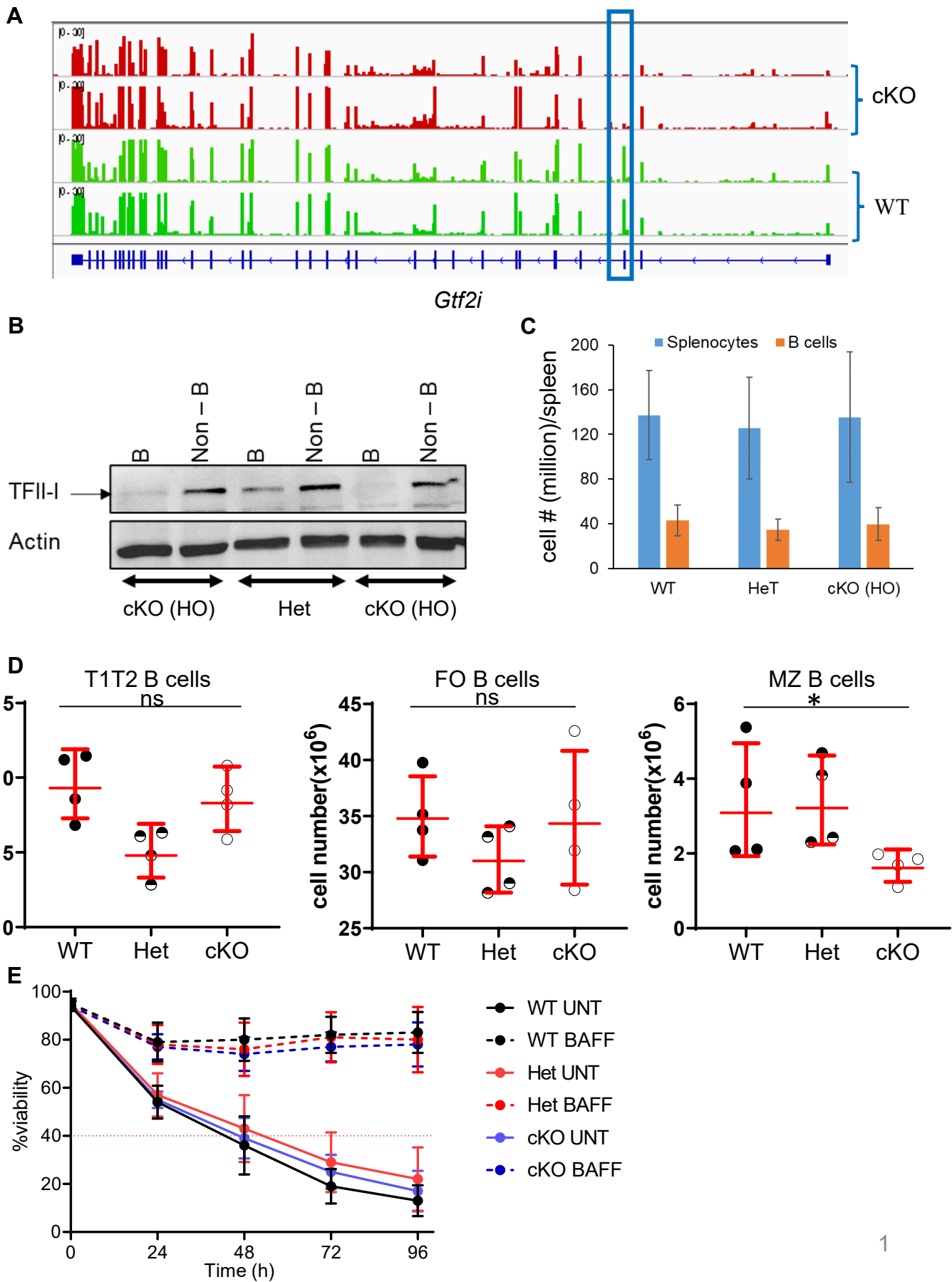


Supp. Fig1:

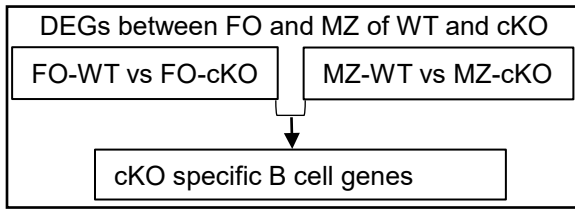


Supp. Fig1:

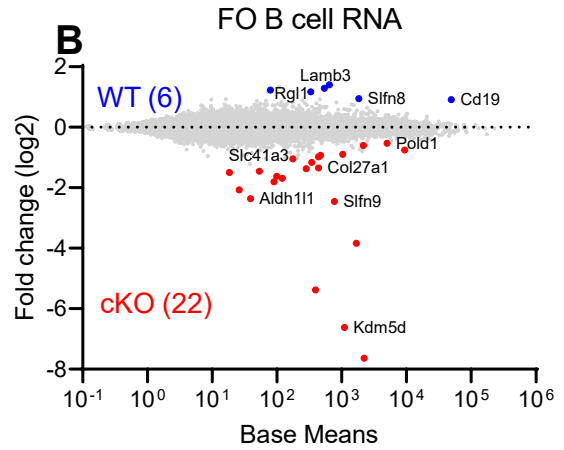
- A:** Genome Browser tracks (IGV) from the RNA-Seq analysis of *Gtf2i* gene in WT and cKO B cells. Figure shows duplicate samples of each strain. Box represent exon 3 position of the *Gtf2i* gene.
- B:** Splenic B cells were isolated from the *Gtf2i^{fl/fl}CD19-Cre⁺* cKO (HO) and *Gtf2i^{fl/+}CD19-Cre* Het mice using Easysep B cell isolation kit by negative selection and the rest of the splenocytes were used as control (Non-B cells). B and non-B cells were lysed in RIPA lysis buffer. Whole cell extracts were fractionated by SDS-PAGE and TFII-I protein expression was analyzed by immunoblotting. β -actin was used to normalize between samples.
- C - D:** Total splenocytes, splenic B cell, T1T2, FO and MZ B cell numbers from cKO (HO), Het and WT mice. Data are representative of 6 independent experiments for splenocytes and B cells and 4 independent experiments for T1T2, FO and MZ B cells..
- E:** Splenic B cells from cKO (HO), Het and WT mice were cultured ex vivo at 37 °C with or without BAFF (200ng/ml) for the indicated times. Viability was determined by propidium iodide staining and flow cytometry. Error bars represent the standard error of the mean between experiments and data are representative of three independent experiments.

Supp. Fig. 2

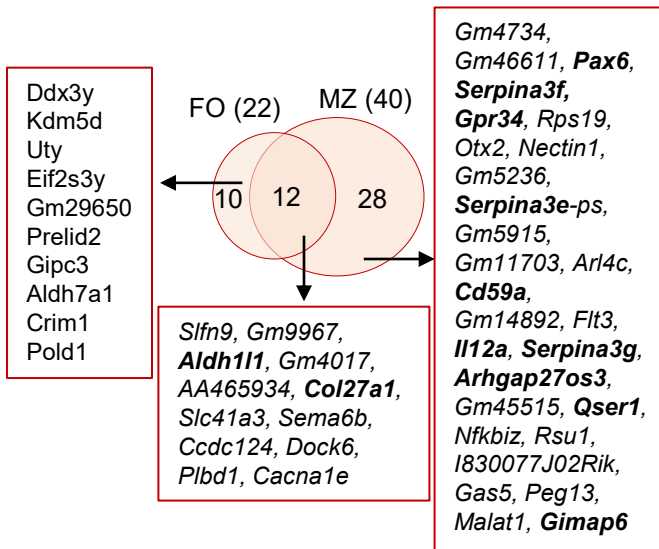
A



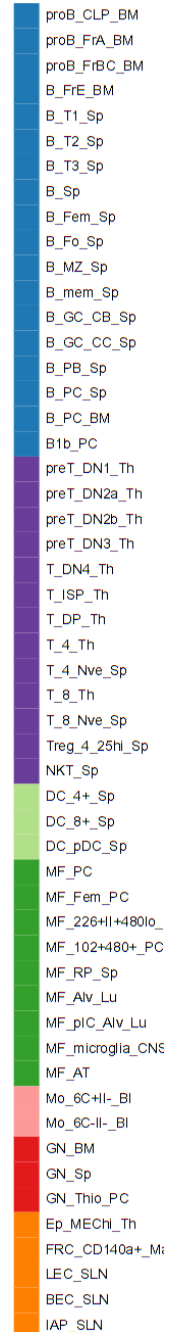
B



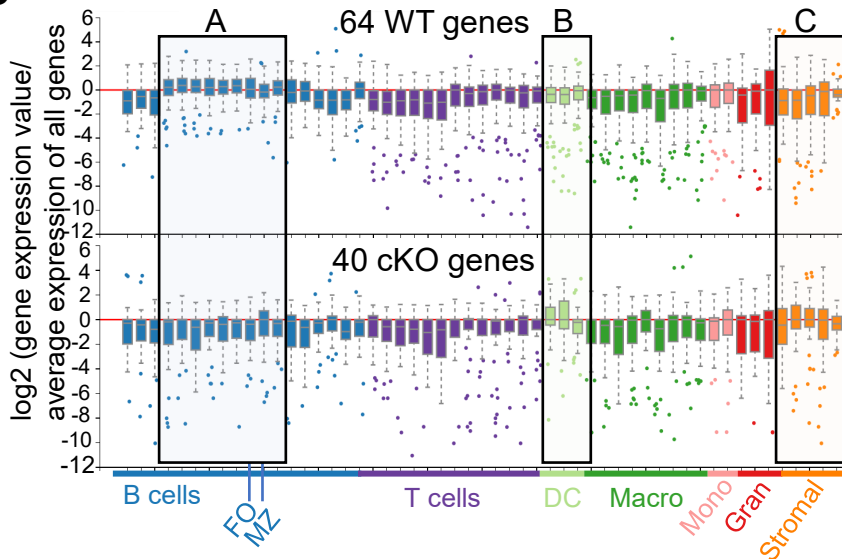
C



E



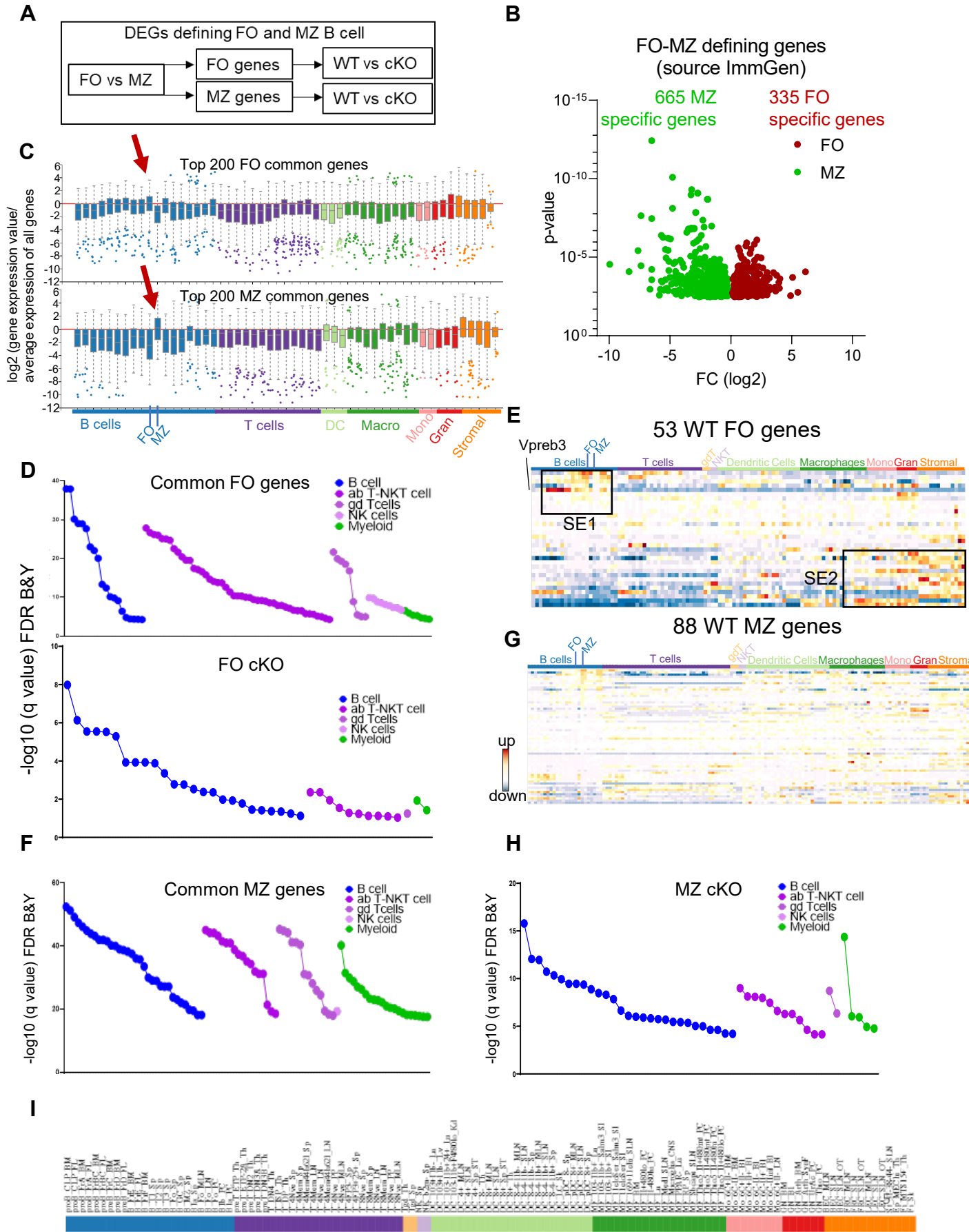
D



Supp. Fig. 2:

- A- Scheme demonstrating the comparison profile for the identification of differentially expressed genes (DEGs). FO genes in the WT were compared to the FO genes in the cKO, similarly WT MZ genes were compared to the cKO MZ genes.
- B- MA plot displaying the log fold-change compared with mean expression and showing the DEGs in FO B cells of the WT (6 genes) and of the cKO mice (22 genes).
- C- Venn diagram showing the overlapping of the 40 cKO MZ genes with the 22 cKO FO genes results in 12 genes that are *Gtf2i* cKO B cells specific. A list of the 12 *Gtf2i* cKO unique genes, the 10 cKO FO and the 28 cKO MZ unique genes are shown.
- D- Box and whiskers plot shows the WT 64 MZ genes and the cKO 40 MZ genes and their expression levels in all the immune cells using ImmGen-database. Genes that are enriched in B cell compartments are shown in box A, genes that are enriched in DC are shown in box B while the genes that are enriched in granulocytes and stromal cells are shown in box C.
- E- Scheme showing the cell populations as presented by ImmGen-Database and shown in all the heatmaps that are created from ImmGen-Database in 2B, 2C and Supp. Fig 2D.

