

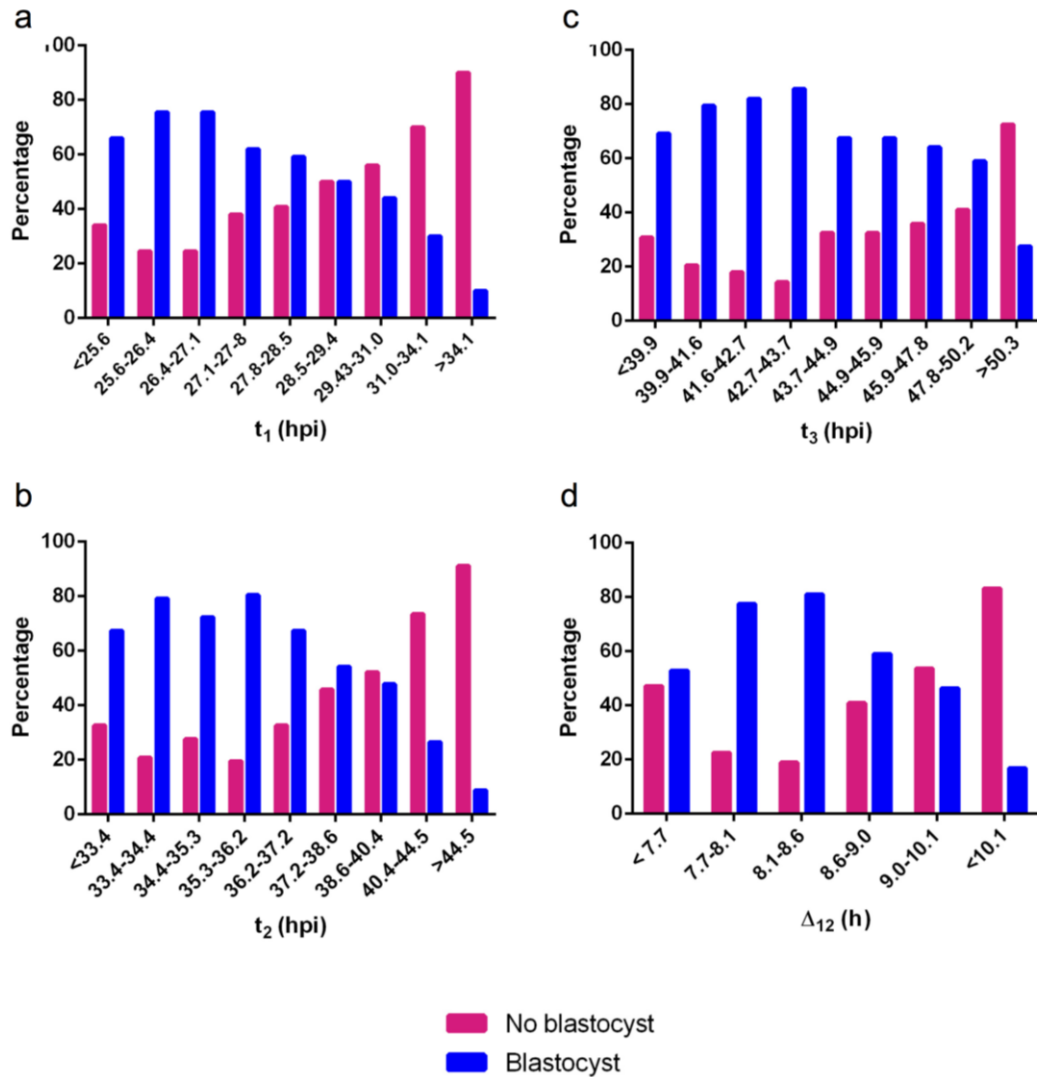
## Supplementary Materials

# Single-cell RNA sequencing reveals developmental heterogeneity of blastomeres during major genome activation in bovine embryos

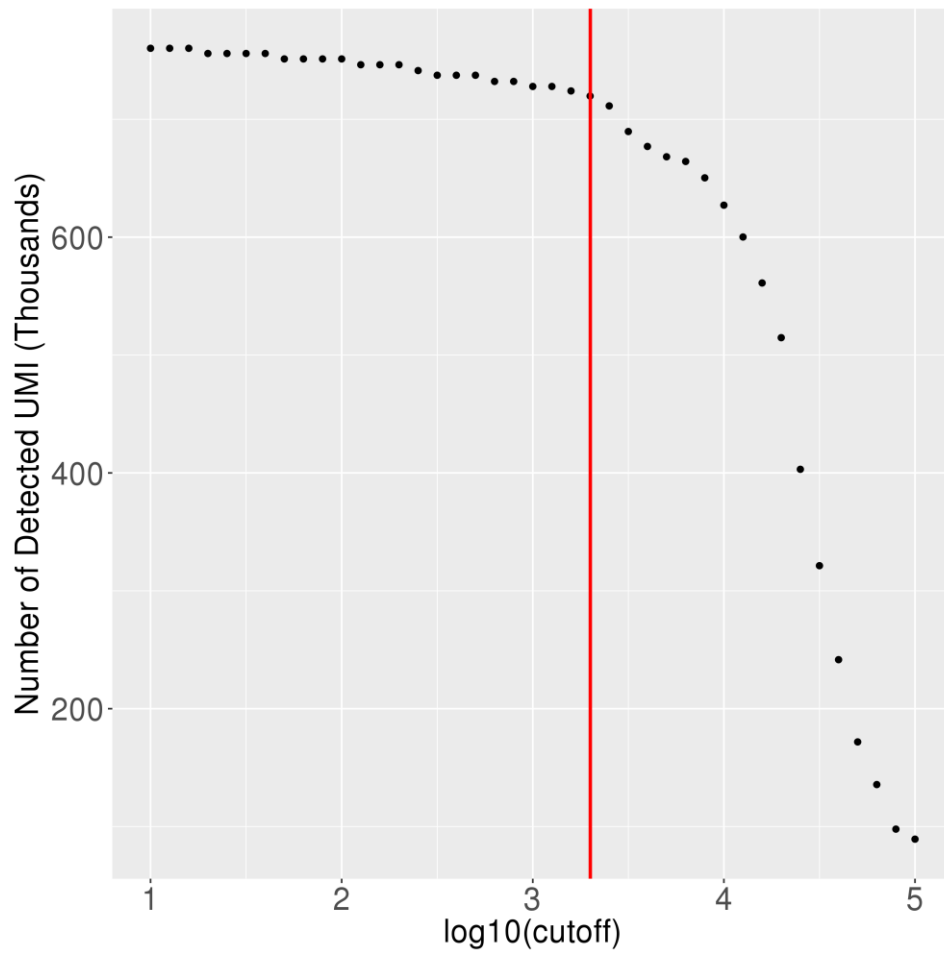
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\*equal contribution

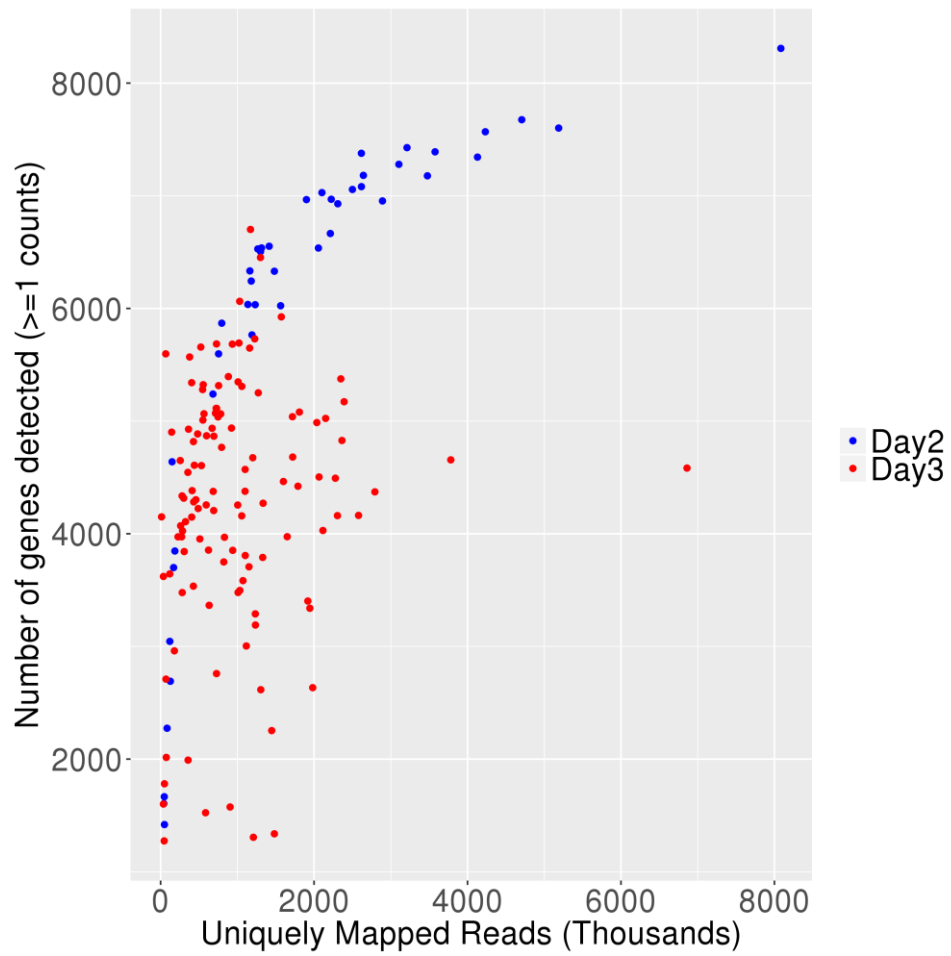
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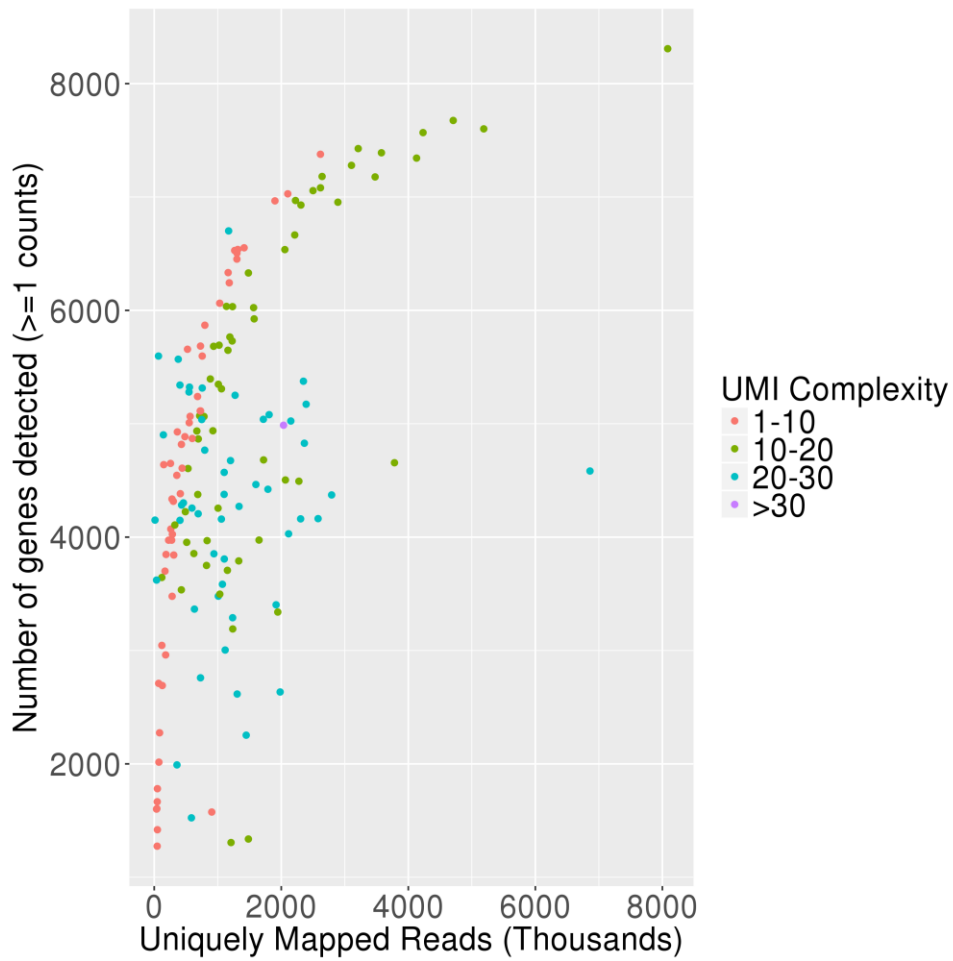
**Supplementary Figure S1.** (a) Early timing of the first cleavage had a positive effect on the blastocyst rate (optimal time range: 25.6-27.1 hpf). (b) Early timing of the second cleavage had a positive effect on the blastocyst rate (optimal time range: 33.4-36.2 hpf). (c) Early timing of the third cleavage had a positive effect on the blastocyst rate (optimal time range: 34.0-43.7 hpf). (d) Very short and very long time between the first and second cleavage had a negative effect on the blastocyst rate (optimal time range: 7.7-8.6 hpf). hpf = hours post fertilization.



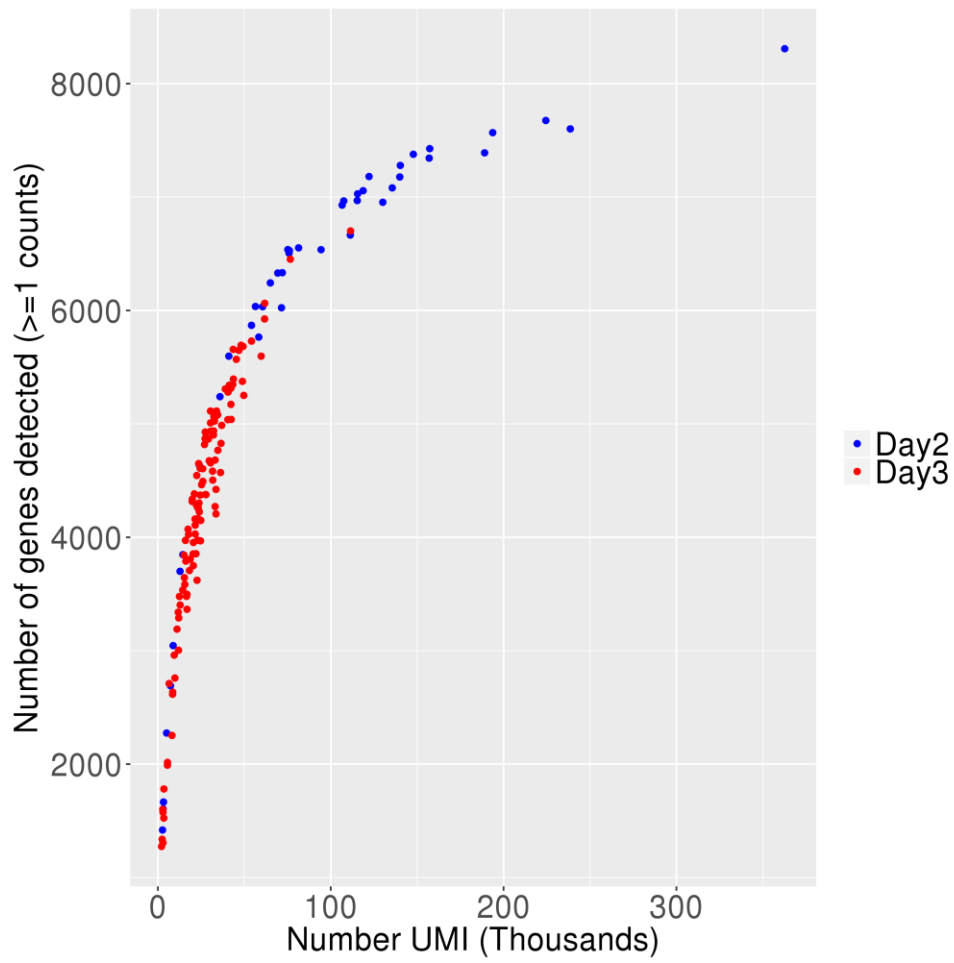
**Supplementary Figure S2.** Sum of the number of UMI counts detected across all cells with respect to the total UMI cut-off. The UMI cut-off is represented in log10 scale. The cut-off was set to 3.4 (~ 2,000 UMI).



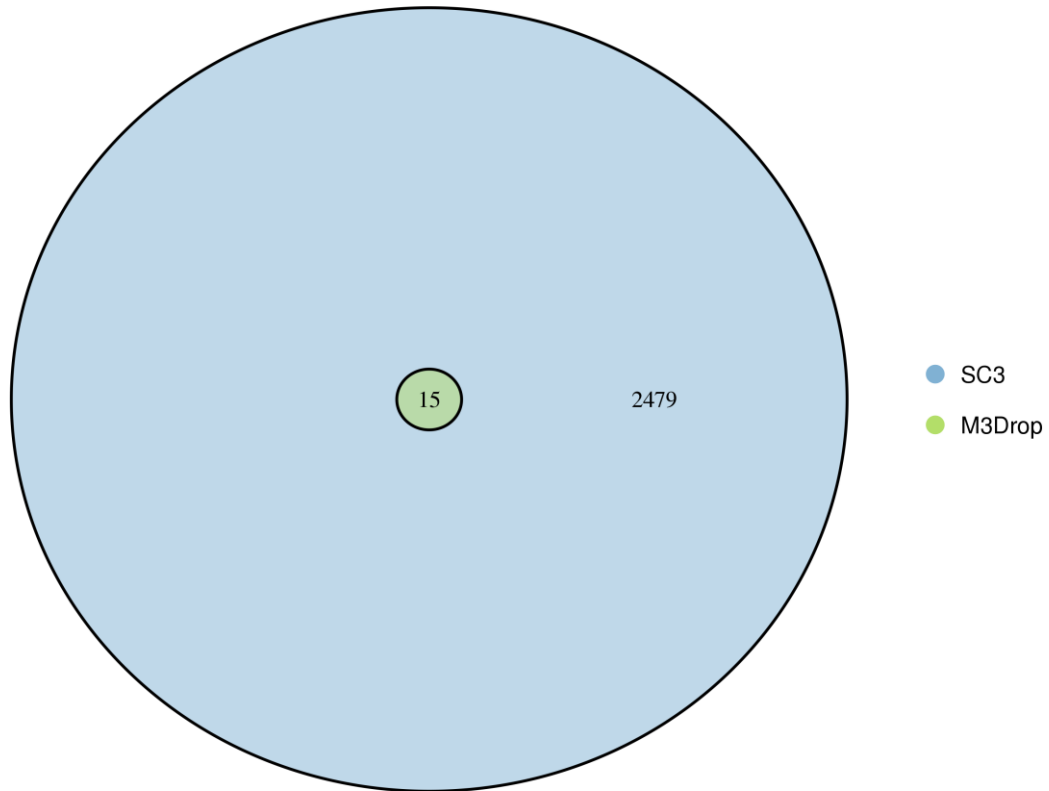
**Supplementary Figure S3.** Saturation Plot. Number of uniquely mapped reads vs. number of genes with detected transcripts ( $\geq 1$  counts). Data points are represented in blue for cells from Day 2 embryos and in red for cells from Day 3 embryos.



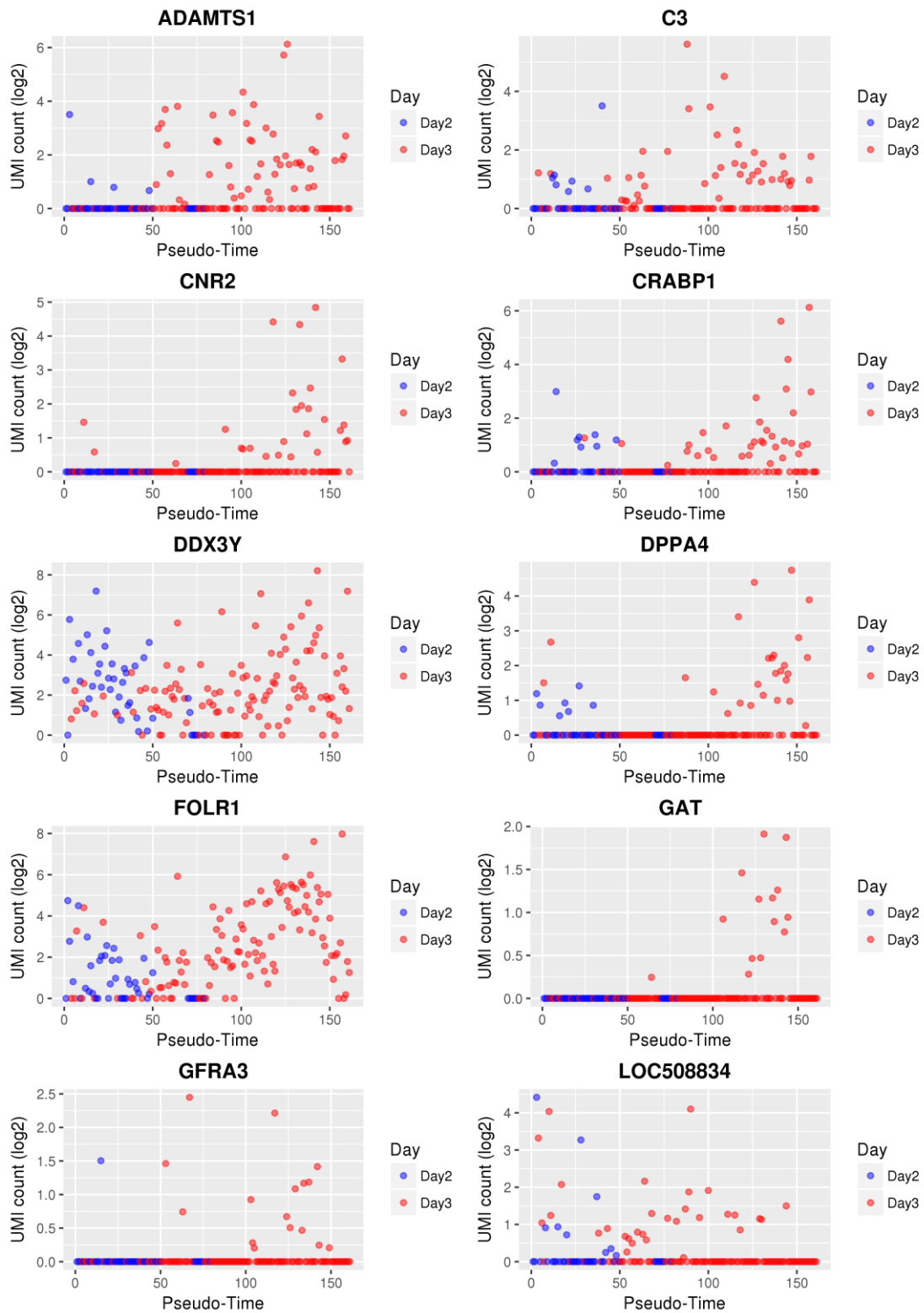
**Supplementary Figure S4.** Saturation Plot. Number of uniquely mapped reads vs. number of genes detected ( $\geq 1$  counts). Data points are represented in different colours according to the UMI complexity. The UMI complexity corresponds to the ratio between all counted molecular identifiers (MIs) and the number of unique molecular identifiers (UMIs).



**Supplementary Figure S5.** Saturation Plot. Number of UMI vs. number of genes with detected transcripts ( $\geq 1$  counts). Data points are represented in blue for cells from Day 2 embryos and in red for cells from Day 3 embryos.

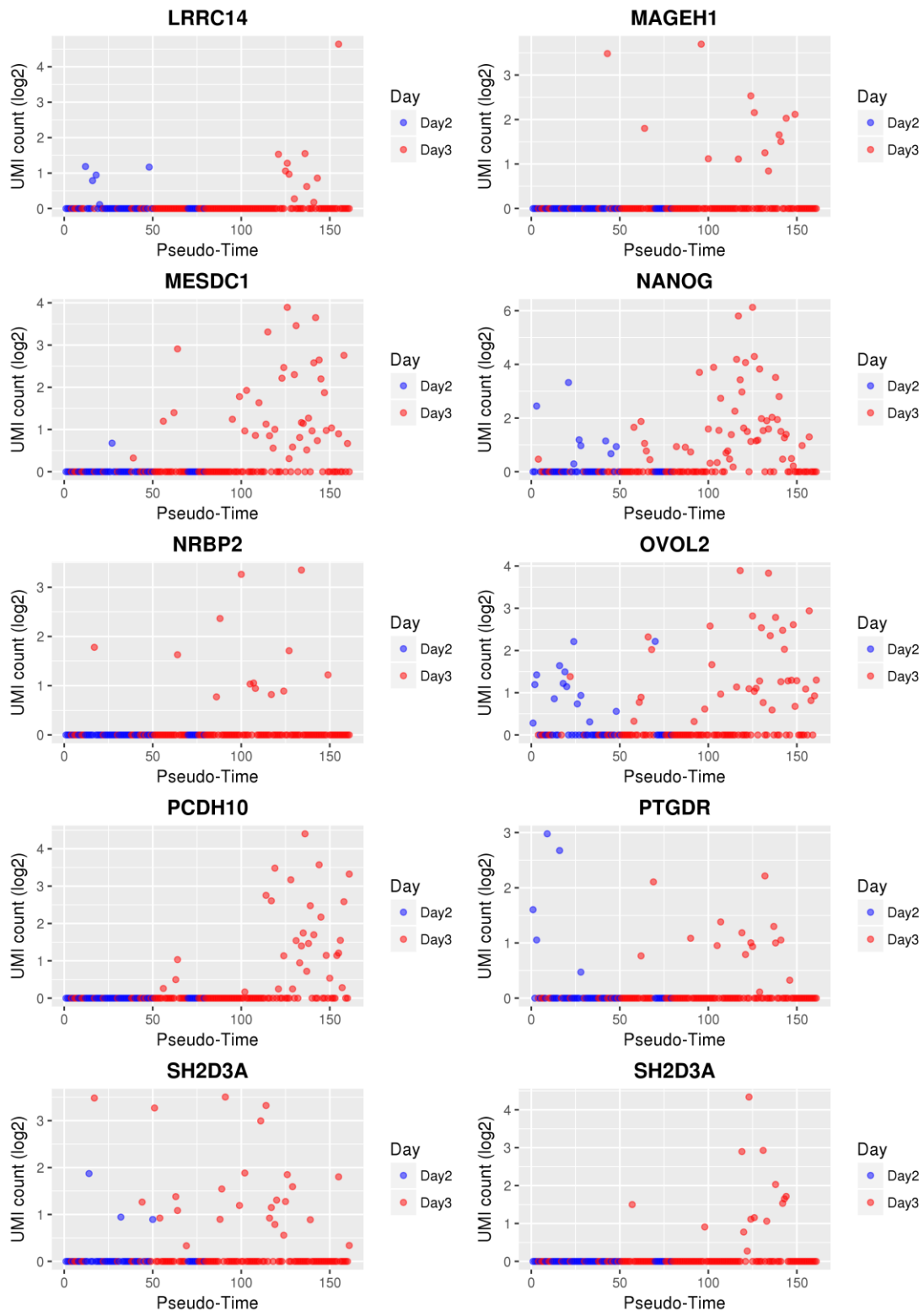


**Supplementary Figure S6.** Venn diagram comparing the 2,494 differentially abundant transcripts (DAT), obtained by using SC3 pipeline, with the 15 genes not affected by drop-outs, obtained by using M3Drop approach.



**Supplementary Figure S7a.** Transcript abundance of the genes first actively transcribed at major embryonic genome activation (EGA). The single cells are aligned according to the pseudo-time line.





**Supplementary Figure S7b.** Transcript abundance of the genes first actively transcribed at major embryonic genome activation (EGA). The single cells are aligned according to the pseudo-time line.

