,594,569  | 60      |
| Shmt1         | 98299   | 11  | 60,601,606  | 60,624,663  | 60      |
| Dhrs7b        | 2384931 | 11  | 60,644,181  | 60,673,697  | 60      |
| Tmem11        | 2144726 | 11  | 60,677,954  | 60,692,774  | 60      |
| Gm16515       | 1344388 | 11  | 60,715,748  | 60,728,252  | 60      |
| Gm16516       | 1344334 | 11  | 60,734,419  | 60,745,369  | 60      |
| Map2k3        | 1346868 | 11  | 60,745,535  | 60,766,313  | 60      |
| Kcnj12        | 108495  | 11  | 60,836,066  | 60,884,633  | 60      |
| Tnfrsf13b     | 1889411 | 11  | 60,940,257  | 60,962,874  | 60      |
| Usp22         | 2144157 | 11  | 60,965,287  | 60,988,557  | 60      |
| Aldh3a1       | 1353451 | 11  | 61,021,039  | 61,031,923  | 60      |

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|---------------|---------|-----|------------|------------|---------|
| Aldh3a2       | 1353452 | 11  | 61,036,919 | 61,080,966 | 60      |
| Slc47a2       | 3588190 | 11  | 61,117,423 | 61,156,352 | 60      |
| Slc47a1       | 1914723 | 11  | 61,156,903 | 61,191,847 | 60      |
| Gm3923        | 3782097 | 11  | 61,204,631 | 61,211,164 | 60      |
| Rnf112        | 106611  | 11  | 61,261,944 | 61,267,633 | 60      |
| Mfap4         | 1342276 | 11  | 61,298,933 | 61,302,402 | 60      |
| Mapk7         | 1346347 | 11  | 61,302,314 | 61,307,908 | 60      |
| 3110043A19Rik | 1920466 | 11  | 61,317,888 | 61,318,561 | 60      |
| B9d1          | 1351471 | 11  | 61,318,646 | 61,326,433 | 60      |
| Epn2          | 1333766 | 11  | 61,330,751 | 61,393,187 | 60      |
| Grap          | 1918770 | 11  | 61,466,767 | 61,486,286 | 60      |
| Slc5a10       | 1926089 | 11  | 61,486,283 | 61,534,328 | 60      |
| Fam83g        | 1916890 | 11  | 61,497,593 | 61,523,453 | 60      |
| Prpsap2       | 2384838 | 11  | 61,543,156 | 61,575,564 | 60      |
| Ulk2          | 1352758 | 11  | 61,589,151 | 61,668,575 | 60      |
| A530017D24Rik | 2144320 | 11  | 61,678,705 | 61,682,270 | 60      |
| Akap10        | 1890218 | 11  | 61,684,809 | 61,743,754 | 60      |
| Gm12273       | 3650148 | 11  | 61,764,417 | 61,766,238 | 60      |
| Cytsb         | 2442356 | 11  | 61,770,281 | 62,036,507 | 60      |
| Gm3406        | 3781584 | 11  | 61,829,616 | 61,837,617 | 60      |
| Adora2b       | 99403   | 11  | 62,062,486 | 62,079,955 | 60      |
| Zswim7        | 1916997 | 11  | 62,080,726 | 62,094,877 | 60      |
| Ttc19         | 1920045 | 11  | 62,094,975 | 62,141,953 | 60      |
| Ncor1         | 1349717 | 11  | 62,129,928 | 62,272,043 | 60      |
| Pigl          | 2681271 | 11  | 62,271,787 | 62,329,795 | 60      |
| Cenpv         | 1920389 | 11  | 62,338,448 | 62,352,763 | 60      |
| Ubb           | 98888   | 11  | 62,364,673 | 62,366,715 | 60      |
| Trpv2         | 1341836 | 11  | 62,387,988 | 62,414,017 | 60      |
| 2410006H16Rik | 1916471 | 11  | 62,416,379 | 62,418,309 | 60      |