Supp. Fig. 3:

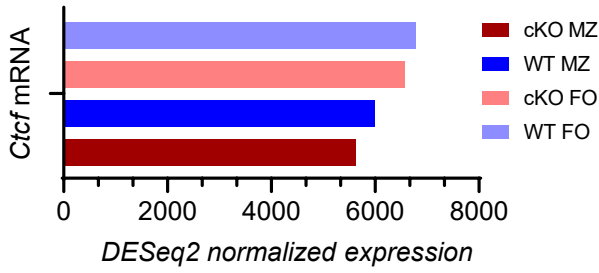


Supp. Fig. 3:

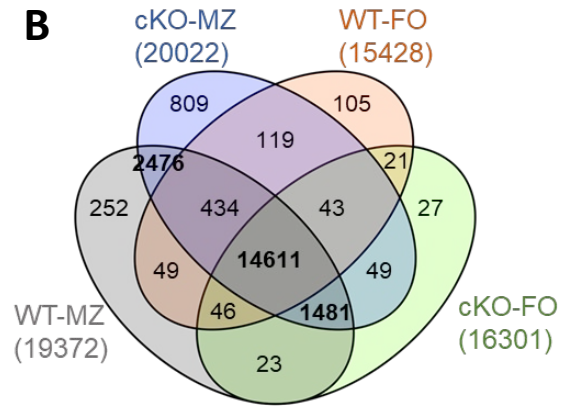
- A: Scheme demonstrating the comparison profile for the identification of differentially expressed genes (DEGs) between FO and MZ genes in the WT and cKO mice. First FO genes were compared to the MZ genes of the WT mice and similarly FO genes were compared to the MZ genes of the cKO mice. Second the WT FO genes were compared to the cKO FO genes, similarly WT MZ genes were compared to the cKO MZ genes.
- B: Volcano plot showing the FO vs MZ genes of C57BL/6 (WT) mice from the Immunological Genome Database (ImmGen-Database). Data shows 335 FO specific genes versus 665 MZ specific genes.
- C: Box and whiskers plot shows the top 200 common FO genes (common in WT and cKO) and their expression levels in all the immune cells using ImmGen-database. Genes that are enriched in B cell compartments are shown in box SD1, genes that are enriched in T cell compartments are shown in box SD2 while the genes that are enriched in monocytes, granulocytes and stromal cells are shown in box SD3.
- D, F and H: Point plots showing the significantly enriched genes in the different populations of the various immune cells that was identified in the ImmGen-database as seen in Fig. 3E – F and Fig. 4C – D. According to these significant genes the boxes were plotted in Fig. 3E – F and Fig. 4C – D.
- E: Heatmap showing the expression levels of the 53 WT specific FO genes in the different immune cells when they were input in the ImmGen-Database. Box SE1 shows the expression levels of these genes in the different subsets of B cells. Box SE2 shows their expression levels in the monocytes, granulocytes and stromal cells.
- G: Heatmap like in E but for the 88 WT MZ genes.
- I: Scheme showing the cell populations as presented by ImmGen-Database and shown in all the heatmaps that are created from ImmGen-Database (Fig. 3E - F, Fig. 4C – D and Supp Fig. 3E – 3G).

Supp. Fig. 4:

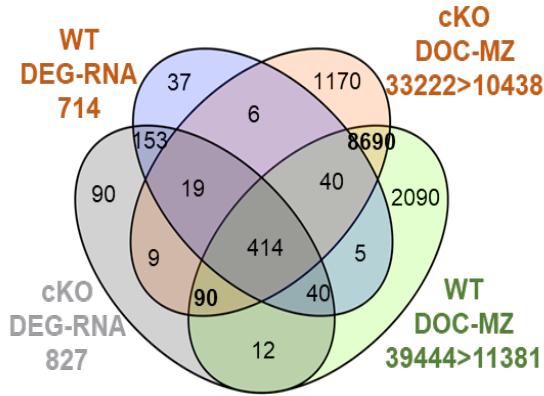
A



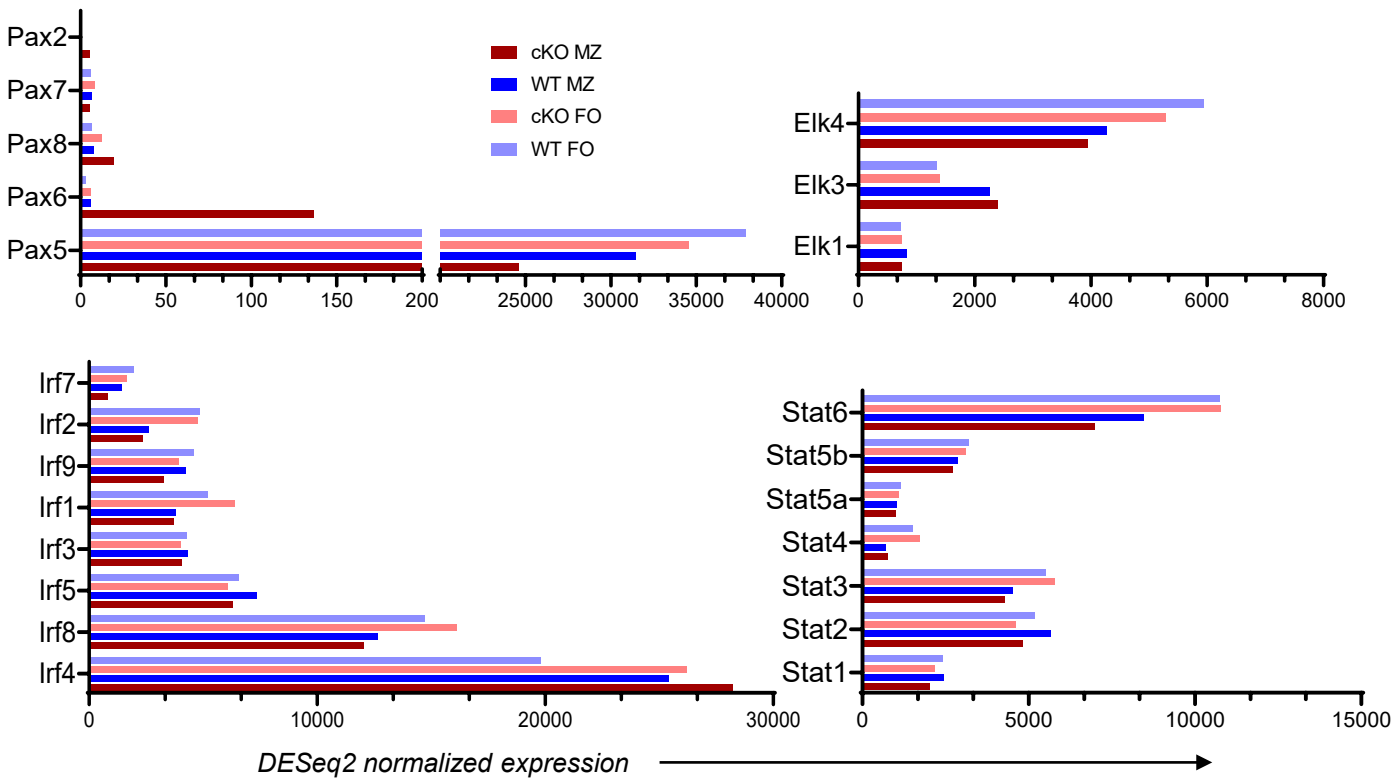
B



C



D



Supp. Fig. 4:

A: *Ctcf* mRNA expression levels of MZ and FO B cells of WT and cKO mice.

B: Open chromatin regions as in Fig.5A were annotated to its associated genes using annotated.pl algorithm in HOMER. These genes were further compared using 4-way Venn to identify shared and unique genes for indicated B cell subsets from WT and cKO B cells.

C: Differentially open chromatin of MZ B cells as in Fig. 6A were annotated to their associated genes (as in Supp Fig. 4B) for WT and cKO B cells. These annotated genes were then overlapped with the MZ DEGs that identified from the RNA-seq data and shown in Fig. 3A-B.

D: DESeq2 normalized mRNA expression levels of the different transcription factor family members.

Supp Table 1

| Gene | WT FO | cKO FO | WT MZ | cKO MZ |
|-------------|--------------|---------------|--------------|---------------|
| Ryr2 | 382.01 | 308.66 | 26.11 | 20.74 |
| Rgl1 | 840.01 | 346.27 | 92.18 | 51.68 |
| Ngfr | 304.56 | 181.56 | 28.20 | 12.13 |
| Slc4a11 | 385.75 | 337.21 | 42.33 | 23.27 |
| Cacna1i | 10115.56 | 9013.73 | 1325.77 | 736.09 |
| Lifr | 238.28 | 180.59 | 21.29 | 10.62 |
| Crisp3 | 467.41 | 425.19 | 60.14 | 32.03 |
| Gm11346 | 1004.75 | 939.90 | 134.31 | 135.64 |
| Gm11690 | 241.05 | 234.51 | 22.99 | 12.13 |
| Prss12 | 173.72 | 346.21 | 15.88 | 34.11 |
| Gm39383 | 119.40 | 60.98 | 7.45 | 5.52 |
| Rflnb | 1504.49 | 1363.37 | 262.48 | 256.42 |
| Slco5a1 | 159.74 | 107.47 | 16.56 | 11.67 |
| Crip3 | 188.94 | 160.24 | 24.49 | 26.83 |
| Gm19951 | 2265.94 | 1999.93 | 414.43 | 338.56 |
| Cdk1 | 290.00 | 253.07 | 47.99 | 36.55 |
| Gad1 | 496.18 | 280.77 | 77.98 | 28.03 |
| Mapk12 | 768.62 | 676.85 | 127.95 | 99.40 |
| Col27a1 | 402.53 | 1097.73 | 71.89 | 183.64 |
| Dmwd | 423.58 | 267.75 | 75.15 | 33.94 |
| Fry | 3008.63 | 2558.38 | 593.10 | 469.09 |
| Ndr1 | 207.07 | 253.46 | 27.10 | 19.78 |
| Dusp3 | 617.27 | 546.83 | 106.40 | 75.51 |
| Wfdc17 | 127.89 | 163.77 | 15.26 | 18.63 |
| Mapk11 | 4319.14 | 4139.79 | 910.05 | 748.53 |
| Fam102b | 617.18 | 592.88 | 121.46 | 129.71 |
| Loxhd1 | 69.04 | 41.40 | 5.12 | 2.54 |
| Hcrtr2 | 192.74 | 189.37 | 23.41 | 13.13 |
| Vim | 9654.25 | 9311.42 | 1943.21 | 1442.64 |
| Dmpk | 268.23 | 148.22 | 46.40 | 28.51 |
| Trib2 | 2570.02 | 3031.38 | 537.25 | 583.53 |
| L1cam | 652.07 | 645.44 | 136.79 | 108.97 |
| Alcam | 977.35 | 813.09 | 207.07 | 147.38 |
| Lamp3 | 179.85 | 165.78 | 31.77 | 42.17 |
| Fcgrt | 976.48 | 930.94 | 203.47 | 170.61 |
| Fcer2a | 30480.27 | 37351.30 | 4740.69 | 6476.49 |
| Cd55 | 20241.06 | 22592.55 | 4685.17 | 5972.21 |
| Lrrc23 | 69.77 | 69.27 | 7.39 | 3.56 |
| Itga6 | 936.41 | 1058.55 | 194.52 | 176.75 |
| Kcnb1 | 540.18 | 485.23 | 111.60 | 103.97 |
| Iqcn | 134.84 | 117.90 | 7.53 | 8.68 |
| Prkcg | 145.87 | 125.84 | 24.94 | 14.68 |
| Gpr146 | 935.40 | 809.83 | 209.70 | 173.90 |
| Ttbk1 | 435.81 | 744.71 | 92.42 | 133.63 |

| | | | | |
|-------------|----------|----------|---------|---------|
| Gadd45g | 908.43 | 1074.66 | 193.68 | 270.50 |
| Gm45552 | 784.76 | 673.40 | 168.45 | 140.88 |
| Sorcs2 | 185.04 | 118.01 | 29.50 | 18.65 |
| Sdc1 | 361.64 | 426.89 | 63.75 | 45.01 |
| Ccdc114 | 178.82 | 153.75 | 36.81 | 38.10 |
| Itgb7 | 7168.33 | 7242.77 | 1818.80 | 1592.37 |
| Bach2 | 9186.68 | 8906.56 | 2369.30 | 2356.71 |
| Rbpms | 228.89 | 369.06 | 50.31 | 99.18 |
| Nacad | 340.94 | 272.76 | 76.44 | 49.75 |
| Stac2 | 1221.96 | 1119.25 | 307.25 | 274.65 |
| Gm15675 | 4079.17 | 3707.58 | 994.90 | 965.87 |
| Bcl6 | 3553.62 | 3800.44 | 925.68 | 787.26 |
| Atp1b1 | 429.02 | 297.60 | 96.57 | 58.45 |
| Maf | 274.64 | 464.16 | 53.04 | 88.01 |
| Ahnak | 7515.09 | 5912.97 | 1224.37 | 472.23 |
| Ssbp2 | 270.06 | 381.56 | 59.85 | 91.13 |
| Gm34225 | 96.28 | 124.91 | 14.89 | 18.30 |
| Pgap1 | 9030.20 | 9151.93 | 2519.39 | 2309.79 |
| Emp3 | 2447.44 | 2217.07 | 652.46 | 486.36 |
| Gm8369 | 4834.54 | 5151.18 | 1308.75 | 1220.55 |
| Gmfg | 3794.03 | 4459.24 | 1056.94 | 1423.81 |
| Qrfp | 137.97 | 137.42 | 29.07 | 24.37 |
| Slc2a6 | 564.91 | 627.62 | 148.01 | 155.87 |
| Enpp1 | 1385.59 | 1226.09 | 392.38 | 336.59 |
| Myadm | 1530.87 | 1164.66 | 202.76 | 94.33 |
| Gm37352 | 377.77 | 341.52 | 91.15 | 60.10 |
| Cd55os | 1530.67 | 1306.68 | 403.45 | 357.91 |
| Scimp | 438.61 | 393.64 | 112.62 | 91.44 |
| Crybg3 | 1307.38 | 1234.90 | 362.17 | 313.77 |
| Tmprss13 | 60.13 | 61.32 | 8.78 | 3.06 |
| Zfp318 | 16463.98 | 15951.14 | 5009.44 | 4303.39 |
| Ldlrad4 | 88.58 | 113.41 | 19.08 | 22.27 |
| Dll1 | 157.05 | 199.35 | 37.77 | 32.07 |
| Rnf144a | 4265.08 | 3896.73 | 1301.11 | 979.23 |
| Mex3b | 229.34 | 209.42 | 62.26 | 56.32 |
| Tctn1 | 1602.98 | 1487.08 | 506.12 | 431.26 |
| Kcnj1 | 65.44 | 73.12 | 6.88 | 8.08 |
| Lef1 | 106.14 | 120.46 | 15.99 | 12.13 |
| Csrp2 | 263.09 | 238.86 | 63.95 | 41.36 |
| Mturn | 424.20 | 357.14 | 129.99 | 132.22 |
| Gm8251 | 155.11 | 99.61 | 30.77 | 18.18 |
| Gm43196 | 192.12 | 194.87 | 54.53 | 61.25 |
| B3gnt5 | 11640.16 | 12188.82 | 3823.36 | 3806.76 |
| 4632428C04F | 192.27 | 172.37 | 44.87 | 37.27 |
| Gm16214 | 173.44 | 157.72 | 48.93 | 42.07 |
| Cdc25b | 3949.16 | 4005.77 | 1266.81 | 1171.79 |
| Rassf3 | 4198.63 | 4447.44 | 1377.03 | 1323.84 |