**Supplementary Table S1.** Row count. Information on the count of generated reads, uniquely mapped reads, unique molecular identifiers (UMIs), molecular identifiers (MIs), and detected genes.

| Library Name | No. reads  | % kept reads after filtering | No. uniquely mapped reads | No. UMI | No. genes detected | All UMI   |
|--------------|------------|------------------------------|---------------------------|---------|--------------------|-----------|
| E1.1_p3      | 4.309.219  | 89%                          | 2.617.309                 | 135.584 | 7.081              | 1.529.101 |
| E1.2_p3      | 3.053.922  | 90%                          | 2.056.708                 | 94.401  | 6.536              | 1.207.649 |
| E1.3_p3      | 88.737     | 87%                          | 47.586                    | 3.230   | 1.666              | 23.673    |
| E1.4_p3      | 67.384     | 83%                          | 28.105                    | 1.501   | 997                | 8.783     |
| E1.5_p3      | 80.205     | 85%                          | 41.752                    | 3.019   | 1.605              | 20.148    |
| E1.6_p3      | 548.917    | 88%                          | 186.014                   | 14.445  | 3.847              | 101.070   |
| E1.7_p3      | 7.874.226  | 90%                          | 4.707.109                 | 224.445 | 7.675              | 2.835.856 |
| E14.1_p3     | 12.610.686 | 90%                          | 8.084.065                 | 362.668 | 8.308              | 4.244.672 |
| E14.2_p3     | 249.717    | 86%                          | 120.012                   | 8.800   | 3.045              | 51.591    |
| E14.3_p3     | 3.501.574  | 90%                          | 2.102.756                 | 115.550 | 7.028              | 1.126.286 |
| E14.4_p3     | 2.412.252  | 90%                          | 1.482.867                 | 69.337  | 6.330              | 757.771   |
| E14.5_p3     | 2.577.675  | 91%                          | 1.315.563                 | 75.167  | 6.537              | 698.945   |
| E14.6_p3     | 1.888.132  | 90%                          | 1.232.652                 | 60.590  | 6.033              | 721.484   |
| E14.7_p3     | 3.528.126  | 91%                          | 2.309.520                 | 106.574 | 6.929              | 1.207.219 |
| E14.8_p3     | 4.520.663  | 90%                          | 2.642.867                 | 122.157 | 7.181              | 1.376.819 |
| E14.9_p3     | 352.989    | 88%                          | 169.544                   | 12.803  | 3.700              | 83.270    |
| E16.1_p3     | 6.772.236  | 90%                          | 4.232.149                 | 193.714 | 7.568              | 2.264.002 |
| E16.2_p3     | 4.167.351  | 89%                          | 2.500.150                 | 118.750 | 7.056              | 1.350.425 |
| E16.3_p3     | 40.178     | 78%                          | 17.930                    | 615     | 481                | 2.413     |
| E16.4_p3     | 2.649.490  | 90%                          | 1.266.674                 | 76.074  | 6.528              | 667.004   |
| E16.5_p3     | 17.830     | 85%                          | 9.177                     | 52      | 48                 | 141       |
| E16.6_p3     | 3.612.133  | 91%                          | 2.224.111                 | 115.331 | 6.969              | 1.225.211 |
| E16.7_p3     | 4.679.685  | 90%                          | 2.616.788                 | 147.803 | 7.377              | 1.363.480 |
| E16.8_p3     | 2.357.782  | 90%                          | 1.302.557                 | 75.886  | 6.505              | 691.882   |
| E16.9_p3     | 1.241.578  | 89%                          | 755.650                   | 41.019  | 5.597              | 400.440   |
| E11.1_p3     | 1.367.911  | 88%                          | 796.982                   | 54.145  | 5.869              | 440.236   |
| E11.2_p3     | 3.483.479  | 91%                          | 2.212.214                 | 111.307 | 6.665              | 1.278.410 |
| E11.3_p3     | 1.834.149  | 90%                          | 1.190.849                 | 58.345  | 5.765              | 655.806   |
| E11.4_p3     | 8.352.228  | 90%                          | 5.188.133                 | 238.601 | 7.601              | 3.000.471 |
| E11.5_p3     | 4.364.058  | 90%                          | 2.891.704                 | 130.121 | 6.954              | 1.642.287 |
| E11.6_p3     | 31.107     | 85%                          | 18.447                    | 261     | 216                | 1.045     |
| E11.7_p3     | 100.289    | 84%                          | 50.032                    | 2.666   | 1.419              | 15.293    |
| E11.8_p3     | 2.392.645  | 90%                          | 1.564.471                 | 71.512  | 6.024              | 848.358   |
| E14.1_p2     | 5.423.343  | 90%                          | 3.577.154                 | 189.025 | 7.390              | 2.006.453 |
| E14.2_p2     | 5.278.511  | 89%                          | 3.211.369                 | 157.273 | 7.427              | 1.725.599 |
| E14.3_p2     | 1.752.728  | 90%                          | 1.137.290                 | 56.431  | 6.035              | 589.384   |
| E14.4_p2     | 1.803.850  | 90%                          | 1.163.582                 | 71.983  | 6.333              | 601.206   |
| E14.5_p2     | 1.861.393  | 89%                          | 1.181.417                 | 65.054  | 6.243              | 613.073   |
| E14.6_p2     | 4.584.879  | 89%                          | 3.105.469                 | 140.255 | 7.279              | 1.667.861 |
| E14.7_p2     | 2.986.164  | 90%                          | 1.900.664                 | 107.522 | 6.966              | 1.060.522 |
| E14.8_p2     | 210.133    | 90%                          | 84.180                    | 5.029   | 2.274              | 14.808    |
| E15.1_p2     | 388.988    | 82%                          | 149.687                   | 23.892  | 4.639              | 62.059    |
| E15.2_p2     | 6.540.522  | 91%                          | 4.130.170                 | 156.960 | 7.343              | 2.348.421 |

|           |           |     |           |         |       |           |
|-----------|-----------|-----|-----------|---------|-------|-----------|
| E15.3_p2  | 5.306.400 | 90% | 3.477.480 | 139.949 | 7.177 | 1.977.386 |
| E15.4_p2  | 232.592   | 88% | 126.840   | 7.275   | 2.691 | 59.799    |
| E15.5_p2  | 1.087.197 | 90% | 682.145   | 35.909  | 5.240 | 358.261   |
| E15.6_p2  | 2.140.465 | 90% | 1.415.147 | 81.403  | 6.552 | 812.163   |
| E2.1_p1   | 2.017.591 | 91% | 1.301.448 | 76.616  | 6.452 | 698.734   |
| E2.2_p1   | 1.438.567 | 91% | 1.009.960 | 43.309  | 5.348 | 585.032   |
| E2.3_p1   | 1.530.360 | 91% | 1.021.546 | 48.109  | 5.693 | 549.746   |
| E2.4_p1   | 2.394.571 | 89% | 1.573.168 | 61.729  | 5.925 | 908.156   |
| E2.5_p1   | 1.194.954 | 91% | 715.114   | 33.663  | 5.070 | 372.875   |
| E2.6_p1   | 1.041.759 | 91% | 693.928   | 29.184  | 4.866 | 360.359   |
| E2.7_p1   | 1.349.760 | 90% | 934.746   | 49.264  | 5.683 | 500.989   |
| E2.8_p1   | 7.580     | 77% | 3.600     | 131     | 106   | 462       |
| E2.9_p1   | 1.687.878 | 90% | 1.030.766 | 61.780  | 6.063 | 527.843   |
| E2.10_p1  | 1.806.208 | 91% | 1.160.519 | 46.836  | 5.648 | 611.734   |
| E2.11_p1  | 1.785.101 | 90% | 1.226.962 | 54.151  | 5.730 | 705.344   |
| E2.12_p1  | 87.483    | 88% | 46.516    | 2.101   | 1.274 | 19.796    |
| E2.13_p1  | 870.011   | 89% | 532.522   | 25.916  | 4.605 | 272.246   |
| E2.14_p1  | 1.394.605 | 90% | 883.201   | 43.669  | 5.395 | 490.327   |
| E2.15_p1  | 1.232.789 | 91% | 783.593   | 32.377  | 5.064 | 394.694   |
| E3.1_p1   | 484.659   | 88% | 301.101   | 19.806  | 4.316 | 143.636   |
| E3.2_p1   | 856.134   | 89% | 410.829   | 21.090  | 4.383 | 173.911   |
| E3.3_p1   | 63.987    | 88% | 36.701    | 2.794   | 1.601 | 10.888    |
| E3.4_p1   | 80.521    | 90% | 11.188    | 17      | 15    | 18        |
| E3.5_p1   | 845.288   | 88% | 482.586   | 27.858  | 4.886 | 212.247   |
| E3.6_p1   | 1.553.963 | 89% | 1.058.614 | 38.977  | 5.308 | 459.240   |
| E3.7_p1   | 620.395   | 89% | 427.105   | 14.349  | 3.535 | 149.818   |
| E3.8_p1   | 528.305   | 88% | 307.432   | 15.121  | 3.842 | 143.592   |
| E3.9_p1   | 426.958   | 87% | 281.918   | 12.473  | 3.478 | 117.755   |
| E3.10_p1  | 1.237.362 | 89% | 729.772   | 30.439  | 5.113 | 256.207   |
| E3.11_p1  | 742.877   | 89% | 439.513   | 24.431  | 4.608 | 187.921   |
| E3.12_p1  | 448.514   | 89% | 261.059   | 17.415  | 4.071 | 120.318   |
| E3.13_p1  | 989.028   | 90% | 598.738   | 27.275  | 4.870 | 213.488   |
| E3.14_p1  | 525.728   | 89% | 279.837   | 19.880  | 4.336 | 112.326   |
| E3.15_p1  | 44.312    | 86% | 22.804    | 1.608   | 1.100 | 4.095     |
| E3.16_p1  | 721.139   | 90% | 363.933   | 27.384  | 4.928 | 134.324   |
| E10.1_p1  | 678.898   | 91% | 428.182   | 26.960  | 4.818 | 189.882   |
| E10.2_p1  | 135.710   | 86% | 69.621    | 6.504   | 2.710 | 29.734    |
| E10.3_p1  | 450.136   | 90% | 274.323   | 15.936  | 3.973 | 126.464   |
| E10.4_p1  | 872.973   | 90% | 523.998   | 43.565  | 5.657 | 230.927   |
| E10.5_p1  | 456.202   | 90% | 285.617   | 17.719  | 4.025 | 149.398   |
| E10.6_p1  | 381.453   | 91% | 226.686   | 15.954  | 3.973 | 100.629   |
| E10.7_p1  | 934.996   | 90% | 551.167   | 30.459  | 5.009 | 250.204   |
| E10.8_p1  | 855.873   | 91% | 565.245   | 32.500  | 5.065 | 255.466   |
| E10.9_p1  | 603.654   | 90% | 355.595   | 22.487  | 4.545 | 152.345   |
| E10.10_p1 | 1.159.038 | 90% | 728.391   | 48.477  | 5.685 | 326.292   |
| E10.11_p1 | 276.785   | 89% | 179.612   | 9.443   | 2.961 | 85.648    |
| E10.12_p1 | 1.115.059 | 90% | 723.902   | 33.903  | 5.113 | 314.641   |

|           |           |     |           |         |       |           |
|-----------|-----------|-----|-----------|---------|-------|-----------|
| E10.13_p1 | 711.883   | 91% | 489.964   | 23.969  | 4.224 | 267.040   |
| E10.14_p1 | 540.288   | 89% | 256.378   | 23.578  | 4.650 | 98.472    |
| E10.15_p1 | 1.055.395 | 90% | 671.050   | 30.536  | 4.936 | 307.538   |
| E10.16_p1 | 504.032   | 88% | 73.522    | 5.543   | 2.015 | 29.192    |
| E16.1_p1  | 978.007   | 87% | 633.021   | 16.849  | 3.365 | 357.514   |
| E16.2_p1  | 263.699   | 92% | 50.136    | 3.472   | 1.781 | 19.789    |
| E16.3_p1  | 1.962.716 | 91% | 1.005.093 | 23.364  | 4.255 | 432.581   |
| E16.4_p1  | 3.551.203 | 90% | 2.348.935 | 48.907  | 5.375 | 1.138.934 |
| E16.5_p1  | 1.730.919 | 91% | 1.057.360 | 23.695  | 4.159 | 528.138   |
| E16.6_p1  | 2.057.572 | 88% | 1.100.607 | 27.582  | 4.377 | 576.931   |
| E16.7_p1  | 1.410.131 | 90% | 823.233   | 20.479  | 3.750 | 393.791   |
| E16.8_p1  | 1.547.770 | 89% | 1.009.226 | 16.546  | 3.479 | 346.615   |
| E16.9_p1  | 3.278.847 | 89% | 2.115.466 | 21.560  | 4.029 | 499.113   |
| E16.10_p1 | 2.353.477 | 91% | 1.273.060 | 49.694  | 5.251 | 1.101.034 |
| E16.11_p1 | 5.352.561 | 91% | 3.782.308 | 30.466  | 4.656 | 592.325   |
| E16.12_p1 | 126.296   | 88% | 66.982    | 59.744  | 5.597 | 1.657.147 |
| E16.13_p1 | 2.547.637 | 92% | 1.482.645 | 2.454   | 1.337 | 31.906    |
| E6.1_p3   | 3.313.306 | 92% | 2.150.788 | 32.716  | 5.024 | 823.510   |
| E6.2_p3   | 583.519   | 90% | 378.301   | 45.381  | 5.569 | 1.169.480 |
| E6.3_p3   | 2.100.105 | 91% | 1.305.781 | 8.492   | 2.616 | 188.154   |
| E6.4_p3   | 2.479.727 | 92% | 1.600.455 | 25.255  | 4.464 | 685.815   |
| E6.5_p3   | 3.079.072 | 92% | 1.808.938 | 34.583  | 5.080 | 847.247   |
| E6.6_p3   | 630.145   | 90% | 404.914   | 41.288  | 5.341 | 975.402   |
| E6.7_p3   | 2.961.826 | 92% | 1.982.352 | 8.565   | 2.634 | 200.862   |
| E6.8_p3   | 1.062.727 | 91% | 555.389   | 41.374  | 5.323 | 1.109.401 |
| E6.9_p3   | 2.657.791 | 91% | 1.330.700 | 16.169  | 3.790 | 281.977   |
| E6.10_p3  | 230.403   | 90% | 144.143   | 32.160  | 4.902 | 724.045   |
| E6.11_p3  | 915.062   | 90% | 585.769   | 3.418   | 1.524 | 70.076    |
| E6.12_p3  | 202.696   | 89% | 119.715   | 15.307  | 3.644 | 305.049   |
| E6.13_p3  | 1.824.904 | 92% | 1.209.171 | 2.924   | 1.306 | 53.800    |
| E6.14_p3  | 1.063.553 | 91% | 431.226   | 22.301  | 4.283 | 600.025   |
| E6.15_p3  | 2.859.582 | 91% | 1.945.259 | 11.750  | 3.339 | 226.671   |
| E6.16_p3  | 1.050.413 | 91% | 547.533   | 40.572  | 5.280 | 1.087.451 |
| E6.17_p3  | 2.078.362 | 91% | 1.234.388 | 12.049  | 3.289 | 275.806   |
| E13.1_p3  | 972.669   | 90% | 594.197   | 23.187  | 4.256 | 582.905   |
| E13.2_p3  | 2.951.080 | 92% | 1.918.743 | 12.871  | 3.403 | 283.369   |
| E13.3_p3  | 2.013.883 | 90% | 1.201.116 | 29.662  | 4.675 | 772.380   |
| E13.4_p3  | 3.617.751 | 91% | 2.579.678 | 22.733  | 4.163 | 558.663   |
| E13.5_p3  | 2.372.234 | 91% | 1.718.379 | 42.413  | 5.039 | 1.240.214 |
| E13.6_p3  | 681.274   | 90% | 405.259   | 24.742  | 4.148 | 705.386   |
| E13.7_p3  | 1.762.899 | 89% | 1.236.018 | 11.054  | 3.190 | 190.909   |
| E13.8_p3  | 4.024.786 | 91% | 2.792.992 | 24.503  | 4.372 | 576.064   |
| E13.9_p3  | 3.348.857 | 91% | 2.391.799 | 42.248  | 5.172 | 1.226.338 |
| E13.10_p3 | 3.211.189 | 91% | 2.363.796 | 36.518  | 4.828 | 1.083.887 |
| E13.11_p3 | 3.114.785 | 92% | 2.035.993 | 36.888  | 4.987 | 1.142.351 |
| E13.12_p3 | 9.530.527 | 91% | 6.860.570 | 31.623  | 4.583 | 925.047   |
| E13.13_p3 | 1.673.906 | 90% | 1.171.403 | 111.463 | 6.701 | 3.310.101 |

|           |           |     |           |        |       |           |
|-----------|-----------|-----|-----------|--------|-------|-----------|
| E13.14_p3 | 1.527.381 | 91% | 940.115   | 20.368 | 3.853 | 570.780   |
| E6.1_p2   | 458.157   | 90% | 324.448   | 21.557 | 4.107 | 418.933   |
| E6.2_p2   | 544.509   | 87% | 358.015   | 5.513  | 1.991 | 142.990   |
| E6.3_p2   | 2.156.427 | 90% | 1.448.085 | 8.154  | 2.253 | 177.198   |
| E6.4_p2   | 19.459    | 85% | 12.502    | 24.784 | 4.150 | 604.287   |
| E6.5_p2   | 1.820.218 | 89% | 1.131.162 | 209    | 165   | 3.544     |
| E6.6_p2   | 711.367   | 89% | 459.833   | 23.777 | 4.302 | 534.044   |
| E6.7_p2   | 1.059.032 | 90% | 728.727   | 9.834  | 2.759 | 210.865   |
| E6.8_p2   | 1.753.787 | 89% | 1.116.952 | 11.908 | 3.004 | 338.414   |
| E6.9_p2   | 1.400.226 | 89% | 923.803   | 32.188 | 4.938 | 498.505   |
| E6.10_p2  | 1.798.549 | 90% | 1.103.207 | 18.695 | 3.807 | 431.391   |
| E6.11_p2  | 3.138.766 | 91% | 2.277.734 | 26.017 | 4.493 | 448.929   |
| E6.12_p2  | 1.176.448 | 89% | 795.060   | 34.686 | 4.767 | 1.033.905 |
| E6.13_p2  | 1.810.894 | 89% | 1.073.477 | 15.574 | 3.584 | 386.426   |
| E6.14_p2  | 3.535.062 | 89% | 2.304.901 | 21.489 | 4.161 | 519.083   |
| E6.15_p2  | 1.272.423 | 88% | 755.965   | 42.258 | 5.315 | 914.185   |
| E6.16_p2  | 1.082.173 | 87% | 624.189   | 22.028 | 3.855 | 409.371   |
| E7.1_p2   | 1.587.929 | 89% | 1.032.524 | 16.790 | 3.497 | 322.032   |
| E7.2_p2   | 1.485.246 | 87% | 832.310   | 24.650 | 3.969 | 480.199   |
| E7.3_p2   | 60.025    | 85% | 36.780    | 22.632 | 3.621 | 469.965   |
| E7.4_p2   | 268.611   | 89% | 55.051    | 958    | 614   | 14.859    |
| E7.5_p2   | 1.448.848 | 87% | 905.615   | 2.928  | 1.575 | 18.495    |
| E7.6_p2   | 2.578.354 | 89% | 1.650.081 | 23.001 | 3.974 | 430.839   |
| E7.7_p2   | 2.994.008 | 89% | 1.790.120 | 33.598 | 4.422 | 755.616   |
| E7.8_p2   | 2.337.832 | 88% | 1.335.756 | 33.096 | 4.271 | 765.655   |
| E7.9_p2   | 1.088.741 | 87% | 692.077   | 33.586 | 4.206 | 745.095   |
| E7.10_p2  | 841.510   | 86% | 511.576   | 20.540 | 3.954 | 308.329   |
| E7.11_p2  | 1.778.504 | 89% | 1.152.046 | 18.256 | 3.707 | 254.304   |
| E7.12_p2  | 2.548.699 | 89% | 1.721.453 | 33.107 | 4.681 | 576.902   |
| E7.13_p2  | 1.765.228 | 88% | 1.101.797 | 36.242 | 4.571 | 788.034   |
| E7.14_p2  | 3.000.717 | 90% | 2.065.209 | 31.731 | 4.504 | 565.914   |
| E7.15_p2  | 1.246.208 | 89% | 748.377   | 40.442 | 5.037 | 922.306   |
| E7.16_p2  | 1.163.853 | 90% | 685.734   | 27.805 | 4.376 | 365.664   |

**Supplementary Table S2.** 2,494 genes with significantly ( $p < 0.01$ ) differently abundant transcripts (DAT) identified by using the SC3 pipeline.

| Gene         | sc3_6_markers_clusts | sc3_6_de_padj |
|--------------|----------------------|---------------|
| DUSP1        | 4                    | 3,19163E-17   |
| UCHL1        | 1                    | 3,46226E-15   |
| PYCR2        | 4                    | 3,6645E-15    |
| MRPL17       | 4                    | 3,69048E-15   |
| BTG1         | 4                    | 4,19081E-15   |
| RNF11        | 4                    | 4,49954E-15   |
| XRCC2        | 1                    | 1,48411E-14   |
| SNHG12       | 4                    | 3,15744E-14   |
| LOC100196901 | 4                    | 3,70682E-14   |
| NETO1        | 1                    | 9,00088E-14   |
| PRNP         | 4                    | 1,67764E-13   |
| RPS19        | 4                    | 1,75244E-13   |
| COG2         | 1                    | 1,91013E-13   |
| ZNF2         | 1                    | 2,18468E-13   |
| TFAP2C       | 4                    | 2,65079E-13   |
| RACK1        | 4                    | 2,80186E-13   |
| PIP5K1A      | 4                    | 3,69806E-13   |
| SDS          | 4                    | 3,70259E-13   |
| TRIP4        | 1                    | 4,26628E-13   |
| ITPR1        | 5                    | 5,12539E-13   |
| RUFY2        | 1                    | 6,73613E-13   |
| RABGEF1      | 1                    | 7,47336E-13   |
| ARFGAP3      | 4                    | 7,53523E-13   |
| PRPS1        | 4                    | 7,74517E-13   |
| DYNC2LI1     | 3                    | 8,85953E-13   |
| SLC25A25     | 4                    | 9,1132E-13    |
| TPMT         | 1                    | 9,80319E-13   |
| GALNT13      | 1                    | 1,11108E-12   |
| RPL36AL      | 4                    | 1,13246E-12   |
| VKORC1       | 4                    | 1,64992E-12   |
| NUDT12       | 1                    | 2,08732E-12   |
| ARMT1        | 4                    | 4,39041E-12   |
| PLS1         | 1                    | 4,67168E-12   |
| FOLR1        | 4                    | 5,56843E-12   |
| TKT          | 4                    | 7,98055E-12   |
| AMIGO2       | 4                    | 8,70221E-12   |
| RPL26        | 4                    | 9,06242E-12   |
| HNRNPAB      | 4                    | 9,50205E-12   |
| TSEN54       | 4                    | 9,50988E-12   |
| GRO1         | 5                    | 9,63135E-12   |
| RHEBL1       | 2                    | 1,4103E-11    |
| CCNC         | 4                    | 1,43501E-11   |
| IL18         | 4                    | 1,47224E-11   |
| RPRD1A       | 4                    | 1,66394E-11   |
| DTWD1        | 1                    | 2,19515E-11   |
| PDE6C        | 1                    | 2,33296E-11   |
| COL1A1       | 4                    | 2,6209E-11    |

|             |   |             |
|-------------|---|-------------|
| DDX17       | 4 | 2,71957E-11 |
| MIER2       | 1 | 2,95389E-11 |
| PARP14      | 4 | 3,07252E-11 |
| KDELC1      | 5 | 3,1476E-11  |
| ERICH1      | 4 | 3,15137E-11 |
| TIGAR       | 1 | 3,25596E-11 |
| HAX1        | 4 | 3,4073E-11  |
| LOC782781   | 4 | 4,24316E-11 |
| C1H3orf58   | 4 | 4,78934E-11 |
| PRR5        | 4 | 5,71604E-11 |
| CCDC126     | 4 | 6,09051E-11 |
| C1D         | 4 | 6,4692E-11  |
| C8H9orf64   | 1 | 6,70047E-11 |
| CEPT1       | 1 | 7,40371E-11 |
| ANK3        | 1 | 7,47493E-11 |
| CDV3        | 4 | 8,17086E-11 |
| RASA1       | 1 | 8,61917E-11 |
| PNP         | 4 | 8,78953E-11 |
| DIABLO      | 4 | 1,06967E-10 |
| F3          | 1 | 1,26512E-10 |
| TMEM128     | 1 | 1,43898E-10 |
| SNAPC1      | 4 | 1,47879E-10 |
| SLC35D1     | 1 | 1,49719E-10 |
| DPP4        | 1 | 1,5061E-10  |
| TYW3        | 4 | 1,53583E-10 |
| PSMA4       | 1 | 1,84571E-10 |
| USP13       | 1 | 1,85677E-10 |
| TIMM10B     | 4 | 2,07667E-10 |
| ACAA1       | 1 | 2,09553E-10 |
| ITM2B       | 4 | 2,16148E-10 |
| YTHDF2      | 4 | 2,2118E-10  |
| CREM        | 3 | 2,31335E-10 |
| RSRP1       | 2 | 2,63661E-10 |
| FAM207A     | 4 | 2,6939E-10  |
| DNAJB9      | 4 | 2,79571E-10 |
| INTS12      | 1 | 2,83159E-10 |
| HIST1H2BD   | 4 | 2,85355E-10 |
| TDH         | 4 | 2,98791E-10 |
| SLC33A1     | 4 | 3,39143E-10 |
| C29H11orf84 | 3 | 4,11135E-10 |
| INPP1       | 1 | 4,12673E-10 |
| RAP1A       | 1 | 5,01104E-10 |
| FDPS        | 1 | 5,02972E-10 |
| RWDD1       | 1 | 5,0301E-10  |
| LEPROTL1    | 1 | 5,12055E-10 |
| PPIL1       | 4 | 5,30125E-10 |
| EXOSC1      | 4 | 5,48554E-10 |
| RPS4Y1      | 4 | 6,01448E-10 |
| CEP57L1     | 1 | 6,60645E-10 |
| MPLKIP      | 4 | 6,60696E-10 |

|           |   |             |
|-----------|---|-------------|
| IFT43     | 1 | 6,79212E-10 |
| SNHG3     | 2 | 7,06082E-10 |
| PQBP1     | 1 | 7,46609E-10 |
| XRCC4     | 1 | 8,11396E-10 |
| ZNF197    | 1 | 8,54631E-10 |
| COX7A1    | 3 | 8,63411E-10 |
| ANAPC5    | 1 | 8,71282E-10 |
| ALAS1     | 1 | 8,91176E-10 |
| ENDOV     | 1 | 9,46649E-10 |
| CCDC85A   | 1 | 9,55386E-10 |
| FASTKD3   | 1 | 1,02304E-09 |
| MOB4      | 1 | 1,03737E-09 |
| MYF5      | 1 | 1,26352E-09 |
| RAB27B    | 1 | 1,30194E-09 |
| ZNF75A    | 1 | 1,36245E-09 |
| DGCR8     | 1 | 1,40902E-09 |
| ARF4      | 1 | 1,43948E-09 |
| LARS      | 1 | 1,55185E-09 |
| NFYA      | 5 | 1,68622E-09 |
| ZCCHC10   | 4 | 1,77536E-09 |
| GART      | 4 | 1,89748E-09 |
| MAP4K1    | 3 | 2,06387E-09 |
| DESI2     | 4 | 2,11214E-09 |
| RPS27     | 4 | 2,11679E-09 |
| PDGFRA    | 4 | 2,19896E-09 |
| IMP3      | 4 | 2,26836E-09 |
| CD52      | 1 | 2,29483E-09 |
| ENKD1     | 1 | 2,46527E-09 |
| NOL11     | 4 | 2,6475E-09  |
| PALB2     | 1 | 2,65143E-09 |
| SLC35A3   | 1 | 2,67465E-09 |
| RMDN3     | 1 | 2,81426E-09 |
| ISG20L2   | 4 | 2,92537E-09 |
| FBXL12    | 4 | 3,08325E-09 |
| TBCA      | 1 | 3,11569E-09 |
| ZNF330    | 1 | 3,20866E-09 |
| MTHFD1L   | 4 | 3,24844E-09 |
| TAF1D     | 4 | 3,81957E-09 |
| CKAP5     | 1 | 3,97094E-09 |
| ASZ1      | 1 | 4,07974E-09 |
| MACROD1   | 1 | 4,21481E-09 |
| POLR1C    | 4 | 4,38991E-09 |
| EIF6      | 4 | 4,44851E-09 |
| LGALS3    | 3 | 4,49756E-09 |
| CBX3      | 4 | 4,49799E-09 |
| SPESP1    | 1 | 4,81327E-09 |
| ADI1      | 1 | 5,0669E-09  |
| DCAF8     | 1 | 5,07549E-09 |
| C8H4orf27 | 1 | 5,08988E-09 |
| ZBTB9     | 4 | 5,12411E-09 |



|           |   |             |
|-----------|---|-------------|
| ZFAND2B   | 4 | 5,32943E-09 |
| TFDP2     | 1 | 5,60791E-09 |
| EIF1AD    | 4 | 5,62308E-09 |
| TMEM159   | 3 | 5,71454E-09 |
| NOP16     | 4 | 6,2815E-09  |
| ZNF879    | 1 | 6,31823E-09 |
| CMC2      | 4 | 6,48633E-09 |
| FAM89A    | 4 | 6,76758E-09 |
| TMEM42    | 3 | 6,83483E-09 |
| DSCC1     | 1 | 7,0952E-09  |
| ATF7IP    | 4 | 7,34295E-09 |
| ICA1      | 1 | 7,66567E-09 |
| RCBTB1    | 1 | 7,86037E-09 |
| LXN       | 4 | 8,21383E-09 |
| DEPDC7    | 1 | 8,30102E-09 |
| TGS1      | 4 | 8,40025E-09 |
| PLA2G4A   | 1 | 8,42859E-09 |
| DNAJA4    | 1 | 9,18969E-09 |
| UQCC3     | 4 | 9,20551E-09 |
| RMDN1     | 3 | 9,43449E-09 |
| C3H1orf52 | 4 | 9,61933E-09 |
| NME7      | 1 | 9,94759E-09 |
| GPALPP1   | 1 | 1,00354E-08 |
| GLRX2     | 2 | 1,04394E-08 |
| ADHFE1    | 1 | 1,04959E-08 |
| BORA      | 1 | 1,0629E-08  |
| TCEB2     | 4 | 1,07568E-08 |
| TMEM196   | 1 | 1,0771E-08  |
| ARHGAP24  | 1 | 1,08472E-08 |
| MGAT5     | 1 | 1,12336E-08 |
| PUS7      | 4 | 1,15242E-08 |
| LHX2      | 3 | 1,17527E-08 |
| ZNF266    | 1 | 1,18925E-08 |
| PIR       | 1 | 1,1968E-08  |
| PRDM14    | 4 | 1,19687E-08 |
| TMEM38B   | 1 | 1,21973E-08 |
| RPL38     | 4 | 1,22444E-08 |
| GLT8D1    | 1 | 1,26168E-08 |
| GOLIM4    | 1 | 1,27811E-08 |
| WRAP53    | 4 | 1,29403E-08 |
| VPS45     | 1 | 1,3006E-08  |
| NFU1      | 1 | 1,32353E-08 |
| LARP4     | 4 | 1,32872E-08 |
| COPB2     | 1 | 1,32906E-08 |
| NLRP9     | 1 | 1,36909E-08 |
| PEX5L     | 1 | 1,41165E-08 |
| MFN2      | 1 | 1,46858E-08 |
| LOC530773 | 3 | 1,50399E-08 |
| ING1      | 4 | 1,53541E-08 |
| ABCA1     | 1 | 1,53985E-08 |

|           |   |             |
|-----------|---|-------------|
| TSPAN14   | 1 | 1,54826E-08 |
| BRDT      | 4 | 1,5578E-08  |
| ELP4      | 1 | 1,5696E-08  |
| CLK1      | 4 | 1,59391E-08 |
| GNPDA2    | 1 | 1,60016E-08 |
| CHMP7     | 1 | 1,6118E-08  |
| APBB1IP   | 1 | 1,61675E-08 |
| C2CD5     | 1 | 1,64053E-08 |
| ETV6      | 1 | 1,66813E-08 |
| HIPK3     | 4 | 1,70586E-08 |
| LDHC      | 1 | 1,70614E-08 |
| SNAI1     | 2 | 1,71212E-08 |
| ZNF133    | 1 | 1,92423E-08 |
| BMPR1A    | 1 | 1,92831E-08 |
| BMP4      | 4 | 1,93364E-08 |
| FAM214B   | 4 | 1,95836E-08 |
| CCSER1    | 1 | 1,97239E-08 |
| BET1      | 1 | 1,98614E-08 |
| TTC32     | 1 | 1,98821E-08 |
| IFNGR1    | 1 | 2,01183E-08 |
| RPH3AL    | 1 | 2,1126E-08  |
| FAM175A   | 3 | 2,1706E-08  |
| CLCN3     | 1 | 2,24827E-08 |
| VANGL1    | 3 | 2,34614E-08 |
| LOC538702 | 1 | 2,44114E-08 |
| EFCAB7    | 1 | 2,54399E-08 |
| ITGA4     | 1 | 2,59645E-08 |
| AGPAT5    | 4 | 2,67182E-08 |
| GCDH      | 1 | 2,8028E-08  |
| HEXIM1    | 4 | 2,83701E-08 |
| SAMD12    | 3 | 2,86603E-08 |
| LIMK2     | 1 | 2,90128E-08 |
| GNPNAT1   | 1 | 2,92014E-08 |
| ACOT9     | 1 | 2,97939E-08 |
| CADPS     | 1 | 3,01728E-08 |
| CDKN2C    | 4 | 3,04157E-08 |
| SMIM8     | 1 | 3,12319E-08 |
| MTMR6     | 1 | 3,25492E-08 |
| IPMK      | 4 | 3,35338E-08 |
| TTC14     | 4 | 3,38309E-08 |
| AIFM1     | 1 | 3,39759E-08 |
| NANOG     | 4 | 3,43914E-08 |
| OSTF1     | 1 | 3,4533E-08  |
| GMPPA     | 1 | 3,51447E-08 |
| DEF6      | 1 | 3,53058E-08 |
| DHX9      | 4 | 3,69638E-08 |
| PSTPIP1   | 1 | 3,94178E-08 |
| CCNL1     | 5 | 3,96771E-08 |
| HTATIP2   | 1 | 3,97208E-08 |
| SLC27A1   | 4 | 3,97596E-08 |