| BC046404      | 2682293 | 11  | 62,418,386 | 62,462,025 | 60      |
| Mmgt2         | 2448491 | 11  | 62,462,241 | 62,479,856 | 60      |
| Zfp287        | 2176561 | 11  | 62,513,858 | 62,545,407 | 60      |
| Gm4019        | 3782193 | 11  | 62,563,799 | 62,564,849 | 60      |
| Gm10428       | 3704375 | 11  | 62,565,413 | 62,567,923 | 60      |
| Zfp286        | 2384758 | 11  | 62,566,879 | 62,602,964 | 60      |
| Trim16        | 2137356 | 11  | 62,633,733 | 62,664,310 | 60      |
| Fbxw10        | 3052463 | 11  | 62,660,571 | 62,690,967 | 60      |
| Fam18b        | 1914760 | 11  | 62,692,957 | 62,730,282 | 60      |
| Cdrt4         | 1913588 | 11  | 62,764,695 | 62,806,597 | 60      |
| Tekt3         | 1918312 | 11  | 62,875,156 | 62,908,466 | 60      |
| Pmp22         | 97631   | 11  | 62,942,484 | 62,973,049 | 60      |

| Gene symbol   | MGI ID  | Chr | Gene start | Gene end   | CNV No. |
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| Hs3st3b1      | 1333853 | 11  | 63,699,294 | 63,735,792 | 60      |
| Cox10         | 1917633 | 11  | 63,776,129 | 63,892,970 | 60      |
| 2810001G20Rik | 1913706 | 11  | 63,892,986 | 63,896,761 | 60      |
| Gm5783        | 3644950 | 11  | 64,076,754 | 64,087,539 | 60      |
| F930015N05Rik | 3606161 | 11  | 64,248,635 | 64,249,314 | 60      |
| Hs3st3a1      | 1333861 | 11  | 64,248,834 | 64,336,343 | 60      |
| Gm12292       | 3649414 | 11  | 64,654,102 | 64,657,255 | 60      |
| Gm2217        | 3780387 | 11  | 94,650,609 | 94,653,690 | 61      |
| Col1a1        | 88467   | 11  | 94,797,538 | 94,814,356 | 61      |
| Sgca          | 894698  | 11  | 94,824,105 | 94,837,641 | 61      |
| Hils1         | 2136691 | 11  | 94,828,907 | 94,829,770 | 61      |
| Ppp1r9b       | 2387581 | 11  | 94,852,349 | 94,868,213 | 61      |
| Samd14        | 2384945 | 11  | 94,871,193 | 94,887,401 | 61      |
| Pdk2          | 1343087 | 11  | 94,887,572 | 94,902,668 | 61      |
| Itga3         | 96602   | 11  | 94,905,788 | 94,938,115 | 61      |
| Dlx3          | 94903   | 11  | 94,981,403 | 94,986,610 | 61      |
| Dlx4          | 94904   | 11  | 95,001,761 | 95,007,115 | 61      |
| Gm11515       | 3649766 | 11  | 95,084,604 | 95,086,946 | 61      |
| Tac4          | 1931130 | 11  | 95,122,843 | 95,130,579 | 61      |
| Myst2         | 2182799 | 11  | 95,135,573 | 95,171,560 | 61      |
| Fam117a       | 2144564 | 11  | 95,198,332 | 95,243,186 | 61      |
| Slc35b1       | 1343133 | 11  | 95,246,006 | 95,253,090 | 61      |
| Spop          | 1343085 | 11  | 95,275,394 | 95,354,720 | 61      |
| Nxph3         | 1336188 | 11  | 95,371,159 | 95,375,884 | 61      |
| Ngfr          | 97323   | 11  | 95,430,132 | 95,449,049 | 61      |
| Phb           | 97572   | 11  | 95,528,271 | 95,542,087 | 61      |
| Gm9796        | 3648412 | 11  | 95,559,134 | 95,559,694 | 61      |