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|-------------|----------|----------|----------|----------|
| Ldlr | 1235.35 | 1128.55 | 358.82 | 306.09 |
| Cdkn2d | 928.71 | 868.49 | 276.31 | 247.34 |
| Vmn2r97 | 396.61 | 330.29 | 120.08 | 86.66 |
| Arhgef18 | 12799.17 | 12138.40 | 4226.16 | 3849.49 |
| Cd200 | 1501.94 | 1824.45 | 480.64 | 476.65 |
| Gm43769 | 48.26 | 73.86 | 7.87 | 14.78 |
| Cdkn1a | 85.54 | 73.69 | 16.73 | 14.13 |
| Pygm | 225.26 | 177.93 | 68.55 | 61.92 |
| Lfng | 1877.89 | 2027.88 | 631.96 | 638.76 |
| Cpm | 2923.84 | 2742.41 | 971.87 | 823.46 |
| Trim59 | 2273.05 | 2392.27 | 725.48 | 865.84 |
| Arhgef3 | 7978.86 | 8223.56 | 2685.47 | 2830.30 |
| Tent5a | 1418.33 | 1033.94 | 474.54 | 316.10 |
| Igf1r | 98.85 | 171.33 | 25.90 | 27.38 |
| Tle1 | 473.12 | 508.01 | 151.01 | 131.33 |
| B3gnt7 | 607.96 | 701.21 | 174.69 | 131.28 |
| Gm23037 | 65.51 | 70.83 | 14.53 | 13.71 |
| Bach2os | 126.93 | 144.82 | 32.47 | 29.85 |
| Smad1 | 233.65 | 124.90 | 68.66 | 43.98 |
| Tagap | 2551.37 | 2765.03 | 885.71 | 941.67 |
| Ighv1-5 | 197.21 | 267.37 | 56.99 | 90.53 |
| Cmah | 10453.48 | 8161.25 | 3495.26 | 2827.21 |
| Rgcc | 163.47 | 201.44 | 25.66 | 22.91 |
| Adap1 | 673.14 | 759.20 | 234.37 | 246.06 |
| Il4ra | 12800.42 | 9503.37 | 4678.31 | 3343.54 |
| Bmf | 2061.03 | 1561.88 | 748.24 | 450.63 |
| Neur13 | 9284.40 | 9114.96 | 3358.23 | 3437.41 |
| Gm5511 | 118.98 | 123.87 | 32.95 | 44.32 |
| Rhebl1 | 523.10 | 513.23 | 183.28 | 232.70 |
| Trim46 | 73.25 | 38.66 | 15.17 | 6.56 |
| Stard8 | 76.56 | 123.65 | 17.21 | 40.32 |
| Orai2 | 2617.79 | 2358.41 | 962.01 | 920.95 |
| Sell | 30972.08 | 29597.09 | 11266.44 | 13080.35 |
| S100a10 | 3308.44 | 3584.51 | 1172.27 | 1054.89 |
| Diras2 | 172.35 | 205.85 | 55.12 | 53.77 |
| Fchsd2 | 13047.43 | 13740.93 | 4946.70 | 5053.01 |
| Tnik | 568.34 | 707.28 | 203.51 | 240.32 |
| Sele | 61.84 | 59.25 | 11.55 | 7.54 |
| Kctd14 | 468.29 | 289.32 | 69.63 | 28.82 |
| Spns2 | 2178.00 | 1866.28 | 793.72 | 561.73 |
| Pde4c | 121.68 | 105.03 | 33.69 | 22.80 |
| Scn8a | 85.65 | 82.36 | 20.78 | 13.80 |
| 1700001K23F | 99.23 | 94.62 | 25.37 | 25.28 |
| Aida | 2342.06 | 2201.24 | 886.41 | 831.61 |
| Itih5 | 452.24 | 321.00 | 152.61 | 109.06 |
| Sfxn3 | 1347.92 | 1274.14 | 501.72 | 509.15 |
| Serinc5 | 1442.83 | 1181.38 | 513.71 | 316.62 |

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|-------------|----------|----------|----------|----------|
| Pde2a | 29.86 | 61.11 | 3.28 | 5.02 |
| Sbk1 | 12795.27 | 11593.17 | 4975.36 | 3397.69 |
| 4932442E05F | 206.84 | 222.80 | 67.86 | 66.99 |
| Ccr7 | 15259.10 | 15424.40 | 4507.61 | 3558.71 |
| Gm26532 | 552.67 | 523.59 | 89.61 | 64.93 |
| Gm36931 | 80.55 | 90.71 | 19.17 | 17.77 |
| Cbx7 | 11932.12 | 11416.15 | 4692.87 | 4693.15 |
| Zfp608 | 4103.13 | 4348.79 | 1577.44 | 1387.29 |
| Lmo2 | 7104.82 | 6372.44 | 2747.05 | 2832.89 |
| Nectin1 | 115.48 | 268.49 | 35.51 | 114.57 |
| Hvcn1 | 9139.81 | 8864.88 | 3548.76 | 2684.06 |
| Selp | 36.13 | 58.52 | 6.94 | 15.21 |
| Sgpp2 | 146.72 | 126.47 | 46.58 | 33.82 |
| Gimap3 | 10173.31 | 9331.27 | 4035.91 | 3955.27 |
| Gm8995 | 18953.59 | 17197.63 | 7505.14 | 7116.62 |
| S1pr4 | 3037.43 | 2668.09 | 1103.95 | 822.93 |
| Ifnlr1 | 122.89 | 156.04 | 40.80 | 29.39 |
| 4930511E03F | 43.94 | 21.99 | 5.94 | 0.52 |
| Sorl1 | 22706.14 | 21079.89 | 9299.09 | 7777.04 |
| Trim16 | 27.10 | 30.04 | 2.77 | 5.04 |
| Cpne5 | 116.17 | 104.07 | 33.72 | 18.65 |
| Ank | 416.05 | 461.12 | 162.44 | 192.97 |
| Gm19261 | 134.43 | 109.50 | 42.21 | 33.84 |
| Pgpep1l | 54.88 | 71.07 | 11.49 | 12.65 |
| Gm48038 | 52.17 | 40.51 | 11.58 | 10.65 |
| Dyrk2 | 2409.17 | 2324.78 | 974.27 | 953.95 |
| Slc4a3 | 57.99 | 39.50 | 13.45 | 6.12 |
| Adamts6 | 1758.92 | 1425.40 | 700.58 | 636.33 |
| Gm35065 | 20.13 | 30.11 | 0.00 | 1.51 |
| Rasa3 | 14193.39 | 13790.57 | 5803.38 | 5125.13 |
| Cisd3 | 379.73 | 375.19 | 145.50 | 150.20 |
| Gm19585 | 349.45 | 300.33 | 136.33 | 120.57 |
| Gm15880 | 104.33 | 120.96 | 32.37 | 36.71 |
| Maml3 | 431.45 | 526.83 | 168.13 | 195.76 |
| Ccdc180 | 83.25 | 124.65 | 26.98 | 44.63 |
| Fam107b | 16520.55 | 16431.24 | 5532.99 | 4934.32 |
| Sfn | 944.40 | 1084.12 | 378.96 | 408.13 |
| Abca1 | 6645.63 | 6769.47 | 2727.43 | 2387.11 |
| Extl1 | 272.10 | 244.19 | 103.74 | 94.67 |
| Cd93 | 530.55 | 579.98 | 175.02 | 128.94 |
| Abca6 | 50.35 | 61.44 | 13.05 | 18.18 |
| Ighd | 57427.08 | 63616.26 | 16195.54 | 18339.50 |
| Capn5 | 886.66 | 743.61 | 354.61 | 323.30 |
| Zc3hav1l | 225.98 | 264.27 | 85.54 | 59.44 |
| Itgb3 | 1242.46 | 1137.99 | 505.89 | 498.13 |
| Bbs9 | 728.14 | 864.80 | 302.48 | 393.83 |
| Gm15987 | 1193.93 | 1208.25 | 491.85 | 495.17 |

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|-------------|----------|----------|----------|----------|
| H3f3a | 2553.24 | 2423.31 | 1077.67 | 990.33 |
| Antxr2 | 740.94 | 702.19 | 302.72 | 260.42 |
| Satb1 | 7112.76 | 7298.97 | 2855.16 | 2336.45 |
| Cc2d2b | 86.09 | 98.74 | 25.57 | 31.26 |
| Cldn10 | 101.27 | 86.56 | 31.85 | 32.27 |
| Slc26a10 | 465.01 | 522.24 | 190.47 | 204.23 |
| Amn | 73.07 | 65.41 | 20.73 | 16.14 |
| Tgfb3 | 161.89 | 139.89 | 56.98 | 43.29 |
| Lmna | 163.52 | 165.87 | 39.50 | 39.01 |
| Ddah2 | 119.86 | 115.48 | 43.09 | 42.98 |
| Dnah8 | 791.94 | 554.12 | 191.98 | 95.31 |
| Mybpc2 | 334.82 | 324.38 | 134.17 | 101.46 |
| Sh3bp5 | 9024.40 | 8759.53 | 3936.97 | 3460.45 |
| 2810405F17F | 55.57 | 58.42 | 13.90 | 15.69 |
| Tcp11l2 | 4973.60 | 4577.67 | 2176.46 | 1865.99 |
| Trib3 | 53.53 | 58.19 | 13.68 | 13.20 |
| Il6ra | 1365.01 | 1710.33 | 572.86 | 546.10 |
| Gm16589 | 173.71 | 148.60 | 67.81 | 62.31 |
| Lbh | 14264.22 | 12824.69 | 6289.63 | 5299.52 |
| Add1 | 10321.79 | 10171.45 | 4560.59 | 4258.46 |
| Xylt1 | 3613.00 | 3349.66 | 1583.81 | 1273.53 |
| F2rl1 | 30.03 | 52.14 | 3.68 | 9.23 |
| Tnnt3 | 156.23 | 143.16 | 59.43 | 47.60 |
| Tuba1a | 497.35 | 540.53 | 202.81 | 195.38 |
| Slc52a3 | 78.66 | 59.04 | 25.80 | 14.69 |
| H1f2 | 1208.65 | 1701.01 | 521.19 | 608.99 |
| Fli1 | 4792.99 | 4265.21 | 2100.33 | 1722.23 |
| Akap12 | 1096.65 | 811.12 | 435.60 | 303.56 |
| Nab2 | 1088.96 | 814.34 | 473.29 | 252.98 |
| Ripor2 | 15052.86 | 13704.05 | 6651.48 | 5225.49 |
| Arhgap31 | 237.80 | 233.05 | 75.15 | 53.69 |
| Slc15a3 | 480.79 | 370.59 | 192.71 | 130.28 |
| Nsmce1 | 1338.66 | 1254.71 | 572.71 | 510.52 |
| Stum | 50.38 | 79.23 | 15.37 | 12.15 |
| Flna | 31897.05 | 28359.81 | 14432.30 | 11688.91 |
| Scml4 | 2952.80 | 2757.85 | 1306.91 | 1319.98 |
| Igsf9 | 293.70 | 351.05 | 115.28 | 101.38 |
| Ssh2 | 11598.44 | 11676.21 | 5060.13 | 4681.70 |
| Samhd1 | 19752.04 | 19496.53 | 8887.15 | 8556.76 |
| Vsir | 702.01 | 634.33 | 289.83 | 233.99 |
| Gm6421 | 2151.83 | 2005.62 | 973.91 | 855.15 |
| Eps8 | 286.80 | 306.47 | 116.13 | 98.49 |
| Gm47782 | 20.76 | 33.18 | 1.87 | 2.51 |
| Galc | 88.79 | 90.58 | 31.45 | 12.73 |
| Baiap2 | 580.89 | 582.09 | 256.38 | 157.19 |
| Prr7 | 369.42 | 364.37 | 152.51 | 154.70 |
| Otud1 | 2058.83 | 1969.37 | 925.77 | 849.24 |

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|-------------|----------|----------|---------|----------|
| Dipk1a | 1840.54 | 1909.31 | 840.97 | 732.90 |
| Zfp53 | 1419.54 | 1727.64 | 621.90 | 733.36 |
| Pdp1 | 462.78 | 487.88 | 199.66 | 204.37 |
| Il24 | 61.43 | 98.81 | 21.91 | 27.84 |
| Marveld2 | 811.13 | 812.47 | 365.15 | 350.24 |
| Serp2 | 48.45 | 62.65 | 13.42 | 9.59 |
| E430014B02F | 214.22 | 192.68 | 69.66 | 57.28 |
| Ehd4 | 2004.89 | 1856.53 | 900.80 | 766.05 |
| Add3 | 13119.63 | 10806.01 | 5829.38 | 4493.98 |
| Klf3 | 5709.44 | 5050.24 | 2653.50 | 2129.19 |
| Dgka | 10159.94 | 9721.23 | 4760.68 | 4572.02 |
| Tmem64 | 2776.86 | 2436.13 | 1286.48 | 970.43 |
| Tub | 47.21 | 45.60 | 14.38 | 7.65 |
| Rhoh | 4727.60 | 4908.45 | 2215.80 | 2246.12 |
| Kif21b | 21167.74 | 18876.36 | 9978.82 | 8196.54 |
| Fam221a | 71.72 | 97.80 | 26.44 | 21.26 |
| Tnfrsf12a | 206.77 | 216.94 | 84.50 | 67.59 |
| Lilra6 | 239.31 | 158.71 | 95.57 | 51.64 |
| Btnl2 | 625.75 | 649.41 | 290.56 | 295.67 |
| Retreg1 | 4461.72 | 4374.48 | 2112.89 | 2037.41 |
| Clcf1 | 5467.09 | 4659.27 | 2577.11 | 2012.42 |
| Trem12 | 7706.86 | 7176.45 | 3672.88 | 3486.40 |
| Fsip1 | 52.54 | 62.99 | 16.34 | 12.22 |
| Fam160a1 | 60.16 | 81.13 | 21.38 | 25.31 |
| Gm11342 | 56.68 | 43.52 | 16.08 | 8.08 |
| Fkbp11 | 93.11 | 89.41 | 34.65 | 17.67 |
| Gm9706 | 58.49 | 64.35 | 16.91 | 17.12 |
| Pgm2l1 | 980.48 | 857.64 | 452.92 | 357.98 |
| Ptk6 | 42.17 | 42.80 | 12.23 | 10.12 |
| Grap2 | 8423.23 | 7495.13 | 3903.66 | 3082.18 |
| Gucd1 | 3695.05 | 3420.15 | 1770.65 | 1405.04 |
| Apbb1 | 75.14 | 88.50 | 27.04 | 33.63 |
| Rasl10a | 31.24 | 29.04 | 7.45 | 1.55 |
| Cerk | 9869.19 | 9519.30 | 4772.85 | 4067.63 |
| Stat4 | 1527.20 | 1744.75 | 700.60 | 780.77 |
| Cgas | 75.99 | 53.61 | 25.06 | 15.16 |
| St6gal1 | 8622.24 | 8915.17 | 4045.53 | 3708.63 |
| Btla | 19098.77 | 23680.38 | 8868.69 | 10787.20 |
| Rph3al | 301.18 | 285.03 | 137.61 | 121.95 |
| Rfx2 | 121.42 | 159.91 | 48.24 | 37.31 |
| Lmbrd1 | 5613.78 | 5518.59 | 2723.56 | 2374.01 |
| Gm47232 | 74.29 | 75.32 | 26.75 | 21.79 |
| Begain | 165.90 | 160.58 | 74.30 | 68.41 |