|            |   |             |
|------------|---|-------------|
| SDF2       | 4 | 3,97883E-08 |
| STK16      | 1 | 4,03451E-08 |
| PRIMPOL    | 1 | 4,19026E-08 |
| SDSL       | 1 | 4,21746E-08 |
| WDR41      | 1 | 4,22941E-08 |
| LIAS       | 1 | 4,42739E-08 |
| TRIM23     | 1 | 4,45806E-08 |
| RNF144B    | 1 | 4,51131E-08 |
| EXOC6      | 1 | 4,56677E-08 |
| VPS16      | 1 | 4,63143E-08 |
| LPPR1      | 1 | 4,63236E-08 |
| DISP3      | 1 | 4,65133E-08 |
| NDUFC1     | 1 | 4,68752E-08 |
| KLF3       | 4 | 4,78944E-08 |
| FBXO38     | 1 | 4,90218E-08 |
| MNF1       | 1 | 5,04428E-08 |
| PPM1H      | 1 | 5,1051E-08  |
| ZNF746     | 3 | 5,16426E-08 |
| UACA       | 1 | 5,16845E-08 |
| PBRM1      | 5 | 5,22857E-08 |
| NAA11      | 4 | 5,37618E-08 |
| MAD1L1     | 1 | 5,57693E-08 |
| ECE2       | 4 | 5,60028E-08 |
| TMEM41B    | 4 | 5,72233E-08 |
| AP5S1      | 1 | 5,72836E-08 |
| ABCB7      | 1 | 5,80744E-08 |
| ZNF408     | 4 | 6,27171E-08 |
| CNDP1      | 1 | 6,30996E-08 |
| ARL14EPL   | 3 | 6,64328E-08 |
| SEPT4      | 1 | 6,71677E-08 |
| MED23      | 1 | 6,76048E-08 |
| MRPL42     | 1 | 6,77048E-08 |
| ZWILCH     | 1 | 6,83961E-08 |
| NDUFB2     | 4 | 6,87129E-08 |
| C23H6orf62 | 4 | 6,92059E-08 |
| RAB7B      | 3 | 6,94937E-08 |
| ATXN7L3    | 4 | 7,18276E-08 |
| DAG1       | 3 | 7,19543E-08 |
| GMPS       | 1 | 7,20854E-08 |
| GOPC       | 1 | 7,27207E-08 |
| PICK1      | 1 | 7,46989E-08 |
| ZSCAN12    | 1 | 7,50106E-08 |
| MKLN1      | 1 | 7,5481E-08  |
| NFXL1      | 1 | 7,81534E-08 |
| MKRN1      | 4 | 7,82952E-08 |
| SLC1A1     | 1 | 7,92608E-08 |
| OXSM       | 3 | 8,05007E-08 |
| AACS       | 3 | 8,29841E-08 |
| CXCL3      | 5 | 8,31593E-08 |
| MT3        | 3 | 8,35287E-08 |

|            |   |             |
|------------|---|-------------|
| PHF5A      | 4 | 8,82837E-08 |
| LIPE       | 1 | 8,86413E-08 |
| MGA        | 4 | 8,86413E-08 |
| GNB5       | 1 | 9,12954E-08 |
| ANAPC13    | 1 | 9,31696E-08 |
| KRR1       | 4 | 9,33508E-08 |
| NNT        | 3 | 9,34465E-08 |
| HACL1      | 1 | 9,87804E-08 |
| BRF2       | 4 | 1,00833E-07 |
| CDKAL1     | 1 | 1,02613E-07 |
| RAB3IP     | 1 | 1,03452E-07 |
| KCTD20     | 4 | 1,07114E-07 |
| ME1        | 1 | 1,08382E-07 |
| SNHG4      | 4 | 1,11707E-07 |
| CCDC86     | 4 | 1,11941E-07 |
| PSMA1      | 4 | 1,12878E-07 |
| MPHOSPH6   | 1 | 1,15002E-07 |
| MCFD2      | 1 | 1,21147E-07 |
| KLF5       | 4 | 1,22365E-07 |
| GADD45GIP1 | 1 | 1,25923E-07 |
| RANBP2     | 4 | 1,29326E-07 |
| C4H7orf57  | 1 | 1,29667E-07 |
| SLC6A20    | 3 | 1,32324E-07 |
| JUP        | 4 | 1,34127E-07 |
| MED4       | 1 | 1,34988E-07 |
| HUWE1      | 4 | 1,35782E-07 |
| G3BP2      | 5 | 1,36603E-07 |
| UBASH3B    | 1 | 1,42506E-07 |
| MRPL38     | 1 | 1,42532E-07 |
| UCK2       | 4 | 1,49289E-07 |
| MCPH1      | 1 | 1,49296E-07 |
| NQO1       | 1 | 1,49438E-07 |
| DPH5       | 1 | 1,50008E-07 |
| DAPL1      | 1 | 1,50798E-07 |
| HERC3      | 1 | 1,5363E-07  |
| SLC25A51   | 1 | 1,55429E-07 |
| EGR4       | 1 | 1,55772E-07 |
| MTMR1      | 1 | 1,56745E-07 |
| ATP9B      | 1 | 1,56827E-07 |
| IMPACT     | 4 | 1,56827E-07 |
| ASPSCR1    | 1 | 1,58179E-07 |
| SNRPB      | 4 | 1,58989E-07 |
| SESTD1     | 1 | 1,60745E-07 |
| CD3G       | 1 | 1,61182E-07 |
| CBX1       | 1 | 1,62879E-07 |
| MNS1       | 1 | 1,63357E-07 |
| TFCP2      | 1 | 1,64009E-07 |
| THEM4      | 1 | 1,64507E-07 |
| CEP120     | 1 | 1,66286E-07 |
| GJA4       | 1 | 1,66949E-07 |

|            |   |             |
|------------|---|-------------|
| STK25      | 1 | 1,69647E-07 |
| CCDC172    | 1 | 1,6992E-07  |
| CCNL2      | 4 | 1,71981E-07 |
| RPS9       | 4 | 1,72533E-07 |
| VIMP       | 4 | 1,73295E-07 |
| NLRP5      | 1 | 1,77011E-07 |
| CERS3      | 3 | 1,81777E-07 |
| LYPLAL1    | 1 | 1,82473E-07 |
| C3H1orf228 | 1 | 1,85123E-07 |
| BBS2       | 1 | 1,8914E-07  |
| RAB31      | 1 | 1,89575E-07 |
| LRRC8C     | 1 | 1,93125E-07 |
| FAM216A    | 1 | 1,98055E-07 |
| COTL1      | 4 | 1,98418E-07 |
| THBS4      | 1 | 1,99177E-07 |
| ZMAT5      | 4 | 2,00116E-07 |
| PSMD5      | 1 | 2,00679E-07 |
| LRRC1      | 1 | 2,1202E-07  |
| PTTG1IP    | 1 | 2,18208E-07 |
| MKRN2      | 1 | 2,18309E-07 |
| DPYSL2     | 4 | 2,18671E-07 |
| ANKRD16    | 1 | 2,19575E-07 |
| CRLS1      | 1 | 2,20763E-07 |
| IPO7       | 4 | 2,20763E-07 |
| FRA10AC1   | 1 | 2,21084E-07 |
| VDAC3      | 3 | 2,27973E-07 |
| NDEL1      | 1 | 2,30481E-07 |
| MAPK1      | 1 | 2,30587E-07 |
| GPR158     | 1 | 2,3126E-07  |
| SCO1       | 4 | 2,31621E-07 |
| SMAD1      | 1 | 2,33137E-07 |
| EWSR1      | 4 | 2,33579E-07 |
| EEF2KMT    | 3 | 2,33919E-07 |
| LRRC40     | 4 | 2,34432E-07 |
| PGM2L1     | 1 | 2,35481E-07 |
| PRKCH      | 1 | 2,35718E-07 |
| PRICKLE1   | 1 | 2,38277E-07 |
| PRDM6      | 1 | 2,44217E-07 |
| GRHPR      | 1 | 2,44862E-07 |
| TMEM223    | 4 | 2,47354E-07 |
| CUTC       | 1 | 2,47526E-07 |
| KIAA0922   | 1 | 2,50076E-07 |
| PITX2      | 4 | 2,52829E-07 |
| TEX261     | 3 | 2,56322E-07 |
| DIAPH2     | 1 | 2,58336E-07 |
| WDR34      | 1 | 2,66635E-07 |
| RPL10A     | 4 | 2,66934E-07 |
| STK39      | 1 | 2,73831E-07 |
| PRPS2      | 1 | 2,76999E-07 |
| DNA2       | 1 | 2,83878E-07 |

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| KLF10    | 4 | 2,92507E-07 |
| PRDX5    | 1 | 2,92876E-07 |
| MTG1     | 1 | 2,98026E-07 |
| MYO6     | 1 | 3,02371E-07 |
| IQCC     | 1 | 3,0306E-07  |
| NKAPL    | 4 | 3,044E-07   |
| VAT1     | 1 | 3,05004E-07 |
| DNMBP    | 1 | 3,07444E-07 |
| LMO1     | 1 | 3,35397E-07 |
| ZNF296   | 2 | 3,40946E-07 |
| CMTM8    | 1 | 3,45163E-07 |
| SLC4A4   | 1 | 3,45667E-07 |
| HPS3     | 1 | 3,49231E-07 |
| PPM1K    | 4 | 3,78709E-07 |
| NUP37    | 1 | 3,81705E-07 |
| ZNF345   | 1 | 3,82427E-07 |
| COLEC12  | 1 | 3,85007E-07 |
| RPS29    | 4 | 3,94228E-07 |
| CDK1     | 4 | 3,94532E-07 |
| WDR55    | 4 | 3,94541E-07 |
| RALYL    | 1 | 3,96782E-07 |
| METTL12  | 4 | 3,99785E-07 |
| MRPL43   | 3 | 4,00801E-07 |
| TNFSF12  | 3 | 4,02026E-07 |
| PAXBP1   | 4 | 4,11458E-07 |
| MRPL14   | 1 | 4,141E-07   |
| GABPB1   | 1 | 4,17339E-07 |
| CDK20    | 2 | 4,17835E-07 |
| PHLDB1   | 1 | 4,2678E-07  |
| PSMG1    | 1 | 4,30733E-07 |
| MTMR3    | 1 | 4,315E-07   |
| VWA9     | 1 | 4,33378E-07 |
| NIPA2    | 4 | 4,39402E-07 |
| MAP4K5   | 1 | 4,47833E-07 |
| CNN2     | 3 | 4,60029E-07 |
| SCP2     | 1 | 4,65729E-07 |
| LSS      | 5 | 4,71869E-07 |
| PARP1    | 1 | 4,75091E-07 |
| HTRA2    | 1 | 4,79654E-07 |
| PTGR2    | 1 | 4,96511E-07 |
| PTGFR    | 4 | 5,0203E-07  |
| OTUD7B   | 1 | 5,04926E-07 |
| TMEM150A | 3 | 5,06519E-07 |
| TTK      | 1 | 5,07875E-07 |
| CAD      | 4 | 5,08804E-07 |
| TXNIP    | 1 | 5,1631E-07  |
| NCBP2    | 4 | 5,17707E-07 |
| LHFPL4   | 1 | 5,17797E-07 |
| SYNRG    | 1 | 5,18043E-07 |
| MCM5     | 1 | 5,23965E-07 |

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| PLEKHO1      | 1 | 5,2718E-07  |
| JMJD6        | 4 | 5,27702E-07 |
| MTFMT        | 1 | 5,28842E-07 |
| CNKSR1       | 3 | 5,31184E-07 |
| TMEM50B      | 1 | 5,64758E-07 |
| TMEM219      | 3 | 5,6551E-07  |
| ZAR1         | 1 | 5,68072E-07 |
| LOC100848703 | 1 | 5,71233E-07 |
| VWF          | 1 | 5,7866E-07  |
| BMPR1B       | 1 | 5,9483E-07  |
| ALG14        | 3 | 6,00511E-07 |
| TRAF3IP1     | 1 | 6,06093E-07 |
| BCKDK        | 1 | 6,12594E-07 |
| RAPGEF4      | 1 | 6,25979E-07 |
| ATIC         | 1 | 6,32902E-07 |
| ZNF395       | 3 | 6,64882E-07 |
| METTL14      | 1 | 6,682E-07   |
| RIC3         | 1 | 6,82601E-07 |
| CLHC1        | 1 | 6,83469E-07 |
| BRI3         | 3 | 6,93051E-07 |
| RIIAD1       | 3 | 6,93933E-07 |
| SUV39H2      | 1 | 7,02516E-07 |
| TBC1D19      | 3 | 7,06088E-07 |
| CEP44        | 1 | 7,13511E-07 |
| BFAR         | 1 | 7,28502E-07 |
| PCDH8        | 4 | 7,31367E-07 |
| SNX2         | 1 | 7,46102E-07 |
| UBASH3A      | 1 | 7,50187E-07 |
| HVCN1        | 1 | 7,60446E-07 |
| CEP41        | 3 | 7,80115E-07 |
| MGC148714    | 3 | 7,81972E-07 |
| MZB1         | 1 | 8,3339E-07  |
| SYNM         | 1 | 8,34288E-07 |
| EBPL         | 1 | 8,44408E-07 |
| FAM213A      | 1 | 8,46266E-07 |
| LCP1         | 3 | 8,47368E-07 |
| KCNJ3        | 1 | 8,63353E-07 |
| TMIGD1       | 1 | 8,70335E-07 |
| ORC4         | 1 | 8,71025E-07 |
| VPS25        | 1 | 8,74117E-07 |
| RPL6         | 4 | 8,87859E-07 |
| SCML2        | 1 | 8,88442E-07 |
| MID1         | 1 | 9,07332E-07 |
| GALK2        | 1 | 9,11876E-07 |
| SPATA22      | 1 | 9,14146E-07 |
| CRIM1        | 1 | 9,59028E-07 |
| PRDX3        | 1 | 9,73771E-07 |
| TMEM266      | 1 | 9,96732E-07 |
| RCOR2        | 3 | 1,00105E-06 |
| C5H12orf66   | 1 | 1,00882E-06 |

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| METTL6   | 1 | 1,08636E-06 |
| TMEM242  | 1 | 1,09852E-06 |
| NRBP1    | 5 | 1,1007E-06  |
| CSRNP2   | 4 | 1,1011E-06  |
| BUB1B    | 1 | 1,10361E-06 |
| FKBP3    | 4 | 1,11614E-06 |
| POLI     | 1 | 1,1225E-06  |
| DNAJC15  | 3 | 1,16074E-06 |
| CYSTM1   | 3 | 1,17542E-06 |
| CROT     | 5 | 1,17551E-06 |
| TMEM50A  | 3 | 1,19121E-06 |
| KCTD3    | 1 | 1,21883E-06 |
| RNASEH2C | 4 | 1,21895E-06 |
| ETS1     | 1 | 1,22399E-06 |
| COQ2     | 1 | 1,23982E-06 |
| B3GALNT2 | 1 | 1,24069E-06 |
| ARPC4    | 1 | 1,24126E-06 |
| GLS2     | 1 | 1,24845E-06 |
| GABPA    | 4 | 1,25357E-06 |
| PLEKHA8  | 1 | 1,26671E-06 |
| SOCS2    | 5 | 1,27634E-06 |
| ABCG5    | 1 | 1,27779E-06 |
| TBCEL    | 1 | 1,27792E-06 |
| ZMYM1    | 4 | 1,30548E-06 |
| EML5     | 1 | 1,30915E-06 |
| ATXN7L1  | 1 | 1,32038E-06 |
| LYRM7    | 1 | 1,33738E-06 |
| UROS     | 1 | 1,348E-06   |
| TDRD7    | 1 | 1,36378E-06 |
| NT5E     | 1 | 1,42406E-06 |
| ZNF548   | 1 | 1,43437E-06 |
| CNPPD1   | 1 | 1,44183E-06 |
| RPL37    | 4 | 1,46989E-06 |
| MOV10    | 1 | 1,47934E-06 |
| PLEKHM3  | 1 | 1,52716E-06 |
| SORBS1   | 1 | 1,53572E-06 |
| NSMCE1   | 1 | 1,54571E-06 |
| SKAP2    | 1 | 1,54988E-06 |
| BBS5     | 1 | 1,56712E-06 |
| ACSL3    | 1 | 1,56976E-06 |
| TJP2     | 1 | 1,57783E-06 |
| FTH1     | 3 | 1,62537E-06 |
| NUDT22   | 1 | 1,64212E-06 |
| EPC1     | 3 | 1,64954E-06 |
| QTRT2    | 1 | 1,65619E-06 |
| BCL2L12  | 4 | 1,66841E-06 |
| CBR1     | 1 | 1,67579E-06 |
| PON2     | 1 | 1,71989E-06 |
| IMPDH1   | 4 | 1,72543E-06 |
| KTI12    | 4 | 1,74985E-06 |



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| IRF6      | 1 | 1,78807E-06 |
| DPPA2     | 4 | 1,81746E-06 |
| FBN1      | 3 | 1,83043E-06 |
| AKR1A1    | 1 | 1,84347E-06 |
| DLD       | 4 | 1,84585E-06 |
| PPP4R3A   | 4 | 1,8684E-06  |
| PLXDC2    | 1 | 1,87219E-06 |
| FAM21A    | 5 | 1,87242E-06 |
| CHMP2B    | 1 | 1,88247E-06 |
| ANO5      | 1 | 1,88358E-06 |
| LRRC6     | 1 | 1,90753E-06 |
| DENND2C   | 4 | 1,98051E-06 |
| ARHGAP26  | 1 | 1,99784E-06 |
| FRS3      | 1 | 2,02602E-06 |
| IL1R1     | 1 | 2,02944E-06 |
| GPR1      | 1 | 2,05102E-06 |
| C7H5orf45 | 1 | 2,08935E-06 |
| SGCE      | 1 | 2,08935E-06 |
| SRSF6     | 2 | 2,10295E-06 |
| MSMO1     | 1 | 2,10667E-06 |
| SERP2     | 3 | 2,10823E-06 |
| RTN2      | 4 | 2,12321E-06 |
| CRYZL1    | 1 | 2,1279E-06  |
| RPE       | 4 | 2,13889E-06 |
| EHMT1     | 1 | 2,16692E-06 |
| TFAM      | 4 | 2,18344E-06 |
| ACSL5     | 5 | 2,18653E-06 |
| MICU1     | 4 | 2,19154E-06 |
| ZNF438    | 1 | 2,19212E-06 |
| NAB1      | 1 | 2,22477E-06 |
| ZNF35     | 1 | 2,22748E-06 |
| SEC22B    | 1 | 2,24992E-06 |
| HAGH      | 1 | 2,2993E-06  |
| UBA3      | 1 | 2,30854E-06 |
| AP1S1     | 1 | 2,32773E-06 |
| TMEM167B  | 1 | 2,34635E-06 |
| LOC789175 | 4 | 2,35248E-06 |
| MANF      | 4 | 2,35281E-06 |
| PARK2     | 1 | 2,36339E-06 |
| MBIP      | 4 | 2,40168E-06 |
| CDK5RAP1  | 1 | 2,42124E-06 |
| ZNF713    | 1 | 2,43167E-06 |
| UQCRFS1   | 4 | 2,45005E-06 |
| PRSS23    | 3 | 2,45429E-06 |
| COX20     | 1 | 2,50766E-06 |
| AMN1      | 1 | 2,50846E-06 |
| LZTFL1    | 1 | 2,51824E-06 |
| EPS15L1   | 1 | 2,54296E-06 |
| HILPDA    | 1 | 2,55432E-06 |
| SLC38A8   | 3 | 2,57296E-06 |

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| GSTA2    | 4 | 2,57331E-06 |
| DNAJC11  | 3 | 2,61057E-06 |
| TMEM186  | 4 | 2,62176E-06 |
| ODF4     | 1 | 2,63147E-06 |
| TUBGCP4  | 1 | 2,63358E-06 |
| DLST     | 1 | 2,64865E-06 |
| NOL6     | 4 | 2,67074E-06 |
| CXADR    | 4 | 2,69602E-06 |
| RBMX     | 4 | 2,69724E-06 |
| FZD3     | 1 | 2,70677E-06 |
| TOB1     | 4 | 2,71252E-06 |
| PTPRF    | 1 | 2,73373E-06 |
| ORC6     | 1 | 2,74575E-06 |
| CYCT     | 4 | 2,76467E-06 |
| PSMD6    | 1 | 2,7934E-06  |
| TM9SF1   | 1 | 2,79637E-06 |
| SLC25A31 | 3 | 2,81898E-06 |
| SLC24A2  | 1 | 2,83562E-06 |
| ALKBH3   | 1 | 2,8471E-06  |
| COQ8A    | 3 | 2,91578E-06 |
| ZNF22    | 1 | 2,92361E-06 |
| EFTUD2   | 1 | 2,94302E-06 |
| GJD2     | 1 | 3,03497E-06 |
| TMEM168  | 1 | 3,03497E-06 |
| SH2B1    | 1 | 3,05681E-06 |
| YPEL3    | 3 | 3,09345E-06 |
| TMEM101  | 1 | 3,10296E-06 |
| ATG4D    | 4 | 3,10811E-06 |
| TMEM161A | 1 | 3,1191E-06  |
| SUPV3L1  | 1 | 3,17727E-06 |
| DNAJB4   | 1 | 3,20085E-06 |
| APOO     | 1 | 3,2178E-06  |
| ROBO1    | 1 | 3,23037E-06 |
| KLHDC2   | 1 | 3,24824E-06 |
| PREP     | 1 | 3,29614E-06 |
| SOX30    | 1 | 3,3045E-06  |
| CCT4     | 4 | 3,38417E-06 |
| EED      | 4 | 3,4271E-06  |
| SOCS7    | 3 | 3,44729E-06 |
| MPV17L2  | 1 | 3,45434E-06 |
| F11R     | 4 | 3,49833E-06 |
| ALDH1A1  | 1 | 3,51421E-06 |
| MTM1     | 1 | 3,5155E-06  |
| TXNDC5   | 1 | 3,55539E-06 |
| PRPF3    | 1 | 3,58658E-06 |
| MEDAG    | 4 | 3,66654E-06 |
| CAB39    | 1 | 3,68164E-06 |
| SNX19    | 3 | 3,69942E-06 |
| MESDC1   | 4 | 3,79639E-06 |
| RTN4     | 2 | 3,79775E-06 |

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| RNF44       | 4 | 3,80896E-06 |
| MYL12B      | 1 | 3,81013E-06 |
| UTP18       | 5 | 3,85036E-06 |
| ZBTB6       | 1 | 3,86509E-06 |
| C15H11orf74 | 1 | 3,90326E-06 |
| DPH2        | 1 | 3,91133E-06 |
| SDF2L1      | 1 | 3,91263E-06 |
| PSMB7       | 1 | 3,91926E-06 |
| PMPCB       | 1 | 3,92406E-06 |
| LACC1       | 1 | 3,93926E-06 |
| FAM72A      | 1 | 3,94538E-06 |
| TSC22D1     | 4 | 3,94864E-06 |
| FAM76B      | 1 | 3,99972E-06 |
| UBE2L6      | 1 | 4,02458E-06 |
| SIPA1L2     | 1 | 4,13407E-06 |
| CLCC1       | 3 | 4,15782E-06 |
| HDGF        | 3 | 4,17356E-06 |
| C20H5orf47  | 1 | 4,26233E-06 |
| FAM45A      | 4 | 4,3261E-06  |
| TMEM39A     | 3 | 4,36023E-06 |
| ZNF692      | 1 | 4,42323E-06 |
| CASP2       | 1 | 4,45322E-06 |
| NR2F2       | 4 | 4,50962E-06 |
| PPAT        | 4 | 4,5709E-06  |
| UFL1        | 1 | 4,61169E-06 |
| SPATA2L     | 3 | 4,61693E-06 |
| SCCPDH      | 3 | 4,68562E-06 |
| LSM8        | 4 | 4,70706E-06 |
| TTC4        | 1 | 4,7889E-06  |
| IFT88       | 1 | 4,81228E-06 |
| PLEKHJ1     | 4 | 4,92065E-06 |
| HARS        | 1 | 4,99265E-06 |
| JUN         | 1 | 5,00038E-06 |
| COPRS       | 1 | 5,02396E-06 |
| ZNF184      | 1 | 5,08874E-06 |
| PDPN        | 1 | 5,10833E-06 |
| ELMOD2      | 1 | 5,18102E-06 |
| SNAPC5      | 4 | 5,19944E-06 |
| RTKN2       | 1 | 5,20383E-06 |
| TMX4        | 1 | 5,21588E-06 |
| NDUFS4      | 1 | 5,2671E-06  |
| NPC1        | 5 | 5,35579E-06 |
| SRI         | 1 | 5,43197E-06 |
| SLC16A13    | 1 | 5,51399E-06 |
| MAP4        | 3 | 5,53716E-06 |
| LUZP2       | 1 | 5,54525E-06 |
| PEX3        | 1 | 5,58656E-06 |
| RUNDC1      | 1 | 5,60636E-06 |
| SIRT1       | 4 | 5,61216E-06 |
| RAB3GAP1    | 5 | 5,61261E-06 |

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| C14H8orf59 | 4 | 5,63431E-06 |
| QARS       | 4 | 5,64074E-06 |
| RDH12      | 1 | 5,6642E-06  |
| RPL13A     | 4 | 5,67315E-06 |
| ZNRF1      | 4 | 5,70061E-06 |
| CDH7       | 1 | 5,72375E-06 |
| SASS6      | 1 | 5,73426E-06 |
| DCTN3      | 1 | 5,7818E-06  |
| TMX3       | 1 | 5,79351E-06 |
| NSMCE2     | 1 | 5,8117E-06  |
| DDRKG1     | 1 | 5,88662E-06 |
| PMS1       | 1 | 6,01496E-06 |
| C11H2orf49 | 3 | 6,19342E-06 |
| EIF2B3     | 3 | 6,1981E-06  |
| IDE        | 1 | 6,29635E-06 |
| TMEM100    | 1 | 6,36518E-06 |
| NRBF2      | 4 | 6,38535E-06 |
| SEMA4A     | 1 | 6,45739E-06 |
| PCYT1B     | 1 | 6,51251E-06 |
| SYT11      | 4 | 6,51582E-06 |
| NOL8       | 4 | 6,59123E-06 |
| TRAPPC13   | 4 | 6,66253E-06 |
| ANKRD50    | 4 | 6,73795E-06 |
| ZAK        | 1 | 6,75989E-06 |
| TGFBRAP1   | 1 | 6,82721E-06 |
| PRKG1      | 3 | 6,89694E-06 |
| NCAPH      | 1 | 7,03305E-06 |
| NECAP1     | 4 | 7,06405E-06 |
| STXBP5     | 1 | 7,07236E-06 |
| TSTD3      | 1 | 7,13407E-06 |
| MFSD13A    | 1 | 7,26535E-06 |
| TMEM45A    | 1 | 7,28436E-06 |
| ITGA2B     | 4 | 7,34353E-06 |
| NKX2-2     | 1 | 7,34353E-06 |
| RDH14      | 1 | 7,40151E-06 |
| GPATCH1    | 3 | 7,68982E-06 |
| PXMP4      | 1 | 7,73642E-06 |
| TAF11      | 4 | 7,79406E-06 |
| NFKBIB     | 4 | 7,86984E-06 |
| RNF219     | 1 | 7,96974E-06 |
| CDCA7      | 1 | 7,97139E-06 |
| MRPS35     | 1 | 8,03397E-06 |
| SPATA24    | 1 | 8,06356E-06 |
| LTBR       | 1 | 8,06982E-06 |
| TIMELESS   | 1 | 8,13859E-06 |
| WDFY2      | 3 | 8,25045E-06 |
| ALG8       | 1 | 8,32588E-06 |
| ZCCHC7     | 1 | 8,34476E-06 |
| MCC        | 1 | 8,366E-06   |
| GPATCH2    | 1 | 8,37165E-06 |

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| TIFA     | 1 | 8,38114E-06 |
| UNC50    | 1 | 8,41033E-06 |
| SPON1    | 1 | 8,47038E-06 |
| CCDC91   | 1 | 8,48912E-06 |
| ATP6V0C  | 1 | 8,58808E-06 |
| FBXO10   | 3 | 8,6654E-06  |
| CRYM     | 4 | 8,6823E-06  |
| VPS26A   | 1 | 8,69839E-06 |
| MRAP2    | 1 | 8,75973E-06 |
| COMMD2   | 1 | 8,76027E-06 |
| TIMM17B  | 1 | 8,82549E-06 |
| ARHGEF12 | 1 | 8,9861E-06  |
| MAP2K1   | 1 | 9,00534E-06 |
| PLCL2    | 3 | 9,01535E-06 |
| MYC      | 4 | 9,07149E-06 |
| NSG1     | 1 | 9,08039E-06 |
| COL4A3BP | 5 | 9,2755E-06  |
| DYRK3    | 5 | 9,38731E-06 |
| AKAP6    | 1 | 9,55267E-06 |
| DICER1   | 1 | 9,61043E-06 |
| PCDH10   | 4 | 9,66191E-06 |
| TMEM86A  | 1 | 9,77883E-06 |
| RPAP1    | 1 | 9,78134E-06 |
| ILDR1    | 3 | 9,79006E-06 |
| RARG     | 1 | 9,83356E-06 |
| LMX1A    | 1 | 9,92271E-06 |
| NADK2    | 1 | 9,97423E-06 |
| LMOD3    | 1 | 1,00436E-05 |
| IFT52    | 1 | 1,0077E-05  |
| MED9     | 4 | 1,00804E-05 |
| JMJD1C   | 1 | 1,04827E-05 |
| ADAMTS1  | 2 | 1,0565E-05  |
| ATP5G2   | 1 | 1,06575E-05 |
| MIER3    | 1 | 1,06926E-05 |
| PUS7L    | 1 | 1,0705E-05  |
| ZW10     | 1 | 1,07317E-05 |
| BLZF1    | 1 | 1,0798E-05  |
| KIAA0754 | 1 | 1,08573E-05 |
| ACAD11   | 1 | 1,08614E-05 |
| ARHGEF39 | 1 | 1,08927E-05 |
| TRIM59   | 3 | 1,09276E-05 |
| FEN1     | 4 | 1,09481E-05 |
| NFKBIE   | 1 | 1,09952E-05 |
| DUSP5    | 1 | 1,10414E-05 |
| ATP10D   | 1 | 1,1058E-05  |
| DSTYK    | 1 | 1,11329E-05 |
| PRKCI    | 1 | 1,11409E-05 |
| P4HA3    | 1 | 1,14299E-05 |
| DNAL4    | 3 | 1,14546E-05 |
| SEC16B   | 3 | 1,14954E-05 |