| Zfp652        | 2442221 | 11  | 95,573,987 | 95,696,429 | 61      |
| B130006D01Rik | 2444371 | 11  | 95,584,901 | 95,588,024 | 61      |
| Gm7564        | 3644307 | 11  | 95,685,266 | 95,685,870 | 61      |
| Phospho1      | 2447348 | 11  | 95,685,813 | 95,693,454 | 61      |
| Abi3          | 1913860 | 11  | 95,691,388 | 95,703,790 | 61      |
| Gngt2         | 893584  | 11  | 95,698,530 | 95,707,048 | 61      |
| Gm11527       | 3649799 | 11  | 95,719,476 | 95,720,488 | 61      |
| B4galnt2      | 1342058 | 11  | 95,727,257 | 95,776,205 | 61      |
| Igf2bp1       | 1890357 | 11  | 95,818,477 | 95,867,254 | 61      |
| Gm2567        | 3780734 | 11  | 95,867,647 | 95,868,469 | 61      |
| Gip           | 107504  | 11  | 95,885,859 | 95,892,145 | 61      |
| Snf8          | 1343161 | 11  | 95,896,199 | 95,908,744 | 61      |
| Ube2z         | 1343160 | 11  | 95,908,746 | 95,926,702 | 61      |
| Atp5g1        | 107653  | 11  | 95,930,166 | 95,936,984 | 61      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Calcoco2      | 1343177 | 11  | 95,960,640  | 95,973,278  | 61      |
| Ttll6         | 2683461 | 11  | 95,995,100  | 96,026,765  | 61      |
| Hoxb13        | 107730  | 11  | 96,055,630  | 96,058,761  | 61      |
| Gm11538       | 3649911 | 11  | 96,064,768  | 96,066,699  | 61      |
| Gm53          | 2684899 | 11  | 96,112,908  | 96,126,182  | 61      |
| Hoxb9         | 96190   | 11  | 96,132,823  | 96,137,909  | 61      |
| Hoxb8         | 96189   | 11  | 96,143,219  | 96,146,639  | 61      |
| Hoxb7         | 96188   | 11  | 96,145,877  | 96,151,650  | 61      |
| Hoxb6         | 96187   | 11  | 96,160,390  | 96,162,883  | 61      |
| Hoxb5         | 96186   | 11  | 96,164,826  | 96,167,435  | 61      |
| Hoxb4         | 96185   | 11  | 96,180,011  | 96,182,952  | 61      |
| Hoxb3         | 96184   | 11  | 96,184,640  | 96,207,999  | 61      |
| Gm11536       | 3650116 | 11  | 96,197,613  | 96,203,422  | 61      |
| Hoxb2         | 96183   | 11  | 96,213,125  | 96,215,330  | 61      |
| Gm10980       | 3779193 | 11  | 96,221,935  | 96,222,064  | 61      |
| Hoxb1         | 96182   | 11  | 96,227,066  | 96,229,570  | 61      |
| Gm11529       | 3649352 | 11  | 96,309,637  | 96,325,861  | 61      |
| Skap1         | 1925723 | 11  | 96,325,907  | 96,620,444  | 61      |
| Gm10480       | 3642435 | 12  | 18,223,364  | 18,224,634  | 63      |
| Gm9590        | 3779999 | 12  | 18,394,561  | 18,413,667  | 63      |
| 5730507C01Rik | 1917882 | 12  | 18,521,544  | 18,540,997  | 63      |
| Gm3944        | 3782118 | 12  | 18,859,727  | 18,876,660  | 63      |
| Gm16844       | 4439768 | 12  | 114,494,412 | 114,498,447 | 64      |
| Gm900         | 2685746 | 12  | 114,509,391 | 114,511,457 | 64      |
| Al324046      | 2144790 | 12  | 114,595,653 | 114,599,443 | 64      |