| Supp Table 2 | | | | |
|---------------------|--------------|---------------|--------------|---------------|
| Gene | WT FO | cKO FO | WT MZ | cKO MZ |
| Zfp36l2 | 16631.20 | 11978.28 | 8539.57 | 3427.26 |
| Gm28935 | 30.81 | 48.12 | 9.85 | 5.10 |
| Gm36955 | 55.29 | 73.24 | 21.91 | 12.73 |
| Dipk2a | 262.13 | 249.76 | 136.86 | 70.49 |
| Eya1 | 196.79 | 125.90 | 97.40 | 31.17 |
| Klf10 | 456.02 | 527.72 | 223.88 | 173.76 |
| Gfi1 | 354.93 | 460.66 | 197.89 | 154.53 |
| Ighv14-4 | 195.35 | 213.00 | 95.09 | 65.18 |
| Rtl5 | 70.01 | 74.36 | 29.81 | 20.69 |
| Igkv8-21 | 355.55 | 287.54 | 176.66 | 107.05 |
| Vat1 | 478.15 | 493.71 | 235.43 | 188.01 |
| Dusp10 | 580.78 | 509.23 | 328.44 | 172.49 |
| Calcr1 | 451.19 | 437.02 | 241.28 | 161.06 |
| Thbd | 43.67 | 55.84 | 25.14 | 14.18 |
| Arc | 72.26 | 83.04 | 36.38 | 24.88 |
| 9030404E10Rik | 67.12 | 58.85 | 22.56 | 11.07 |
| Cd209a | 31.43 | 32.06 | 8.72 | 1.99 |
| Cacna1d | 333.31 | 275.55 | 170.65 | 104.71 |
| Gabrb1 | 19.23 | 42.98 | 9.46 | 6.12 |
| Slc26a11 | 1076.18 | 1173.84 | 527.20 | 479.30 |
| Ii21r | 8104.14 | 6061.95 | 4006.79 | 2557.93 |
| Hlx | 73.83 | 90.77 | 37.89 | 28.34 |
| Plpp2 | 128.31 | 116.94 | 68.49 | 40.23 |
| Dusp4 | 1346.33 | 2116.74 | 364.24 | 412.42 |
| Spred2 | 199.39 | 189.62 | 86.09 | 63.98 |
| Ighv8-6 | 17.38 | 33.62 | 5.58 | 4.61 |
| Orm2 | 70.94 | 75.66 | 27.49 | 18.22 |
| Pold1 | 5565.73 | 8136.02 | 2812.52 | 3480.47 |
| Trim25 | 11110.55 | 9058.02 | 5359.01 | 3705.25 |
| Rnf125 | 86.38 | 85.81 | 20.51 | 5.57 |
| Gm49105 | 598.65 | 599.97 | 294.73 | 248.00 |
| Lpp | 2315.21 | 1914.09 | 1107.71 | 793.18 |
| Gm50107 | 117.74 | 127.25 | 59.97 | 44.51 |
| Igkv4-61 | 48.73 | 58.92 | 38.08 | 17.70 |
| Shisa8 | 167.09 | 199.09 | 93.96 | 64.02 |
| Rap1b | 12257.71 | 12415.47 | 5906.56 | 5272.09 |
| Rasa4 | 710.64 | 933.86 | 349.39 | 401.89 |
| Kcnh4 | 89.04 | 89.13 | 37.29 | 25.09 |
| Acsl3 | 591.95 | 617.32 | 294.65 | 263.11 |
| Papln | 24.60 | 36.48 | 12.74 | 5.62 |
| Trip10 | 285.28 | 259.00 | 134.16 | 106.10 |
| Gm48591 | 25.69 | 36.21 | 6.48 | 4.09 |

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|---------------|----------|----------|---------|---------|
| B4galnt2 | 53.85 | 50.14 | 19.03 | 13.63 |
| Tagln2 | 3174.17 | 3300.99 | 1563.42 | 1386.46 |
| Afap1 | 210.34 | 259.05 | 114.15 | 104.57 |
| Ckap4 | 946.25 | 852.45 | 467.13 | 364.96 |
| A3galt2 | 81.74 | 81.86 | 33.49 | 27.86 |
| Aff3 | 5203.11 | 5051.79 | 2733.25 | 2216.78 |
| Cd2 | 5854.94 | 5614.87 | 3251.40 | 2493.45 |
| Rps6ka5 | 1722.17 | 1892.57 | 917.18 | 838.04 |
| Brpf3 | 2603.32 | 2599.54 | 1279.85 | 1152.22 |
| Ms4a4c | 4730.68 | 4927.82 | 2079.12 | 1672.50 |
| BC049352 | 302.42 | 310.29 | 148.30 | 112.63 |
| Gm20559 | 4848.04 | 4536.93 | 2387.95 | 2009.14 |
| Gpd1l | 6990.70 | 7611.97 | 3482.68 | 3440.69 |
| Gfod1 | 539.39 | 413.34 | 165.82 | 63.09 |
| Gna15 | 406.48 | 490.42 | 214.76 | 212.93 |
| Fxyd5 | 1887.35 | 2004.69 | 935.22 | 903.99 |
| Cd83 | 11691.11 | 13676.48 | 6360.98 | 4985.05 |
| Tbx6 | 384.80 | 327.44 | 182.20 | 141.18 |
| Mtss1 | 6334.50 | 5628.23 | 3526.00 | 2582.06 |
| Pisd-ps1 | 1768.54 | 1533.28 | 1075.34 | 694.56 |
| Hspa4l | 838.67 | 892.71 | 395.88 | 248.72 |
| Mef2c | 15906.81 | 14224.79 | 8123.50 | 6559.91 |
| Gm35019 | 2.47 | 30.12 | 0.93 | 0.50 |
| Mfsd6 | 317.02 | 380.75 | 179.09 | 169.50 |
| Nav2 | 39.53 | 69.27 | 24.78 | 24.33 |
| Tspan18 | 13.33 | 30.16 | 4.67 | 4.55 |
| Rictor | 4537.48 | 4355.04 | 2354.05 | 2000.15 |
| Ier5l | 126.70 | 132.55 | 57.25 | 51.44 |
| Ms4a4a | 75.11 | 78.44 | 28.89 | 25.28 |
| Ccm2 | 5983.75 | 5235.64 | 3086.45 | 2440.59 |
| Chrna2 | 209.93 | 245.91 | 92.12 | 99.14 |
| Cyp2d22 | 250.69 | 274.60 | 119.29 | 120.80 |
| Tec | 4446.37 | 4395.25 | 2436.90 | 2006.21 |
| Lrrc8a | 284.95 | 328.56 | 139.30 | 146.80 |
| Cdkl5 | 156.90 | 142.69 | 90.03 | 58.36 |
| Fer1l5 | 193.52 | 255.48 | 125.93 | 94.38 |
| Prr18 | 24.08 | 32.84 | 5.55 | 7.11 |
| Cecr2 | 1019.59 | 826.47 | 531.84 | 347.00 |
| Rab6b | 238.36 | 275.65 | 116.71 | 121.04 |
| Gm7707 | 13.36 | 24.68 | 18.37 | 1.01 |
| Plekho1 | 5253.39 | 5261.01 | 2793.89 | 2493.16 |
| Chst15 | 3582.53 | 3609.57 | 1989.28 | 1700.80 |
| A430088P11Rik | 39.25 | 61.48 | 16.22 | 20.23 |
| Tnks1bp1 | 1280.63 | 1225.27 | 721.26 | 572.03 |

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|----------|----------|----------|---------|---------|
| Fgd3 | 6465.39 | 6115.49 | 3474.99 | 2872.35 |
| Ndnf | 30.62 | 34.29 | 9.34 | 8.13 |
| Gm37176 | 130.20 | 113.66 | 56.91 | 44.53 |
| Atp6v0a1 | 3228.93 | 3367.74 | 1757.62 | 1524.73 |
| Gm20627 | 17.59 | 30.83 | 5.58 | 6.53 |
| Tmem65 | 305.12 | 328.50 | 169.68 | 149.92 |
| Klra1 | 31.93 | 28.03 | 7.36 | 5.04 |
| Lsp1 | 18122.40 | 17906.91 | 9879.47 | 8669.80 |
| Gm30948 | 15.86 | 23.39 | 0.45 | 1.50 |
| Gm37593 | 94.52 | 91.27 | 38.56 | 35.49 |
| Rgs13 | 64.79 | 74.40 | 24.23 | 18.35 |
| Ighv1-36 | 42.20 | 71.72 | 28.74 | 24.20 |
| Cnn3 | 3528.57 | 3435.14 | 1754.89 | 1651.51 |
| Kif19a | 206.10 | 171.93 | 103.15 | 76.96 |
| Reck | 26.14 | 34.69 | 8.86 | 6.15 |
| Rara | 2533.56 | 2599.46 | 1277.52 | 1256.60 |
| Dennd5b | 4248.45 | 3444.06 | 2093.19 | 1634.71 |
| Cplx2 | 68.80 | 91.80 | 44.02 | 33.55 |
| Lasp1 | 2955.84 | 2805.01 | 1581.89 | 1378.37 |

Supp Table 3

| Gene | WT FO | cKO FO | WT MZ | cKO MZ |
|---------------|--------------|---------------|--------------|---------------|
| I830077J02Rik | 56.87 | 44.20 | 3562.91 | 5070.75 |
| Asb2 | 47.84 | 33.45 | 2503.44 | 2433.18 |
| Gpr156 | 10.18 | 2.18 | 772.65 | 781.21 |
| Ackr3 | 43.72 | 42.92 | 2501.07 | 3113.03 |
| Adam28 | 9.79 | 5.20 | 668.52 | 652.74 |
| Tsga13 | 11.72 | 7.94 | 794.39 | 869.39 |
| S1pr3 | 241.93 | 198.18 | 7570.85 | 8085.39 |
| Neb1 | 93.26 | 111.17 | 2850.30 | 3608.07 |
| Plxnd1 | 235.96 | 233.44 | 6288.00 | 7490.84 |
| Rgs10 | 55.42 | 47.89 | 1515.88 | 1277.12 |
| Tbc1d9 | 89.31 | 150.56 | 2358.74 | 3373.35 |
| Rxfp1 | 11.72 | 9.06 | 481.11 | 393.37 |
| Pla2g7 | 26.13 | 25.51 | 830.30 | 801.95 |
| Ceacam2 | 14.10 | 13.66 | 590.13 | 640.31 |
| Rap1gap | 87.64 | 72.57 | 2224.96 | 1517.64 |
| Ackr2 | 53.59 | 52.82 | 1678.37 | 2102.60 |
| Ffar2 | 53.42 | 55.04 | 1374.25 | 1656.27 |
| Gm2065 | 8.77 | 7.05 | 350.09 | 312.03 |
| Rec8 | 18.11 | 35.93 | 610.50 | 629.55 |
| Trpm2 | 54.44 | 59.37 | 1337.95 | 1674.55 |
| Nrp2 | 31.32 | 29.77 | 835.11 | 1080.36 |
| Myof | 613.99 | 579.07 | 11868.65 | 9884.74 |
| Zfp532 | 2.92 | 5.49 | 271.65 | 313.01 |
| Tmod2 | 5.26 | 3.25 | 262.34 | 188.38 |
| Serpine2 | 9.82 | 10.91 | 407.98 | 372.59 |
| Cd9 | 92.97 | 79.56 | 1582.65 | 1452.13 |
| Srgap3 | 30.43 | 12.53 | 711.95 | 406.48 |
| Zc3h12c | 277.18 | 295.04 | 4118.69 | 3548.02 |
| Grip2 | 7.75 | 11.42 | 314.33 | 309.40 |
| Ms4a14 | 3.83 | 7.00 | 209.19 | 136.30 |
| Sema7a | 506.98 | 440.76 | 7191.19 | 4766.05 |
| Sorbs2 | 19.49 | 18.24 | 456.55 | 392.54 |
| Il10 | 11.72 | 15.50 | 282.12 | 265.34 |
| AW011738 | 159.08 | 124.84 | 2149.72 | 2184.74 |
| Ube2e2 | 0.97 | 1.12 | 135.92 | 200.21 |
| Gm4956 | 6.32 | 6.94 | 182.40 | 148.22 |
| Lipc | 30.53 | 16.06 | 543.74 | 361.78 |
| Ms4a7 | 8.32 | 10.52 | 263.63 | 237.28 |
| Myo18b | 1.93 | 1.12 | 139.09 | 162.07 |
| Ldlrad3 | 78.67 | 82.08 | 1076.94 | 909.77 |
| Fcrl5 | 516.84 | 463.80 | 6390.63 | 6834.72 |
| Cd300lf | 132.38 | 116.09 | 1762.66 | 1726.80 |

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|---------------|---------|---------|----------|----------|
| Grk3 | 180.44 | 201.08 | 2070.98 | 2077.80 |
| Atxn1 | 212.61 | 219.89 | 2352.96 | 2181.03 |
| Lair1 | 46.19 | 43.92 | 530.38 | 728.27 |
| Cdh17 | 209.35 | 201.76 | 2105.17 | 2347.27 |
| Tlr3 | 131.59 | 117.16 | 1294.18 | 1072.16 |
| Smyd2 | 13.17 | 23.28 | 214.97 | 296.62 |
| Rundc3b | 24.55 | 13.32 | 374.43 | 343.98 |
| Cdc42bpb | 140.82 | 192.82 | 1434.17 | 1560.33 |
| Alpl | 59.23 | 56.12 | 737.68 | 721.79 |
| Ptpn14 | 533.26 | 327.41 | 4907.51 | 4095.29 |
| Csf2rb | 321.22 | 279.89 | 3036.63 | 2601.74 |
| Pde4a | 348.69 | 338.19 | 3011.62 | 1962.51 |
| Cd36 | 749.78 | 635.11 | 5785.48 | 4965.26 |
| Dse | 40.01 | 27.87 | 377.65 | 197.82 |
| Mfhas1 | 664.40 | 481.31 | 4845.20 | 3412.53 |
| 1700071M16Rik | 1.00 | 2.18 | 72.34 | 61.52 |
| Stc1 | 1.00 | 2.18 | 65.15 | 108.16 |
| Gm43916 | 5.33 | 7.22 | 177.02 | 132.38 |
| Gm16793 | 2.47 | 2.13 | 87.06 | 66.90 |
| Tspan15 | 25.60 | 11.92 | 1939.25 | 1589.32 |
| 9630028I04Rik | 41.27 | 45.93 | 374.13 | 425.90 |
| Tnfrsf21 | 80.51 | 97.14 | 678.53 | 631.87 |
| Nlrp1b | 8.75 | 13.82 | 118.63 | 171.92 |
| Zfyve28 | 59.53 | 52.31 | 484.12 | 490.53 |
| Ptafr | 9.25 | 1.12 | 135.11 | 70.25 |
| Sel1l3 | 8.77 | 4.25 | 123.08 | 56.38 |
| Drd5 | 1.50 | 0.56 | 117.01 | 71.37 |
| Gm15513 | 43.06 | 37.09 | 366.54 | 394.88 |
| Lilrb4a | 114.09 | 120.43 | 999.85 | 972.77 |
| Nedd4 | 1246.76 | 1446.03 | 8128.17 | 8879.16 |
| Dph5 | 734.99 | 753.75 | 4639.04 | 4882.63 |
| Oosp1 | 10.20 | 10.01 | 121.15 | 122.98 |
| Slit3 | 3.90 | 1.12 | 83.27 | 61.82 |
| Dyrk4 | 9.34 | 18.35 | 118.62 | 188.64 |
| Sema6b | 35.97 | 116.77 | 289.85 | 691.13 |
| Slc39a4 | 23.39 | 22.94 | 196.18 | 224.46 |
| Cd59a | 4.37 | 10.40 | 76.93 | 196.67 |
| Cacnb4 | 24.46 | 10.01 | 212.32 | 97.94 |
| Stom | 115.98 | 101.50 | 761.44 | 662.62 |
| Cd1d1 | 1034.37 | 1101.67 | 6329.27 | 8019.74 |
| Pdia4 | 4925.05 | 5055.92 | 28704.75 | 28764.13 |
| Gml | 4.40 | 2.57 | 81.29 | 58.40 |
| Sirpa | 163.30 | 119.13 | 1139.70 | 924.20 |
| 5730409E04Rik | 3.92 | 8.95 | 76.62 | 122.15 |