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| BSDC1        | 1 | 1,15298E-05 |
| ADAMTS9      | 1 | 1,16223E-05 |
| SLC40A1      | 1 | 1,16306E-05 |
| MRPL33       | 1 | 1,18592E-05 |
| OSBPL11      | 1 | 1,19738E-05 |
| GLOD4        | 1 | 1,2015E-05  |
| NUPL2        | 4 | 1,20451E-05 |
| RNASEH1      | 4 | 1,22028E-05 |
| C1H21orf33   | 1 | 1,22155E-05 |
| GAB1         | 1 | 1,22716E-05 |
| THUMPD3      | 1 | 1,2357E-05  |
| DCTN1        | 1 | 1,24104E-05 |
| PFKFB3       | 1 | 1,24168E-05 |
| TBC1D2       | 4 | 1,26374E-05 |
| GADD45B      | 1 | 1,2878E-05  |
| SORCS3       | 1 | 1,28791E-05 |
| CHD8         | 4 | 1,29631E-05 |
| PPP3R1       | 1 | 1,31934E-05 |
| OVOL1        | 1 | 1,32976E-05 |
| LOC100847759 | 4 | 1,34232E-05 |
| TMEM184B     | 1 | 1,34451E-05 |
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| MECP2        | 3 | 1,34486E-05 |
| WDR61        | 1 | 1,3523E-05  |
| MRPL3        | 1 | 1,36781E-05 |
| MTIF2        | 1 | 1,3816E-05  |
| ATP5A1       | 1 | 1,40596E-05 |
| MDGA1        | 1 | 1,40927E-05 |
| STAP2        | 1 | 1,42219E-05 |
| TAF13        | 4 | 1,42329E-05 |
| ITGB4        | 1 | 1,44699E-05 |
| PPP1R21      | 1 | 1,4487E-05  |
| RBAK         | 4 | 1,45591E-05 |
| UCHL5        | 1 | 1,46931E-05 |
| STX17        | 1 | 1,47249E-05 |
| CCDC50       | 3 | 1,47413E-05 |
| RECQL        | 1 | 1,49872E-05 |
| SOD2         | 1 | 1,53397E-05 |
| PGAM5        | 3 | 1,53576E-05 |
| FANCM        | 1 | 1,53623E-05 |
| NDUFAF7      | 1 | 1,54785E-05 |
| FAM76A       | 1 | 1,54969E-05 |
| SLC9A9       | 1 | 1,5578E-05  |
| ZNF135       | 1 | 1,56296E-05 |
| ETFDH        | 1 | 1,56638E-05 |
| PRDX6        | 3 | 1,56801E-05 |
| WDPCP        | 1 | 1,58926E-05 |
| MND1         | 1 | 1,59629E-05 |
| RPAIN        | 1 | 1,59726E-05 |
| C10H14orf1   | 1 | 1,60382E-05 |

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| MAPK1IP1L | 4 | 1,60611E-05 |
| CLIP1     | 6 | 1,62183E-05 |
| RAD52     | 3 | 1,63089E-05 |
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| ZNF419    | 1 | 1,6825E-05  |
| PIH1D2    | 1 | 1,69865E-05 |
| ZMAT3     | 1 | 1,71195E-05 |
| UIMC1     | 1 | 1,71248E-05 |
| RNF130    | 1 | 1,72359E-05 |
| PCCB      | 1 | 1,7262E-05  |
| NDUFA12   | 3 | 1,7304E-05  |
| MTMR14    | 4 | 1,73783E-05 |
| SLC25A15  | 1 | 1,7383E-05  |
| ANKRD39   | 3 | 1,75236E-05 |
| ARHGAP1   | 4 | 1,75408E-05 |
| CISD2     | 1 | 1,75963E-05 |
| LOC613444 | 4 | 1,77128E-05 |
| FBXO11    | 5 | 1,773E-05   |
| DPP6      | 1 | 1,77348E-05 |
| ST5       | 1 | 1,7836E-05  |
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| OIP5      | 1 | 1,8098E-05  |
| PATJ      | 1 | 1,81588E-05 |
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| GFPT2     | 1 | 1,82807E-05 |
| MRPS15    | 3 | 1,85354E-05 |
| C4H7orf25 | 3 | 1,85897E-05 |
| SNX4      | 1 | 1,86337E-05 |
| BAMBI     | 4 | 1,86485E-05 |
| NIPAL1    | 4 | 1,86921E-05 |
| KATNBL1   | 3 | 1,86925E-05 |
| CAPN14    | 1 | 1,9019E-05  |
| CPB2      | 1 | 1,91098E-05 |
| SCG3      | 1 | 1,91971E-05 |
| IPP       | 1 | 1,94646E-05 |
| NDUFB3    | 4 | 1,94994E-05 |
| DDA1      | 1 | 1,96373E-05 |
| FLAD1     | 1 | 1,9839E-05  |
| DTX2      | 1 | 1,99508E-05 |
| COQ7      | 1 | 2,01552E-05 |
| ST7L      | 1 | 2,03921E-05 |
| LUC7L     | 4 | 2,05431E-05 |
| ATP23     | 4 | 2,07907E-05 |
| GHDC      | 3 | 2,11914E-05 |
| ODZ3      | 1 | 2,1772E-05  |
| HAUS4     | 1 | 2,23576E-05 |
| TRIM52    | 1 | 2,24358E-05 |
| PIH1D1    | 4 | 2,28904E-05 |

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| ARL4D       | 2 | 2,30246E-05 |
| MAGOHB      | 1 | 2,30367E-05 |
| RAB6B       | 1 | 2,34365E-05 |
| TTF2        | 1 | 2,34689E-05 |
| SSSCA1      | 4 | 2,34999E-05 |
| DTX1        | 1 | 2,36564E-05 |
| SNX11       | 1 | 2,37992E-05 |
| HACE1       | 1 | 2,38917E-05 |
| HKDC1       | 1 | 2,39252E-05 |
| ZBTB40      | 1 | 2,39857E-05 |
| YTHDF1      | 1 | 2,41698E-05 |
| DIRC2       | 1 | 2,43405E-05 |
| GTF2I       | 1 | 2,48933E-05 |
| CPSF6       | 4 | 2,51672E-05 |
| SDHAF3      | 1 | 2,51786E-05 |
| TMEM110     | 1 | 2,5349E-05  |
| TCIRG1      | 1 | 2,53495E-05 |
| SMAD3       | 1 | 2,5524E-05  |
| CXXC1       | 1 | 2,57434E-05 |
| ELK3        | 1 | 2,59572E-05 |
| OMA1        | 1 | 2,60376E-05 |
| PDSS2       | 1 | 2,6088E-05  |
| USP3        | 4 | 2,61972E-05 |
| CDK14       | 1 | 2,68195E-05 |
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| UBXN1       | 1 | 2,71549E-05 |
| RNF181      | 1 | 2,7684E-05  |
| PEX5        | 1 | 2,80148E-05 |
| FBXO3       | 1 | 2,81177E-05 |
| WDR74       | 4 | 2,82611E-05 |
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| CAT         | 1 | 2,86709E-05 |
| TSPYL4      | 1 | 2,89684E-05 |
| WDR48       | 1 | 2,91989E-05 |
| IP6K1       | 1 | 2,9309E-05  |
| PRRG2       | 4 | 2,95881E-05 |
| ZNF397      | 1 | 2,9772E-05  |
| EXOSC9      | 1 | 3,02059E-05 |
| LSM12       | 3 | 3,0481E-05  |
| CPNE1       | 3 | 3,04999E-05 |
| EIF3D       | 4 | 3,05051E-05 |
| WIF1        | 1 | 3,06313E-05 |
| PJA2        | 1 | 3,07504E-05 |
| MTHFD2      | 3 | 3,12791E-05 |
| SLC39A12    | 3 | 3,15183E-05 |
| SSX2IP      | 5 | 3,19114E-05 |
| C18H16orf87 | 4 | 3,19196E-05 |
| C3H1orf123  | 3 | 3,22518E-05 |
| UBXN4       | 5 | 3,22534E-05 |
| SHISA2      | 1 | 3,22696E-05 |



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| AP1AR     | 1 | 3,24269E-05 |
| FAM89B    | 4 | 3,2465E-05  |
| AXIN1     | 1 | 3,25789E-05 |
| ECI2      | 1 | 3,30119E-05 |
| MFSD1     | 1 | 3,3027E-05  |
| RNF167    | 4 | 3,31544E-05 |
| MGEA5     | 4 | 3,36687E-05 |
| ZNF326    | 4 | 3,38222E-05 |
| TRIM25    | 1 | 3,38782E-05 |
| ZBED8     | 1 | 3,3913E-05  |
| TNFAIP8L1 | 2 | 3,40834E-05 |
| KCNN4     | 3 | 3,41182E-05 |
| MED31     | 4 | 3,43803E-05 |
| APBA3     | 1 | 3,44894E-05 |
| INSIG1    | 3 | 3,49925E-05 |
| SLC20A1   | 1 | 3,50108E-05 |
| PYM1      | 1 | 3,51026E-05 |
| AHSA2     | 1 | 3,51027E-05 |
| FXN       | 1 | 3,53063E-05 |
| AARSD1    | 1 | 3,54248E-05 |
| GFI1      | 1 | 3,56239E-05 |
| MGP       | 4 | 3,57649E-05 |
| RHBDL2    | 1 | 3,57649E-05 |
| OPA1      | 1 | 3,58235E-05 |
| METTL22   | 3 | 3,62608E-05 |
| SPINK5    | 1 | 3,63403E-05 |
| ETV1      | 1 | 3,67809E-05 |
| KLHDC1    | 1 | 3,68188E-05 |
| S100B     | 1 | 3,73137E-05 |
| TRPS1     | 1 | 3,77641E-05 |
| GUCY2C    | 4 | 3,83616E-05 |
| MRPL19    | 1 | 3,92947E-05 |
| NKAIN2    | 1 | 3,96311E-05 |
| MRVI1     | 1 | 3,96693E-05 |
| NEGR1     | 1 | 3,98281E-05 |
| FHIT      | 3 | 3,98401E-05 |
| CREB5     | 1 | 4,02096E-05 |
| GTF2H3    | 1 | 4,05024E-05 |
| ATXN3     | 1 | 4,05458E-05 |
| RGS3      | 1 | 4,0651E-05  |
| SLC22A5   | 3 | 4,06733E-05 |
| CMTM7     | 3 | 4,07465E-05 |
| MYOF      | 1 | 4,08808E-05 |
| CHEK1     | 5 | 4,1628E-05  |
| GRAP2     | 1 | 4,19055E-05 |
| AMT       | 4 | 4,19643E-05 |
| ACAT1     | 1 | 4,20804E-05 |
| PDIA5     | 3 | 4,22524E-05 |
| HIKESHI   | 1 | 4,23337E-05 |
| TXN2      | 4 | 4,23348E-05 |

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| DHX35     | 1 | 4,25184E-05 |
| SHOX2     | 3 | 4,33918E-05 |
| MFSD14A   | 1 | 4,35623E-05 |
| IL1R2     | 1 | 4,35753E-05 |
| EDF1      | 3 | 4,36043E-05 |
| EFNB1     | 1 | 4,36964E-05 |
| CAPN7     | 1 | 4,4098E-05  |
| PAFAH1B2  | 3 | 4,42322E-05 |
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| NCOA4     | 1 | 4,4556E-05  |
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| ASAH1     | 1 | 4,50313E-05 |
| ZNF34     | 1 | 4,53759E-05 |
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| MYH8      | 1 | 4,64381E-05 |
| GSDMC     | 1 | 4,64973E-05 |
| TIMMDC1   | 4 | 4,67141E-05 |
| KIF15     | 1 | 4,67368E-05 |
| LOC534742 | 3 | 4,67483E-05 |
| KCNK1     | 1 | 4,6785E-05  |
| WTIP      | 1 | 4,7181E-05  |
| CCNH      | 3 | 4,74782E-05 |
| CPNE8     | 4 | 4,76346E-05 |
| MDM4      | 1 | 4,76521E-05 |
| GNA14     | 1 | 4,80132E-05 |
| RARS2     | 1 | 4,80132E-05 |
| ETFA      | 1 | 4,82717E-05 |
| PIGP      | 1 | 4,83491E-05 |
| SLC10A7   | 1 | 4,84919E-05 |
| POLR2F    | 4 | 4,88082E-05 |
| ZFAND3    | 1 | 4,88964E-05 |
| USP38     | 4 | 4,89607E-05 |
| CHAC1     | 3 | 4,91663E-05 |
| BMS1      | 4 | 4,92266E-05 |
| LMO3      | 1 | 4,92386E-05 |
| CCNB1IP1  | 1 | 4,96539E-05 |
| SHROOM3   | 1 | 4,96843E-05 |
| ANAPC11   | 3 | 5,02037E-05 |
| NOL4      | 1 | 5,0853E-05  |
| MTERF4    | 1 | 5,08575E-05 |
| NIPSNAP3A | 4 | 5,10771E-05 |
| GNA11     | 3 | 5,11095E-05 |
| FANCI     | 1 | 5,11539E-05 |
| HACD2     | 1 | 5,15094E-05 |
| FBXO21    | 3 | 5,16816E-05 |
| RCSD1     | 4 | 5,22947E-05 |
| TBC1D14   | 1 | 5,25303E-05 |
| HACD3     | 1 | 5,27998E-05 |
| GRK3      | 1 | 5,28331E-05 |

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| TAOK3      | 3 | 5,30428E-05 |
| TUFT1      | 4 | 5,33506E-05 |
| RMI2       | 1 | 5,34715E-05 |
| PSME4      | 4 | 5,4057E-05  |
| ACTL6A     | 4 | 5,41157E-05 |
| RCN2       | 1 | 5,4174E-05  |
| ACTR6      | 1 | 5,42763E-05 |
| MACROD2    | 1 | 5,4389E-05  |
| PEX11A     | 1 | 5,52055E-05 |
| MTHFSD     | 1 | 5,57685E-05 |
| RTN4IP1    | 1 | 5,59546E-05 |
| NCF2       | 1 | 5,59672E-05 |
| UBE3A      | 5 | 5,60771E-05 |
| GNAI1      | 1 | 5,61839E-05 |
| DARS       | 1 | 5,63164E-05 |
| CCDC93     | 1 | 5,67131E-05 |
| LRIG2      | 1 | 5,67293E-05 |
| SMDT1      | 4 | 5,67543E-05 |
| MRS2       | 4 | 5,67923E-05 |
| SLC25A14   | 1 | 5,72771E-05 |
| DGKB       | 3 | 5,72975E-05 |
| SPATA5L1   | 4 | 5,7398E-05  |
| DSP        | 1 | 5,83171E-05 |
| BTBD1      | 4 | 5,84223E-05 |
| C14H8orf76 | 3 | 5,84478E-05 |
| CCDC65     | 1 | 5,87803E-05 |
| CHD6       | 1 | 5,89582E-05 |
| VT11B      | 1 | 5,93493E-05 |
| LRRIQ4     | 1 | 5,95457E-05 |
| TMUB2      | 4 | 6,03038E-05 |
| MRPL1      | 4 | 6,09225E-05 |
| LRSAM1     | 1 | 6,1556E-05  |
| XPA        | 3 | 6,1556E-05  |
| SNTA1      | 1 | 6,15577E-05 |
| GPRC5D     | 1 | 6,20985E-05 |
| HORMAD1    | 4 | 6,2119E-05  |
| SHFM1      | 4 | 6,2119E-05  |
| GPR39      | 1 | 6,25365E-05 |
| KATNAL1    | 1 | 6,2556E-05  |
| CARD19     | 4 | 6,25606E-05 |
| XRN1       | 1 | 6,26179E-05 |
| HIBADH     | 1 | 6,28453E-05 |
| AK6        | 4 | 6,34037E-05 |
| MALSU1     | 4 | 6,34037E-05 |
| RBP4       | 1 | 6,34282E-05 |
| LCT        | 1 | 6,34817E-05 |
| SPR        | 1 | 6,3973E-05  |
| MTO1       | 1 | 6,4051E-05  |
| DDX4       | 1 | 6,41119E-05 |
| DPCD       | 1 | 6,43957E-05 |

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| NR4A1     | 1 | 6,48777E-05 |
| CHGA      | 1 | 6,52986E-05 |
| UBE2S     | 2 | 6,53191E-05 |
| SYNJ2BP   | 1 | 6,54964E-05 |
| FERMT1    | 1 | 6,57465E-05 |
| BSP5      | 1 | 6,58392E-05 |
| BTBD9     | 3 | 6,60431E-05 |
| GCC1      | 1 | 6,81535E-05 |
| ANXA11    | 1 | 6,86996E-05 |
| RAF1      | 1 | 6,9112E-05  |
| BPHL      | 1 | 7,00806E-05 |
| NUAK2     | 1 | 7,02791E-05 |
| ATOX1     | 1 | 7,0604E-05  |
| RSPO3     | 1 | 7,13815E-05 |
| TCHP      | 1 | 7,14718E-05 |
| LAS1L     | 5 | 7,29709E-05 |
| NDUFB6    | 1 | 7,30707E-05 |
| AIMP1     | 4 | 7,35503E-05 |
| EFR3A     | 1 | 7,36856E-05 |
| BCL10     | 1 | 7,40049E-05 |
| NUBPL     | 1 | 7,40841E-05 |
| TOB2      | 4 | 7,41736E-05 |
| PTGS2     | 1 | 7,42133E-05 |
| TMEM230   | 1 | 7,50639E-05 |
| CD63      | 1 | 7,54435E-05 |
| SLC38A9   | 1 | 7,5725E-05  |
| CD247     | 1 | 7,61744E-05 |
| EPB41L4A  | 1 | 7,64138E-05 |
| SERTAD1   | 4 | 7,65315E-05 |
| GALNT1    | 1 | 7,70498E-05 |
| ZIM2      | 1 | 7,73761E-05 |
| PAN2      | 1 | 7,75566E-05 |
| ANKRD46   | 1 | 7,77539E-05 |
| CYBRD1    | 3 | 7,7805E-05  |
| DDHD1     | 1 | 7,84788E-05 |
| RBM46     | 1 | 7,88053E-05 |
| DNAJC12   | 4 | 7,90329E-05 |
| ACOT7     | 1 | 7,9201E-05  |
| WDR83     | 4 | 7,9652E-05  |
| LRRC8E    | 3 | 8,04857E-05 |
| MARCH11   | 1 | 8,09861E-05 |
| POLL      | 1 | 8,10231E-05 |
| GPD1L     | 4 | 8,19719E-05 |
| OSBPL3    | 1 | 8,28703E-05 |
| PLEKHA3   | 1 | 8,35395E-05 |
| ADCY6     | 1 | 8,35554E-05 |
| C3H1orf50 | 1 | 8,35554E-05 |
| PLEKHA1   | 1 | 8,51409E-05 |
| FBXO15    | 1 | 8,67911E-05 |
| DENND1A   | 1 | 8,75373E-05 |

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| LNX1        | 1 | 8,77264E-05 |
| SPRY1       | 1 | 8,79353E-05 |
| POLR2D      | 4 | 8,8046E-05  |
| CFAP97      | 3 | 8,9237E-05  |
| GCNT1       | 1 | 8,96606E-05 |
| CCAR1       | 4 | 9,0549E-05  |
| ADRM1       | 1 | 9,0841E-05  |
| KIZ         | 1 | 9,24523E-05 |
| HRASLS      | 1 | 9,26339E-05 |
| TCEA1       | 1 | 9,28069E-05 |
| TIMM9       | 3 | 9,28627E-05 |
| RGS10       | 3 | 9,29226E-05 |
| PLPP2       | 1 | 9,32008E-05 |
| PPP3CC      | 1 | 9,34404E-05 |
| SNAPC3      | 4 | 9,35019E-05 |
| SLC35B2     | 1 | 9,36344E-05 |
| TBCD        | 1 | 9,38685E-05 |
| FAAP24      | 1 | 9,38953E-05 |
| PHACTR3     | 3 | 9,39886E-05 |
| PEX14       | 1 | 9,46228E-05 |
| ABCD4       | 1 | 9,49744E-05 |
| CXHXorf36   | 1 | 9,54592E-05 |
| MOB1A       | 4 | 9,5845E-05  |
| BEND4       | 1 | 9,62964E-05 |
| CORO6       | 3 | 9,65013E-05 |
| ATL3        | 1 | 9,71092E-05 |
| TFDP1       | 1 | 9,73957E-05 |
| SLC23A2     | 1 | 9,75596E-05 |
| TEX9        | 1 | 9,79474E-05 |
| NEIL1       | 3 | 9,82469E-05 |
| ELK4        | 1 | 9,87328E-05 |
| CIRBP       | 1 | 9,87641E-05 |
| CTDSPL2     | 1 | 9,87641E-05 |
| SNRNP40     | 3 | 9,88412E-05 |
| SPINK2      | 3 | 9,88732E-05 |
| THOP1       | 3 | 9,90959E-05 |
| DDB2        | 1 | 9,93511E-05 |
| NPHS2       | 1 | 9,95011E-05 |
| GRAMD1A     | 1 | 0,000100031 |
| SURF4       | 3 | 0,00010076  |
| ATG3        | 4 | 0,000100795 |
| PPP2R2B     | 1 | 0,000101066 |
| CDIP1       | 3 | 0,000101271 |
| DNTTIP1     | 1 | 0,000101499 |
| EXOSC8      | 3 | 0,000102142 |
| FBXO48      | 1 | 0,000102267 |
| NCAPG2      | 1 | 0,000102342 |
| C15H11orf49 | 1 | 0,00010339  |
| TERF2       | 1 | 0,000103474 |
| APLF        | 5 | 0,000103495 |

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| WFIKKN2 | 1 | 0,000103538 |
| ETFRF1  | 1 | 0,000103804 |
| TMCC1   | 3 | 0,000103962 |
| WDTC1   | 1 | 0,000104196 |
| PSMD10  | 1 | 0,000105365 |
| GSTA4   | 1 | 0,000105475 |
| ZDHHC17 | 4 | 0,00010583  |
| HNF1B   | 3 | 0,000106689 |
| SLC11A2 | 1 | 0,000107772 |
| MSRB2   | 1 | 0,000107991 |
| DSC3    | 4 | 0,000108241 |
| ICE2    | 1 | 0,000108531 |
| PLEKHG3 | 1 | 0,000109019 |
| RWDD3   | 1 | 0,000109474 |
| MKKS    | 1 | 0,00010978  |
| TLE3    | 1 | 0,000109969 |
| DPP8    | 1 | 0,000110936 |
| SPAST   | 1 | 0,000112074 |
| GFM2    | 1 | 0,000112911 |
| GFER    | 3 | 0,000113018 |
| DDIT4   | 3 | 0,000113652 |
| MRE11A  | 1 | 0,000114259 |
| CLDN10  | 1 | 0,000114278 |
| ZNF277  | 1 | 0,000115275 |
| G2E3    | 4 | 0,000115582 |
| TIMM10  | 4 | 0,000115749 |
| NDUFAF6 | 3 | 0,000116252 |
| POLD1   | 1 | 0,000116431 |
| IMPA2   | 1 | 0,000116597 |
| LAMTOR2 | 3 | 0,000116597 |
| CHD1    | 4 | 0,000117408 |
| TXNL4A  | 3 | 0,000117649 |
| TIPRL   | 1 | 0,000118591 |
| RNF115  | 1 | 0,000118726 |
| SFT2D1  | 3 | 0,000119965 |
| CENPH   | 1 | 0,000120045 |
| NELL2   | 4 | 0,000120282 |
| ELL     | 3 | 0,000120763 |
| SNX15   | 1 | 0,000121012 |
| SMARCA1 | 1 | 0,000122549 |
| LRRTM2  | 1 | 0,000123008 |
| RPA1    | 3 | 0,000124099 |
| UTP4    | 4 | 0,000124195 |
| XKRX    | 1 | 0,00012435  |
| HSPA1A  | 1 | 0,000124573 |
| XXYLT1  | 1 | 0,000124629 |
| EMC10   | 4 | 0,00012487  |
| CRY1    | 1 | 0,000124906 |
| FAM96B  | 1 | 0,000124939 |
| CAPRIN1 | 4 | 0,000126645 |

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| NPR2        | 1 | 0,000126717 |
| SPIRE2      | 1 | 0,000126853 |
| CHM         | 5 | 0,000127393 |
| PACSIN2     | 3 | 0,000128399 |
| C25H16orf91 | 4 | 0,000129527 |
| NFKB2       | 3 | 0,00012987  |
| ACYP1       | 3 | 0,00013031  |
| CAMKK2      | 3 | 0,000130594 |
| PNPO        | 5 | 0,000131489 |
| TRAPPC9     | 1 | 0,000132492 |
| RRP8        | 1 | 0,000133203 |
| METTL13     | 1 | 0,00013552  |
| SLC18A2     | 1 | 0,000136892 |
| SCMH1       | 3 | 0,000139035 |
| SOX5        | 1 | 0,000140433 |
| KIFAP3      | 1 | 0,000141193 |
| TRIM3       | 3 | 0,000142091 |
| TOMM5       | 4 | 0,000142137 |
| AQR         | 1 | 0,000142985 |
| TIMM22      | 4 | 0,000143397 |
| CMYA5       | 1 | 0,000143633 |
| ACAP2       | 1 | 0,000143895 |
| LARP4B      | 1 | 0,000143921 |
| VPS11       | 1 | 0,000144701 |
| CTCFL       | 1 | 0,000144846 |
| TMEFF1      | 1 | 0,000145908 |
| PGM2        | 4 | 0,000146537 |
| RNF170      | 1 | 0,00014858  |
| ZFYVE26     | 1 | 0,000148912 |
| HEATR4      | 1 | 0,000149954 |
| IFIT3       | 1 | 0,000150066 |
| SH3GLB2     | 3 | 0,000150093 |
| SLC9A3R1    | 3 | 0,00015021  |
| TRIM21      | 3 | 0,000151803 |
| PIP5K1C     | 3 | 0,000153109 |
| GIGYF1      | 1 | 0,0001539   |
| UBE2M       | 1 | 0,000154735 |
| ZNF33B      | 1 | 0,000154841 |
| MCU         | 1 | 0,000155465 |
| PSPH        | 1 | 0,000156003 |
| SLC25A3     | 4 | 0,000159395 |
| SMN2        | 1 | 0,000159652 |
| NFKB1       | 1 | 0,000162282 |
| UEVLD       | 1 | 0,000162282 |
| PIN1        | 4 | 0,000163103 |
| HDHD2       | 3 | 0,000163603 |
| NFKBIA      | 1 | 0,000164227 |
| CASP6       | 1 | 0,000164597 |
| TIMD4       | 1 | 0,000165293 |
| MBNL3       | 1 | 0,000165321 |

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| MSANTD3  | 1 | 0,000165634 |
| SLC39A1  | 1 | 0,000165964 |
| PLPP1    | 1 | 0,00016648  |
| ERCC4    | 1 | 0,00016758  |
| GABRG1   | 1 | 0,000167611 |
| CFAP43   | 1 | 0,0001681   |
| AAMP     | 4 | 0,000168748 |
| YIPF6    | 1 | 0,000170307 |
| STXBP6   | 1 | 0,000170597 |
| PEX7     | 1 | 0,000170971 |
| PTPRK    | 3 | 0,000170971 |
| DOCK10   | 1 | 0,000171594 |
| ADGRG1   | 1 | 0,000171696 |
| FAM234A  | 1 | 0,000172714 |
| CLVS2    | 1 | 0,000174809 |
| RNASEH2A | 1 | 0,000175113 |
| TSPAN13  | 1 | 0,000176046 |
| YPEL4    | 3 | 0,000176265 |
| CLGN     | 1 | 0,000176975 |
| AIDA     | 1 | 0,000179424 |
| XRCC3    | 1 | 0,000179437 |
| FGR      | 1 | 0,000181451 |
| TSEN15   | 1 | 0,000182154 |
| NRIP3    | 3 | 0,000183325 |
| ZNF3     | 1 | 0,000183339 |
| CDK5     | 1 | 0,000185423 |
| BRWD1    | 1 | 0,000185801 |
| CDKN1A   | 1 | 0,000186007 |
| CCNE1    | 2 | 0,000186054 |
| ELMOD1   | 1 | 0,000186825 |
| RCHY1    | 1 | 0,000187107 |
| LIN28A   | 1 | 0,000187658 |
| SLC35A1  | 1 | 0,00018825  |
| PRDM1    | 1 | 0,000189574 |
| MOB1B    | 1 | 0,000190102 |
| REL      | 1 | 0,000191623 |
| PPTC7    | 1 | 0,000191944 |
| ERCC5    | 1 | 0,000192413 |
| FOSL1    | 1 | 0,000193373 |
| MADD     | 1 | 0,00019387  |
| ARHGEF4  | 1 | 0,000195015 |
| PDIA3    | 2 | 0,000195352 |
| HOXB7    | 1 | 0,000195442 |
| BACE2    | 1 | 0,000195524 |
| RTEL1    | 1 | 0,000195723 |
| PCDHGC3  | 1 | 0,000196135 |
| GTF2H1   | 4 | 0,000196848 |
| NOP58    | 4 | 0,000197242 |
| PRKAA2   | 1 | 0,000197652 |
| RRAGD    | 1 | 0,000199719 |



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|-----------|---|-------------|
| PCP4      | 1 | 0,000202346 |
| GAD1      | 1 | 0,000203553 |
| LRRC59    | 1 | 0,000204438 |
| MED18     | 1 | 0,000204722 |
| UBA5      | 1 | 0,000205172 |
| MRPL22    | 4 | 0,000206049 |
| CDKL1     | 1 | 0,0002061   |
| SLC35B1   | 3 | 0,00020741  |
| CHD9      | 1 | 0,000209251 |
| ZNF512    | 1 | 0,00020978  |
| POLR2M    | 1 | 0,00020998  |
| MASTL     | 3 | 0,000209986 |
| PIM2      | 1 | 0,000210201 |
| RUNDC3B   | 1 | 0,00021025  |
| UQCR10    | 4 | 0,00021025  |
| CPSF4     | 1 | 0,000210817 |
| RIPK1     | 1 | 0,000211149 |
| ATG12     | 4 | 0,000211583 |
| RRP1      | 1 | 0,000213644 |
| NEK9      | 1 | 0,00021425  |
| PFDN4     | 1 | 0,00021425  |
| PURB      | 4 | 0,000216134 |
| SNRNP70   | 4 | 0,000216372 |
| RILPL1    | 3 | 0,000217957 |
| PEX19     | 1 | 0,000218977 |
| CHMP3     | 1 | 0,000220351 |
| TNIP1     | 3 | 0,000222294 |
| ZNF394    | 4 | 0,00022395  |
| ABCB11    | 1 | 0,000225492 |
| TXNRD1    | 1 | 0,000225807 |
| CENPO     | 1 | 0,000226768 |
| LAMC1     | 1 | 0,000226804 |
| BTG3      | 4 | 0,000227267 |
| CLDN11    | 1 | 0,000227349 |
| MAP4K3    | 1 | 0,000230297 |
| PPM1B     | 5 | 0,000231736 |
| AQP11     | 4 | 0,000235544 |
| CTNNA2    | 1 | 0,000235617 |
| HIST1H2AC | 4 | 0,000238401 |
| MED26     | 2 | 0,000239025 |
| ERC1      | 1 | 0,000239541 |
| CACNA1D   | 1 | 0,000240435 |
| USP4      | 1 | 0,000240638 |
| SUPT7L    | 1 | 0,000240823 |
| ERLIN2    | 4 | 0,000241727 |
| SF3A2     | 4 | 0,000242072 |
| FOXN1     | 1 | 0,000242941 |
| FLOT1     | 1 | 0,00024317  |
| DHX16     | 4 | 0,000246087 |
| STXBP4    | 1 | 0,000246231 |