| Gm11029       | 3779252 | 12  | 114,655,095 | 114,657,149 | 64      |
| Gm10423       | 3704397 | 12  | 114,655,290 | 114,655,712 | 64      |
| Adam6b        | 2444636 | 12  | 114,727,776 | 114,730,046 | 64      |
| Adam6a        | 2676316 | 12  | 114,782,119 | 114,784,625 | 64      |
| Gm16970       | 4439894 | 12  | 114,826,478 | 114,826,911 | 64      |
| Gm16948       | 4439872 | 12  | 114,849,395 | 114,849,828 | 64      |
| Gm16592       | 4439516 | 12  | 114,940,335 | 114,940,789 | 64      |
| Gm16609       | 4439533 | 12  | 115,097,360 | 115,097,827 | 64      |
| Gm16700       | 4439624 | 12  | 115,117,307 | 115,117,740 | 64      |
| Gm16698       | 4439622 | 12  | 115,134,619 | 115,135,157 | 64      |
| Gm16699       | 4439623 | 12  | 115,150,236 | 115,150,694 | 64      |
| Gm16996       | 4439920 | 12  | 115,170,170 | 115,170,588 | 64      |
| Gm16612       | 4439536 | 12  | 115,186,493 | 115,186,943 | 64      |
| Gm16683       | 4439607 | 12  | 115,232,680 | 115,233,109 | 64      |
| Gm16999       | 4439923 | 12  | 115,272,016 | 115,272,487 | 64      |
| Gm16840       | 4439764 | 12  | 115,298,056 | 115,298,484 | 64      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Gm16842       | 4439766 | 12  | 115,391,395 | 115,391,855 | 64      |
| Gm16839       | 4439763 | 12  | 115,460,999 | 115,461,465 | 64      |
| Gm7112        | 3648045 | 12  | 115,500,863 | 115,501,161 | 64      |
| Gm16932       | 4439856 | 12  | 115,526,363 | 115,526,793 | 64      |
| Gm7175        | 3646379 | 12  | 115,538,172 | 115,538,465 | 64      |
| Gm17000       | 4439924 | 12  | 115,707,286 | 115,707,606 | 64      |
| Gm16697       | 4439621 | 12  | 115,821,780 | 115,822,213 | 64      |
| Gm16735       | 4439659 | 12  | 116,089,401 | 116,089,834 | 64      |
| Gm16966       | 4439890 | 12  | 116,229,319 | 116,229,612 | 64      |
| AB069917      | 3576502 | 12  | 116,396,614 | 116,397,046 | 64      |
| Gm9740        | 3815333 | 12  | 116,532,277 | 116,532,573 | 64      |
| Gm16900       | 4439824 | 12  | 116,597,351 | 116,597,783 | 64      |
| Gm9232        | 3704125 | 12  | 116,624,918 | 116,625,199 | 64      |
| Gm16709       | 4439633 | 12  | 116,996,195 | 116,996,627 | 64      |
| Gm16710       | 4439634 | 12  | 117,040,859 | 117,041,291 | 64      |
| Gm16746       | 4439670 | 12  | 117,100,078 | 117,100,511 | 64      |
| Gm16812       | 4439736 | 12  | 117,106,984 | 117,107,413 | 64      |
| Adarb2        | 2151118 | 13  | 8,202,112   | 8,767,993   | 65      |
| Gm8372        | 3644813 | 13  | 8,452,489   | 8,454,561   | 65      |
| Wdr37         | 1920393 | 13  | 8,802,214   | 8,870,976   | 65      |
| Idi1          | 2442264 | 13  | 8,885,220   | 8,891,616   | 65      |
| Gm9745        | 3704398 | 13  | 8,940,951   | 8,947,489   | 65      |
| Idi2          | 2444315 | 13  | 8,952,109   | 8,960,181   | 65      |