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|---------------|---------|---------|----------|----------|
| Vash2 | 4.37 | 5.88 | 79.13 | 137.89 |
| Cyp39a1 | 252.33 | 221.09 | 1591.24 | 1292.31 |
| Marcks | 1364.13 | 1140.41 | 7620.71 | 6450.34 |
| Mzb1 | 156.07 | 181.51 | 960.52 | 918.89 |
| Dzip1 | 9.77 | 24.45 | 110.29 | 131.59 |
| Gdpd5 | 15.62 | 22.21 | 140.19 | 133.87 |
| Lrrc25 | 57.04 | 42.80 | 425.64 | 369.71 |
| Gpr55 | 48.29 | 18.80 | 406.25 | 228.87 |
| Abcb1a | 39.38 | 20.04 | 900.30 | 587.96 |
| Ppl | 99.00 | 124.19 | 1494.17 | 1611.81 |
| Igkv2-107 | 20.87 | 11.53 | 202.79 | 113.54 |
| Coro2b | 8.16 | 2.57 | 115.68 | 76.82 |
| Cyp8b1 | 1.00 | 4.14 | 53.31 | 52.19 |
| Trim30c | 68.97 | 47.28 | 414.99 | 280.07 |
| Galm | 6.80 | 5.20 | 83.44 | 73.47 |
| Cln8 | 22.60 | 16.51 | 230.02 | 119.51 |
| Fam149a | 4.92 | 1.12 | 84.30 | 63.26 |
| Gm12503 | 7.23 | 6.05 | 98.30 | 85.96 |
| Plau | 7.91 | 12.20 | 196.59 | 172.66 |
| Kcnk13 | 30.05 | 23.16 | 223.27 | 198.01 |
| Dtx1 | 4656.89 | 4986.58 | 24720.93 | 25031.32 |
| Guca2b | 1.47 | 4.31 | 57.11 | 35.06 |
| Trem1 | 31.99 | 45.55 | 233.13 | 336.21 |
| Lysmd2 | 25.75 | 17.57 | 177.46 | 168.31 |
| Hbegf | 2.45 | 3.86 | 57.90 | 73.54 |
| Hmgn3 | 134.16 | 107.87 | 708.83 | 645.29 |
| Ntng2 | 38.78 | 82.96 | 283.48 | 433.84 |
| A930005H10Rik | 119.54 | 98.64 | 642.48 | 664.24 |
| Dok2 | 33.59 | 41.97 | 218.75 | 210.48 |
| Neb | 36.13 | 16.73 | 224.63 | 178.09 |
| 5033430I15Rik | 5.44 | 6.27 | 74.94 | 85.53 |
| Gm42372 | 13.17 | 16.28 | 104.79 | 98.92 |
| Gm4610 | 189.91 | 169.18 | 980.95 | 1097.10 |
| Slc22a3 | 1.47 | 3.92 | 77.51 | 46.78 |
| Grn | 960.92 | 807.68 | 4508.69 | 3928.06 |
| Tns1 | 18.97 | 8.06 | 153.18 | 96.96 |
| Nhs | 16.59 | 32.39 | 119.28 | 164.12 |
| Cdon | 323.82 | 311.49 | 1536.37 | 1723.31 |
| Cfp | 574.16 | 680.97 | 2752.76 | 3548.62 |
| Grm6 | 72.55 | 85.78 | 371.78 | 348.15 |
| Ttc8 | 9.79 | 18.91 | 84.89 | 102.96 |
| Myo6 | 58.82 | 46.66 | 292.53 | 332.04 |
| Gm32834 | 0.97 | 1.00 | 43.71 | 44.53 |
| Prf1 | 65.79 | 51.87 | 354.58 | 363.90 |

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|----------|---------|---------|----------|----------|
| Ryk | 8.23 | 8.11 | 79.79 | 85.89 |
| Bst1 | 22.16 | 19.69 | 169.09 | 299.37 |
| Gm45867 | 203.99 | 176.81 | 952.85 | 717.40 |
| Gm37422 | 8.77 | 6.10 | 91.63 | 127.86 |
| Terb1 | 167.98 | 128.33 | 803.96 | 770.07 |
| Adamdec1 | 9.68 | 10.69 | 81.89 | 96.10 |
| Cd1d2 | 9.75 | 8.22 | 84.12 | 138.08 |
| Agrn | 202.69 | 164.72 | 918.06 | 892.27 |
| Dusp16 | 989.28 | 927.01 | 4824.48 | 4271.18 |
| Plac8 | 4818.04 | 6232.70 | 20282.58 | 20831.89 |
| Slc22a17 | 44.41 | 59.53 | 230.30 | 277.71 |
| Cfap126 | 12.10 | 11.58 | 90.21 | 77.01 |
| Nod2 | 87.62 | 77.44 | 418.79 | 310.67 |
| Cish | 8.32 | 14.44 | 86.00 | 55.06 |
| Meis3 | 121.08 | 124.95 | 587.29 | 482.35 |
| Vwa5a | 170.50 | 181.45 | 803.05 | 884.79 |
| Mpeg1 | 690.13 | 603.02 | 4760.20 | 4544.16 |
| Spag5 | 55.75 | 50.30 | 369.71 | 306.46 |
| Sla2 | 31.62 | 23.67 | 177.05 | 109.07 |
| Eppk1 | 42.41 | 31.94 | 208.47 | 188.54 |
| Ahr | 294.70 | 219.91 | 1367.48 | 1317.46 |
| Epm2a | 11.74 | 15.33 | 82.02 | 93.76 |
| Npr2 | 9.72 | 3.81 | 85.67 | 62.59 |
| Gm11707 | 22.87 | 33.28 | 136.71 | 139.90 |
| Jph1 | 2.42 | 3.25 | 46.10 | 62.83 |
| Dkk1 | 19.85 | 21.82 | 127.13 | 146.09 |
| Tm6sf1 | 2165.06 | 1946.66 | 8617.21 | 7431.73 |
| Alpk2 | 115.52 | 92.94 | 522.96 | 449.41 |
| Dtx4 | 177.73 | 200.80 | 729.02 | 713.60 |
| Aldh5a1 | 3.92 | 3.64 | 49.64 | 62.35 |
| Slc6a13 | 4.35 | 6.94 | 49.04 | 79.02 |
| Akr1e1 | 41.20 | 51.70 | 198.79 | 219.13 |
| Txlnb | 4.37 | 3.64 | 53.32 | 39.94 |
| Pclaf | 52.95 | 33.40 | 363.88 | 340.02 |
| Il9r | 3692.93 | 4416.20 | 14469.04 | 20323.21 |
| Rsu1 | 657.46 | 748.34 | 2607.60 | 3734.39 |
| Ccr1 | 50.05 | 32.50 | 643.37 | 757.88 |
| Bub1 | 27.44 | 18.75 | 209.18 | 158.43 |
| Adamts13 | 0.95 | 3.08 | 38.17 | 54.73 |
| Bfsp1 | 4.87 | 2.13 | 51.76 | 41.54 |
| Gbp8 | 146.80 | 117.04 | 596.10 | 514.41 |
| Kntc1 | 38.61 | 23.67 | 258.23 | 255.88 |
| Espl1 | 39.04 | 26.58 | 282.49 | 208.06 |
| Id2 | 220.41 | 185.78 | 909.14 | 699.78 |

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|---------------|----------|----------|----------|----------|
| Pik3r4 | 3356.40 | 2977.81 | 17530.46 | 15237.65 |
| Chrm3 | 0.50 | 0.50 | 34.68 | 59.27 |
| Endod1 | 388.94 | 354.20 | 1467.81 | 980.23 |
| P4htm | 39.22 | 47.00 | 185.52 | 156.94 |
| Asap2 | 167.50 | 141.06 | 640.11 | 562.27 |
| Gm5547 | 29.40 | 18.52 | 144.60 | 135.50 |
| Rhobtb1 | 7.68 | 10.74 | 80.68 | 58.67 |
| Camkmt | 127.94 | 93.89 | 506.44 | 522.72 |
| Pmepa1 | 77.94 | 52.22 | 400.58 | 287.44 |
| Zap70 | 55.58 | 31.89 | 265.52 | 139.99 |
| Kif18b | 18.31 | 8.56 | 153.12 | 115.64 |
| Slc9a9 | 56.37 | 32.62 | 234.32 | 183.61 |
| Ly96 | 68.40 | 63.28 | 278.27 | 241.45 |
| Rhbdf1 | 672.33 | 1015.96 | 2545.91 | 3738.96 |
| Mybl2 | 60.62 | 53.65 | 257.14 | 282.02 |
| Tpst2 | 1342.28 | 1653.35 | 5191.04 | 4781.05 |
| AF067061 | 6.71 | 5.26 | 72.56 | 34.35 |
| Emb | 92.54 | 93.24 | 409.50 | 495.67 |
| Plcd3 | 17.88 | 10.86 | 638.52 | 330.00 |
| Cr2 | 25346.33 | 24148.84 | 88341.18 | 92019.62 |
| Akap1 | 17.02 | 14.71 | 90.66 | 111.46 |
| Hs3st3b1 | 89.78 | 85.11 | 356.06 | 295.94 |
| Inpp4a | 594.48 | 721.46 | 2130.76 | 1663.45 |
| Ell3 | 65.08 | 77.55 | 263.53 | 262.78 |
| Dglucy | 239.70 | 280.04 | 862.77 | 963.04 |
| Gm36936 | 21.16 | 21.65 | 132.57 | 113.63 |
| Cdca5 | 28.17 | 29.16 | 165.39 | 162.24 |
| Tubg2 | 66.31 | 62.38 | 277.99 | 237.95 |
| Jaml | 169.00 | 149.45 | 624.00 | 504.75 |
| Lurap1 | 102.07 | 86.94 | 410.08 | 443.12 |
| Gm22748 | 39.81 | 68.32 | 181.67 | 191.91 |
| Epcam | 83.86 | 113.81 | 344.38 | 289.69 |
| Crebl2 | 1030.78 | 1038.03 | 3573.83 | 3626.24 |
| Clspn | 37.23 | 37.10 | 235.98 | 208.66 |
| 5830418P13Rik | 72.98 | 47.50 | 281.13 | 295.41 |
| Fam241b | 1.00 | 2.57 | 34.66 | 41.09 |
| Mlkl | 7.30 | 9.57 | 56.17 | 51.80 |
| Disc1 | 12.19 | 10.29 | 80.25 | 97.58 |
| Afdn | 23.44 | 15.05 | 112.41 | 113.63 |
| Pde8a | 335.74 | 364.03 | 1268.06 | 1262.01 |
| Kifc3 | 13.01 | 14.71 | 80.90 | 77.16 |
| Ccna2 | 60.42 | 39.17 | 351.11 | 318.52 |
| Slc39a11 | 93.83 | 142.40 | 342.38 | 369.14 |
| Abcb1b | 97.78 | 83.71 | 363.26 | 328.48 |

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|---------------|---------|---------|---------|---------|
| E2f8 | 23.63 | 14.71 | 137.61 | 117.06 |
| Mgst1 | 43.88 | 48.68 | 183.86 | 219.93 |
| Cenpf | 47.11 | 24.68 | 281.87 | 243.58 |
| Tmtc4 | 144.52 | 158.70 | 566.66 | 578.83 |
| Hdgfl3 | 243.93 | 230.70 | 846.59 | 883.37 |
| Mcm10 | 30.39 | 17.74 | 184.55 | 190.15 |
| Gm31499 | 1.93 | 1.01 | 38.37 | 43.86 |
| 4930568A12Rik | 18.90 | 21.87 | 95.95 | 114.04 |
| Ldhd | 9.77 | 17.96 | 61.99 | 73.86 |
| Derl3 | 101.64 | 109.26 | 427.36 | 440.23 |
| Dnase1l3 | 125.43 | 73.35 | 1020.76 | 668.77 |
| Mvb12b | 17.43 | 24.56 | 91.71 | 100.10 |
| Gm42047 | 137.69 | 67.53 | 485.45 | 297.68 |
| Osgin1 | 102.00 | 152.29 | 441.54 | 517.40 |
| lqgap3 | 11.13 | 6.83 | 96.95 | 79.93 |
| Gm38244 | 14.96 | 12.42 | 94.64 | 97.16 |
| Itm2c | 247.94 | 303.49 | 893.67 | 834.63 |
| Perm1 | 90.85 | 82.31 | 322.99 | 368.12 |
| Hes5 | 42.29 | 26.13 | 191.57 | 117.13 |
| Mocos | 4.40 | 2.07 | 44.23 | 42.50 |
| Tpx2 | 64.76 | 40.62 | 308.31 | 247.53 |
| Fam92a | 55.89 | 41.01 | 211.95 | 234.16 |
| Pde4d | 235.90 | 271.95 | 2059.20 | 1836.40 |
| Insrr | 0.48 | 3.02 | 42.08 | 35.93 |
| Ube2c | 20.30 | 12.64 | 142.25 | 119.49 |
| Carmil1 | 1074.00 | 1083.12 | 3471.79 | 3459.07 |
| Rbm47 | 23.35 | 20.59 | 114.54 | 88.00 |
| Gpx7 | 11.70 | 22.21 | 63.85 | 65.37 |
| Mfsd4b4 | 90.08 | 94.05 | 323.17 | 376.82 |
| lsg15 | 150.16 | 113.80 | 527.42 | 392.05 |
| Dtl | 68.39 | 78.40 | 304.05 | 358.77 |
| Cul9 | 434.97 | 514.00 | 1424.51 | 1566.33 |
| Esco2 | 24.13 | 13.71 | 148.16 | 132.86 |
| Birc5 | 35.69 | 24.34 | 207.19 | 186.03 |
| P2ry12 | 4.35 | 7.00 | 44.90 | 37.43 |
| Smco4 | 27.99 | 18.30 | 128.84 | 126.74 |
| Stil | 28.15 | 16.67 | 159.91 | 115.41 |
| Aox4 | 7.27 | 2.07 | 50.74 | 43.12 |
| 2010300C02Rik | 1.45 | 3.25 | 33.13 | 41.33 |
| Klf5 | 2.92 | 3.25 | 39.08 | 34.85 |
| Gm37780 | 84.78 | 91.04 | 372.90 | 605.02 |
| Gm43990 | 6.25 | 8.06 | 49.72 | 58.15 |
| Per3 | 235.19 | 253.39 | 769.62 | 868.18 |
| Csf2rb2 | 15.03 | 8.56 | 85.29 | 68.79 |