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|------------|---|-------------|
| KLK5       | 4 | 0,000246821 |
| ZMYM2      | 1 | 0,000247866 |
| HPS5       | 1 | 0,000248207 |
| LEF1       | 1 | 0,000249467 |
| BIVM       | 1 | 0,000249544 |
| ATP6V1D    | 3 | 0,000250811 |
| ZNF638     | 5 | 0,000254715 |
| VPS39      | 1 | 0,000256582 |
| NR112      | 1 | 0,000257252 |
| ACBD4      | 1 | 0,000258758 |
| SLC25A17   | 1 | 0,000258983 |
| ARL15      | 1 | 0,00025936  |
| CYB561A3   | 1 | 0,000261776 |
| SKIL       | 4 | 0,00026302  |
| TNK2       | 2 | 0,000264448 |
| PTPN18     | 3 | 0,000268104 |
| NOS2       | 3 | 0,000268699 |
| DNMT3A     | 1 | 0,000268773 |
| PSTPIP2    | 1 | 0,000271213 |
| RHOG       | 3 | 0,00027384  |
| DDC        | 1 | 0,000274945 |
| LOC513767  | 1 | 0,000275213 |
| PRKDC      | 1 | 0,00027556  |
| EXOC3L1    | 1 | 0,000276507 |
| MCM8       | 1 | 0,00027676  |
| FLNB       | 1 | 0,00027693  |
| RCC1       | 1 | 0,000277835 |
| GABRG2     | 3 | 0,000279614 |
| CPQ        | 1 | 0,00028001  |
| NFIB       | 1 | 0,000281306 |
| PRKG2      | 1 | 0,000281428 |
| LEAP2      | 1 | 0,000281702 |
| TMEM147    | 1 | 0,000284296 |
| BCAR1      | 1 | 0,000286942 |
| SH3GL2     | 1 | 0,000287426 |
| LEPROT     | 1 | 0,000293434 |
| RNF166     | 3 | 0,000293444 |
| PLEK2      | 1 | 0,000293945 |
| FAM84B     | 4 | 0,00029675  |
| ZMAT4      | 2 | 0,000297496 |
| MPDZ       | 1 | 0,000297529 |
| C2H2orf76  | 1 | 0,000298242 |
| SMARCD2    | 2 | 0,000298348 |
| C7H19orf52 | 3 | 0,000298418 |
| ACVR1      | 1 | 0,000298498 |
| TSFM       | 3 | 0,00029891  |
| DHX36      | 4 | 0,000299492 |
| LBH        | 3 | 0,00029982  |
| FUBP3      | 3 | 0,000301086 |
| PDXDC1     | 1 | 0,000304578 |

|          |   |             |
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| APBA1    | 1 | 0,000304873 |
| AFAP1L2  | 1 | 0,000310333 |
| LYSMD3   | 1 | 0,000313597 |
| STX6     | 1 | 0,000314644 |
| CD3E     | 1 | 0,000317256 |
| TWIST1   | 3 | 0,000319705 |
| DENND4A  | 1 | 0,000320487 |
| CC2D1A   | 3 | 0,000320958 |
| TRIM27   | 4 | 0,000321588 |
| REEP2    | 1 | 0,000322009 |
| F2R      | 1 | 0,000322509 |
| DNAJC10  | 4 | 0,000323441 |
| FARSA    | 1 | 0,000326794 |
| POLR3C   | 1 | 0,000328299 |
| PSMD12   | 1 | 0,000328866 |
| PDCD10   | 4 | 0,000329542 |
| HINT1    | 3 | 0,000330337 |
| CITED2   | 3 | 0,000330372 |
| GLIPR2   | 4 | 0,000333292 |
| LHX4     | 1 | 0,000333883 |
| TTC27    | 1 | 0,000334101 |
| DLG3     | 1 | 0,000334169 |
| MYH10    | 1 | 0,000334831 |
| DMAP1    | 1 | 0,000335113 |
| KLHL42   | 1 | 0,000335113 |
| SLC39A14 | 1 | 0,000335481 |
| DYRK1B   | 1 | 0,000336631 |
| VPS33A   | 1 | 0,000336854 |
| STAR     | 3 | 0,000338742 |
| MUTYH    | 1 | 0,000342625 |
| CHPF2    | 1 | 0,000343627 |
| CPN1     | 1 | 0,000343798 |
| EIF3G    | 4 | 0,000344292 |
| CCBL1    | 1 | 0,000346089 |
| GMIP     | 1 | 0,000346875 |
| BCL6B    | 1 | 0,000350495 |
| CELF2    | 1 | 0,000352499 |
| ZNF181   | 1 | 0,000354178 |
| TM9SF2   | 3 | 0,000354732 |
| PLS3     | 4 | 0,000356349 |
| SPDYA    | 1 | 0,000357819 |
| PUM1     | 4 | 0,000359711 |
| ZNF451   | 1 | 0,000361054 |
| ARHGEF2  | 1 | 0,000361596 |
| BTD      | 1 | 0,00036272  |
| TP53I3   | 1 | 0,000368459 |
| CHMP4B   | 1 | 0,000370188 |
| DEPTOR   | 1 | 0,000370919 |
| HPS1     | 1 | 0,000371906 |
| IP6K2    | 3 | 0,000375104 |

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|-----------|---|-------------|
| ACO1      | 3 | 0,000375764 |
| DNAJC7    | 1 | 0,00037638  |
| RB1       | 1 | 0,000379739 |
| PDZD8     | 4 | 0,000382253 |
| ESPL1     | 4 | 0,000382693 |
| DNMT3B    | 1 | 0,000382884 |
| SNCA      | 1 | 0,000383932 |
| LIG4      | 1 | 0,000385396 |
| RPL12     | 4 | 0,000386973 |
| DDX3Y     | 4 | 0,000391242 |
| CSNK1A1   | 5 | 0,000391538 |
| ARCN1     | 1 | 0,000391842 |
| LIG3      | 5 | 0,000392389 |
| NES       | 1 | 0,000394242 |
| AP1B1     | 1 | 0,000394792 |
| PBK       | 1 | 0,000399423 |
| MMAA      | 1 | 0,000399968 |
| PACRGL    | 1 | 0,000400941 |
| C6H4orf17 | 1 | 0,000401225 |
| FEZ1      | 3 | 0,000402357 |
| TUBE1     | 1 | 0,000404028 |
| ZNF652    | 1 | 0,000406773 |
| ATF7IP2   | 1 | 0,000406962 |
| FAN1      | 1 | 0,000407619 |
| TRAF4     | 3 | 0,00041091  |
| FAM19A1   | 1 | 0,000411637 |
| MRPL52    | 3 | 0,000411753 |
| IBSP      | 1 | 0,000412778 |
| PKM       | 1 | 0,00041317  |
| ITGB1     | 1 | 0,000413962 |
| ATF3      | 4 | 0,000414403 |
| ATP2B1    | 1 | 0,000414713 |
| NDUFS2    | 1 | 0,000414713 |
| CCDC28B   | 1 | 0,000418751 |
| SCFD1     | 1 | 0,000423575 |
| STXBP5L   | 3 | 0,000423575 |
| HYOU1     | 3 | 0,000423934 |
| ARHGEF28  | 1 | 0,000424276 |
| MXD1      | 1 | 0,000428454 |
| STX18     | 1 | 0,000428593 |
| TMEM115   | 1 | 0,000430229 |
| HEXA      | 1 | 0,000430838 |
| FAR1      | 4 | 0,000433064 |
| SPRY2     | 1 | 0,000433432 |
| KCNH1     | 3 | 0,000438327 |
| NCR3LG1   | 1 | 0,000438386 |
| ZNF148    | 4 | 0,00043842  |
| TMED3     | 1 | 0,000439648 |
| HMG20B    | 4 | 0,000443129 |
| NUMA1     | 4 | 0,000444124 |

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| SARS2    | 1 | 0,000444448 |
| PBXIP1   | 1 | 0,000447191 |
| DIS3L    | 4 | 0,000448074 |
| NDUFB5   | 1 | 0,000450421 |
| BNIP3    | 2 | 0,000451035 |
| THTPA    | 1 | 0,000451659 |
| OXA1L    | 1 | 0,000453791 |
| ZMPSTE24 | 1 | 0,000455244 |
| VRK3     | 1 | 0,000455297 |
| ZSWIM8   | 1 | 0,00045554  |
| SMARCD1  | 1 | 0,000456556 |
| PARP11   | 3 | 0,0004581   |
| PEX2     | 3 | 0,00045904  |
| DRC7     | 1 | 0,000461797 |
| INIP     | 3 | 0,000463815 |
| FXYD6    | 1 | 0,000466195 |
| SERINC3  | 1 | 0,000466238 |
| AS3MT    | 3 | 0,000471135 |
| ATP6V1C1 | 3 | 0,000475792 |
| SLC9A1   | 3 | 0,000476183 |
| HID1     | 1 | 0,000477643 |
| ASNS     | 1 | 0,000478559 |
| EXOSC6   | 1 | 0,000480679 |
| ANXA2    | 1 | 0,000481853 |
| NSMCE4A  | 1 | 0,00048342  |
| TBK1     | 1 | 0,000484349 |
| JAM2     | 4 | 0,000488578 |
| SEPT8    | 1 | 0,000490657 |
| PPCS     | 1 | 0,000492257 |
| EMC6     | 5 | 0,000493051 |
| CBR4     | 1 | 0,000502653 |
| NHS      | 1 | 0,000504278 |
| STRAP    | 1 | 0,000504278 |
| HSPB11   | 1 | 0,000505772 |
| MRPL35   | 1 | 0,000506827 |
| MYOM1    | 1 | 0,000509774 |
| ADCY9    | 1 | 0,000515693 |
| CEP135   | 1 | 0,00051857  |
| EBF1     | 1 | 0,000521424 |
| ABCC1    | 1 | 0,000523378 |
| SDCCAG3  | 1 | 0,000524931 |
| TPI1     | 1 | 0,000525274 |
| DRG1     | 4 | 0,000525621 |
| SNX27    | 1 | 0,000526143 |
| METTL8   | 1 | 0,000528564 |
| UNC5D    | 1 | 0,000530857 |
| EEDP1    | 1 | 0,000532056 |
| OCRL     | 1 | 0,000532497 |
| UCP3     | 1 | 0,000535031 |
| OCEL1    | 1 | 0,000536409 |

|            |   |             |
|------------|---|-------------|
| MINA       | 1 | 0,00053714  |
| PLCG1      | 1 | 0,00053757  |
| DCTN5      | 1 | 0,00054036  |
| RND3       | 4 | 0,00054046  |
| CAND1      | 4 | 0,000545091 |
| VPS26B     | 1 | 0,000546898 |
| CDK7       | 3 | 0,000551151 |
| SEC22A     | 1 | 0,000558088 |
| SUMO3      | 1 | 0,000561782 |
| GNG4       | 1 | 0,00056234  |
| CSPG5      | 2 | 0,000562945 |
| CERS2      | 1 | 0,000564855 |
| CREB3L2    | 3 | 0,000572122 |
| CDH3       | 1 | 0,000572802 |
| ARFGAP1    | 1 | 0,000575445 |
| KLHL24     | 4 | 0,000581618 |
| CD320      | 1 | 0,000582112 |
| PANX1      | 1 | 0,000583163 |
| TJAP1      | 1 | 0,000585372 |
| ARPC1B     | 3 | 0,000585376 |
| SLC41A2    | 1 | 0,000588025 |
| RAD23A     | 3 | 0,000592331 |
| CLSTN3     | 1 | 0,000593918 |
| FREM1      | 1 | 0,000597638 |
| COX19      | 1 | 0,000599185 |
| TMEM59     | 4 | 0,000599185 |
| ALG6       | 1 | 0,000599251 |
| DTWD2      | 1 | 0,000599891 |
| ZNF576     | 4 | 0,000602584 |
| LRR1       | 1 | 0,000604464 |
| ANAPC10    | 1 | 0,000604731 |
| SPATA20    | 1 | 0,000606699 |
| SGPL1      | 1 | 0,000610604 |
| MED29      | 4 | 0,000611633 |
| RASGEF1B   | 1 | 0,000611633 |
| PAK3       | 1 | 0,000612241 |
| COMMD6     | 3 | 0,000614368 |
| VSIG1      | 1 | 0,000617052 |
| PARK7      | 3 | 0,000618975 |
| GABARAPL1  | 4 | 0,000620931 |
| PLEKHH3    | 3 | 0,000620931 |
| CDK5RAP2   | 1 | 0,000621599 |
| LENG8      | 2 | 0,000625219 |
| C8B        | 1 | 0,000627186 |
| FKBP7      | 1 | 0,000627513 |
| C26H10orf2 | 1 | 0,000627942 |
| C7H19orf43 | 4 | 0,000628179 |
| POC5       | 1 | 0,000628256 |
| NSUN5      | 1 | 0,00063006  |
| GOLM1      | 1 | 0,000639362 |

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|------------|---|-------------|
| ASAP3      | 1 | 0,000639832 |
| PALM2      | 1 | 0,000640652 |
| DNAJB2     | 3 | 0,000643854 |
| DPM2       | 3 | 0,000645625 |
| C7H19orf24 | 4 | 0,000648972 |
| STK19      | 4 | 0,000649401 |
| EVI5L      | 1 | 0,000651512 |
| SNX24      | 1 | 0,000657759 |
| WDR89      | 4 | 0,000658722 |
| EFEMP1     | 1 | 0,000665177 |
| KCNA5      | 1 | 0,000665745 |
| GJB4       | 1 | 0,000667669 |
| FANCG      | 1 | 0,000668613 |
| CREB1      | 3 | 0,000670215 |
| PTPN3      | 1 | 0,000679465 |
| MRPL58     | 3 | 0,000681868 |
| MYL6B      | 3 | 0,000681868 |
| BORCS5     | 3 | 0,000682494 |
| ABTB1      | 4 | 0,00068612  |
| ALAD       | 1 | 0,000688875 |
| ADA        | 1 | 0,000691958 |
| TFAP2B     | 1 | 0,000693144 |
| NKD1       | 1 | 0,000700079 |
| PROSC      | 4 | 0,000701712 |
| NRF1       | 2 | 0,000703584 |
| SLC35G1    | 1 | 0,000704667 |
| FBLN5      | 1 | 0,000705818 |
| SGSH       | 1 | 0,000712001 |
| IRAK2      | 3 | 0,000719436 |
| ST3GAL6    | 1 | 0,000726132 |
| OTUD4      | 1 | 0,000731288 |
| DHX32      | 1 | 0,000738355 |
| ACOT8      | 1 | 0,000741256 |
| TUBGCP5    | 1 | 0,000741795 |
| MANBAL     | 1 | 0,000743638 |
| GRB7       | 1 | 0,000747258 |
| ITGA2      | 1 | 0,000748213 |
| EMC8       | 3 | 0,00075419  |
| HEY2       | 1 | 0,000756241 |
| PCCA       | 3 | 0,000756324 |
| GCHFR      | 4 | 0,000760013 |
| OLFML1     | 1 | 0,000760013 |
| GPS2       | 1 | 0,000762547 |
| CCZ1       | 1 | 0,000763911 |
| MED19      | 4 | 0,000766242 |
| TANK       | 1 | 0,00077751  |
| CDA        | 1 | 0,000782059 |
| ERCC8      | 4 | 0,000782059 |
| TAF6       | 1 | 0,000782059 |
| PTPRB      | 1 | 0,000782544 |

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|----------|---|-------------|
| GMCL1    | 1 | 0,000786218 |
| MAP1B    | 1 | 0,000787971 |
| AP1M2    | 1 | 0,000789005 |
| TSG101   | 3 | 0,000790462 |
| SESN2    | 1 | 0,000794723 |
| TRIM13   | 3 | 0,000797137 |
| ADCYAP1  | 5 | 0,000798986 |
| FRMD3    | 1 | 0,000799709 |
| LPGAT1   | 1 | 0,000799709 |
| OSGEPL1  | 3 | 0,000801124 |
| PRRG4    | 1 | 0,000804678 |
| DNAJC21  | 1 | 0,000817104 |
| UQCC     | 1 | 0,000827418 |
| SDR42E1  | 1 | 0,00083575  |
| MID1IP1  | 4 | 0,000837384 |
| RASGRP2  | 1 | 0,000843978 |
| PTBP2    | 1 | 0,000846781 |
| CARS2    | 1 | 0,000848226 |
| PTRH2    | 4 | 0,000848226 |
| MTRR     | 1 | 0,000849417 |
| MANBA    | 3 | 0,000852963 |
| CD59     | 1 | 0,000855825 |
| TMEM198  | 1 | 0,000866779 |
| TRPV6    | 1 | 0,000870343 |
| KIN      | 3 | 0,000871312 |
| CETN3    | 1 | 0,000877933 |
| FUT8     | 1 | 0,000881102 |
| RTCB     | 1 | 0,000884315 |
| S100A10  | 4 | 0,000885473 |
| CLN5     | 3 | 0,00088637  |
| MAPKAPK3 | 3 | 0,000889291 |
| CA6      | 1 | 0,000893865 |
| FGFR2    | 1 | 0,000893865 |
| ATP1B3   | 4 | 0,000898234 |
| CSTB     | 1 | 0,000898345 |
| DGKA     | 1 | 0,000898902 |
| CTNS     | 1 | 0,000899376 |
| RAD54B   | 4 | 0,000901399 |
| NUDT9    | 3 | 0,000904429 |
| NDRG3    | 1 | 0,000907073 |
| ITFG1    | 1 | 0,000907872 |
| EIF4E3   | 1 | 0,000909339 |
| MAK      | 4 | 0,000912199 |
| KIAA0907 | 4 | 0,000914352 |
| FBXO22   | 1 | 0,000918224 |
| CRHBP    | 3 | 0,000924886 |
| DTNB     | 1 | 0,000927969 |
| CCS      | 2 | 0,000931689 |
| PIK3CB   | 1 | 0,000932506 |
| SSFA2    | 1 | 0,000944654 |



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| PRMT2      | 1 | 0,000953444 |
| MRPL57     | 4 | 0,000957841 |
| XAB2       | 1 | 0,000969506 |
| GTF3C1     | 1 | 0,000973503 |
| DPP10      | 3 | 0,000977004 |
| CACNA1E    | 1 | 0,000983639 |
| LAMP1      | 5 | 0,000983733 |
| DTD1       | 1 | 0,000987627 |
| CDKN1B     | 1 | 0,000989167 |
| BHMT       | 1 | 0,000991396 |
| TBX18      | 1 | 0,000991396 |
| ACTC1      | 1 | 0,000992509 |
| ACCS       | 1 | 0,000993645 |
| LRRC45     | 1 | 0,000995538 |
| LOC788142  | 1 | 0,000997921 |
| NSUN6      | 3 | 0,001003067 |
| EFHB       | 3 | 0,001005563 |
| KCNK5      | 4 | 0,001011774 |
| PGGT1B     | 1 | 0,00101807  |
| C2H2orf47  | 1 | 0,001019056 |
| BBS7       | 1 | 0,001021438 |
| DDX28      | 1 | 0,00103224  |
| UBE2G2     | 1 | 0,00103588  |
| PTPN5      | 1 | 0,00103812  |
| CMBL       | 1 | 0,001039467 |
| KANSL2     | 4 | 0,001040723 |
| PNOC       | 1 | 0,001049103 |
| DHRS4      | 1 | 0,001053172 |
| EXOG       | 1 | 0,001059754 |
| MORN2      | 3 | 0,001069831 |
| VMP1       | 4 | 0,001075127 |
| SUN2       | 1 | 0,001083258 |
| GLCE       | 1 | 0,001085248 |
| PFN1       | 3 | 0,001097303 |
| ERLIN1     | 1 | 0,001104823 |
| KPNB1      | 1 | 0,001105711 |
| PRRC1      | 1 | 0,001113334 |
| LETMD1     | 3 | 0,001115626 |
| SERGEF     | 1 | 0,001120244 |
| PPP1R1A    | 1 | 0,001122844 |
| HIP1       | 1 | 0,0011238   |
| ARFIP1     | 1 | 0,00112506  |
| HYKK       | 1 | 0,001129048 |
| C20H5orf22 | 1 | 0,001129659 |
| LOC512899  | 1 | 0,001132368 |
| CNGA3      | 1 | 0,001134978 |
| BDH1       | 4 | 0,001137132 |
| LOC534913  | 3 | 0,001140105 |
| RAD1       | 1 | 0,00114752  |
| POR        | 1 | 0,001148283 |

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| FAM13A    | 1 | 0,001152642 |
| ATP6V1C2  | 1 | 0,001154022 |
| POLR1B    | 1 | 0,001156099 |
| TMCC2     | 3 | 0,001161699 |
| SFXN4     | 1 | 0,001164924 |
| P4HA1     | 1 | 0,001166141 |
| GPR179    | 1 | 0,001171625 |
| APIP      | 1 | 0,001173245 |
| SMYD3     | 3 | 0,001175321 |
| PTCD3     | 1 | 0,00118411  |
| FERMT3    | 1 | 0,001184243 |
| NOS1AP    | 1 | 0,001185229 |
| ARPC3     | 1 | 0,001187666 |
| SOCS4     | 4 | 0,001187666 |
| DYNC111   | 1 | 0,001189114 |
| TSKU      | 1 | 0,001190236 |
| KLHDC9    | 1 | 0,001209096 |
| POLR2I    | 4 | 0,001212211 |
| LIX1L     | 3 | 0,00121915  |
| BCAT1     | 3 | 0,001221185 |
| P2RX1     | 1 | 0,001230863 |
| ARFGAP2   | 1 | 0,001235998 |
| RPS19BP1  | 4 | 0,001236847 |
| STK3      | 5 | 0,001240878 |
| SF3B3     | 4 | 0,001241507 |
| LDLR      | 1 | 0,001246172 |
| JAK1      | 1 | 0,001263167 |
| MSX2      | 1 | 0,00127546  |
| FGFR1OP2  | 4 | 0,001276471 |
| NEK3      | 1 | 0,001283079 |
| SFRP1     | 1 | 0,001285736 |
| KLHDC10   | 1 | 0,001287066 |
| SDHAF2    | 1 | 0,001289409 |
| ZNF341    | 1 | 0,001289409 |
| ILDR2     | 1 | 0,001289996 |
| BLOC1S6   | 3 | 0,001291581 |
| PPP2CB    | 4 | 0,001292312 |
| ABHD6     | 1 | 0,001296917 |
| BTRC      | 3 | 0,001296917 |
| IFT81     | 1 | 0,001297461 |
| PTN       | 1 | 0,001301648 |
| NAP1L4    | 1 | 0,001302145 |
| IQSEC1    | 3 | 0,001302516 |
| SGCB      | 1 | 0,001310702 |
| PSMD3     | 1 | 0,001315518 |
| STIM1     | 1 | 0,001316926 |
| GABPB2    | 1 | 0,001322149 |
| CLCN4     | 1 | 0,001322389 |
| LOC616319 | 1 | 0,001323658 |
| WNT2B     | 1 | 0,001327094 |

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| ZKSCAN8  | 4 | 0,001330252 |
| NHEDC1   | 1 | 0,001331468 |
| IDI1     | 1 | 0,001356693 |
| SCLY     | 4 | 0,001369267 |
| BICDL2   | 3 | 0,001370153 |
| TNPO3    | 4 | 0,00137056  |
| DOLK     | 3 | 0,001375957 |
| ADGRL3   | 1 | 0,001378666 |
| CTU1     | 4 | 0,001391189 |
| LATS1    | 1 | 0,001399899 |
| TTC21B   | 1 | 0,001401645 |
| GAN      | 4 | 0,001401712 |
| MAPKAP1  | 1 | 0,001402318 |
| WDR70    | 5 | 0,001411445 |
| CPTP     | 3 | 0,001416147 |
| GPC5     | 1 | 0,00141667  |
| EHD4     | 1 | 0,001443884 |
| HMG20A   | 1 | 0,001453555 |
| UMPS     | 4 | 0,001456429 |
| SAR1B    | 1 | 0,001471159 |
| NDUFA5   | 1 | 0,001475525 |
| SLC39A7  | 1 | 0,00148448  |
| CUX2     | 3 | 0,001485206 |
| FNDC3A   | 1 | 0,001486772 |
| HSPBAP1  | 1 | 0,001495812 |
| USO1     | 1 | 0,001499125 |
| MMACHC   | 4 | 0,001500755 |
| LAMTOR5  | 1 | 0,001504046 |
| CASC1    | 1 | 0,001505699 |
| PCBD1    | 1 | 0,001541544 |
| PTPRR    | 1 | 0,001542787 |
| FNTB     | 1 | 0,001543277 |
| ZHX2     | 1 | 0,001561492 |
| NAV3     | 1 | 0,001562455 |
| LRRFIP1  | 1 | 0,001574612 |
| SLC5A6   | 4 | 0,0015859   |
| CNEP1R1  | 3 | 0,0015873   |
| ZNF445   | 1 | 0,0015873   |
| RASGEF1A | 3 | 0,001603422 |
| UBE2D4   | 1 | 0,001619135 |
| MRPS2    | 3 | 0,001630016 |
| RFX5     | 3 | 0,001632001 |
| AK3      | 1 | 0,00163607  |
| HMMR     | 1 | 0,00163607  |
| ARL2BP   | 1 | 0,001647093 |
| SPIN1    | 4 | 0,001663772 |
| HARBI1   | 1 | 0,001673252 |
| MSI1     | 1 | 0,00167601  |
| RWDD2A   | 1 | 0,00167601  |
| SIGMAR1  | 1 | 0,00167601  |

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| CNOT10   | 3 | 0,001676741 |
| SULF2    | 1 | 0,001676987 |
| FARS2    | 1 | 0,001678171 |
| HSPA1L   | 1 | 0,001692895 |
| CMTR1    | 1 | 0,00170005  |
| TLR2     | 5 | 0,001701931 |
| MRPL48   | 1 | 0,001708364 |
| TBL2     | 1 | 0,001709682 |
| GCNT3    | 1 | 0,001711203 |
| FBXL14   | 1 | 0,001713199 |
| MGAT4B   | 3 | 0,001715447 |
| ACACA    | 1 | 0,001720605 |
| PPP3CB   | 1 | 0,001723207 |
| ZFYVE27  | 4 | 0,001729542 |
| EXTL3    | 1 | 0,001731609 |
| C5       | 1 | 0,00173381  |
| FAM92A1  | 3 | 0,00174717  |
| GATB     | 3 | 0,001771756 |
| FAT1     | 1 | 0,001772161 |
| MCTP1    | 3 | 0,00177239  |
| RNF7     | 1 | 0,001773873 |
| ATP5B    | 4 | 0,001775351 |
| PPP1R1B  | 1 | 0,001780863 |
| SLC31A2  | 1 | 0,001789812 |
| ULK3     | 1 | 0,001813118 |
| GTSE1    | 1 | 0,001817496 |
| MGAT4A   | 1 | 0,001820852 |
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| VIPAS39  | 1 | 0,001847185 |
| WLS      | 3 | 0,001863281 |
| PHC2     | 1 | 0,001863821 |
| GOLGA7B  | 3 | 0,001876497 |
| EIF2S1   | 1 | 0,00187794  |
| DNM3     | 1 | 0,001882042 |
| HSPD1    | 1 | 0,00188868  |
| SNX22    | 1 | 0,00188868  |
| ANKRD1   | 3 | 0,001891488 |
| EMG1     | 4 | 0,001899242 |
| TMEM126A | 1 | 0,001900033 |
| ASL      | 1 | 0,001903363 |
| ALDH3A2  | 1 | 0,001906221 |
| GPX8     | 1 | 0,001906221 |
| FRZB     | 1 | 0,001923991 |
| MRPS9    | 3 | 0,001923991 |
| USP44    | 1 | 0,001935283 |
| ITPA     | 3 | 0,001936121 |
| PTGER4   | 4 | 0,001941848 |
| TFB1M    | 1 | 0,001954803 |
| MRPS28   | 3 | 0,001992206 |

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| PDE12     | 4 | 0,002000459 |
| TMEM127   | 1 | 0,002012563 |
| PNPLA6    | 1 | 0,002013716 |
| POLR3F    | 4 | 0,002017029 |
| DYM       | 3 | 0,002035929 |
| RPL7L1    | 4 | 0,002046128 |
| NUP155    | 4 | 0,002047426 |
| ZSWIM7    | 1 | 0,002052313 |
| GET4      | 1 | 0,002056397 |
| VRK2      | 1 | 0,002056397 |
| BAHD1     | 3 | 0,002059231 |
| HESX1     | 1 | 0,002059231 |
| RAB28     | 1 | 0,002059231 |
| ZSCAN26   | 1 | 0,002069557 |
| OGDHL     | 1 | 0,002093648 |
| JAG1      | 1 | 0,002099358 |
| PPM1L     | 3 | 0,002106886 |
| YARS      | 4 | 0,002106886 |
| ACRV1     | 1 | 0,002116778 |
| BANP      | 3 | 0,002116778 |
| ORAI1     | 1 | 0,002116778 |
| ZNF774    | 1 | 0,002117173 |
| PORCN     | 3 | 0,002118503 |
| SUGP1     | 4 | 0,002119984 |
| FBXO18    | 1 | 0,002130756 |
| SYT4      | 3 | 0,002160627 |
| MAPK9     | 1 | 0,002170669 |
| TRAPPC3   | 1 | 0,002175536 |
| ADORA2B   | 1 | 0,002186329 |
| H1FO      | 1 | 0,002198201 |
| KIAA2012  | 1 | 0,002199535 |
| KCNMA1    | 1 | 0,002202221 |
| FXR2      | 1 | 0,002202783 |
| B4GALT6   | 1 | 0,002214889 |
| C7H5orf24 | 1 | 0,002215002 |
| TMEM41A   | 3 | 0,002237782 |
| COPS5     | 3 | 0,002239304 |
| DEUP1     | 1 | 0,002243772 |
| UBE3D     | 1 | 0,002243987 |
| EIF2B1    | 1 | 0,002252515 |
| ZNF621    | 1 | 0,002267501 |
| BROX      | 4 | 0,002280057 |
| LOC788201 | 1 | 0,002289312 |
| CDC42BPG  | 1 | 0,002293615 |
| ARL8B     | 1 | 0,00229451  |
| FBF1      | 3 | 0,00230526  |
| MICAL1    | 1 | 0,002309884 |
| TDRKH     | 1 | 0,0023118   |
| SNX3      | 1 | 0,00231542  |
| RFWD2     | 1 | 0,002317541 |