| Gtpbp4        | 1916487 | 13  | 8,971,710   | 8,995,258   | 65      |
| Larp4b        | 106330  | 13  | 9,093,151   | 9,172,332   | 65      |
| Dip2c         | 1920179 | 13  | 9,276,228   | 9,668,171   | 65      |
| Zmynd11       | 1913755 | 13  | 9,684,082   | 9,764,567   | 65      |
| Chrm3         | 88398   | 13  | 9,875,859   | 10,360,049  | 65      |
| Pde4d         | 99555   | 13  | 109,240,142 | 110,743,669 | 67      |
| Al452195      | 2145249 | 13  | 110,744,317 | 110,746,171 | 67      |
| Thrb          | 98743   | 14  | 18,493,474  | 18,870,600  | 68      |
| Nr1d2         | 2449205 | 14  | 19,036,568  | 19,071,641  | 68      |
| Rpl15         | 1913730 | 14  | 19,100,337  | 19,103,905  | 68      |
| Nkiras1       | 1916971 | 14  | 19,103,650  | 19,116,456  | 68      |
| Ube2e1        | 107411  | 14  | 19,115,236  | 19,164,373  | 68      |
| Ube2e2        | 2384997 | 14  | 19,406,091  | 19,726,781  | 68      |
| Dach1         | 1277991 | 14  | 98,186,072  | 98,568,984  | 70      |
| Mzt1          | 1924039 | 14  | 99,434,692  | 99,445,299  | 70      |
| 6720463M24Rik | 1924994 | 14  | 99,445,596  | 99,473,326  | 70      |
| Dis3          | 1919912 | 14  | 99,476,489  | 99,498,959  | 70      |
| Pibf1         | 1261910 | 14  | 99,498,652  | 99,653,712  | 70      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Klf5          | 1338056 | 14  | 99,697,910  | 99,712,624  | 70      |
| Klf12         | 1333796 | 14  | 100,269,869 | 100,549,015 | 70      |
| Cdh10         | 107436  | 15  | 18,750,084  | 18,943,989  | 72      |
| Gm6267        | 3779581 | 15  | 19,440,077  | 19,648,475  | 72      |
| Acot10        | 1928940 | 15  | 20,595,089  | 20,596,408  | 72      |
| Cdh12         | 109503  | 15  | 21,041,207  | 21,519,288  | 72      |
| Gm2727        | 3780896 | 15  | 21,825,012  | 21,829,418  | 72      |
| Kcns2         | 1197011 | 15  | 34,767,136  | 34,772,092  | 73      |
| Stk3          | 1928487 | 15  | 34,805,251  | 35,085,561  | 73      |
| Osr2          | 1930813 | 15  | 35,225,867  | 35,233,060  | 73      |
| Vps13b        | 1916380 | 15  | 35,301,304  | 35,859,849  | 73      |
| Gm7968        | 3644983 | 15  | 35,519,069  | 35,521,393  | 73      |
| Cox6c         | 104614  | 15  | 35,855,641  | 35,868,001  | 73      |
| Rgs22         | 3613651 | 15  | 35,939,245  | 36,052,087  | 73      |
| Fbxo43        | 1926053 | 15  | 36,079,815  | 36,094,639  | 73      |
| 1700074I03Rik | 1920780 | 15  | 36,094,375  | 36,095,202  | 73      |
| Polr2k        | 102725  | 15  | 36,103,855  | 36,106,698  | 73      |
| Spag1         | 1349387 | 15  | 36,109,123  | 36,165,365  | 73      |
| Rnf19a        | 1353623 | 15  | 36,169,689  | 36,212,888  | 73      |
| Pdia5         | 1919849 | 16  | 35,397,399  | 35,490,959  | 74      |
| Sema5b        | 107555  | 16  | 35,541,231  | 35,664,818  | 74      |