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|---------|---------|---------|---------|---------|
| Dctd | 40.82 | 47.51 | 158.36 | 193.95 |
| Rnf43 | 87.16 | 86.95 | 332.91 | 289.85 |
| Scd2 | 1988.45 | 2051.37 | 6298.09 | 6086.62 |
| Cd80 | 36.40 | 29.82 | 159.24 | 121.83 |
| Bzw2 | 657.85 | 653.62 | 2043.82 | 2214.35 |
| Fgl2 | 27.80 | 16.45 | 150.90 | 137.89 |
| Trabd2b | 8.30 | 16.40 | 69.09 | 65.47 |
| Tjp2 | 60.60 | 85.49 | 226.10 | 256.30 |
| Ltk | 506.00 | 375.82 | 1557.18 | 1270.94 |
| Tlcd2 | 28.15 | 32.84 | 113.48 | 99.40 |
| Wwc1 | 3.42 | 3.75 | 36.05 | 32.39 |
| Gm35419 | 1.00 | 0.56 | 29.45 | 28.05 |
| Col15a1 | 0.50 | 1.51 | 29.48 | 29.46 |
| Gpm6b | 61.65 | 57.80 | 230.01 | 261.80 |
| Mical3 | 475.18 | 538.70 | 1443.41 | 1614.93 |
| Adam3 | 1.47 | 2.01 | 32.45 | 44.60 |
| Hck | 2503.43 | 2250.54 | 7571.84 | 6907.07 |
| Mcoln3 | 260.37 | 118.14 | 917.05 | 535.97 |
| Isoc2b | 52.28 | 77.70 | 199.76 | 225.74 |
| Cdca3 | 74.56 | 62.55 | 307.02 | 246.19 |
| Shcbp1 | 23.73 | 12.25 | 127.62 | 111.22 |
| Mfsd2a | 13.24 | 23.39 | 67.20 | 96.32 |
| Raph1 | 11.06 | 6.88 | 68.99 | 52.28 |
| Hmmr | 23.59 | 15.27 | 153.71 | 115.48 |
| Heyl | 1.45 | 1.01 | 32.14 | 34.15 |
| Cdca2 | 63.28 | 60.43 | 235.02 | 171.99 |
| Ikake | 627.32 | 625.03 | 1884.28 | 1751.89 |
| Ypel2 | 322.75 | 193.65 | 1028.11 | 609.99 |
| Nuf2 | 18.31 | 16.90 | 123.14 | 111.62 |
| Mir704 | 12.72 | 14.83 | 63.37 | 63.19 |
| Azin2 | 2.47 | 2.07 | 32.28 | 45.01 |
| Abr | 1098.41 | 1182.51 | 3340.30 | 3202.67 |
| Prdm1 | 114.87 | 107.44 | 436.59 | 336.26 |
| Nbl1 | 3.95 | 2.52 | 40.72 | 50.64 |
| Cdk1 | 44.60 | 33.90 | 222.39 | 210.09 |
| Crim1 | 164.83 | 344.33 | 510.68 | 737.14 |
| Tbx19 | 1.95 | 0.56 | 31.71 | 33.63 |
| Ttk | 19.28 | 18.52 | 99.31 | 63.60 |
| Plscr1 | 107.38 | 88.70 | 347.96 | 362.14 |
| Akr7a5 | 480.52 | 512.25 | 1453.08 | 1223.96 |
| Ephx2 | 1.47 | 3.69 | 29.31 | 61.16 |
| Bid | 1383.02 | 1230.30 | 4059.46 | 3821.72 |
| Tcf19 | 73.06 | 62.94 | 294.14 | 270.41 |
| Smad3 | 1011.58 | 975.90 | 3020.89 | 2928.70 |

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|---------------|---------|--------|---------|---------|
| Gm22720 | 7.80 | 3.58 | 58.14 | 74.93 |
| Tyms | 59.93 | 72.18 | 210.44 | 211.58 |
| Matk | 404.94 | 471.36 | 1182.19 | 1414.84 |
| BC030867 | 5.30 | 4.76 | 46.99 | 44.92 |
| Cdh5 | 18.57 | 19.58 | 83.17 | 80.62 |
| 6530402F18Rik | 97.94 | 164.49 | 311.96 | 426.85 |
| Nme4 | 12.60 | 15.39 | 58.50 | 115.78 |
| Kif13a | 123.72 | 195.99 | 382.62 | 500.55 |
| Myl4 | 317.79 | 342.88 | 950.54 | 1063.43 |
| Slc6a21 | 10.18 | 12.70 | 52.81 | 48.15 |
| Tfpi | 49.68 | 51.81 | 166.15 | 150.77 |
| 1700048O20Rik | 85.22 | 61.09 | 267.10 | 378.76 |
| Naip5 | 410.18 | 419.32 | 1237.00 | 1123.76 |
| Uhrf1 | 238.72 | 189.84 | 770.72 | 653.17 |
| Poglut2 | 73.32 | 103.95 | 232.32 | 261.44 |
| Tet1 | 80.67 | 60.66 | 281.03 | 296.34 |
| Cdk5r1 | 334.29 | 361.62 | 960.59 | 964.85 |
| Stxbp1 | 73.82 | 80.96 | 233.14 | 276.61 |
| Pla2g4a | 20.37 | 21.37 | 85.19 | 114.83 |
| Scamp1 | 5.82 | 6.10 | 46.86 | 50.63 |
| Gm17999 | 1.00 | 2.69 | 25.29 | 37.96 |
| Bcl2l15 | 0.97 | 3.08 | 27.43 | 26.79 |
| Nusap1 | 96.49 | 72.06 | 391.05 | 351.72 |
| Odaph | 6.82 | 12.20 | 41.36 | 60.48 |
| Nlrx1 | 57.20 | 83.70 | 185.48 | 244.70 |
| Ankle1 | 12.46 | 11.02 | 108.17 | 93.24 |
| Zfp239 | 99.67 | 102.59 | 336.38 | 413.65 |
| Ly6k | 46.85 | 62.01 | 177.02 | 214.87 |
| Rrm2 | 120.94 | 102.44 | 457.27 | 469.92 |
| Dnaja4 | 8.44 | 7.16 | 79.18 | 114.47 |
| 9430041J12Rik | 0.95 | 1.00 | 27.38 | 29.90 |
| Chil6 | 0.48 | 1.00 | 24.89 | 30.45 |
| Lmbr1 | 21.30 | 22.44 | 85.29 | 78.95 |
| Rgmb | 90.40 | 97.81 | 273.09 | 277.37 |
| Gng7 | 3.40 | 1.68 | 31.68 | 47.62 |
| C030013C21Rik | 8.27 | 9.06 | 45.62 | 61.39 |
| Pqlc2 | 664.63 | 608.69 | 1826.83 | 1563.34 |
| Mettl21a | 115.35 | 93.66 | 335.63 | 324.66 |
| Zfp976 | 31.73 | 33.74 | 116.24 | 142.55 |
| Tmem151b | 31.03 | 24.68 | 112.40 | 113.47 |
| Slc29a3 | 1062.94 | 921.22 | 2910.89 | 2522.60 |
| Tfdp1 | 302.65 | 302.22 | 889.98 | 922.60 |
| Chn2 | 14.05 | 9.18 | 66.28 | 71.82 |
| Cdh23 | 5.35 | 6.44 | 39.98 | 28.54 |

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|---------------|---------|----------|----------|----------|
| Tmem231 | 61.67 | 60.54 | 189.76 | 226.40 |
| Zfp442 | 8.84 | 11.25 | 48.39 | 40.06 |
| Gm40634 | 18.92 | 22.16 | 77.77 | 76.49 |
| Tmeff1 | 9.29 | 13.04 | 51.87 | 56.44 |
| Melk | 14.46 | 9.40 | 86.48 | 61.92 |
| Myc | 6752.05 | 10081.41 | 24389.19 | 26413.79 |
| Plxnc1 | 2779.47 | 2709.26 | 7459.99 | 6708.34 |
| Zfp612 | 27.86 | 33.74 | 96.27 | 135.40 |
| Slc4a8 | 391.57 | 392.40 | 1102.12 | 1104.55 |
| Lacc1 | 186.48 | 222.39 | 526.40 | 728.36 |
| Pbk | 9.61 | 8.34 | 71.56 | 60.04 |
| Ckap2l | 40.27 | 30.05 | 170.68 | 158.36 |
| Gm26560 | 1.97 | 0.50 | 29.59 | 17.19 |
| Mirt1 | 3060.66 | 2579.91 | 8193.26 | 7402.73 |
| 1110002J07Rik | 0.97 | 1.51 | 28.34 | 21.41 |
| Snhg18 | 55.36 | 55.50 | 178.73 | 197.80 |
| Rtl8c | 2.47 | 1.57 | 28.54 | 33.48 |
| 5930403N24Rik | 1.00 | 2.07 | 26.85 | 27.31 |
| Igkv1-108 | 8.18 | 2.24 | 51.25 | 50.54 |
| Camk2a | 35.90 | 43.14 | 119.28 | 116.43 |
| Naip6 | 265.92 | 165.47 | 741.37 | 571.94 |
| Clstn1 | 123.55 | 141.05 | 347.64 | 431.43 |
| Ptprs | 447.57 | 454.79 | 1222.95 | 1116.04 |
| Robo1 | 1.50 | 1.01 | 26.19 | 42.07 |
| Megf8 | 27.38 | 32.96 | 97.15 | 84.22 |
| Col20a1 | 108.26 | 75.70 | 305.35 | 377.11 |
| E2f1 | 139.62 | 124.56 | 394.73 | 425.61 |
| Gm50462 | 0.50 | 1.00 | 23.96 | 26.31 |
| Slc35f2 | 43.79 | 38.77 | 137.60 | 143.75 |
| Prr11 | 28.10 | 21.09 | 121.05 | 91.18 |
| Ncapg | 56.40 | 33.85 | 225.98 | 220.16 |
| Gm28417 | 96.07 | 111.94 | 283.23 | 375.55 |
| 4930451G09Rik | 69.42 | 55.94 | 212.32 | 177.69 |
| Grik5 | 67.30 | 64.74 | 201.47 | 244.08 |
| Plpp3 | 284.81 | 261.18 | 766.98 | 734.27 |
| Acot6 | 11.31 | 9.51 | 53.43 | 54.22 |
| Plscr4 | 2.92 | 0.56 | 30.55 | 28.27 |
| Rilpl2 | 1694.23 | 1831.22 | 4610.69 | 4947.39 |
| Nucb2 | 445.46 | 509.61 | 1168.83 | 1205.54 |
| Anln | 25.11 | 16.11 | 114.37 | 87.11 |
| Rnasel | 425.20 | 449.71 | 1136.46 | 1248.14 |
| Col6a6 | 5.42 | 7.05 | 54.18 | 64.36 |
| Poglut3 | 6.32 | 3.69 | 35.90 | 40.54 |
| Ptgr1 | 11.99 | 10.18 | 66.95 | 59.25 |

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|---------------|---------|---------|----------|----------|
| Gm11998 | 163.87 | 77.76 | 512.42 | 329.03 |
| Jdp2 | 19.02 | 23.17 | 71.16 | 101.25 |
| Slc25a13 | 15.98 | 15.89 | 64.41 | 80.51 |
| 2900026A02Rik | 13.05 | 33.90 | 55.61 | 167.28 |
| Trim32 | 104.16 | 99.59 | 297.92 | 275.72 |
| Gm26574 | 5.89 | 5.26 | 35.54 | 43.10 |
| Tyrobp | 465.86 | 392.41 | 1221.62 | 1045.60 |
| Zfp937 | 19.47 | 15.05 | 71.07 | 80.62 |
| Fbxo10 | 66.52 | 83.70 | 191.58 | 194.24 |
| Gm12679 | 8.20 | 6.66 | 48.67 | 56.18 |
| Rasl11a | 5.33 | 3.13 | 34.74 | 47.24 |
| Hes1 | 1062.14 | 1134.24 | 2769.89 | 3278.48 |
| Cacna1e | 4263.80 | 7272.93 | 10833.29 | 14981.43 |
| Cdca8 | 85.25 | 85.05 | 268.35 | 216.81 |
| Hspa12a | 194.27 | 123.81 | 522.22 | 394.16 |
| Ube2r2 | 2009.02 | 2006.25 | 5193.06 | 5028.37 |
| Mtln | 75.58 | 108.59 | 218.78 | 254.32 |
| Prkcz | 79.34 | 51.93 | 245.76 | 252.14 |
| Edaradd | 1315.66 | 1204.23 | 3420.32 | 3128.45 |
| Lrtm2 | 11.53 | 15.95 | 55.75 | 56.62 |
| Odc1 | 1595.12 | 2041.60 | 4334.96 | 4820.11 |
| Gramd1b | 516.76 | 537.90 | 1324.77 | 1434.59 |
| Nmrk1 | 197.81 | 189.84 | 515.70 | 471.41 |
| Bsn | 56.61 | 56.51 | 172.62 | 175.36 |
| Troap | 17.50 | 7.39 | 70.44 | 66.02 |
| 2210414B05Rik | 32.34 | 25.23 | 108.19 | 121.76 |
| Myo10 | 67.26 | 51.75 | 210.26 | 173.31 |
| Erich2 | 3.35 | 1.00 | 33.21 | 16.19 |
| Traf1 | 1697.98 | 1833.77 | 4367.39 | 4626.43 |
| Neil3 | 18.64 | 10.13 | 125.26 | 99.43 |
| Arsb | 286.98 | 283.13 | 736.93 | 678.08 |
| Tmem18 | 260.00 | 259.95 | 683.11 | 727.94 |
| Rad54b | 21.80 | 18.58 | 85.10 | 62.00 |
| Rad54l | 69.08 | 61.43 | 211.62 | 209.76 |
| Cblc | 5.26 | 7.39 | 44.16 | 46.69 |
| Lpcat2 | 317.12 | 439.33 | 841.53 | 976.48 |
| Cipc | 1205.43 | 1196.28 | 3002.07 | 3051.50 |
| Car9 | 7.77 | 13.32 | 38.17 | 43.13 |
| Acad8 | 73.83 | 57.35 | 208.78 | 168.11 |
| Borcs7 | 276.54 | 256.13 | 710.75 | 704.09 |
| Gm6377 | 2143.73 | 2599.47 | 6891.57 | 7411.19 |
| Gm20069 | 1.00 | 1.00 | 24.95 | 24.40 |
| Obscn | 33.68 | 18.70 | 127.75 | 86.72 |
| Grhpr | 415.54 | 427.45 | 1038.71 | 969.07 |