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| CMPK1       | 1 | 0,002324502 |
| RPL18       | 4 | 0,002330531 |
| CDC7        | 1 | 0,002330644 |
| PKIG        | 1 | 0,002330644 |
| MLF1        | 1 | 0,002331154 |
| SLC46A1     | 1 | 0,002337003 |
| GTF2E1      | 4 | 0,002339682 |
| LRIG3       | 1 | 0,002346632 |
| CBLB        | 1 | 0,002346836 |
| ANKRD27     | 1 | 0,002348237 |
| EMILIN2     | 3 | 0,002355818 |
| NAE1        | 1 | 0,002367687 |
| DIP2B       | 1 | 0,002369921 |
| EMC7        | 1 | 0,002369921 |
| RHPN2       | 4 | 0,002369921 |
| ARSB        | 1 | 0,002370004 |
| PTMS        | 3 | 0,002373189 |
| ABCA4       | 1 | 0,002383933 |
| BCL7C       | 3 | 0,002387085 |
| BLOC1S5     | 3 | 0,002387085 |
| MRGPRX2     | 4 | 0,002387115 |
| STMN1       | 3 | 0,002387115 |
| ITGA6       | 1 | 0,002397557 |
| BRIX1       | 1 | 0,002413713 |
| C7H19orf66  | 1 | 0,002413713 |
| RASD2       | 3 | 0,002414695 |
| UXS1        | 3 | 0,002419785 |
| IMPA1       | 3 | 0,002424157 |
| CECR5       | 1 | 0,00242905  |
| MTERF3      | 6 | 0,002435834 |
| NDUFA7      | 1 | 0,00244509  |
| HHEX        | 1 | 0,002467904 |
| RAB3C       | 3 | 0,002473661 |
| ATP6V0A1    | 1 | 0,002479199 |
| INPP5K      | 4 | 0,002481063 |
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| DVL1        | 1 | 0,00249924  |
| AIM1L       | 1 | 0,002519286 |
| CSTF2T      | 4 | 0,002522574 |
| C9H6orf203  | 1 | 0,002528452 |
| GPR84       | 3 | 0,002533141 |
| TUBGCP3     | 3 | 0,002533141 |
| NAIF1       | 4 | 0,002542512 |
| PPT1        | 1 | 0,002542512 |
| GFRA3       | 4 | 0,002544483 |
| SLC3A2      | 1 | 0,002551391 |
| C10H14orf37 | 1 | 0,002556731 |
| DECR1       | 1 | 0,002590619 |
| TMEM55B     | 3 | 0,002601897 |
| MLN         | 3 | 0,002608544 |

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| RARRES1    | 3 | 0,002616015 |
| FARP1      | 1 | 0,002625609 |
| ZNF384     | 2 | 0,002633626 |
| USP15      | 5 | 0,002642667 |
| KCNH5      | 1 | 0,00266065  |
| CSK        | 1 | 0,002670467 |
| UNC93B1    | 3 | 0,002677155 |
| NAA60      | 3 | 0,002678542 |
| MAN2A1     | 1 | 0,002692364 |
| BLOC1S1    | 3 | 0,002693075 |
| APOBEC2    | 3 | 0,002698753 |
| ECHS1      | 1 | 0,002707442 |
| COMMD7     | 1 | 0,002722133 |
| CNKSR3     | 1 | 0,002723949 |
| ZNF689     | 3 | 0,002725352 |
| ATG7       | 1 | 0,002725926 |
| ZCCHC4     | 1 | 0,002730235 |
| NDUFA9     | 1 | 0,002741827 |
| C16H1orf27 | 1 | 0,002761189 |
| SFXN1      | 1 | 0,002762926 |
| TAB1       | 3 | 0,002765929 |
| TEK        | 1 | 0,002780371 |
| ZDHHC13    | 1 | 0,002789557 |
| CCDC115    | 4 | 0,002794578 |
| SOX2       | 3 | 0,002796215 |
| NAAA       | 3 | 0,002797539 |
| SUPT3H     | 1 | 0,00281543  |
| CALCOCO2   | 1 | 0,002823739 |
| ADPRM      | 4 | 0,002832946 |
| PPP1R3F    | 3 | 0,002838523 |
| PNRC2      | 3 | 0,002841993 |
| ERP44      | 1 | 0,002844677 |
| MIOS       | 1 | 0,002852477 |
| SLC8B1     | 1 | 0,002853963 |
| WDR54      | 1 | 0,002859461 |
| PIIP5K1    | 1 | 0,002862093 |
| PIP4K2B    | 1 | 0,002864164 |
| MRPS27     | 1 | 0,002869858 |
| GPN3       | 4 | 0,00287423  |
| DAPK1      | 1 | 0,00290186  |
| SRSF9      | 3 | 0,00290186  |
| IGFLR1     | 4 | 0,002906477 |
| LMO2       | 5 | 0,002922058 |
| EPN2       | 1 | 0,002936998 |
| SMIM14     | 1 | 0,002954828 |
| TRIM32     | 1 | 0,002964788 |
| PSMB6      | 4 | 0,002967296 |
| RPS6KC1    | 1 | 0,002969075 |
| TRPC6      | 1 | 0,002970809 |
| PHLPP2     | 1 | 0,002981126 |

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| LETM1     | 3 | 0,00298344  |
| CHRNA7    | 1 | 0,002993913 |
| MTMR10    | 1 | 0,003008076 |
| TUBB6     | 1 | 0,003021367 |
| ABR       | 3 | 0,003024952 |
| ACSS1     | 4 | 0,003028142 |
| SIAE      | 1 | 0,003035456 |
| KIF4A     | 5 | 0,003072853 |
| TDP2      | 1 | 0,003075672 |
| CPNE3     | 1 | 0,003086111 |
| SYN3      | 3 | 0,003160119 |
| CALB2     | 1 | 0,003164618 |
| METTL18   | 1 | 0,003171404 |
| COX10     | 1 | 0,003171513 |
| CSNK1E    | 3 | 0,003171513 |
| SPCS3     | 4 | 0,003185127 |
| RPA2      | 1 | 0,003189359 |
| RFC3      | 3 | 0,003211983 |
| HSPB1     | 3 | 0,003228392 |
| OGDH      | 1 | 0,003234315 |
| CCAR2     | 1 | 0,003265077 |
| TRMT12    | 3 | 0,003270534 |
| DONSON    | 1 | 0,003278974 |
| MRPL47    | 3 | 0,003298548 |
| NCAPD2    | 4 | 0,00330789  |
| CDK16     | 1 | 0,003342163 |
| OGFR      | 1 | 0,003382965 |
| RNF121    | 3 | 0,003393082 |
| NCSTN     | 3 | 0,003394624 |
| CDC42EP4  | 1 | 0,003420978 |
| LTA4H     | 3 | 0,003423215 |
| NQO2      | 1 | 0,003425797 |
| NUCKS1    | 3 | 0,003431093 |
| ECD       | 1 | 0,00345243  |
| ADAMTS12  | 1 | 0,003452449 |
| TMED5     | 4 | 0,003452449 |
| PKN2      | 1 | 0,003458495 |
| KIF3B     | 3 | 0,003458929 |
| UBE2D1    | 1 | 0,003507763 |
| CASC3     | 1 | 0,003508257 |
| RPAP2     | 1 | 0,003508257 |
| GTF2A1L   | 1 | 0,003513407 |
| TTL       | 1 | 0,003517372 |
| KLHL20    | 1 | 0,003539308 |
| LYRM9     | 1 | 0,003548049 |
| AGO3      | 4 | 0,003553701 |
| VCAN      | 3 | 0,003557973 |
| QDPR      | 3 | 0,003580778 |
| PIGM      | 4 | 0,003582393 |
| LOC533308 | 1 | 0,003599048 |



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| DDX6     | 1 | 0,003613049 |
| CKMT2    | 3 | 0,003633953 |
| TSR3     | 3 | 0,00364131  |
| SCG5     | 1 | 0,003656384 |
| PAQR7    | 3 | 0,003660115 |
| ATP5G1   | 1 | 0,003678582 |
| MRPL46   | 1 | 0,003705062 |
| STAT1    | 1 | 0,003707165 |
| WDR77    | 4 | 0,003708953 |
| TMCO3    | 3 | 0,003714449 |
| ZBTB11   | 5 | 0,003716877 |
| SUMF1    | 1 | 0,003753354 |
| UTP6     | 4 | 0,003756592 |
| BCAR3    | 1 | 0,003762176 |
| PCGF5    | 1 | 0,003762176 |
| VAPB     | 3 | 0,003772599 |
| BID      | 1 | 0,003773977 |
| IER2     | 4 | 0,003775639 |
| CTDSPL   | 1 | 0,003781034 |
| SNX5     | 4 | 0,003824179 |
| MYD88    | 1 | 0,003851229 |
| ZC4H2    | 3 | 0,003874484 |
| FAM81B   | 1 | 0,003884988 |
| RNF128   | 4 | 0,003894887 |
| IVD      | 1 | 0,003897645 |
| TBC1D9B  | 3 | 0,003898072 |
| RILPL2   | 1 | 0,003932757 |
| TMEM106B | 3 | 0,003937765 |
| PITPNA   | 1 | 0,00394235  |
| C1GALT1  | 4 | 0,00394665  |
| HLF      | 3 | 0,00394665  |
| SNX30    | 1 | 0,003948709 |
| RUFY3    | 1 | 0,003953793 |
| PIK3R1   | 1 | 0,003963108 |
| SLC44A3  | 1 | 0,003981263 |
| TMEM206  | 1 | 0,003981263 |
| FAF2     | 1 | 0,004013911 |
| ZNF705A  | 3 | 0,004015428 |
| RAD9A    | 1 | 0,004019672 |
| HECTD2   | 1 | 0,004023016 |
| HAT1     | 4 | 0,004029957 |
| CPOX     | 1 | 0,004035896 |
| EPB41L3  | 1 | 0,004035896 |
| CIDEA    | 1 | 0,004043    |
| NUDT16   | 1 | 0,004050245 |
| PSTK     | 1 | 0,004058357 |
| GCAT     | 1 | 0,004063879 |
| ZSCAN31  | 1 | 0,004087927 |
| EIF2A    | 4 | 0,004096651 |
| ETV5     | 1 | 0,004096651 |

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| SYTL4    | 3 | 0,004109118 |
| CSNK2A2  | 3 | 0,004117196 |
| SMG5     | 4 | 0,00411936  |
| NXT1     | 1 | 0,004122344 |
| TRAT1    | 3 | 0,004131262 |
| NOSTRIN  | 1 | 0,00413377  |
| AARS     | 4 | 0,004183632 |
| PHF1     | 3 | 0,004185119 |
| EXOSC4   | 1 | 0,004218751 |
| CLASP2   | 1 | 0,004237858 |
| UXT      | 4 | 0,004269979 |
| BSP3     | 1 | 0,004271747 |
| PSMG2    | 3 | 0,004288392 |
| STRN3    | 5 | 0,004295918 |
| SLA2     | 1 | 0,004323241 |
| RNF138   | 4 | 0,004354793 |
| HINFP    | 4 | 0,004355642 |
| HIST3H2A | 1 | 0,004363319 |
| ARRDC4   | 1 | 0,004406088 |
| HDDC3    | 1 | 0,004407276 |
| MRPS5    | 1 | 0,004420822 |
| DEF8     | 1 | 0,004425203 |
| CLN8     | 3 | 0,004432803 |
| HMBOX1   | 1 | 0,004438646 |
| B4GALT3  | 5 | 0,00444504  |
| POLR2C   | 1 | 0,004459415 |
| TMEM35   | 3 | 0,00447635  |
| UBALD1   | 4 | 0,004501876 |
| PFKFB2   | 1 | 0,004509682 |
| BUD13    | 3 | 0,004580206 |
| SORCS1   | 1 | 0,004580982 |
| STC1     | 3 | 0,004580982 |
| RPL14    | 4 | 0,004581392 |
| LRRTM1   | 1 | 0,004585915 |
| ORMDL3   | 2 | 0,004587156 |
| TAOK2    | 1 | 0,004587156 |
| RNF123   | 3 | 0,004610083 |
| NKIRAS2  | 1 | 0,004613137 |
| CARD14   | 4 | 0,004614853 |
| LRCH4    | 1 | 0,004630865 |
| COQ3     | 4 | 0,004640492 |
| EIF2B2   | 4 | 0,004663528 |
| WDR91    | 1 | 0,004666358 |
| DBT      | 1 | 0,004668487 |
| ADGRE5   | 1 | 0,0047068   |
| GAS7     | 1 | 0,004714886 |
| NXN      | 3 | 0,004717503 |
| MEST     | 1 | 0,004722657 |
| FAM210B  | 3 | 0,00473322  |
| PRIM2    | 1 | 0,004748879 |

|             |   |             |
|-------------|---|-------------|
| PDE6A       | 1 | 0,004753185 |
| HEATR6      | 1 | 0,004769451 |
| C14H8orf33  | 4 | 0,004779259 |
| IL17RB      | 1 | 0,004779259 |
| BDNF        | 1 | 0,004822306 |
| DIS3L2      | 1 | 0,004832182 |
| CNST        | 1 | 0,004865929 |
| PPP2R3C     | 1 | 0,00486836  |
| TOR2A       | 1 | 0,004875266 |
| CYCS        | 1 | 0,004908616 |
| TUBA4A      | 4 | 0,004918124 |
| BCKDHB      | 1 | 0,004918712 |
| NOL12       | 1 | 0,004939072 |
| DPPA4       | 4 | 0,004966559 |
| C15H11orf70 | 1 | 0,004966675 |
| LRP10       | 4 | 0,004967348 |
| TLE1        | 4 | 0,004982855 |
| STK33       | 1 | 0,00499298  |
| C7H5orf30   | 4 | 0,005001948 |
| PRPF31      | 4 | 0,005003887 |
| BARHL2      | 1 | 0,005063582 |
| ENHO        | 1 | 0,005069613 |
| TOR1AIP1    | 1 | 0,005069613 |
| NUP188      | 1 | 0,005095838 |
| RAB32       | 1 | 0,005099532 |
| PLA2G16     | 1 | 0,005105095 |
| TBC1D7      | 3 | 0,005105095 |
| TMEM163     | 3 | 0,005105095 |
| KCNE1       | 1 | 0,005106827 |
| LOC534155   | 4 | 0,005112424 |
| ISY1        | 3 | 0,005113543 |
| PRPF4B      | 4 | 0,005174474 |
| TBC1D20     | 3 | 0,005202385 |
| FAM228B     | 1 | 0,005208985 |
| HSPA2       | 5 | 0,005212466 |
| PHPT1       | 1 | 0,005219872 |
| PRMT7       | 1 | 0,005236894 |
| ARRDC1      | 1 | 0,005240916 |
| PIGS        | 1 | 0,005276172 |
| CDX1        | 3 | 0,005282702 |
| SLC35A5     | 3 | 0,005282702 |
| LPCAT4      | 3 | 0,00529033  |
| RAC3        | 1 | 0,005316631 |
| STAM2       | 4 | 0,005322059 |
| SARAF       | 1 | 0,005344972 |
| POLA1       | 1 | 0,005402    |
| TRAIP       | 1 | 0,005402    |
| GRM1        | 1 | 0,005433269 |
| SLC35F5     | 1 | 0,005433269 |
| LYSMD4      | 1 | 0,005435278 |

|          |   |             |
|----------|---|-------------|
| STX8     | 2 | 0,005448837 |
| TRPM7    | 1 | 0,005454134 |
| DTNBP1   | 3 | 0,00546821  |
| KRTCAP3  | 1 | 0,005579776 |
| SEC14L1  | 1 | 0,005589311 |
| CAPZB    | 1 | 0,005637545 |
| GALNT2   | 1 | 0,005678233 |
| SDCBP    | 3 | 0,005715446 |
| TEX30    | 1 | 0,005744609 |
| METTL21B | 3 | 0,005803238 |
| ADCY7    | 1 | 0,005812579 |
| PIGW     | 4 | 0,005821165 |
| TP63     | 3 | 0,005821165 |
| DCK      | 3 | 0,005826727 |
| ALG2     | 4 | 0,005839595 |
| ORC2     | 1 | 0,005863028 |
| DBN1     | 3 | 0,005866494 |
| MEGF10   | 1 | 0,005867479 |
| PDHX     | 1 | 0,005887593 |
| CDX2     | 1 | 0,00590016  |
| UBTD2    | 1 | 0,005905155 |
| FH       | 1 | 0,005931983 |
| HIRIP3   | 1 | 0,005948812 |
| MRPL10   | 3 | 0,005951717 |
| RNF214   | 3 | 0,005960119 |
| WBP4     | 1 | 0,005974885 |
| PATL1    | 5 | 0,006016422 |
| RXRA     | 1 | 0,006079207 |
| MRPS22   | 1 | 0,006095436 |
| ZCCHC11  | 3 | 0,006097608 |
| AIMP2    | 4 | 0,006108042 |
| ACADS    | 1 | 0,006119905 |
| AZIN2    | 3 | 0,006148145 |
| GF1B     | 1 | 0,006148145 |
| TRMT11   | 1 | 0,006167192 |
| NT5C3B   | 1 | 0,006176911 |
| MFF      | 3 | 0,0061882   |
| MED25    | 1 | 0,006212317 |
| SQSTM1   | 1 | 0,006261512 |
| MYL6     | 1 | 0,006320268 |
| TRMT10B  | 3 | 0,006348766 |
| SETDB2   | 4 | 0,006351109 |
| ALDH5A1  | 3 | 0,006366306 |
| TRIM37   | 1 | 0,00637258  |
| ACOT13   | 1 | 0,006384032 |
| MRRF     | 1 | 0,006393316 |
| KIAA1551 | 4 | 0,006399854 |
| PPRC1    | 4 | 0,006402607 |
| GATA2    | 1 | 0,006429783 |
| PSMC3IP  | 3 | 0,006450633 |

|            |   |             |
|------------|---|-------------|
| DPP3       | 3 | 0,006484501 |
| DUSP4      | 2 | 0,006484501 |
| SMYD2      | 1 | 0,006544242 |
| MYCBP2     | 1 | 0,006571798 |
| PCED1A     | 1 | 0,006580498 |
| PLA2G4D    | 1 | 0,006589775 |
| ANKRA2     | 1 | 0,006604496 |
| PAFAH2     | 1 | 0,00660695  |
| RBFOX1     | 1 | 0,006625548 |
| HSF2BP     | 1 | 0,006659799 |
| ING2       | 2 | 0,006671385 |
| KRAS       | 1 | 0,006679518 |
| MTMR7      | 1 | 0,006679518 |
| NENF       | 3 | 0,006753953 |
| TRAPPC11   | 1 | 0,006781487 |
| CAPNS1     | 4 | 0,006790189 |
| CHCHD6     | 1 | 0,006799349 |
| NAGK       | 1 | 0,006854768 |
| MBOAT1     | 1 | 0,006897043 |
| PDCL2      | 3 | 0,006904875 |
| C5H12orf4  | 1 | 0,00690507  |
| CCR8       | 1 | 0,006920098 |
| ZPR1       | 4 | 0,006931019 |
| MSN        | 1 | 0,006936196 |
| RBMX2      | 1 | 0,006953672 |
| MIP        | 1 | 0,006979838 |
| CTNNA3     | 3 | 0,006984334 |
| MIS12      | 4 | 0,007002246 |
| ZDHHC21    | 1 | 0,007019107 |
| C11H9orf16 | 4 | 0,007019127 |
| RNF185     | 4 | 0,007092415 |
| CDKN2AIP   | 4 | 0,007143869 |
| PIK3C3     | 1 | 0,007146646 |
| CAST       | 2 | 0,00714819  |
| GARS       | 1 | 0,007153285 |
| CPA1       | 1 | 0,007163567 |
| RALGPS2    | 3 | 0,007168215 |
| DUSP11     | 4 | 0,007171553 |
| GMPR       | 1 | 0,007178558 |
| RLIM       | 4 | 0,007191088 |
| WDR19      | 1 | 0,007195182 |
| DGUOK      | 3 | 0,007219138 |
| EXOC1      | 1 | 0,007236437 |
| LIPT2      | 1 | 0,007260711 |
| RAB26      | 3 | 0,007260711 |
| ZMYM3      | 1 | 0,007279177 |
| FRMD5      | 1 | 0,007401861 |
| KMT5A      | 4 | 0,007410414 |
| RIOK2      | 1 | 0,007412675 |
| URB1       | 4 | 0,007416699 |

|             |   |             |
|-------------|---|-------------|
| SMCHD1      | 4 | 0,007417914 |
| ZC3H4       | 1 | 0,007442828 |
| ABCF3       | 4 | 0,007452537 |
| MAN1A1      | 1 | 0,007473662 |
| CSTF2       | 1 | 0,007473845 |
| ZNF570      | 1 | 0,007514198 |
| ZBED5       | 1 | 0,007569151 |
| GCLC        | 1 | 0,007581257 |
| NPRL2       | 1 | 0,00763053  |
| MAB21L1     | 1 | 0,00765764  |
| ATG4C       | 4 | 0,00767663  |
| MUM1        | 3 | 0,007677033 |
| TEFM        | 1 | 0,007710682 |
| C21H14orf2  | 3 | 0,007731225 |
| TTYH1       | 3 | 0,007764028 |
| GRK2        | 1 | 0,007862783 |
| LIX1        | 1 | 0,007877377 |
| ELN         | 3 | 0,007941771 |
| NSFL1C      | 1 | 0,007941771 |
| FEM1A       | 4 | 0,007970337 |
| CHPF        | 1 | 0,007997016 |
| ITPRIP      | 4 | 0,008027605 |
| HK1         | 2 | 0,008072913 |
| RNF122      | 1 | 0,008074664 |
| POLA2       | 1 | 0,008142728 |
| TRAPPC10    | 3 | 0,008157375 |
| LIN7B       | 1 | 0,008172137 |
| MSH6        | 4 | 0,008182419 |
| CDYL        | 1 | 0,008190213 |
| PYURF       | 3 | 0,008229837 |
| RNF43       | 1 | 0,00824559  |
| PPP1R13L    | 1 | 0,008263941 |
| FGF16       | 1 | 0,008344226 |
| NADK        | 1 | 0,00837861  |
| ARIH2       | 3 | 0,008411697 |
| CTPS1       | 1 | 0,008411697 |
| PI4K2B      | 1 | 0,008429291 |
| NT5DC1      | 3 | 0,008447511 |
| IQCD        | 4 | 0,008488485 |
| EIF4EBP2    | 5 | 0,008548759 |
| C24H18orf25 | 1 | 0,008562681 |
| IL2RA       | 1 | 0,008562681 |
| PSAT1       | 1 | 0,008568754 |
| TSPAN33     | 1 | 0,00858584  |
| DNAJC18     | 1 | 0,008618209 |
| RPRD1B      | 4 | 0,00864536  |
| NCKIPSD     | 1 | 0,008670522 |
| COPS6       | 1 | 0,008683954 |
| FAT2        | 1 | 0,008746286 |
| SRF         | 3 | 0,008761545 |

|            |   |             |
|------------|---|-------------|
| TRAP1      | 3 | 0,008781144 |
| GNG12      | 1 | 0,008811502 |
| RPF2       | 1 | 0,008888981 |
| WDR6       | 4 | 0,008916522 |
| UBL4A      | 1 | 0,008925377 |
| IAH1       | 1 | 0,008949835 |
| NDUFS8     | 3 | 0,008994069 |
| MBTD1      | 5 | 0,009023039 |
| TMX1       | 4 | 0,009023039 |
| UPP2       | 1 | 0,009069447 |
| CPE        | 1 | 0,009103802 |
| IL2RG      | 4 | 0,009160343 |
| ACACB      | 1 | 0,009180295 |
| ZNF329     | 1 | 0,009195134 |
| FECH       | 1 | 0,009258712 |
| RAD51B     | 1 | 0,009307576 |
| DCLRE1C    | 1 | 0,009313812 |
| CCDC36     | 1 | 0,009345922 |
| RGL1       | 1 | 0,009398127 |
| RND2       | 1 | 0,009436791 |
| VPS50      | 1 | 0,009540973 |
| DFNA5      | 1 | 0,009551717 |
| FCF1       | 3 | 0,009551717 |
| MRPL41     | 4 | 0,009551717 |
| DNASE1     | 4 | 0,009572089 |
| ODF2L      | 1 | 0,009585034 |
| NUDT11     | 3 | 0,009603152 |
| MCRS1      | 4 | 0,009605893 |
| ARHGEF37   | 1 | 0,00961075  |
| C9H6orf118 | 3 | 0,009614828 |
| PRKACA     | 3 | 0,009622304 |
| TNFSF8     | 1 | 0,0096315   |
| SNX29      | 1 | 0,009667983 |
| CMTM4      | 1 | 0,009687578 |
| ARHGEF16   | 1 | 0,009704424 |
| TUG1       | 4 | 0,009735821 |
| PRKCE      | 1 | 0,00974598  |
| SMIM12     | 4 | 0,009763965 |
| PARVG      | 1 | 0,009767631 |
| PDSS1      | 1 | 0,009779268 |
| GLDC       | 1 | 0,009803759 |
| MRPL16     | 4 | 0,009843099 |
| NPAS2      | 1 | 0,009848027 |
| RPS6KA3    | 1 | 0,009848027 |
| EOGT       | 1 | 0,009917712 |
| SMG6       | 1 | 0,00997363  |
| RPTOR      | 1 | 0,009990719 |

**Supplementary Table S3.** Cluster specific marker genes identified using SC3 pipeline with a threshold of the adjusted p-value < 0.01 and the area under the ROC curve (AUROC) > 0.85.

| Gene name  | adjusted p-value | AUROC       | Cluster |
|------------|------------------|-------------|---------|
| C8H9orf64  | 5,78322E-11      | 0,868639668 | 1       |
| COG2       | 3,18661E-10      | 0,860159225 | 1       |
| DPP4       | 1,09151E-10      | 0,859813084 | 1       |
| F3         | 1,01963E-10      | 0,871408792 | 1       |
| NETO1      | 5,25661E-11      | 0,857995846 | 1       |
| RUFY2      | 5,26725E-10      | 0,859813084 | 1       |
| TIGAR      | 2,2572E-10       | 0,864053306 | 1       |
| TMEM128    | 5,35744E-10      | 0,859640014 | 1       |
| TPMT       | 1,85153E-11      | 0,869505019 | 1       |
| UCHL1      | 4,81329E-10      | 0,853409484 | 1       |
| XRCC2      | 1,12258E-11      | 0,858428522 | 1       |
| ZNF75A     | 4,96539E-10      | 0,857130495 | 1       |
| RHEBL1     | 8,21539E-06      | 0,855979644 | 2       |
| AMIGO2     | 8,57864E-06      | 0,865198711 | 4       |
| AMT        | 1,35901E-05      | 0,85754565  | 4       |
| ARFGAP3    | 3,34991E-07      | 0,895005371 | 4       |
| ARHGAP1    | 6,1081E-06       | 0,866272825 | 4       |
| ARMT1      | 4,12503E-07      | 0,888829216 | 4       |
| ATF7IP     | 4,1745E-06       | 0,872180451 | 4       |
| C14H8orf59 | 1,60997E-07      | 0,900912997 | 4       |
| C1D        | 6,31323E-07      | 0,889366273 | 4       |
| C3H1orf52  | 1,0613E-05       | 0,863050483 | 4       |
| CAD        | 1,32611E-08      | 0,918367347 | 4       |
| CCDC126    | 8,25557E-07      | 0,886949517 | 4       |
| CCT4       | 5,17188E-06      | 0,870032223 | 4       |
| CDK1       | 9,85311E-06      | 0,863856069 | 4       |
| CDKN2C     | 1,95214E-05      | 0,851638024 | 4       |
| CXADR      | 3,19081E-05      | 0,851235231 | 4       |
| DESI2      | 2,11316E-07      | 0,889500537 | 4       |
| DLD        | 3,41191E-05      | 0,851235231 | 4       |
| EIF3D      | 1,54396E-05      | 0,859291085 | 4       |
| EIF6       | 5,42133E-07      | 0,891245972 | 4       |
| EXOSC1     | 5,09899E-06      | 0,870032223 | 4       |
| FAM207A    | 7,47777E-08      | 0,886815252 | 4       |
| FAM89A     | 1,14757E-06      | 0,880773362 | 4       |
| FOLR1      | 3,65359E-08      | 0,914607948 | 4       |
| GART       | 5,55874E-06      | 0,868689581 | 4       |
| HAX1       | 5,46665E-07      | 0,890708915 | 4       |
| HIST1H2BD  | 7,6562E-09       | 0,926154672 | 4       |
| IL18       | 1,33071E-07      | 0,89943609  | 4       |
| IMP3       | 1,28889E-07      | 0,90386681  | 4       |
| IPMK       | 1,66538E-05      | 0,852712137 | 4       |
| ISG20L2    | 8,56319E-08      | 0,892722879 | 4       |
| ITM2B      | 3,01123E-08      | 0,900778733 | 4       |
| KLF3       | 5,76141E-06      | 0,859828142 | 4       |
| KLF5       | 5,61358E-07      | 0,888426423 | 4       |
| LARP4      | 5,79018E-06      | 0,86895811  | 4       |
| LOC782781  | 1,24401E-07      | 0,901718582 | 4       |
| LRRC40     | 2,1534E-06       | 0,87755102  | 4       |
| LSM8       | 3,8289E-06       | 0,871911923 | 4       |
| MANF       | 7,06591E-06      | 0,855263158 | 4       |
| MBIP       | 6,54952E-06      | 0,867883996 | 4       |
| MED31      | 1,98476E-05      | 0,856068743 | 4       |
| MRPL17     | 1,98026E-07      | 0,90037594  | 4       |



|         |             |             |   |
|---------|-------------|-------------|---|
| MTHFD1L | 2,35239E-07 | 0,895542427 | 4 |
| NAA11   | 9,59681E-07 | 0,883458647 | 4 |
| NANOG   | 2,21636E-06 | 0,861976369 | 4 |
| NCBP2   | 8,23006E-07 | 0,887486574 | 4 |
| NDUFB2  | 1,39641E-06 | 0,882384533 | 4 |
| NDUFB3  | 3,04196E-06 | 0,870435016 | 4 |
| NKAPL   | 6,17809E-07 | 0,88990333  | 4 |
| NOL6    | 1,26957E-06 | 0,883190118 | 4 |
| NOP16   | 1,00822E-06 | 0,883458647 | 4 |
| PARP14  | 8,49937E-07 | 0,87150913  | 4 |
| PDCD10  | 1,04396E-05 | 0,863050483 | 4 |
| PHF5A   | 1,90154E-05 | 0,855397422 | 4 |
| PIP5K1A | 2,52619E-05 | 0,853383459 | 4 |
| PLEKHJ1 | 1,42305E-05 | 0,857411386 | 4 |
| PPAT    | 9,59053E-06 | 0,863990333 | 4 |
| PPIL1   | 3,90162E-06 | 0,855934479 | 4 |
| PRPS1   | 2,5436E-05  | 0,853920516 | 4 |
| PSMA1   | 3,08411E-06 | 0,862916219 | 4 |
| PYCR2   | 2,77566E-05 | 0,853383459 | 4 |
| RACK1   | 4,44504E-06 | 0,871643394 | 4 |
| RNF11   | 7,78745E-07 | 0,888023631 | 4 |
| RPL26   | 2,97325E-06 | 0,875402793 | 4 |
| RPL36AL | 4,45686E-06 | 0,871643394 | 4 |
| RPL37   | 6,89829E-07 | 0,888560687 | 4 |
| RPL38   | 7,635E-06   | 0,866272825 | 4 |
| RPS19   | 3,95417E-08 | 0,91433942  | 4 |
| RPS27   | 3,00288E-07 | 0,896616541 | 4 |
| RPS29   | 6,74663E-07 | 0,889366273 | 4 |
| RPS4Y1  | 7,33016E-07 | 0,888560687 | 4 |
| RPS9    | 3,75967E-06 | 0,87244898  | 4 |
| SCO1    | 3,90642E-06 | 0,862379162 | 4 |
| SLC27A1 | 1,8594E-05  | 0,852577873 | 4 |
| SLC33A1 | 2,57437E-08 | 0,90829753  | 4 |
| SNHG12  | 3,3282E-07  | 0,887218045 | 4 |
| SNRPB   | 5,43696E-06 | 0,869495166 | 4 |
| SYT11   | 2,96711E-05 | 0,852846402 | 4 |
| TAF11   | 8,12336E-06 | 0,86546724  | 4 |
| TCEB2   | 1,32201E-06 | 0,882384533 | 4 |
| TIMM10B | 1,75964E-07 | 0,885606874 | 4 |
| TMEM41B | 2,86018E-05 | 0,852309345 | 4 |
| TSC22D1 | 3,20347E-05 | 0,852040816 | 4 |
| TSEN54  | 5,12698E-06 | 0,866004296 | 4 |
| TTC14   | 7,33487E-07 | 0,888292159 | 4 |
| TYW3    | 3,5239E-06  | 0,865601504 | 4 |
| UQCRFS1 | 1,66106E-06 | 0,878625134 | 4 |
| ZBTB9   | 1,69814E-06 | 0,880504834 | 4 |
| ZNRF1   | 1,66365E-06 | 0,879699248 | 4 |
| GRO1    | 4,91E-006   | 0,860767991 | 5 |