| Gm4439        | 3782622 | 16  | 54,204,783  | 54,212,403  | 75      |
| Hspa13        | 1309463 | 16  | 75,755,435  | 75,767,066  | 76      |
| Samsn1        | 1914992 | 16  | 75,859,038  | 76,022,515  | 76      |
| Gm16509       | 3641946 | 16  | 80,947,590  | 80,950,214  | 78      |
| Tcp10b        | 98542   | 17  | 13,253,977  | 13,275,092  | 79      |
| Gm11166       | 3810119 | 17  | 13,289,545  | 13,291,338  | 79      |
| Unc93a        | 1933250 | 17  | 13,301,483  | 13,324,657  | 79      |
| Gm10512       | 3642173 | 17  | 13,397,908  | 13,399,077  | 79      |
| Smok2a        | 1351487 | 17  | 13,414,054  | 13,420,524  | 79      |
| Smok2b        | 3037705 | 17  | 13,421,718  | 13,430,055  | 79      |
| Gm9880        | 3711246 | 17  | 13,547,438  | 13,569,717  | 79      |
| BC018101      | 3052731 | 17  | 17,201,077  | 17,226,592  | 80      |
| Zfp97         | 105921  | 17  | 17,258,379  | 17,283,795  | 80      |
| Vmn2r113      | 3648972 | 17  | 23,080,151  | 23,095,781  | 81      |
| Zfp40         | 99185   | 17  | 23,310,836  | 23,330,219  | 81      |
| Btbd9         | 1916625 | 17  | 30,357,046  | 30,667,310  | 82      |
| Gm9874        | 3642006 | 17  | 30,622,456  | 30,622,908  | 82      |
| Glo1          | 95742   | 17  | 30,729,806  | 30,749,539  | 82      |
| 1700097N02Rik | 1914772 | 17  | 30,759,394  | 30,762,030  | 82      |
| Dnahc8        | 107714  | 17  | 30,763,936  | 31,012,209  | 82      |

| Gene symbol   | MGI ID  | Chr | Gene start | Gene end   | CNV No. |
|---------------|---------|-----|------------|------------|---------|
| Gm9937        | 3642051 | 17  | 31,011,751 | 31,012,146 | 82      |
| Glp1r         | 99571   | 17  | 31,038,812 | 31,073,455 | 82      |
| H2-T24        | 95958   | 17  | 36,142,640 | 36,157,505 | 83      |
| H2-T23        | 95957   | 17  | 36,166,921 | 36,169,646 | 83      |
| H2-T22        | 95956   | 17  | 36,175,352 | 36,179,692 | 83      |
| H2-T9         | 95965   | 17  | 36,175,352 | 36,179,692 | 83      |
| Gm6034        | 3646212 | 17  | 36,179,906 | 36,195,590 | 83      |
| Gm11127       | 3779381 | 17  | 36,193,272 | 36,193,385 | 83      |
| H2-BI         | 892004  | 17  | 36,216,993 | 36,221,404 | 83      |
| C920025E04Rik | 2442805 | 17  | 36,246,172 | 36,248,792 | 83      |
| H2-T10        | 95942   | 17  | 36,254,035 | 36,258,389 | 83      |
| Gm10500       | 3641966 | 17  | 36,258,775 | 36,265,692 | 83      |
| Gm10499       | 3702919 | 17  | 36,278,703 | 36,282,868 | 83      |
| 2410017I17Rik | 1916967 | 17  | 36,292,064 | 36,292,354 | 83      |
| Gm8909        | 3704134 | 17  | 36,301,918 | 36,305,467 | 83      |
| H2-T3         | 95959   | 17  | 36,322,518 | 36,327,232 | 83      |
| Rpp21         | 1914926 | 17  | 36,392,618 | 36,394,788 | 83      |
| Trim39        | 1890659 | 17  | 36,395,818 | 36,408,949 | 83      |