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|---------------|----------|----------|----------|----------|
| Ankrd13b | 13.98 | 14.55 | 59.32 | 54.10 |
| Morn1 | 38.78 | 33.85 | 114.79 | 136.24 |
| Gask1a | 14.26 | 7.89 | 60.63 | 67.21 |
| Prag1 | 1136.81 | 1044.53 | 2946.55 | 2507.39 |
| Armc2 | 10.18 | 9.57 | 46.35 | 40.42 |
| Psap | 14171.19 | 13832.63 | 34476.83 | 33472.35 |
| Gm6637 | 6.35 | 5.26 | 33.83 | 63.16 |
| Ak7 | 3.90 | 9.51 | 26.19 | 47.16 |
| Cit | 111.19 | 96.39 | 323.87 | 294.22 |
| Rgs3 | 348.57 | 297.07 | 871.84 | 705.86 |
| Grk5 | 243.45 | 229.48 | 614.43 | 671.99 |
| Abcg3 | 579.93 | 456.74 | 1419.71 | 1213.58 |
| Fam228b | 10.65 | 10.69 | 44.82 | 49.18 |
| Kif4 | 37.23 | 21.88 | 149.77 | 145.30 |
| Echdc3 | 20.83 | 19.53 | 70.75 | 67.81 |
| Kif2c | 22.04 | 10.52 | 120.73 | 77.33 |
| Slc20a2 | 669.48 | 654.41 | 1619.64 | 1466.39 |
| Ctsb | 2366.74 | 2561.84 | 5647.73 | 5725.78 |
| Kif23 | 236.85 | 192.20 | 636.43 | 480.20 |
| Bcl2a1b | 91.10 | 109.71 | 244.55 | 316.21 |
| Myzap | 200.93 | 210.21 | 497.03 | 487.67 |
| Kif15 | 101.28 | 76.09 | 331.21 | 287.54 |
| Cdca7l | 150.56 | 119.96 | 388.37 | 517.73 |
| Plbd1 | 1037.65 | 1604.69 | 2488.58 | 3472.51 |
| 1700027J07Rik | 46.29 | 25.06 | 151.01 | 161.11 |
| Gm12493 | 5.75 | 4.08 | 39.80 | 47.59 |
| Hpgds | 308.63 | 272.82 | 775.41 | 606.12 |
| Gm37145 | 46.10 | 50.24 | 133.91 | 137.64 |
| Prkar2a | 263.18 | 295.89 | 664.32 | 679.64 |
| Plk1 | 44.72 | 42.08 | 146.08 | 121.81 |
| Tnfsf18 | 6.78 | 6.38 | 33.58 | 43.03 |
| Cenph | 38.25 | 38.94 | 118.14 | 123.29 |
| 9530020I12Rik | 1.43 | 1.12 | 23.30 | 34.87 |
| Msl3l2 | 31.71 | 27.42 | 104.81 | 83.50 |
| Mki67 | 465.46 | 263.15 | 2558.08 | 2105.36 |
| Kif14 | 20.35 | 4.31 | 95.82 | 88.21 |
| Rnd3 | 8.75 | 11.64 | 35.99 | 80.10 |
| Top2a | 384.97 | 249.89 | 1915.98 | 1466.68 |
| Acer2 | 8.84 | 10.74 | 39.52 | 60.73 |
| Cntln | 39.63 | 40.17 | 122.16 | 125.04 |
| Oosp2 | 0.48 | 0.50 | 21.17 | 26.36 |
| Gm34829 | 1.00 | 3.25 | 23.55 | 51.08 |
| Tmtc2 | 2.42 | 0.56 | 23.73 | 20.24 |
| Pimreg | 5.75 | 2.69 | 42.89 | 36.19 |

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|---------------|---------|---------|---------|---------|
| Aurkb | 160.61 | 136.18 | 435.96 | 340.21 |
| Ighv6-3 | 416.00 | 429.15 | 1002.33 | 969.69 |
| Ccnb2 | 56.18 | 50.47 | 175.69 | 155.58 |
| Pacc1 | 861.76 | 575.83 | 2016.53 | 1656.64 |
| Sbf2 | 254.32 | 195.84 | 612.85 | 555.42 |
| Serpina3g | 828.42 | 1428.09 | 1990.89 | 3400.58 |
| Pik3r3 | 59.77 | 54.83 | 158.23 | 169.64 |
| Nipal4 | 1.00 | 3.81 | 21.55 | 36.21 |
| Tspear | 22.42 | 17.51 | 68.40 | 78.07 |
| Gm12504 | 20.42 | 24.12 | 67.84 | 98.27 |
| Rab37 | 227.81 | 185.62 | 573.93 | 676.03 |
| Tmem41a | 29.67 | 24.73 | 86.50 | 89.52 |
| Bcl7a | 2534.02 | 2592.76 | 5952.91 | 5454.67 |
| Antxr1 | 4.37 | 2.13 | 27.18 | 21.79 |
| Cks1b | 57.82 | 56.40 | 172.01 | 153.12 |
| Prc1 | 96.00 | 66.75 | 286.03 | 275.47 |
| C430002N11Rik | 15.43 | 8.89 | 55.58 | 70.03 |
| Grhl1 | 33.92 | 26.02 | 103.07 | 90.46 |
| C030013G03Rik | 0.97 | 0.56 | 19.71 | 16.74 |
| Mzt2 | 61.24 | 43.25 | 158.47 | 167.95 |
| Skida1 | 2.92 | 5.09 | 26.53 | 32.93 |
| Rnft2 | 24.55 | 11.13 | 76.02 | 77.02 |
| Src | 8.27 | 11.64 | 34.51 | 50.64 |
| Tmem154 | 890.36 | 729.87 | 2721.97 | 2353.80 |
| Cenpe | 143.92 | 107.93 | 406.21 | 299.12 |
| Zfp992 | 27.06 | 21.43 | 85.65 | 65.68 |
| As3mt | 430.71 | 421.68 | 1002.40 | 1025.06 |
| Anxa9 | 63.87 | 61.89 | 166.22 | 173.36 |
| Abhd17c | 441.57 | 428.53 | 1018.58 | 1011.32 |
| Aspm | 75.34 | 60.26 | 242.54 | 179.84 |
| Mdfic | 507.60 | 551.03 | 1167.55 | 1230.20 |
| Bcl2a1d | 25.22 | 43.63 | 78.94 | 115.09 |
| Ccnf | 113.90 | 80.41 | 289.74 | 255.10 |
| Hgfac | 1.00 | 1.00 | 17.87 | 33.06 |
| Zfr2 | 45.26 | 39.00 | 121.41 | 128.39 |
| Mapre3 | 60.23 | 75.25 | 156.42 | 196.89 |
| Slc7a7 | 154.16 | 139.39 | 375.61 | 305.78 |
| Smim10l1 | 319.58 | 316.84 | 735.11 | 758.88 |
| Prob1 | 105.08 | 88.96 | 255.41 | 251.51 |
| Tspan31 | 369.35 | 368.13 | 865.68 | 828.74 |
| Actrt3 | 2.47 | 8.45 | 23.08 | 40.69 |
| Rundc3a | 23.42 | 10.13 | 71.84 | 54.65 |
| Gbp7 | 564.06 | 579.13 | 1329.99 | 1422.09 |
| Pyroxd2 | 42.03 | 38.38 | 114.48 | 99.40 |

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|---------------|---------|---------|---------|---------|
| Tenm4 | 120.31 | 97.97 | 285.97 | 228.72 |
| Zfp783 | 309.89 | 381.13 | 713.23 | 1016.64 |
| Slc29a1 | 327.05 | 331.31 | 757.75 | 835.27 |
| Klk8 | 4.85 | 20.42 | 26.31 | 69.53 |
| 6330562C20Rik | 14.78 | 14.21 | 55.95 | 49.17 |
| Btbd19 | 286.26 | 309.01 | 657.51 | 728.29 |
| Fhit | 15.05 | 13.43 | 51.42 | 45.64 |
| Golim4 | 233.62 | 214.12 | 540.52 | 517.15 |
| Arhgef9 | 3.88 | 9.01 | 25.82 | 40.76 |
| Hcst | 294.53 | 295.52 | 678.33 | 653.55 |
| Gmnn | 160.17 | 146.35 | 386.55 | 517.39 |
| Zscan12 | 71.78 | 59.97 | 182.98 | 199.30 |
| Pif1 | 23.37 | 10.46 | 96.33 | 65.15 |
| F730043M19Rik | 114.92 | 97.60 | 311.66 | 318.44 |
| Lmo7 | 26.15 | 8.45 | 88.89 | 62.00 |
| Spc24 | 35.18 | 35.25 | 122.83 | 126.67 |
| Cenpm | 20.26 | 24.45 | 68.43 | 71.90 |
| Fbxw17 | 159.49 | 149.42 | 380.03 | 526.86 |
| Trim6 | 9.63 | 28.59 | 37.52 | 89.28 |
| Wdfy2 | 2528.74 | 2687.37 | 5665.13 | 6154.06 |
| Zfp975 | 38.25 | 36.93 | 102.72 | 99.85 |
| Zdhhc1 | 107.04 | 110.90 | 255.98 | 285.10 |
| Pip4k2a | 3438.55 | 3492.12 | 7700.52 | 7821.81 |
| Ptprv | 175.13 | 155.31 | 402.52 | 410.14 |
| Fam83h | 8.70 | 6.77 | 36.72 | 37.48 |
| Gm45206 | 32.37 | 34.47 | 92.53 | 101.43 |
| Phf19 | 362.15 | 394.54 | 819.35 | 834.58 |
| Rps6ka1 | 1607.53 | 1494.36 | 3577.51 | 3102.07 |
| Gm28802 | 9.20 | 10.40 | 37.20 | 46.09 |
| Wdr60 | 62.25 | 54.50 | 159.11 | 158.64 |
| Sema4b | 4146.95 | 3791.79 | 9034.39 | 8488.48 |
| Sapcd2 | 5.85 | 5.93 | 41.24 | 40.16 |
| Kif11 | 87.17 | 51.09 | 556.33 | 433.83 |
| Slc25a4 | 1337.97 | 1479.30 | 2908.43 | 3286.13 |
| Gm13986 | 1.00 | 0.56 | 16.82 | 23.42 |
| Rogdi | 1290.22 | 1167.72 | 2809.39 | 2905.37 |
| Egr2 | 405.89 | 624.67 | 955.73 | 1423.27 |
| Dna2 | 137.94 | 94.39 | 324.99 | 308.30 |
| Atp11a | 18.97 | 15.44 | 56.57 | 105.77 |
| Selenbp1 | 17.93 | 23.44 | 59.01 | 70.72 |
| Gpr68 | 18.00 | 32.84 | 55.73 | 86.55 |
| Syngap1 | 45.72 | 32.18 | 117.96 | 92.94 |
| Ralb | 209.70 | 238.80 | 466.29 | 511.64 |
| Cdc6 | 36.56 | 30.72 | 115.42 | 144.71 |

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|---------------|---------|---------|----------|----------|
| Thyn1 | 104.33 | 79.17 | 245.68 | 235.85 |
| Ahcyl2 | 1074.91 | 1097.81 | 2334.39 | 2814.55 |
| Gm37759 | 8.73 | 3.81 | 36.67 | 26.83 |
| Lynx1 | 2021.00 | 2214.07 | 4528.52 | 5716.50 |
| Pld4 | 6574.94 | 5366.23 | 14098.68 | 11507.84 |
| Rabl2 | 37.58 | 45.10 | 97.07 | 108.66 |
| Nlrc3 | 1317.61 | 1278.04 | 2841.59 | 2900.81 |
| Slc43a1 | 202.11 | 126.97 | 488.88 | 408.23 |
| 2010016I18Rik | 248.02 | 257.63 | 549.16 | 618.15 |
| Slc36a4 | 150.79 | 123.95 | 352.00 | 348.93 |
| Spns3 | 497.46 | 481.75 | 1083.96 | 1023.19 |
| Copg2 | 1088.80 | 1157.25 | 2342.00 | 2421.08 |
| Gm50386 | 170.43 | 119.23 | 375.06 | 409.23 |
| Ccr5 | 78.80 | 68.15 | 185.71 | 177.13 |
| Diaph3 | 49.20 | 48.51 | 133.83 | 155.44 |
| Stmn1 | 51.13 | 51.65 | 142.49 | 138.49 |
| Kif5a | 7.30 | 8.06 | 31.57 | 43.15 |
| Capn2 | 522.76 | 421.29 | 1121.88 | 947.85 |
| Espn | 4.87 | 3.86 | 27.66 | 24.83 |
| Pde1c | 17.95 | 21.99 | 53.86 | 73.54 |
| Arhgap27os3 | 799.95 | 861.47 | 1792.54 | 3014.09 |
| Ticrr | 94.71 | 81.40 | 232.58 | 212.94 |
| Ndst1 | 4721.55 | 4140.83 | 9989.16 | 9695.28 |
| Atp6v1g2 | 72.82 | 75.20 | 168.30 | 186.49 |
| Klrb1f | 44.62 | 32.79 | 110.40 | 123.44 |
| A730063M14Rik | 22.78 | 20.42 | 64.16 | 88.19 |
| Dnhd1 | 233.04 | 229.01 | 524.00 | 664.88 |
| Armc3 | 99.28 | 105.85 | 223.73 | 234.44 |
| Bbs5 | 6.85 | 4.76 | 28.79 | 34.01 |
| Sfmbt2 | 2.90 | 3.13 | 21.21 | 31.00 |
| Nsg2 | 10.65 | 9.96 | 39.05 | 37.96 |
| Serpinb6b | 75.35 | 85.82 | 184.74 | 262.06 |
| Ank3 | 0.97 | 2.69 | 17.98 | 25.98 |
| St3gal4 | 69.99 | 66.14 | 164.10 | 162.81 |
| Parpbp | 21.28 | 16.33 | 79.38 | 65.65 |
| 1700034H15Rik | 12.72 | 14.10 | 44.48 | 50.64 |
| Rcn1 | 163.02 | 178.15 | 355.12 | 430.78 |
| 4930581F22Rik | 110.04 | 100.55 | 245.42 | 249.12 |
| Arhgef39 | 37.33 | 40.95 | 93.86 | 101.79 |
| Tmcc3 | 517.58 | 451.69 | 1146.91 | 1107.26 |
| Kctd17 | 1.50 | 3.75 | 18.35 | 29.42 |
| Slc43a3 | 174.16 | 166.10 | 433.18 | 454.75 |
| Tmed6 | 5.37 | 6.77 | 26.39 | 37.45 |
| Tgm2 | 27.01 | 26.58 | 74.71 | 115.23 |

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|---------|---------|---------|---------|---------|
| Abhd5 | 71.51 | 53.49 | 189.79 | 198.64 |
| Gm44260 | 99.09 | 79.18 | 223.55 | 213.63 |
| Car7 | 34.73 | 39.39 | 86.95 | 97.23 |
| Gm34121 | 13.12 | 7.72 | 44.76 | 47.45 |
| Slc12a5 | 23.42 | 25.73 | 69.01 | 200.18 |
| Ccdc116 | 80.78 | 87.28 | 178.72 | 201.60 |
| Mccc2 | 300.52 | 255.49 | 646.22 | 635.96 |
| Plekhg5 | 56.82 | 62.39 | 136.80 | 155.70 |
| Tlr7 | 1914.72 | 1267.31 | 4141.90 | 3502.47 |
| Gm28913 | 10.74 | 6.44 | 36.61 | 48.20 |
| Fanca | 779.97 | 653.36 | 1613.78 | 1746.39 |
| Sfxn1 | 918.12 | 977.55 | 1890.47 | 2213.18 |