**Supplementary Table S4.** GO terms related to the six topics identified by using SC3 tool.

| GO-ID      | GO-term                                  | Corrected p-value | No. genes |
|------------|--|-------------------|-----------|
| GO:0042254 | ribosome biogenesis                      | 2,90E-06          | 9         |
| GO:0042255 | ribosome assembly                        | 2,90E-03          | 3         |
| GO:0042273 | ribosomal large subunit biogenesis       | 3,60E-03          | 3         |
| GO:0046112 | nucleobase biosynthetic process          | 4,20E-03          | 3         |
| GO:0006414 | translational elongation                 | 4,60E-03          | 3         |
| GO:0008652 | cellular amino acid biosynthetic process | 5,40E-03          | 3         |

**Supplementary Table S5.** GO terms of the different topics, obtained by using CellTree tool.

| Topic | GO-ID      | GO Term  | Corrected p-value | No. genes |
|-------|------------|--|-------------------|-----------|
| 1     | GO:0006412 | translation  | 1,50E-06          | 286       |
| 1     | GO:0051301 | cell division  | 2,20E-06          | 151       |
| 2     | GO:0006412 | translation  | 4,10E-18          | 286       |
| 2     | GO:0006446 | regulation of translational initiation                   | 1,30E-08          | 29        |
| 2     | GO:0000398 | mRNA splicing, via spliceosome                           | 1,70E-07          | 79        |
| 2     | GO:0002181 | cytoplasmic translation                                  | 5,60E-07          | 22        |
| 2     | GO:0006364 | rRNA processing  | 3,10E-06          | 74        |
| 2     | GO:0000245 | spliceosomal complex assembly                            | 5,20E-06          | 14        |
| 2     | GO:0048025 | negative regulation of mRNA splicing, via spliceosome    | 5,60E-06          | 8         |
| 2     | GO:0051301 | cell division  | 1,10E-05          | 151       |
| 2     | GO:0000381 | regulation of alternative mRNA splicing, via spliceosome | 1,90E-05          | 16        |
| 3     | GO:0006412 | translation  | 2,20E-06          | 286       |
| 4     | GO:0015986 | ATP synthesis coupled proton transport                   | 7,10E-04          | 18        |
| 5     | GO:0070125 | mitochondrial translational elongation                   | 6,50E-05          | 74        |
| 6     | GO:0015850 | organic hydroxy compound transport                       | 3,00E-04          | 20        |

**Supplementary Table S6.** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E1.1_p3 | E1.2_p3 | E1.3_p3 | E1.5_p3 | E1.6_p3 | E1.7_p3 | E14.1_p3 | E14.2_p3 | E14.3_p3 | E14.4_p3 |
|-------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|
| Embryo_Name | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  |
| ADAMTS1     | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,67110 | 3,50328  | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,18876 | 0,00000  | 0,00000  | 1,38160  | 0,00000  |
| DDX3Y       | 2,43825 | 3,86615 | 0,00000 | 1,13034 | 0,20664 | 4,62469 | 5,77262  | 1,83990  | 1,47810  | 0,17612  |
| DPPA4       | 0,55656 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,19126  | 0,00000  | 0,00000  | 0,00000  |
| FOLR1       | 0,24529 | 1,94864 | 0,00000 | 0,00000 | 0,00000 | 0,21505 | 2,76916  | 0,00000  | 0,92678  | 0,25927  |
| GAT         | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000 | 0,34869 | 0,00000 | 0,00000 | 0,00000 | 0,16610 | 4,41607  | 0,00000  | 0,00000  | 0,24595  |
| LRRC14      | 0,78762 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,16807 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 0,00000 | 0,67110 | 0,00000 | 0,00000 | 0,00000 | 0,93555 | 2,44839  | 0,00000  | 0,00000  | 1,14474  |
| NRBP2       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 1,64048 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,55796 | 1,42322  | 2,21397  | 0,00000  | 0,00000  |
| PCDH10      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 2,67432 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,05318  | 0,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E14.5_p3 | E14.6_p3 | E14.7_p3 | E14.8_p3 | E14.9_p3 | E16.1_p3 | E16.2_p3 | E16.4_p3 | E16.6_p3 | E16.7_p3 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E3  | Day2-E3  | Day2-E3  | Day2-E3  | Day2-E3  |
| ADAMTS1     | 0,00000  | 0,00000  | 0,79088  | 0,00000  | 0,00000  | 1,00321  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 1,04184  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000  | 0,00000  | 0,92325  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,95255  | 0,00000  | 0,00000  |
| DDX3Y       | 0,84410  | 3,10329  | 2,80570  | 1,32973  | 0,00000  | 4,11920  | 3,54740  | 1,61735  | 3,78990  | 4,57516  |
| DPPA4       | 0,00000  | 0,85679  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,86264  | 0,00000  |
| FOLR1       | 1,24762  | 0,00000  | 2,42825  | 0,48920  | 0,00000  | 1,58496  | 1,83668  | 0,68228  | 0,81194  | 4,49400  |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,50359  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000  | 0,00000  | 3,26991  | 0,00000  | 0,00000  | 0,93555  | 0,72074  | 1,74559  | 0,00000  | 0,91107  |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 1,18505  | 0,00000  | 0,00000  | 0,11153  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 0,00000  | 0,00000  | 0,97174  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,00000  | 0,00000  | 0,93555  | 0,00000  | 0,00000  | 0,00000  | 1,14474  | 0,00000  | 0,00000  | 0,00000  |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000  | 0,00000  | 0,47210  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,89320  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E16.8_p3 | E16.9_p3 | E11.1_p3 | E11.2_p3 | E11.3_p3 | E11.4_p3 | E11.5_p3 | E11.7_p3 | E11.8_p3 | E14.1_p2 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E3  | Day2-E3  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E5  |
| ADAMTS1     | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000  | 0,67110  | 3,50328  | 0,00000  | 0,00000  | 0,93555  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,18505  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 2,84016  | 0,74219  | 3,44824  | 2,69165  | 3,31987  | 4,43327  | 2,27331  | 0,00000  | 2,74154  | 5,20949  |
| DPPA4       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| FOLR1       | 0,00000  | 0,00000  | 0,77318  | 0,00000  | 0,00000  | 2,07905  | 0,69917  | 0,00000  | 0,00000  | 2,56260  |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,29132  |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,73522  | 0,00000  | 0,28137  | 2,20967  |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 2,97724  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,60245  | 0,00000  |
| SH2D3A      | 0,00000  | 0,94392  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E14.2_p2 | E14.3_p2 | E14.4_p2 | E14.5_p2 | E14.6_p2 | E14.7_p2 | E14.8_p2 | E15.1_p2 | E15.2_p2 | E15.3_p2 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E6  | Day2-E6  | Day2-E6  |
| ADAMTS1     | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,58228  | 0,80975  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 1,29530  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,99000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 3,55433  | 0,85846  | 2,63397  | 1,14829  | 2,39224  | 1,81670  | 0,00000  | 0,00000  | 7,18738  | 3,09041  |
| DPPA4       | 1,41544  | 0,00000  | 0,00000  | 0,00000  | 0,67639  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,92678  |
| FOLR1       | 1,84471  | 0,47210  | 0,00000  | 0,97550  | 2,04848  | 0,33506  | 0,00000  | 4,74319  | 0,00000  | 0,00000  |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,94392  | 0,00000  |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,67639  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 1,19126  | 0,00000  | 0,00000  | 0,00000  | 3,32379  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,00000  | 0,00000  | 0,30887  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,19126  | 1,21841  | 1,49391  |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,87173  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E15.4_p2 | E15.5_p2 | E15.6_p2 | E2.1_p1 | E2.2_p1 | E2.3_p1 | E2.4_p1 | E2.5_p1 | E2.6_p1 | E2.7_p1 |
|-------------|----------|----------|----------|---------|---------|---------|---------|---------|---------|---------|
| Embryo_Name | Day2-E6  | Day2-E6  | Day2-E6  | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 |
| ADAMTS1     | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| C3          | 0,00000  | 0,00000  | 1,14311  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,29132 |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,58472 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| CRABP1      | 0,00000  | 0,00000  | 0,32407  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,05318 |
| DDX3Y       | 0,00000  | 1,90222  | 5,00928  | 1,05878 | 1,29880 | 1,14474 | 1,94810 | 1,58924 | 0,00000 | 2,24148 |
| DPPA4       | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| FOLR1       | 0,00000  | 1,87173  | 2,97724  | 0,00000 | 0,34869 | 0,00000 | 3,69344 | 0,00000 | 0,00000 | 3,48211 |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| LOC508834   | 0,00000  | 0,00000  | 0,00000  | 2,07296 | 0,00000 | 0,00000 | 0,00000 | 4,03585 | 0,00000 | 0,00000 |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| MESDC1      | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,32407 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| NANOG       | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 1,77948 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| OVOL2       | 0,00000  | 0,00000  | 0,85679  | 0,00000 | 0,00000 | 0,00000 | 1,38160 | 0,00000 | 0,00000 | 0,00000 |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| SH2D3A      | 0,00000  | 0,00000  | 0,00000  | 3,48211 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,26432 | 3,26991 |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |

| Cell_Name   | E2.9_p1 | E2.10_p1 | E2.11_p1 | E2.12_p1 | E2.13_p1 | E2.14_p1 | E2.15_p1 | E3.1_p1 | E3.2_p1 | E3.3_p1 |
|-------------|---------|----------|----------|----------|----------|----------|----------|---------|---------|---------|
| Embryo_Name | Day3-E1 | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E2 | Day3-E2 | Day3-E2 |
| ADAMTS1     | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| C3          | 1,19126 | 1,21841  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| CNR2        | 1,46071 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 1,21841 | 0,00000 |
| CRABP1      | 0,00000 | 0,00000  | 1,26019  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 1,03250 | 0,00000 |
| DDX3Y       | 2,57825 | 0,80975  | 0,99964  | 0,00000  | 3,12006  | 1,21990  | 2,21349  | 0,71900 | 3,95445 | 1,46071 |
| DPPA4       | 2,67432 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,50359  | 0,00000  | 0,27245 | 2,23112 | 0,00000 |
| FOLR1       | 4,40102 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 3,26991  | 0,00000  | 0,00000 | 2,69505 | 0,00000 |
| GAT         | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| GFRA3       | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| LOC508834   | 1,24192 | 3,31987  | 0,00000  | 0,00000  | 0,76627  | 0,00000  | 1,04184  | 0,00000 | 0,00000 | 0,00000 |
| LRRC14      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 4,63658 | 0,00000 | 0,00000 |
| MAGEH1      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| MESDC1      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,89835 | 0,00000 | 0,00000 |
| NANOG       | 0,00000 | 0,46716  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| NRBP2       | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| OVOL2       | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,08502 | 0,00000 | 0,00000 |
| PCDH10      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,20672 | 1,54772 | 0,00000 |
| PTGDR       | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| SH2D3A      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,80193 | 0,00000 | 0,00000 |
| SLC2A5      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E3.5_p1 | E3.6_p1 | E3.7_p1 | E3.8_p1 | E3.9_p1 | E3.10_p1 | E3.11_p1 | E3.12_p1 | E3.13_p1 | E3.14_p1 |
|-------------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2  | Day3-E2  | Day3-E2  | Day3-E2  | Day3-E2  |
| ADAMTS1     | 0,00000 | 1,82677 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 1,95350  | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000 | 0,96838 | 0,00000 | 0,92325 | 0,78762 | 0,00000  | 1,77968  | 0,00000  | 0,95255  | 0,00000  |
| CNR2        | 0,00000 | 3,32379 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 1,38160  | 0,00000  | 1,54265  | 0,00000  |
| CRABP1      | 2,19744 | 6,12416 | 0,00000 | 4,18915 | 0,00000 | 0,00000  | 2,97724  | 0,66911  | 1,06599  | 0,00000  |
| DDX3Y       | 1,93530 | 2,40524 | 3,08684 | 1,88401 | 0,00000 | 1,79134  | 3,31971  | 1,86940  | 3,95718  | 1,03023  |
| DPPA4       | 0,00000 | 3,88976 | 0,00000 | 1,76252 | 0,97550 | 0,00000  | 0,00000  | 2,80277  | 4,74319  | 0,00000  |
| FOLR1       | 1,74559 | 7,97417 | 2,17689 | 5,05871 | 2,94169 | 5,04581  | 0,00000  | 2,07600  | 2,54629  | 3,89069  |
| GAT         | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,20664  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 2,11597  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,97550 | 0,00000 | 0,00000 | 2,19744 | 0,00000 | 0,00000  | 2,75428  | 1,03674  | 1,87173  | 0,00000  |
| NANOG       | 0,21505 | 1,29530 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,48920  | 0,00000  |
| NRBP2       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,21990  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 2,60873 | 2,93915 | 0,00000 | 1,28098 | 0,00000 | 0,67639  | 0,81481  | 0,00000  | 1,29530  | 1,28485  |
| PCDH10      | 1,14578 | 0,28137 | 1,14311 | 2,17148 | 0,00000 | 0,00000  | 2,58438  | 0,00000  | 0,00000  | 0,53358  |
| PTGDR       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,32453 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E3.16_p1 | E10.1_p1 | E10.2_p1 | E10.3_p1 | E10.4_p1 | E10.5_p1 | E10.6_p1 | E10.7_p1 | E10.8_p1 | E10.9_p1 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E2  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  |
| ADAMTS1     | 0,00000  | 1,29913  | 0,00000  | 0,00000  | 0,00000  | 0,89320  | 0,00000  | 0,32407  | 0,00000  | 2,70686  |
| C3          | 0,00000  | 0,46716  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,94864  | 0,00000  | 1,13506  | 0,00000  |
| CNR2        | 0,92325  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,89044  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,24595  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 7,18196  | 2,33772  | 0,00000  | 0,62097  | 1,32446  | 1,38160  | 3,51824  | 2,27100  | 1,78872  | 2,19709  |
| DPPA4       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| FOLR1       | 1,78888  | 0,00000  | 1,74045  | 1,75626  | 1,25456  | 0,00000  | 0,00000  | 1,83990  | 0,77764  | 0,17612  |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000  | 0,79088  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,16539  | 0,58228  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,66911  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,39891  | 0,00000  |
| NANOG       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,77318  | 1,87314  | 0,00000  |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,92678  | 0,00000  | 0,00000  | 0,00000  | 1,29913  | 0,00000  | 0,00000  | 0,00000  | 0,89320  | 0,00000  |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 3,32379  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 2,10601  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,76627  | 0,00000  |
| SH2D3A      | 0,00000  | 0,00000  | 0,00000  | 0,33307  | 0,33919  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E10.10_p1 | E10.11_p1 | E10.12_p1 | E10.13_p1 | E10.14_p1 | E10.15_p1 | E10.16_p1 | E16.1_p1 | E16.2_p1 | E16.3_p1 |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|
| Embryo_Name | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E4  | Day3-E4  | Day3-E4  |
| ADAMTS1     | 2,36361   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 1,78821  | 1,84471  |
| C3          | 0,11153   | 0,00000   | 1,95350   | 0,00000   | 0,25927   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 1,47223  |
| CNR2        | 0,00000   | 0,00000   | 0,24529   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000   | 1,70985   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,96697  | 0,00000  |
| DDX3Y       | 3,48118   | 0,92240   | 2,55263   | 2,33103   | 1,92823   | 3,28240   | 0,00000   | 1,87840  | 0,00000  | 2,96339  |
| DPPA4       | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| FOLR1       | 1,75934   | 2,68350   | 0,73619   | 0,81293   | 0,00000   | 1,27750   | 2,07296   | 4,21560  | 2,07310  | 5,61349  |
| GAT         | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000   | 0,00000   | 0,74219   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 0,00000   | 0,00000   | 0,73522   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 1,25229  | 0,00000  | 0,00000  |
| MESDC1      | 0,00000   | 1,63376   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 1,65544   | 0,69917   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,47210   | 0,00000  | 0,97550  | 1,62813  |
| NRBP2       | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,32407   | 0,00000   | 0,00000   | 0,00000   | 0,77318   | 2,32047   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| PCDH10      | 0,00000   | 0,00000   | 0,49486   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 2,21397  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000   | 0,00000   | 1,38070   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 1,30554  |
| SLC2A5      | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,77318  |

| Cell_Name   | E16.4_p1 | E16.5_p1 | E16.6_p1 | E16.7_p1 | E16.8_p1 | E16.9_p1 | E16.10_p1 | E16.11_p1 | E16.12_p1 | E16.13_p1 |
|-------------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Embryo_Name | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4   | Day3-E4   | Day3-E4   | Day3-E4   |
| ADAMTS1     | 0,82721  | 2,19829  | 1,96309  | 1,62813  | 0,33506  | 0,00000  | 6,12416   | 0,00000   | 5,72040   | 0,00000   |
| C3          | 1,00000  | 0,00000  | 1,14362  | 0,00000  | 2,67432  | 0,00000  | 1,91241   | 2,18432   | 0,00000   | 0,00000   |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,48920  | 0,00000   | 0,00000   | 0,89320   | 0,00000   |
| CRABP1      | 5,61496  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,11816   | 0,00000   | 0,94408   | 1,46118   |
| DDX3Y       | 4,60547  | 1,31186  | 4,29209  | 4,02543  | 2,19813  | 0,46418  | 0,71631   | 4,08722   | 4,89392   | 0,00000   |
| DPPA4       | 1,84483  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 4,39371   | 3,40622   | 0,85127   | 0,00000   |
| FOLR1       | 7,60786  | 3,18151  | 6,86635  | 5,13456  | 4,70930  | 5,29520  | 4,73822   | 3,00155   | 5,44820   | 2,87835   |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,28137  | 0,00000   | 1,46071   | 0,00000   | 0,00000   |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,50636   | 2,21397   | 0,67110   | 0,00000   |
| LOC508834   | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| LRRC14      | 0,17612  | 0,00000  | 1,05992  | 0,00000  | 0,00000  | 1,53135  | 1,27750   | 0,00000   | 0,00000   | 0,00000   |
| MAGEH1      | 1,50359  | 1,65544  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,15566   | 1,11195   | 2,53252   | 0,00000   |
| MESDC1      | 2,57863  | 0,96697  | 0,00000  | 0,00000  | 0,85127  | 0,00000  | 3,89069   | 0,00000   | 2,46661   | 0,00000   |
| NANOG       | 1,50080  | 2,80277  | 6,12416  | 1,49776  | 4,18915  | 4,06814  | 4,29410   | 5,80731   | 1,12446   | 0,00000   |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,81947   | 0,89044   | 0,00000   |
| OVOL2       | 1,26019  | 0,00000  | 2,81712  | 0,00000  | 1,13517  | 0,00000  | 1,03250   | 0,00000   | 0,00000   | 0,00000   |
| PCDH10      | 1,69725  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,24529  | 0,00000   | 2,60759   | 1,13506   | 0,00000   |
| PTGDR       | 1,05235  | 0,00000  | 0,93555  | 0,00000  | 0,00000  | 0,79088  | 0,00000   | 0,00000   | 1,00321   | 0,00000   |
| SH2D3A      | 0,00000  | 0,00000  | 1,27617  | 0,00000  | 0,92270  | 0,00000  | 1,84946   | 1,14829   | 0,55796   | 0,00000   |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,27245  | 0,00000  | 0,00000  | 1,15505   | 0,00000   | 1,11195   | 0,00000   |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E6.1_p3 | E6.2_p3 | E6.3_p3 | E6.4_p3 | E6.5_p3 | E6.6_p3 | E6.7_p3 | E6.8_p3 | E6.9_p3 | E6.10_p3 |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Embryo_Name | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5  |
| ADAMTS1     | 3,16657 | 2,97724 | 0,00000 | 0,00000 | 0,00000 | 3,69344 | 1,60245 | 0,16610 | 3,48211 | 0,00000  |
| C3          | 1,05318 | 0,27245 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| CNR2        | 0,00000 | 0,00000 | 1,25233 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| CRABP1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| DDX3Y       | 0,00000 | 1,24762 | 0,00000 | 0,00000 | 1,14471 | 2,18556 | 0,00000 | 1,83668 | 1,49264 | 1,00535  |
| DPPA4       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| FOLR1       | 0,53389 | 2,34071 | 0,00000 | 2,21709 | 0,00000 | 1,97937 | 4,26284 | 0,67110 | 4,43822 | 0,62007  |
| GAT         | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| GFRA3       | 0,00000 | 1,46194 | 0,00000 | 2,44839 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| LOC508834   | 0,62097 | 0,67965 | 0,00000 | 0,00000 | 0,00000 | 0,49486 | 0,00000 | 1,29422 | 0,00000 | 0,00000  |
| LRRC14      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| MAGEH1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| MESDC1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,19530 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| NANOG       | 0,00000 | 0,00000 | 0,00000 | 0,45003 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| NRBP2       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| OVOL2       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 2,02175 | 0,00000 | 0,00000  |
| PCDH10      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,25927 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| PTGDR       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| SH2D3A      | 0,00000 | 0,00000 | 3,50328 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| SLC2A5      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,49776 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |

| Cell_Name   | E6.11_p3 | E6.12_p3 | E6.13_p3 | E6.14_p3 | E6.15_p3 | E6.16_p3 | E6.17_p3 | E13.1_p3 | E13.2_p3 | E13.3_p3 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E6  | Day3-E6  | Day3-E6  |
| ADAMTS1     | 0,00000  | 0,80198  | 0,38788  | 1,26432  | 0,00000  | 0,00000  | 0,00000  | 2,47590  | 0,72074  | 2,51264  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,03674  | 0,00000  | 0,00000  | 1,12446  | 0,34869  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000  | 0,60125  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 0,00000  | 1,25233  | 0,00000  | 1,64482  | 2,32047  | 2,22372  | 2,07905  | 1,16809  | 1,50969  | 1,92241  |
| DPPA4       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,64999  | 0,00000  | 0,00000  |
| FOLR1       | 0,00000  | 1,49838  | 0,00000  | 0,62442  | 1,97104  | 3,04725  | 1,53892  | 2,32706  | 2,12571  | 4,69259  |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,92240  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,28137  | 0,00000  |
| LOC508834   | 0,00000  | 0,00000  | 0,00000  | 1,08502  | 0,00000  | 0,89044  | 0,00000  | 1,41544  | 0,00000  | 0,00000  |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MAGEH1      | 0,00000  | 0,00000  | 3,69344  | 0,00000  | 0,00000  | 3,48211  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| NANOG       | 0,00000  | 0,00000  | 0,00000  | 0,93555  | 0,00000  | 0,00000  | 0,00000  | 0,91107  | 0,00000  | 1,54075  |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| OVOL2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |



**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E13.4_p3 | E13.5_p3 | E13.6_p3 | E13.7_p3 | E13.8_p3 | E13.9_p3 | E13.10_p3 | E13.11_p3 | E13.12_p3 | E13.13_p3 |
|-------------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Embryo_Name | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6   | Day3-E6   | Day3-E6   | Day3-E6   |
| ADAMTS1     | 3,57161  | 0,00000  | 0,00000  | 2,52948  | 3,17122  | 4,33652  | 3,87475   | 0,00000   | 0,00000   | 3,80880   |
| C3          | 0,00000  | 5,60728  | 0,00000  | 0,00000  | 0,00000  | 3,46774  | 1,39891   | 0,24595   | 0,00000   | 0,76644   |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,66911  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| CRABP1      | 0,00000  | 0,76627  | 0,00000  | 0,00000  | 0,53389  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| DDX3Y       | 3,06377  | 2,15566  | 1,73238  | 1,13517  | 2,95684  | 2,86263  | 1,74539   | 0,00000   | 5,45845   | 5,59767   |
| DPPA4       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,24192  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| FOLR1       | 1,57960  | 3,86318  | 1,32149  | 3,34438  | 4,58992  | 3,36528  | 2,82033   | 0,51672   | 2,20967   | 5,92083   |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,24529   |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,92372  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| LOC508834   | 1,18505  | 0,00000  | 0,00000  | 0,11153  | 0,00000  | 0,00000  | 0,00000   | 0,25927   | 0,00000   | 2,16104   |
| LRRC14      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 1,80193   |
| MESDC1      | 1,24192  | 0,00000  | 0,00000  | 0,00000  | 1,92731  | 0,00000  | 0,00000   | 0,00000   | 0,85846   | 2,90865   |
| NANOG       | 3,70179  | 0,00000  | 1,38304  | 0,00000  | 3,89069  | 0,31678  | 2,73537   | 0,00000   | 0,00000   | 1,05517   |
| NRBP2       | 0,00000  | 2,36366  | 0,00000  | 0,77318  | 0,00000  | 0,00000  | 1,05318   | 0,00000   | 0,94392   | 1,62896   |
| OVOL2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,57863  | 0,96697   | 0,00000   | 0,00000   | 0,00000   |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 1,03250   |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,38160   | 0,00000   | 0,00000   | 0,00000   |
| SH2D3A      | 0,00000  | 0,89638  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,92372   | 0,00000   | 1,08325   |
| SLC2A5      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |

| Cell_Name   | E13.14_p3 | E6.1_p2 | E6.2_p2 | E6.3_p2 | E6.4_p2 | E6.6_p2 | E6.7_p2 | E6.8_p2 | E6.9_p2 | E6.10_p2 |
|-------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Embryo_Name | Day3-E6   | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7  |
| ADAMTS1     | 0,00000   | 2,77684 | 0,00000 | 0,00000 | 3,00241 | 2,55554 | 1,19530 | 0,00000 | 0,47460 | 0,61362  |
| C3          | 0,00000   | 1,16643 | 0,00000 | 0,93555 | 0,00000 | 2,51264 | 4,50962 | 0,00000 | 0,00000 | 1,54075  |
| CNR2        | 0,00000   | 4,41607 | 0,00000 | 0,00000 | 0,45602 | 0,69326 | 0,00000 | 0,00000 | 0,69802 | 0,00000  |
| CRABP1      | 0,00000   | 0,00000 | 0,00000 | 0,62007 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,79088 | 0,00000  |
| DDX3Y       | 0,00000   | 2,64569 | 0,00000 | 0,00000 | 1,98203 | 1,24307 | 2,83219 | 0,00000 | 3,48323 | 0,45003  |
| DPPA4       | 0,00000   | 0,92270 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| FOLR1       | 2,25281   | 1,65472 | 1,80685 | 3,44188 | 4,59336 | 1,08325 | 1,83473 | 1,86940 | 3,57278 | 0,70081  |
| GAT         | 0,00000   | 0,00000 | 0,00000 | 0,46418 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| GFRA3       | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,20218 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| LOC508834   | 0,00000   | 0,85387 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 4,10014 | 1,91246 | 1,25229  |
| LRRC14      | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| MAGEH1      | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,11816 | 0,00000  |
| MESDC1      | 1,77948   | 0,55796 | 0,00000 | 2,21397 | 1,12736 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 3,30978  |
| NANOG       | 0,00000   | 3,42731 | 0,00000 | 0,00000 | 0,17612 | 0,33919 | 0,00000 | 0,73619 | 1,59363 | 2,25735  |
| NRBP2       | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,03250 | 0,00000 | 0,00000 | 3,26213 | 0,00000  |
| OVOL2       | 0,00000   | 3,89069 | 0,31678 | 1,09211 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| PCDH10      | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 2,75428 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| PTGDR       | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,95255 | 0,00000 | 1,08502 | 0,00000 | 0,00000  |
| SH2D3A      | 1,19126   | 0,00000 | 0,00000 | 0,00000 | 3,32379 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| SLC2A5      | 0,00000   | 0,00000 | 0,00000 | 4,33652 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E6.11_p2 | E6.12_p2 | E6.13_p2 | E6.14_p2 | E6.15_p2 | E6.16_p2 | E7.1_p2 | E7.2_p2 | E7.3_p2 | E7.5_p2 |
|-------------|----------|----------|----------|----------|----------|----------|---------|---------|---------|---------|
| Embryo_Name | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8 |
| ADAMTS1     | 1,66432  | 0,00000  | 0,00000  | 0,00000  | 1,27750  | 0,00000  | 1,61735 | 0,00000 | 1,71534 | 0,00000 |
| C3          | 0,00000  | 3,40622  | 0,85127  | 0,00000  | 0,00000  | 0,98709  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,95017 | 2,32310 | 4,33652 | 0,00000 |
| CRABP1      | 0,00000  | 1,00321  | 0,00000  | 0,00000  | 0,58228  | 1,32528  | 0,00000 | 1,85449 | 1,54772 | 0,00000 |
| DDX3Y       | 7,05816  | 6,15876  | 2,09560  | 0,94813  | 2,56935  | 1,92762  | 5,94301 | 2,85256 | 2,47054 | 0,93555 |
| DPPA4       | 0,62007  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,21742  | 2,21200 | 0,00000 | 0,00000 | 0,00000 |
| FOLR1       | 5,21146  | 3,05295  | 2,27462  | 1,65611  | 1,32446  | 4,45104  | 5,63815 | 5,39697 | 3,32221 | 0,92325 |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,89320  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,16807 | 1,08502 | 0,46716 | 0,00000 |
| LOC508834   | 1,27385  | 1,87314  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 1,15505 | 0,00000 | 0,00000 |
| LRRRC14     | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,55009  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| MAGEH1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,84410 | 0,00000 | 0,00000 | 0,00000 |
| MESDC1      | 0,00000  | 0,00000  | 0,00000  | 0,96561  | 1,00321  | 0,00000  | 1,16539 | 0,58228 | 0,80975 | 0,00000 |
| NANOG       | 0,77576  | 0,00000  | 0,00000  | 0,00000  | 2,97292  | 2,02875  | 1,59366 | 3,82985 | 1,89928 | 0,00000 |
| NRBP2       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 3,34799 | 0,00000 | 0,00000 | 0,00000 |
| OVOL2       | 0,00000  | 0,00000  | 0,61362  | 1,66432  | 0,00000  | 0,58930  | 3,83127 | 1,27750 | 0,00000 | 0,00000 |
| PCDH10      | 0,00000  | 0,00000  | 0,00000  | 0,16610  | 3,48211  | 4,40102  | 1,39891 | 0,24595 | 0,94515 | 0,00000 |
| PTGDR       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,18505  | 0,00000  | 0,00000 | 0,11153 | 0,00000 | 0,00000 |
| SH2D3A      | 2,99490  | 1,54265  | 0,00000  | 1,88329  | 0,78762  | 0,00000  | 0,00000 | 1,59255 | 0,00000 | 0,00000 |
| SLC2A5      | 0,00000  | 0,00000  | 0,90818  | 0,00000  | 2,89717  | 0,00000  | 0,00000 | 0,00000 | 1,05992 | 0,00000 |

| Cell_Name   | E7.6_p2 | E7.7_p2 | E7.8_p2 | E7.9_p2 | E7.10_p2 | E7.11_p2 | E7.12_p2 | E7.13_p2 | E7.14_p2 | E7.15_p2 |
|-------------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  |
| ADAMTS1     | 0,74219 | 2,10601 | 0,00000 | 1,48396 | 0,00000  | 0,00000  | 3,43457  | 0,77482  | 1,64048  | 1,69561  |
| C3          | 0,90818 | 1,78217 | 1,19530 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,53135  |
| CNR2        | 0,00000 | 4,84122 | 0,57637 | 2,46661 | 1,11816  | 0,00000  | 0,00000  | 1,85997  | 0,00000  | 1,83990  |
| CRABP1      | 1,14578 | 0,51672 | 1,14311 | 0,00000 | 0,00000  | 0,30887  | 3,08684  | 0,92372  | 2,76236  | 1,08325  |
| DDX3Y       | 2,28929 | 4,98154 | 8,20464 | 4,21791 | 4,20226  | 2,26871  | 5,35898  | 6,60016  | 1,38304  | 3,64363  |
| DPPA4       | 0,00000 | 0,00000 | 2,00419 | 0,99964 | 2,29994  | 0,00000  | 1,58205  | 1,77623  | 0,00000  | 1,14311  |
| FOLR1       | 4,14593 | 3,85090 | 5,37707 | 5,98847 | 4,99388  | 5,52029  | 4,68207  | 4,18643  | 4,42558  | 5,32544  |
| GAT         | 1,91241 | 0,77318 | 1,87314 | 0,00000 | 0,00000  | 1,16809  | 0,94392  | 1,26019  | 1,15505  | 0,00000  |
| GFRA3       | 0,00000 | 1,41544 | 0,24529 | 0,00000 | 1,18505  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| LOC508834   | 1,13517 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 1,49776  | 0,00000  | 0,00000  | 0,00000  |
| LRRRC14     | 0,27318 | 0,00000 | 0,85679 | 0,00000 | 0,62097  | 0,00000  | 0,00000  | 0,00000  | 0,96838  | 0,00000  |
| MAGEH1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 2,02875  | 0,00000  | 0,00000  | 0,00000  |
| MESDC1      | 2,29994 | 3,64862 | 0,73522 | 0,00000 | 0,51672  | 1,14311  | 2,64554  | 1,27040  | 0,30887  | 3,45879  |
| NANOG       | 1,97948 | 0,46825 | 1,26407 | 1,94258 | 0,00000  | 0,00000  | 1,39298  | 3,51281  | 1,14829  | 1,53045  |
| NRBP2       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,70985  | 0,00000  |
| OVOL2       | 2,53900 | 2,47703 | 2,02875 | 0,00000 | 0,00000  | 2,34920  | 0,00000  | 2,78388  | 1,10453  | 0,76627  |
| PCDH10      | 0,00000 | 0,00000 | 0,00000 | 2,47590 | 0,72074  | 1,74559  | 3,57161  | 1,46513  | 0,00000  | 1,54075  |
| PTGDR       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,29913  | 0,00000  | 0,00000  | 1,00000  | 0,00000  | 0,00000  |
| SH2D3A      | 0,00000 | 0,00000 | 0,00000 | 0,88748 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| SLC2A5      | 0,00000 | 1,53135 | 1,64905 | 0,00000 | 0,00000  | 0,00000  | 1,71534  | 2,02875  | 0,00000  | 2,92790  |