| H2-M10.2      | 1276525 | 17  | 36,421,224 | 36,423,385 | 83      |
| H2-M10.1      | 1276522 | 17  | 36,459,803 | 36,463,100 | 83      |
| H2-M10.3      | 1276524 | 17  | 36,501,950 | 36,505,361 | 83      |
| Gm318         | 2685164 | 17  | 36,533,966 | 36,535,604 | 83      |
| H2-M10.4      | 1276527 | 17  | 36,595,862 | 36,599,279 | 83      |
| H2-M11        | 2676637 | 17  | 36,684,020 | 36,686,199 | 83      |
| H2-M9         | 1276570 | 17  | 36,777,351 | 36,779,611 | 83      |
| H2-M1         | 95913   | 17  | 36,806,953 | 36,809,164 | 83      |
| H2-M10.5      | 1276526 | 17  | 36,909,855 | 36,913,179 | 83      |
| Ehd3          | 1928900 | 17  | 74,154,181 | 74,181,433 | 84      |
| Xdh           | 98973   | 17  | 74,233,248 | 74,299,522 | 84      |
| Srd5a2        | 2150380 | 17  | 74,367,046 | 74,397,256 | 84      |
| Memo1         | 1924140 | 17  | 74,600,046 | 74,694,156 | 84      |
| Dpy30         | 1913560 | 17  | 74,698,821 | 74,715,761 | 84      |
| Spast         | 1858896 | 17  | 74,738,327 | 74,787,826 | 84      |
| Slc30a6       | 2386741 | 17  | 74,794,972 | 74,823,569 | 84      |
| Nlrc4         | 3036243 | 17  | 74,825,635 | 74,858,448 | 84      |
| Yipf4         | 1915114 | 17  | 74,888,856 | 74,899,313 | 84      |
| Birc6         | 1276108 | 17  | 74,927,635 | 75,102,403 | 84      |
| Ttc27         | 1921446 | 17  | 75,117,090 | 75,262,909 | 84      |
| Ltbp1         | 109151  | 17  | 75,404,908 | 75,791,852 | 84      |
| Rasgrp3       | 3028579 | 17  | 75,864,953 | 75,928,383 | 84      |
| Fam98a        | 1919972 | 17  | 75,936,426 | 75,951,286 | 84      |



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|---------------|---------|-----|------------|------------|---------|
| Gm10494       | 3642373 | 17  | 79,908,583 | 79,908,708 | 85      |
| Gm11097       | 3779333 | 17  | 79,926,431 | 79,927,237 | 85      |
| Fam82a1       | 2147043 | 17  | 80,014,240 | 80,081,492 | 85      |
| 4921513D11Rik | 1918173 | 17  | 80,026,017 | 80,028,021 | 85      |
| Cyp1b1        | 88590   | 17  | 80,106,293 | 80,114,381 | 85      |
| 1700038P13Rik | 1920515 | 17  | 80,112,612 | 80,115,776 | 85      |
| Gm9382        | 3644108 | 17  | 80,133,214 | 80,144,413 | 85      |
| Atl2          | 1929492 | 17  | 80,247,732 | 80,295,463 | 85      |
| HnrpII        | 1919942 | 17  | 80,429,683 | 80,461,608 | 85      |
| Galm          | 2442420 | 17  | 80,526,811 | 80,584,441 | 85      |
| Srsf7         | 1926232 | 17  | 80,600,653 | 80,606,645 | 85      |
| Ttc39d        | 1914987 | 17  | 80,606,800 | 80,617,276 | 85      |
| Gemin6        | 1914492 | 17  | 80,623,781 | 80,627,837 | 85      |
| Dhx57         | 2147067 | 17  | 80,637,652 | 80,689,816 | 85      |
| Morn2         | 2674071 | 17  | 80,689,572 | 80,696,813 | 85      |
| Arhgef33      | 2685787 | 17  | 80,746,880 | 80,769,745 | 85      |
| Gm10190       | 3642237 | 17  | 80,772,558 | 80,772,881 | 85      |