Supp Table 4

| Gene | WT FO | cKO FO | WT MZ | cKO MZ |
|--------------|--------------|---------------|--------------|---------------|
| Gm4734 | 3.42 | 4.75 | 2.87 | 356.38 |
| Ngp | 12.81 | 4.30 | 13.86 | 140.38 |
| Ltf | 5.44 | 6.09 | 3.83 | 94.52 |
| Adgrd1 | 12.74 | 4.19 | 39.17 | 45.05 |
| Smox | 10.82 | 9.45 | 36.68 | 73.92 |
| Specc1 | 18.38 | 21.53 | 52.70 | 122.76 |
| Pax6 | 3.92 | 6.88 | 7.17 | 137.56 |
| Sh2d1b1 | 7.71 | 2.62 | 32.85 | 46.94 |
| Gm48505 | 20.33 | 16.44 | 56.57 | 83.08 |
| Adgra2 | 20.42 | 23.83 | 45.53 | 103.17 |
| Art3 | 8.27 | 2.01 | 27.90 | 30.88 |
| Kif22 | 116.96 | 56.78 | 283.49 | 257.23 |
| Camp | 6.40 | 3.57 | 8.53 | 53.04 |
| Snca | 1.95 | 4.58 | 4.28 | 72.38 |
| Gm5915 | 6.40 | 3.69 | 3.83 | 53.43 |
| Gm15796 | 4.97 | 4.25 | 10.49 | 77.13 |
| Gm5236 | 1.00 | 2.62 | 1.48 | 100.49 |
| Atp2b4 | 12.08 | 6.43 | 14.96 | 57.73 |
| Aqp1 | 9.68 | 15.49 | 10.68 | 110.12 |
| Spire1 | 6.30 | 8.33 | 27.50 | 53.88 |
| Gpr34 | 25.45 | 58.06 | 161.99 | 534.53 |
| Rad51b | 16.59 | 10.90 | 36.82 | 55.63 |
| Ttc41 | 59.62 | 50.74 | 129.66 | 164.98 |
| Poln | 44.13 | 33.23 | 86.31 | 116.07 |
| Nrep | 9.32 | 8.83 | 20.88 | 101.90 |
| Add2 | 1.97 | 4.19 | 8.14 | 43.65 |
| Serpina3e-ps | 3.90 | 6.20 | 2.90 | 93.23 |
| Prom1 | 7.32 | 3.74 | 15.10 | 34.82 |
| Gm46611 | 19.66 | 28.08 | 18.72 | 172.81 |
| Tspan33 | 5.37 | 3.63 | 6.94 | 46.08 |
| Trps1 | 635.81 | 540.50 | 1297.19 | 1516.94 |
| Eno2 | 12.67 | 9.89 | 17.91 | 72.35 |
| Timd2 | 10.65 | 1.00 | 40.04 | 33.22 |
| Ccdc122 | 35.45 | 39.60 | 83.76 | 134.06 |
| Fn1 | 51.87 | 15.05 | 57.81 | 103.37 |
| Sptb | 22.92 | 26.29 | 38.57 | 132.65 |
| Otx2 | 1.97 | 3.74 | 1.96 | 64.88 |
| Mpo | 2.47 | 9.39 | 4.28 | 78.35 |
| Epb42 | 6.40 | 7.66 | 4.71 | 69.94 |
| Znrf3 | 77.34 | 61.38 | 152.00 | 180.28 |
| Rad51 | 75.87 | 51.07 | 175.24 | 186.75 |
| Strip2 | 2.93 | 9.89 | 12.01 | 53.14 |

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|---------------|--------|--------|---------|---------|
| Asns | 12.27 | 14.04 | 36.54 | 65.99 |
| Rnase4 | 13.98 | 8.00 | 47.54 | 52.01 |
| Car1 | 20.47 | 14.93 | 14.76 | 84.24 |
| Aldoart2 | 1.50 | 2.06 | 3.35 | 80.40 |
| Gm17025 | 3.45 | 4.19 | 13.15 | 32.69 |
| Gm14892 | 1.00 | 1.00 | 1.93 | 101.54 |
| Optn | 214.44 | 156.94 | 438.95 | 415.21 |
| Chil3 | 17.86 | 3.74 | 9.27 | 61.44 |
| Fggy | 35.66 | 31.72 | 80.96 | 97.91 |
| 3000002C10Rik | 47.25 | 41.23 | 88.94 | 137.98 |
| Cdc45 | 107.10 | 84.03 | 252.54 | 261.20 |
| Alox5ap | 42.77 | 40.95 | 85.95 | 124.42 |
| Zkscan7 | 202.95 | 166.72 | 423.58 | 431.68 |
| Ermap | 30.90 | 26.34 | 36.74 | 107.96 |
| Nbdy | 33.90 | 35.97 | 72.16 | 113.63 |
| Dclre1a | 63.98 | 46.21 | 140.45 | 134.34 |
| Dmtn | 1.00 | 2.57 | 4.28 | 35.01 |
| Gm43065 | 31.76 | 19.47 | 67.26 | 73.02 |
| Ggnbp1 | 37.54 | 42.90 | 68.92 | 127.79 |
| Ncapd3 | 703.61 | 524.10 | 1371.00 | 1294.35 |
| Sgip1 | 4.38 | 4.13 | 21.07 | 32.16 |
| Rorb | 2.97 | 1.50 | 5.28 | 40.11 |
| Oip5 | 26.46 | 20.25 | 45.14 | 69.84 |
| Ank1 | 23.30 | 42.68 | 49.67 | 141.49 |
| Fam135a | 8.73 | 2.51 | 23.06 | 26.35 |
| Gm15523 | 1.50 | 1.00 | 15.58 | 22.72 |
| Gm11942 | 29.36 | 40.95 | 49.08 | 140.08 |
| Chaf1a | 122.20 | 110.65 | 292.02 | 332.77 |
| Gm43071 | 212.31 | 185.49 | 448.00 | 461.94 |
| Cip2a | 138.89 | 97.47 | 288.36 | 266.97 |
| Rps19-ps4 | 3.42 | 6.26 | 1.93 | 45.73 |
| Nek2 | 59.70 | 41.45 | 138.49 | 157.74 |
| Trim10 | 3.88 | 6.65 | 4.28 | 76.29 |
| Zmat4 | 1.48 | 1.56 | 15.67 | 24.41 |
| Lmntd1 | 12.60 | 9.06 | 34.89 | 41.16 |
| Zfp985 | 7.30 | 10.23 | 23.06 | 44.62 |
| Ypel4 | 3.38 | 5.25 | 5.19 | 42.07 |
| Dmd | 25.87 | 19.53 | 71.78 | 71.48 |
| Gm16216 | 2.45 | 3.74 | 5.19 | 38.53 |
| Car12 | 3.42 | 1.56 | 17.11 | 22.84 |
| Pon3 | 50.97 | 48.17 | 116.71 | 136.66 |
| Slc35g1 | 11.74 | 12.08 | 39.82 | 55.20 |
| Zfp518b | 106.19 | 79.90 | 184.61 | 201.19 |
| Rad51ap1 | 68.68 | 47.61 | 153.88 | 146.45 |

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|---------------|---------|---------|----------|----------|
| Gm12726 | 3.45 | 1.50 | 7.09 | 34.98 |
| Stk39 | 4.40 | 4.25 | 18.16 | 27.28 |
| 2900005J15Rik | 8.80 | 11.18 | 27.67 | 44.87 |
| 9530062K07Rik | 20.31 | 15.71 | 38.80 | 56.23 |
| Soat2 | 5.30 | 2.57 | 19.77 | 26.28 |
| C920021L13Rik | 121.02 | 97.62 | 257.92 | 260.22 |
| Hk3 | 30.15 | 28.14 | 64.45 | 83.80 |
| Myo3b | 20.56 | 13.59 | 45.82 | 48.21 |
| BC147527 | 184.90 | 125.08 | 575.32 | 552.69 |
| Nova1 | 1.48 | 1.00 | 9.10 | 29.70 |
| Dennd2a | 4.85 | 2.57 | 18.81 | 22.84 |
| Cryl1 | 208.74 | 188.87 | 404.50 | 451.77 |
| Gm11703 | 1.50 | 3.01 | 1.48 | 55.10 |
| Gm7312 | 1.97 | 3.07 | 3.35 | 45.84 |
| Zranb3 | 219.37 | 169.64 | 406.67 | 400.67 |
| Cbx2 | 71.96 | 46.21 | 153.26 | 122.24 |
| Cyb5r2 | 2.47 | 2.68 | 14.81 | 26.79 |
| Med12l | 87.25 | 62.66 | 187.63 | 159.28 |
| Evi2a | 1044.12 | 1058.72 | 2143.26 | 2429.96 |
| 44256 | 17.02 | 26.62 | 41.66 | 86.55 |
| Gm9159 | 5.40 | 7.38 | 5.22 | 62.83 |
| 1700029J07Rik | 390.04 | 344.87 | 793.28 | 782.01 |
| E230016M11Rik | 99.87 | 67.92 | 172.11 | 170.98 |
| Mest | 57.29 | 57.56 | 117.08 | 159.62 |
| Akap17b | 164.79 | 102.05 | 308.30 | 252.02 |
| Enah | 9.73 | 5.14 | 13.57 | 31.66 |
| Zfp786 | 5.35 | 4.08 | 23.94 | 25.85 |
| Apof | 48.27 | 35.12 | 107.57 | 113.41 |
| Gm4977 | 16.17 | 18.29 | 24.02 | 247.62 |
| Myo1b | 5.92 | 9.11 | 17.31 | 38.60 |
| Gm5879 | 2.45 | 5.87 | 6.10 | 35.87 |
| Aifm2 | 20.90 | 36.13 | 54.99 | 98.20 |
| Ncapg2 | 148.06 | 96.66 | 342.79 | 294.06 |
| Dnph1 | 2.90 | 2.57 | 18.04 | 27.67 |
| Kel | 1.95 | 4.13 | 3.26 | 57.35 |
| Fuca2 | 573.46 | 515.63 | 1193.30 | 1151.31 |
| Ube2e3 | 351.82 | 300.83 | 694.30 | 672.39 |
| Tmc1 | 15.71 | 11.52 | 48.41 | 47.09 |
| 44440 | 5.85 | 4.13 | 8.87 | 26.18 |
| Dennd2d | 3154.38 | 2945.35 | 6269.47 | 6419.64 |
| Depdc1b | 6.33 | 6.88 | 27.75 | 34.24 |
| Mst1 | 153.22 | 156.53 | 328.55 | 358.97 |
| Cd180 | 6455.01 | 7296.71 | 12912.29 | 16008.75 |
| Ska3 | 33.21 | 22.38 | 62.53 | 68.00 |

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|---------------|---------|---------|----------|----------|
| Mageh1 | 7.80 | 8.78 | 22.49 | 36.08 |
| Lgalsl | 31.52 | 24.22 | 69.91 | 78.71 |
| Ceacam16 | 450.12 | 378.71 | 819.22 | 828.97 |
| Gm32401 | 276.05 | 228.60 | 510.50 | 517.61 |
| Gda | 9.16 | 10.23 | 11.64 | 65.00 |
| Gm12739 | 2.93 | 4.81 | 3.41 | 49.91 |
| Gm12912 | 12.58 | 18.29 | 23.60 | 346.64 |
| Klrg1 | 6.28 | 2.57 | 12.18 | 22.33 |
| Tctex1d2 | 95.80 | 79.15 | 218.67 | 195.71 |
| Zwilch | 128.85 | 96.56 | 240.16 | 227.33 |
| Inca1 | 29.31 | 19.58 | 55.17 | 57.09 |
| Gm37607 | 42.63 | 27.41 | 68.52 | 79.43 |
| Apobr | 25.61 | 18.96 | 61.59 | 58.36 |
| Dram2 | 982.37 | 845.01 | 1852.98 | 1816.60 |
| Cryzl2 | 138.22 | 157.28 | 258.58 | 350.75 |
| Gm35315 | 46.23 | 26.40 | 92.50 | 87.94 |
| Pam | 7.35 | 6.71 | 22.91 | 30.52 |
| Gm43672 | 132.61 | 122.06 | 211.54 | 282.42 |
| Ppfia4 | 38.47 | 28.24 | 81.88 | 80.76 |
| Morrbid | 9.73 | 9.89 | 34.08 | 39.00 |
| Zfp248 | 21.47 | 28.58 | 54.89 | 76.06 |
| Ccdc162 | 4.88 | 5.25 | 19.72 | 25.33 |
| Nol4l | 16.71 | 16.56 | 50.69 | 56.61 |
| Nckap1 | 8.30 | 7.77 | 15.70 | 39.87 |
| Tssk4 | 34.50 | 29.75 | 77.76 | 80.00 |
| Adam15 | 101.38 | 91.36 | 172.77 | 216.25 |
| Fscn1 | 9.77 | 10.29 | 30.73 | 41.02 |
| Gm6749 | 1.50 | 2.06 | 1.96 | 30.34 |
| Cdc25c | 14.93 | 9.50 | 51.08 | 41.30 |
| Extl2 | 74.32 | 54.94 | 164.60 | 141.38 |
| Gm19345 | 139.60 | 117.48 | 278.71 | 262.32 |
| S100a9 | 14.33 | 15.37 | 20.34 | 316.92 |
| Smim24 | 63.12 | 59.92 | 144.41 | 143.04 |
| Igfbp5 | 3.40 | 2.51 | 6.72 | 37.00 |
| Smad6 | 1.50 | 1.56 | 17.54 | 19.29 |
| Ccnb1 | 36.02 | 21.31 | 60.65 | 72.32 |
| Meis1 | 11.70 | 15.55 | 13.63 | 66.75 |
| 4930426D05Rik | 1248.44 | 1120.60 | 2411.38 | 2348.34 |
| Entpd1 | 415.17 | 433.65 | 867.22 | 940.61 |
| AU020206 | 5213.93 | 5153.65 | 10420.42 | 10767.02 |
| Catsperg1 | 39.13 | 21.42 | 46.93 | 60.79 |
| Fancd2 | 101.02 | 84.92 | 229.61 | 207.68 |
| Fsd2 | 33.52 | 34.45 | 73.88 | 89.11 |
| Insyn1 | 4.42 | 2.62 | 21.79 | 20.30 |

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|----------|---------|---------|---------|---------|
| Pfn2 | 64.04 | 46.10 | 67.03 | 124.05 |
| Fads6 | 4.40 | 2.62 | 19.09 | 19.29 |
| Cyp2u1 | 5.42 | 6.76 | 23.51 | 28.87 |
| Gm12988 | 3.95 | 4.13 | 8.93 | 41.18 |
| Pbx4 | 152.64 | 131.37 | 304.33 | 285.95 |
| Cd59b | 1.00 | 6.20 | 14.48 | 28.91 |
| Mcrip2 | 20.42 | 17.34 | 34.18 | 50.61 |
| Prr22 | 37.85 | 35.64 | 72.35 | 89.54 |
| Serpinb9 | 119.97 | 129.41 | 235.20 | 297.87 |
| Tmcc2 | 54.16 | 42.79 | 39.90 | 277.02 |
| Dapk2 | 2.97 | 1.56 | 8.96 | 19.11 |
| St14 | 837.43 | 942.43 | 1688.54 | 1964.77 |
| Tbc1d24 | 39.06 | 40.62 | 73.31 | 98.80 |
| Gm18119 | 5.40 | 6.26 | 5.70 | 41.15 |
| Gpr179 | 5.87 | 7.21 | 24.16 | 30.44 |
| F11r | 4.97 | 3.07 | 23.06 | 22.81 |
| Kif20a | 103.08 | 93.16 | 238.20 | 234.23 |
| Wdr6 | 1642.58 | 1468.92 | 3224.44 | 3075.50 |
| Bub1b | 181.10 | 147.12 | 432.24 | 373.28 |
| M1ap | 36.42 | 37.37 | 63.88 | 92.41 |
| Gm50253 | 4.88 | 4.75 | 17.34 | 24.46 |
| Gm10644 | 46.79 | 32.56 | 74.67 | 80.71 |
| Nlgn2 | 5.33 | 8.94 | 27.90 | 39.34 |
| Aldh1l2 | 24.25 | 14.82 | 40.83 | 46.01 |
| Gm44250 | 32.05 | 33.11 | 80.70 | 84.67 |
| Lcn2 | 3.99 | 5.14 | 2.36 | 49.92 |
| Pglyrp2 | 872.99 | 862.41 | 1650.21 | 1775.18 |