**Supplementary Table S6 (continued).** Subset of twenty genes analysed for studying the major embryonic genome activation (EGA). The genes and their normalised log<sub>2</sub>(UMI+1) values are reported.

| Cell_Name   | E7.16_p2 |  |  |  |  |  |  |  |  |  |
|-------------|----------|--|--|--|--|--|--|--|--|--|
| Embryo_Name | Day3-E8  |  |  |  |  |  |  |  |  |  |
| ADAMTS1     | 0,00000  |  |  |  |  |  |  |  |  |  |
| C3          | 1,27750  |  |  |  |  |  |  |  |  |  |
| CNR2        | 0,44060  |  |  |  |  |  |  |  |  |  |
| CRABP1      | 0,00000  |  |  |  |  |  |  |  |  |  |
| DDX3Y       | 5,40931  |  |  |  |  |  |  |  |  |  |
| DPPA4       | 1,46071  |  |  |  |  |  |  |  |  |  |
| FOLR1       | 5,52419  |  |  |  |  |  |  |  |  |  |
| GAT         | 0,47210  |  |  |  |  |  |  |  |  |  |
| GFRA3       | 0,00000  |  |  |  |  |  |  |  |  |  |
| LOC508834   | 0,00000  |  |  |  |  |  |  |  |  |  |
| LRRC14      | 0,00000  |  |  |  |  |  |  |  |  |  |
| MAGEH1      | 0,00000  |  |  |  |  |  |  |  |  |  |
| MESDC1      | 0,00000  |  |  |  |  |  |  |  |  |  |
| NANOG       | 1,17720  |  |  |  |  |  |  |  |  |  |
| NRBP2       | 0,00000  |  |  |  |  |  |  |  |  |  |
| OVOL2       | 0,00000  |  |  |  |  |  |  |  |  |  |
| PCDH10      | 3,17122  |  |  |  |  |  |  |  |  |  |
| PTGDR       | 0,00000  |  |  |  |  |  |  |  |  |  |
| SH2D3A      | 0,00000  |  |  |  |  |  |  |  |  |  |
| SLC2A5      | 0,00000  |  |  |  |  |  |  |  |  |  |

**Supplementary Table S7.** Gene normalised log2(UMI+1) values.

| Cell_Name   | E1.1_p3 | E1.2_p3 | E1.3_p3 | E1.5_p3 | E1.6_p3 | E1.7_p3 | E14.1_p3 | E14.2_p3 | E14.3_p3 | E14.4_p3 |
|-------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|
| Embryo_Name | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E1 | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  |
| ADAMTS1     | 3,21616 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,29572 | 3,89299  | 0,00000  | 1,78821  | 2,81712  |
| C3          | 1,14426 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 3,02408 | 1,05517  | 0,00000  | 1,78217  | 1,83990  |
| CNR2        | 0,00000 | 0,67110 | 0,00000 | 0,00000 | 0,00000 | 0,93555 | 2,44839  | 0,00000  | 0,00000  | 1,14474  |
| CRABP1      | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,59255  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 3,39166 | 2,91468 | 0,00000 | 0,00000 | 1,14578 | 2,22061 | 5,31012  | 2,64554  | 2,38870  | 1,65472  |
| DPPA4       | 7,03909 | 4,95991 | 0,53736 | 2,07421 | 2,99490 | 7,19387 | 6,90775  | 2,19709  | 6,21623  | 5,39856  |
| FOLR1       | 1,46071 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 3,41166 | 0,00000  | 0,00000  | 1,86940  | 0,00000  |
| GAT         | 1,41297 | 1,91504 | 0,76353 | 1,15505 | 0,89835 | 1,89138 | 4,70739  | 0,97550  | 3,37991  | 1,36097  |
| GFRA3       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E14.5_p3 | E14.6_p3 | E14.7_p3 | E14.8_p3 | E14.9_p3 | E16.1_p3 | E16.2_p3 | E16.4_p3 | E16.6_p3 | E16.7_p3 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E2  | Day2-E3  | Day2-E3  | Day2-E3  | Day2-E3  | Day2-E3  |
| ADAMTS1     | 0,82721  | 2,53252  | 2,54389  | 2,86263  | 0,00000  | 3,22788  | 5,45845  | 2,69423  | 4,58428  | 3,52555  |
| C3          | 0,77764  | 0,17612  | 0,61362  | 1,05992  | 0,00000  | 0,32453  | 3,09799  | 1,27750  | 2,39962  | 0,60125  |
| CNR2        | 0,00000  | 0,00000  | 0,97174  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 4,39165  | 1,88401  | 4,34223  | 1,96676  | 2,27815  | 4,08089  | 4,72417  | 1,03023  | 6,77023  | 3,71865  |
| DPPA4       | 5,93136  | 6,11973  | 6,26225  | 6,91555  | 0,00000  | 6,05283  | 6,18417  | 4,86038  | 7,05230  | 4,61686  |
| FOLR1       | 0,27318  | 4,24988  | 0,00000  | 1,18876  | 0,00000  | 0,37949  | 0,00000  | 2,16539  | 1,54265  | 0,00000  |
| GAT         | 2,19744  | 5,14470  | 4,51654  | 5,14905  | 0,00000  | 4,47753  | 5,40084  | 2,78680  | 1,54291  | 4,83526  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E16.8_p3 | E16.9_p3 | E11.1_p3 | E11.2_p3 | E11.3_p3 | E11.4_p3 | E11.5_p3 | E11.7_p3 | E11.8_p3 | E14.1_p2 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E3  | Day2-E3  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E4  | Day2-E5  |
| ADAMTS1     | 3,83780  | 4,83285  | 0,00000  | 0,62929  | 0,00000  | 5,20208  | 3,19320  | 0,00000  | 4,41607  | 6,34888  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,10601  | 2,96821  | 1,48396  | 0,00000  | 0,00000  | 2,37994  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,29132  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 3,11726  | 1,65611  | 0,80916  | 3,41053  | 3,90145  | 4,10960  | 2,22732  | 0,92325  | 1,66842  | 4,09717  |
| DPPA4       | 6,48644  | 5,29320  | 4,04890  | 5,03916  | 1,83668  | 7,66637  | 7,07255  | 0,00000  | 2,61320  | 7,65590  |
| FOLR1       | 0,92325  | 0,78762  | 0,00000  | 0,85692  | 0,00000  | 1,52134  | 0,00000  | 0,00000  | 0,00000  | 1,83237  |
| GAT         | 3,69344  | 3,93132  | 0,31504  | 4,41607  | 4,40102  | 4,24848  | 1,60626  | 0,00000  | 0,76644  | 6,71081  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E14.2_p2 | E14.3_p2 | E14.4_p2 | E14.5_p2 | E14.6_p2 | E14.7_p2 | E14.8_p2 | E15.1_p2 | E15.2_p2 | E15.3_p2 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E5  | Day2-E6  | Day2-E6  | Day2-E6  |
| ADAMTS1     | 4,47776  | 0,63934  | 0,94515  | 1,26432  | 4,75155  | 2,03963  | 0,00000  | 0,93555  | 2,28929  | 3,67430  |
| C3          | 1,64752  | 1,64048  | 0,00000  | 0,00000  | 0,00000  | 2,21709  | 0,00000  | 0,00000  | 2,21397  | 0,67110  |
| CNR2        | 1,19126  | 0,00000  | 0,00000  | 0,00000  | 3,32379  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| DDX3Y       | 3,96357  | 3,91751  | 2,50499  | 2,58218  | 3,96147  | 2,48248  | 0,89044  | 1,82775  | 4,79069  | 1,60341  |
| DPPA4       | 8,54127  | 6,06040  | 4,67942  | 5,32334  | 6,83289  | 6,19007  | 1,14362  | 1,91473  | 9,31342  | 6,80194  |
| FOLR1       | 1,43290  | 0,00000  | 0,24529  | 0,00000  | 1,18505  | 0,00000  | 0,00000  | 0,00000  | 1,96664  | 0,00000  |
| GAT         | 1,51946  | 1,70985  | 2,21739  | 2,28929  | 4,30936  | 6,77997  | 0,91107  | 2,57863  | 3,52382  | 4,64526  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S7 (continued).** Gene normalised log<sub>2</sub>(UMI+1) values.

| Cell_Name   | E15.4_p2 | E15.5_p2 | E15.6_p2 | E2.1_p1 | E2.2_p1 | E2.3_p1 | E2.4_p1 | E2.5_p1 | E2.6_p1 | E2.7_p1 |
|-------------|----------|----------|----------|---------|---------|---------|---------|---------|---------|---------|
| Embryo_Name | Day2-E6  | Day2-E6  | Day2-E6  | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 | Day3-E1 |
| ADAMTS1     | 0,00000  | 1,46513  | 3,99287  | 1,95017 | 4,08884 | 4,33652 | 1,77073 | 1,14426 | 3,89069 | 0,79630 |
| C3          | 0,00000  | 0,00000  | 0,00000  | 1,49838 | 0,00000 | 0,34573 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 1,78821 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,60678 |
| DDX3Y       | 0,00000  | 2,26937  | 2,67429  | 3,71644 | 0,40216 | 3,95818 | 1,95350 | 0,00000 | 1,36455 | 4,76104 |
| DPPA4       | 1,91241  | 3,24919  | 6,45215  | 6,74763 | 5,38728 | 2,89599 | 4,84360 | 4,35993 | 4,18404 | 4,92475 |
| FOLR1       | 0,00000  | 0,00000  | 0,00000  | 3,89622 | 0,00000 | 0,00000 | 0,00000 | 1,00000 | 0,89320 | 0,00000 |
| GAT         | 3,40622  | 0,00000  | 0,68272  | 3,89069 | 0,57637 | 1,09211 | 2,17380 | 0,00000 | 0,00000 | 1,85997 |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 |

| Cell_Name   | E2.9_p1 | E2.10_p1 | E2.11_p1 | E2.12_p1 | E2.13_p1 | E2.14_p1 | E2.15_p1 | E3.1_p1 | E3.2_p1 | E3.3_p1 |
|-------------|---------|----------|----------|----------|----------|----------|----------|---------|---------|---------|
| Embryo_Name | Day3-E1 | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E1  | Day3-E2 | Day3-E2 | Day3-E2 |
| ADAMTS1     | 1,70652 | 2,17380  | 2,52517  | 0,20664  | 1,85997  | 1,78217  | 1,19530  | 1,05067 | 0,00000 | 0,00000 |
| C3          | 0,56618 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,20672  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| CNR2        | 0,00000 | 0,46716  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| CRABP1      | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,66911 | 0,00000 | 0,00000 |
| DDX3Y       | 5,90762 | 4,69118  | 0,85387  | 0,91629  | 3,16993  | 1,44073  | 1,14362  | 3,71031 | 7,79258 | 1,25233 |
| DPPA4       | 4,23326 | 5,77717  | 5,41114  | 0,00000  | 2,44475  | 5,05658  | 7,75389  | 5,48468 | 6,78392 | 1,63374 |
| FOLR1       | 0,00000 | 0,00000  | 1,91246  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 |
| GAT         | 2,55554 | 2,62287  | 0,77764  | 0,00000  | 0,33919  | 0,00000  | 0,00000  | 0,32453 | 2,25735 | 0,00000 |
| GFRA3       | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,20672 | 1,54772 | 0,00000 |

| Cell_Name   | E3.5_p1 | E3.6_p1 | E3.7_p1 | E3.8_p1 | E3.9_p1 | E3.10_p1 | E3.11_p1 | E3.12_p1 | E3.13_p1 | E3.14_p1 |
|-------------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2 | Day3-E2  | Day3-E2  | Day3-E2  | Day3-E2  | Day3-E2  |
| ADAMTS1     | 1,66432 | 0,73619 | 0,00000 | 0,00000 | 0,00000 | 2,39962  | 0,60125  | 0,00000  | 2,97292  | 2,84016  |
| C3          | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,80685 | 0,00000  | 0,00000  | 0,29132  | 0,00000  | 0,00000  |
| CNR2        | 0,21505 | 1,29530 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,48920  | 0,00000  |
| CRABP1      | 0,00000 | 3,19320 | 0,00000 | 0,00000 | 3,46774 | 0,00000  | 0,00000  | 0,00000  | 0,76644  | 0,00000  |
| DDX3Y       | 6,13153 | 5,81517 | 5,30807 | 5,37088 | 4,55931 | 3,31293  | 4,93356  | 4,20484  | 5,71509  | 4,04883  |
| DPPA4       | 6,18611 | 7,48980 | 4,03056 | 2,27131 | 5,35014 | 8,58115  | 5,64034  | 1,56187  | 8,39554  | 7,79700  |
| FOLR1       | 0,00000 | 1,15505 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GAT         | 1,64999 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,74219  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 1,14578 | 0,28137 | 1,14311 | 2,17148 | 0,00000 | 0,00000  | 2,58438  | 0,00000  | 0,00000  | 0,53358  |

| Cell_Name   | E3.16_p1 | E10.1_p1 | E10.2_p1 | E10.3_p1 | E10.4_p1 | E10.5_p1 | E10.6_p1 | E10.7_p1 | E10.8_p1 | E10.9_p1 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E2  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  | Day3-E3  |
| ADAMTS1     | 0,00000  | 2,10601  | 0,00000  | 0,00000  | 2,78388  | 0,00000  | 0,00000  | 1,27617  | 0,00000  | 0,00000  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,16539  | 0,00000  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,77318  | 1,87314  | 0,00000  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,80193  | 0,00000  | 0,00000  |
| DDX3Y       | 3,56555  | 5,05763  | 4,41229  | 4,92009  | 3,41588  | 2,19744  | 8,10857  | 6,40778  | 7,73907  | 4,39095  |
| DPPA4       | 5,54957  | 2,83468  | 1,51136  | 4,63438  | 8,63919  | 2,97179  | 6,01336  | 5,45593  | 4,78498  | 6,80227  |
| FOLR1       | 0,00000  | 2,75428  | 1,03674  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| GAT         | 0,82119  | 0,76627  | 0,00000  | 0,00000  | 1,22866  | 0,85846  | 0,00000  | 0,00000  | 0,00000  | 1,17720  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 3,32379  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S7 (continued).** Gene normalised log<sub>2</sub>(UMI+1) values.

| Cell_Name   | E10.10_p1 | E10.11_p1 | E10.12_p1 | E10.13_p1 | E10.14_p1 | E10.15_p1 | E10.16_p1 | E16.1_p1 | E16.2_p1 | E16.3_p1 |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|
| Embryo_Name | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E3   | Day3-E4  | Day3-E4  | Day3-E4  |
| ADAMTS1     | 1,39298   | 1,20278   | 1,77948   | 0,00000   | 0,50636   | 2,21397   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| C3          | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 1,65544   | 0,69917   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,47210   | 0,00000  | 0,97550  | 1,62813  |
| CRABP1      | 4,33652   | 0,85127   | 0,68272   | 0,00000   | 1,15558   | 1,70652   | 0,00000   | 1,13034  | 0,00000  | 0,90818  |
| DDX3Y       | 7,12210   | 7,48980   | 4,13115   | 1,24307   | 6,27648   | 9,13454   | 3,48323   | 2,80305  | 5,38188  | 9,06169  |
| DPPA4       | 9,11988   | 2,84058   | 6,46009   | 2,75026   | 6,26823   | 8,72613   | 1,77073   | 1,77427  | 0,00000  | 1,78888  |
| FOLR1       | 0,00000   | 0,00000   | 3,46774   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| GAT         | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 1,46194   | 1,49838   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000   | 0,00000   | 0,49486   | 0,00000   | 0,00000   | 0,00000   | 0,00000   | 0,00000  | 0,00000  | 0,00000  |

| Cell_Name   | E16.4_p1 | E16.5_p1 | E16.6_p1 | E16.7_p1 | E16.8_p1 | E16.9_p1 | E16.10_p1 | E16.11_p1 | E16.12_p1 | E16.13_p1 |
|-------------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Embryo_Name | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4  | Day3-E4   | Day3-E4   | Day3-E4   | Day3-E4   |
| ADAMTS1     | 0,00000  | 0,00000  | 0,00000  | 0,79088  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| CNR2        | 1,50080  | 2,80277  | 6,12416  | 1,49776  | 4,18915  | 4,06814  | 4,29410   | 5,80731   | 1,12446   | 0,00000   |
| CRABP1      | 3,42731  | 1,19530  | 0,44060  | 0,00000  | 0,33919  | 1,05992  | 0,73619   | 0,58930   | 2,73805   | 0,00000   |
| DDX3Y       | 7,24418  | 3,04423  | 4,03767  | 4,86010  | 8,63919  | 4,42863  | 8,09567   | 5,39466   | 6,01138   | 3,91837   |
| DPPA4       | 5,66681  | 3,66755  | 4,76343  | 1,34479  | 3,63189  | 4,52073  | 5,56796   | 3,08754   | 2,90538   | 0,33919   |
| FOLR1       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,91107  | 0,00000  | 0,96697   | 0,00000   | 5,30037   | 0,00000   |
| GAT         | 0,00000  | 0,00000  | 0,00000  | 1,16539  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 0,00000   |
| GFRA3       | 1,69725  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,24529  | 0,00000   | 2,60759   | 1,13506   | 0,00000   |

| Cell_Name   | E6.1_p3 | E6.2_p3 | E6.3_p3 | E6.4_p3 | E6.5_p3 | E6.6_p3 | E6.7_p3 | E6.8_p3 | E6.9_p3 | E6.10_p3 |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Embryo_Name | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5 | Day3-E5  |
| ADAMTS1     | 1,32528 | 1,32149 | 0,00000 | 0,00000 | 1,21990 | 0,00000 | 0,00000 | 1,14311 | 1,46071 | 0,00000  |
| C3          | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| CNR2        | 0,00000 | 0,00000 | 0,00000 | 0,45003 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| CRABP1      | 1,04905 | 0,00000 | 0,00000 | 2,97292 | 0,00000 | 0,00000 | 2,92790 | 1,24192 | 0,00000 | 0,00000  |
| DDX3Y       | 7,26164 | 4,14799 | 5,59246 | 4,10689 | 5,04581 | 8,02373 | 3,17647 | 3,41719 | 7,79650 | 2,62211  |
| DPPA4       | 4,28110 | 4,47928 | 0,81293 | 3,38582 | 2,58127 | 5,00026 | 1,84203 | 5,87633 | 4,93963 | 6,68168  |
| FOLR1       | 0,00000 | 0,00000 | 0,31678 | 1,09211 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 1,19530  |
| GAT         | 2,54859 | 0,71900 | 0,00000 | 0,00000 | 0,95719 | 0,56313 | 2,58438 | 0,00000 | 0,00000 | 0,00000  |
| GFRA3       | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,25927 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |

| Cell_Name   | E6.11_p3 | E6.12_p3 | E6.13_p3 | E6.14_p3 | E6.15_p3 | E6.16_p3 | E6.17_p3 | E13.1_p3 | E13.2_p3 | E13.3_p3 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E5  | Day3-E6  | Day3-E6  | Day3-E6  |
| ADAMTS1     | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,29132  | 2,61685  | 1,21841  | 0,00000  | 0,00000  | 4,24988  |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |
| CNR2        | 0,00000  | 0,00000  | 0,00000  | 0,93555  | 0,00000  | 0,00000  | 0,00000  | 0,91107  | 0,00000  | 1,54075  |
| CRABP1      | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 1,14829  | 0,55796  | 1,42322  |
| DDX3Y       | 1,70652  | 5,43112  | 4,04075  | 1,05517  | 3,00241  | 5,32305  | 3,65643  | 4,36765  | 2,88016  | 4,03323  |
| DPPA4       | 1,22985  | 4,59306  | 0,00000  | 5,52133  | 3,29727  | 2,91041  | 2,72397  | 3,14091  | 1,64048  | 3,80602  |
| FOLR1       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,32453  | 0,00000  | 0,77576  | 0,00000  | 0,00000  |
| GAT         | 0,00000  | 1,21841  | 0,00000  | 0,27318  | 3,32379  | 0,85679  | 0,00000  | 0,62097  | 0,00000  | 0,00000  |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  |

**Supplementary Table S7 (continued).** Gene normalised log<sub>2</sub>(UMI+1) values.

| Cell_Name   | E13.4_p3 | E13.5_p3 | E13.6_p3 | E13.7_p3 | E13.8_p3 | E13.9_p3 | E13.10_p3 | E13.11_p3 | E13.12_p3 | E13.13_p3 |
|-------------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Embryo_Name | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6  | Day3-E6   | Day3-E6   | Day3-E6   | Day3-E6   |
| ADAMTS1     | 0,00000  | 1,83153  | 1,05368  | 0,00000  | 1,38160  | 0,00000  | 2,53187   | 1,15545   | 0,92325   | 1,29422   |
| C3          | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,47210  | 1,76252  | 0,00000   | 1,62813   | 0,00000   | 1,13458   |
| CNR2        | 3,70179  | 0,00000  | 1,38304  | 0,00000  | 3,89069  | 0,31678  | 2,73537   | 0,00000   | 0,00000   | 1,05517   |
| CRABP1      | 3,04945  | 1,75239  | 5,00083  | 0,62007  | 3,91057  | 2,21739  | 3,30978   | 0,62442   | 2,42780   | 3,41799   |
| DDX3Y       | 4,75680  | 6,10662  | 3,65580  | 5,89742  | 5,49665  | 6,43518  | 5,06922   | 3,94819   | 7,40937   | 9,23290   |
| DPPA4       | 4,41464  | 6,18191  | 4,79510  | 2,51649  | 4,12084  | 6,96281  | 4,03559   | 8,62168   | 4,09665   | 7,32810   |
| FOLR1       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 1,30554   | 0,00000   | 0,00000   |
| GAT         | 2,99490  | 1,54265  | 0,00000  | 0,92325  | 1,29422  | 0,00000  | 1,77968   | 2,81711   | 0,00000   | 2,85510   |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000   | 0,00000   | 0,00000   | 1,03250   |

| Cell_Name   | E13.14_p3 | E6.1_p2 | E6.2_p2 | E6.3_p2 | E6.4_p2 | E6.6_p2 | E6.7_p2 | E6.8_p2 | E6.9_p2 | E6.10_p2 |
|-------------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Embryo_Name | Day3-E6   | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7 | Day3-E7  |
| ADAMTS1     | 1,48054   | 0,00000 | 0,00000 | 0,00000 | 1,80497 | 0,00000 | 0,00000 | 0,89044 | 0,00000 | 1,41544  |
| C3          | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 2,65979 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| CNR2        | 0,00000   | 3,42731 | 0,00000 | 0,00000 | 0,17612 | 0,33919 | 0,00000 | 0,73619 | 1,59363 | 2,25735  |
| CRABP1      | 0,96561   | 1,58924 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,73522  |
| DDX3Y       | 4,40473   | 6,69286 | 2,69165 | 4,97964 | 5,97301 | 4,03009 | 4,09759 | 2,18742 | 4,72315 | 3,24925  |
| DPPA4       | 4,77958   | 6,49444 | 1,05878 | 1,67372 | 5,55521 | 2,93927 | 1,58924 | 0,97174 | 4,20173 | 3,99245  |
| FOLR1       | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |
| GAT         | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,45486 | 1,28098 | 1,18505 | 0,67639 | 0,00000  |
| GFRA3       | 0,00000   | 0,00000 | 0,00000 | 0,00000 | 2,75428 | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  |

| Cell_Name   | E6.11_p2 | E6.12_p2 | E6.13_p2 | E6.14_p2 | E6.15_p2 | E6.16_p2 | E7.1_p2 | E7.2_p2 | E7.3_p2 | E7.5_p2 |
|-------------|----------|----------|----------|----------|----------|----------|---------|---------|---------|---------|
| Embryo_Name | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E7  | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8 |
| ADAMTS1     | 0,24529  | 1,28098  | 1,18505  | 1,13506  | 0,81481  | 0,00000  | 0,00000 | 1,28485 | 0,00000 | 0,00000 |
| C3          | 2,34289  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| CNR2        | 0,77576  | 0,00000  | 0,00000  | 0,00000  | 2,97292  | 2,02875  | 1,59366 | 3,82985 | 1,89928 | 0,00000 |
| CRABP1      | 0,00000  | 0,28137  | 0,00000  | 1,46071  | 0,00000  | 0,56313  | 3,08684 | 1,48233 | 1,55009 | 0,00000 |
| DDX3Y       | 4,61941  | 5,58092  | 4,07165  | 3,38458  | 4,68969  | 7,39589  | 4,55502 | 8,95796 | 5,16599 | 3,52716 |
| DPPA4       | 3,43133  | 3,24727  | 3,67504  | 5,30273  | 4,38815  | 4,85255  | 1,75224 | 4,16349 | 3,90876 | 1,27040 |
| FOLR1       | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| GAT         | 0,11153  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000 | 0,00000 | 0,00000 | 0,00000 |
| GFRA3       | 0,00000  | 0,00000  | 0,00000  | 0,16610  | 3,48211  | 4,40102  | 1,39891 | 0,24595 | 0,94515 | 0,00000 |

| Cell_Name   | E7.6_p2 | E7.7_p2 | E7.8_p2 | E7.9_p2 | E7.10_p2 | E7.11_p2 | E7.12_p2 | E7.13_p2 | E7.14_p2 | E7.15_p2 |
|-------------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| Embryo_Name | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8 | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  | Day3-E8  |
| ADAMTS1     | 1,90650 | 0,00000 | 1,29913 | 0,48920 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 2,67432  |
| C3          | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 3,40622  |
| CNR2        | 1,97948 | 0,46825 | 1,26407 | 1,94258 | 0,00000  | 0,00000  | 1,39298  | 3,51281  | 1,14829  | 1,53045  |
| CRABP1      | 1,83473 | 1,21841 | 0,00000 | 0,00000 | 0,00000  | 0,85679  | 0,00000  | 1,38611  | 0,20218  | 2,07421  |
| DDX3Y       | 5,19347 | 8,46429 | 4,61818 | 6,50470 | 5,85599  | 5,06170  | 6,52990  | 4,75234  | 6,43901  | 5,03658  |
| DPPA4       | 2,52975 | 6,42557 | 4,49365 | 5,23414 | 2,45291  | 4,24559  | 5,56808  | 5,74629  | 3,40458  | 8,26415  |
| FOLR1       | 0,00000 | 1,16539 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,00000  | 0,28137  |
| GAT         | 0,00000 | 0,00000 | 0,00000 | 0,00000 | 0,00000  | 0,00000  | 0,00000  | 0,77318  | 1,22135  | 0,00000  |
| GFRA3       | 0,00000 | 0,00000 | 0,00000 | 2,47590 | 0,72074  | 1,74559  | 3,57161  | 1,46513  | 0,00000  | 1,54075  |

**Supplementary Table S7 (continued).** Gene normalised log<sub>2</sub>(UMI+1) values.

| Cell_Name   | E7.16_p2 |  |  |  |  |  |  |  |  |  |
|-------------|----------|--|--|--|--|--|--|--|--|--|
| Embryo_Name | Day3-E8  |  |  |  |  |  |  |  |  |  |
| ADAMTS1     | 0,00000  |  |  |  |  |  |  |  |  |  |
| C3          | 0,00000  |  |  |  |  |  |  |  |  |  |
| CNR2        | 1,17720  |  |  |  |  |  |  |  |  |  |
| CRABP1      | 0,00000  |  |  |  |  |  |  |  |  |  |
| DDX3Y       | 5,64210  |  |  |  |  |  |  |  |  |  |
| DPPA4       | 4,35503  |  |  |  |  |  |  |  |  |  |
| FOLR1       | 0,00000  |  |  |  |  |  |  |  |  |  |
| GAT         | 0,00000  |  |  |  |  |  |  |  |  |  |
| GFRA3       | 3,17122  |  |  |  |  |  |  |  |  |  |