| Sos1          | 98354   | 17  | 80,793,092 | 80,879,793 | 85      |
| Cdkl4         | 3587025 | 17  | 80,923,496 | 80,963,174 | 85      |
| F420015M19Rik | 3588283 | 17  | 80,963,368 | 80,965,648 | 85      |
| Map4k3        | 2154405 | 17  | 80,979,852 | 81,127,433 | 85      |
| Dcc           | 94869   | 18  | 71,418,392 | 72,510,723 | 87      |
| Gm10533       | 3641672 | 18  | 72,502,149 | 72,502,627 | 87      |
| Gm4422        | 3782607 | 18  | 73,070,187 | 73,080,742 | 87      |
| Mex3c         | 2652843 | 18  | 73,732,698 | 73,752,229 | 87      |
| Smad4         | 894293  | 18  | 73,798,663 | 73,863,434 | 87      |
| Elac1         | 1890495 | 18  | 73,894,692 | 73,914,133 | 87      |
| Me2           | 2147351 | 18  | 73,929,694 | 73,975,046 | 87      |
| Mro           | 2152817 | 18  | 74,019,039 | 74,040,987 | 87      |
| Mapk4         | 2444559 | 18  | 74,088,140 | 74,225,013 | 87      |
| Gm9925        | 3641738 | 18  | 74,224,756 | 74,225,238 | 87      |
| Gm672         | 2685518 | 18  | 75,590,878 | 75,857,208 | 88      |
| Zbtb7c        | 2443302 | 18  | 75,979,832 | 76,308,215 | 88      |
| 1700003O11Rik | 1922882 | 18  | 76,173,865 | 76,175,331 | 88      |
| 4833419G08Rik | 1922092 | 18  | 76,218,694 | 76,220,270 | 88      |
| Smad2         | 108051  | 18  | 76,401,563 | 76,464,962 | 88      |
| Nfatc1        | 102469  | 18  | 80,802,944 | 80,909,797 | 89      |
| Atp9b         | 1354757 | 18  | 80,931,816 | 81,130,797 | 89      |
| Sall3         | 109295  | 18  | 81,163,115 | 81,183,317 | 89      |
| Gm3773        | 3781947 | 19  | 35,470,644 | 35,674,415 | 90      |
| A830019P07Rik | 3028035 | 19  | 35,910,851 | 35,999,067 | 90      |

| Gene symbol   | MGI ID  | Chr | Gene start  | Gene end    | CNV No. |
|---------------|---------|-----|-------------|-------------|---------|
| Htr7          | 99841   | 19  | 36,033,224  | 36,131,850  | 90      |
| Rpp30         | 1859683 | 19  | 36,158,221  | 36,179,262  | 90      |
| Gm14525       | 3802008 | X   | 26,099,903  | 26,129,764  | 92      |
| Gm2015        | 3780184 | X   | 26,202,257  | 26,212,991  | 92      |
| Gm6121        | 3779555 | X   | 26,339,869  | 26,362,823  | 92      |
| Dmrtc1c1      | 1918333 | X   | 99,998,302  | 100,005,281 | 94      |
| Dmrtc1c2      | 3802967 | X   | 100,042,978 | 100,049,955 | 94      |
| Mid1          | 1100537 | X   | 166,123,131 | 166,428,730 | 96      |
| G530011O06Rik | 3603513 | X   | 166,412,975 | 166,416,849 | 96      |
| Gm4064        | 3782239 | Y   | 2,041,075   | 2,052,134   | 98      |
| Rbmy1a1       | 104732  | Y   | 2,086,609   | 2,097,407   | 98      |
| Gm10256       | 3710530 | Y   | 2,118,068   | 2,129,384   | 98      |
| Gm10352       | 3708825 | Y   | 2,160,043   | 2,168,098   | 98      |
| Gm3376        | 3781554 | Y   | 2,387,258   | 2,398,856   | 98      |