

Supplementary Table 1: High importance genes in early placental development. TE_8d=trophectoderm day 8; ALC_45d=allantochorion day 45; ALC_4m=allantochorion 4 months. Expression shown in TPM. Genes met the criteria of TPM >100 in either ALC or Chorionic Girdle and > 100-fold change in expression compared with Day 8 TE.

| ENSEMBL_GeneID | Symbol | TE_8d | Chorionic | | |
|--------------------|---------|----------|-----------|----------|----------|
| | | | Girdle | ALC_45d | ALC_4m |
| ENSECAG00000012558 | A2M | 0 | 0.86418 | 160.9487 | 544.0636 |
| ENSECAG00000000430 | ACE2 | 0.023335 | 4.584532 | 189.8253 | 241.9033 |
| ENSECAG00000023229 | AFP | 0 | 1.076306 | 4838.728 | 4.174136 |
| ENSECAG00000001279 | AGTR1 | 0 | 5.48596 | 209.8588 | 205.2216 |
| ENSECAG00000014858 | AHSG | 0 | 0.1727 | 249.6846 | 0.186189 |
| ENSECAG00000010406 | AHSP | 0.636893 | 18.729 | 206.819 | 61.01289 |
| ENSECAG00000010305 | ALB | 0.198212 | 0.13926 | 158.3453 | 1.333221 |
| ENSECAG00000008365 | AMBP | 0.455452 | 0.146242 | 293.2215 | 0.18908 |
| ENSECAG00000015794 | ANXA1 | 1.437773 | 9.685087 | 529.8172 | 207.5191 |
| ENSECAG00000009752 | APOA1 | 5.420888 | 35.81311 | 660.5335 | 70.47006 |
| ENSECAG00000014224 | APOC2 | 2.335513 | 0.472079 | 469.6934 | 0.631896 |
| ENSECAG00000022047 | APOD | 0 | 1.134937 | 267.6469 | 582.1907 |
| ENSECAG00000008236 | APOE | 1.115124 | 237.2002 | 3034.657 | 5760.143 |
| ENSECAG00000022165 | APOH | 1.065395 | 0.1958 | 223.7406 | 0.180248 |
| ENSECAG00000023485 | ARG1 | 0 | 0.033401 | 112.002 | 0.184207 |
| ENSECAG00000000685 | B2M | 7.638251 | 1355.572 | 564.5303 | 883.0592 |
| ENSECAG00000018814 | BCAM | 2.223458 | 35.21793 | 234.1195 | 363.0995 |
| ENSECAG00000018717 | BGN | 0 | 2.03943 | 181.6441 | 270.2461 |
| ENSECAG00000022739 | CA4 | 4.221228 | 243.2427 | 751.2457 | 1.410487 |
| ENSECAG00000000964 | CAMK2N1 | 1.389667 | 285.0068 | 18.97732 | 22.43341 |
| ENSECAG00000015071 | CAVIN1 | 0.381121 | 5.900569 | 175.8121 | 229.7611 |
| ENSECAG00000019861 | CCDC80 | 0 | 3.627241 | 116.8464 | 68.83914 |
| ENSECAG00000008624 | CCL28 | 0.17009 | 8.279626 | 138.7543 | 12.79817 |
| ENSECAG00000031389 | CDKN1C | 0 | 1644.249 | 400.8951 | 1209.552 |
| ENSECAG00000018841 | CGA | 12.09338 | 2243.289 | 219.9934 | 2.419742 |
| ENSECAG00000032097 | CNN2 | 1.673788 | 174.7718 | 138.964 | 342.5547 |
| ENSECAG00000016361 | COL18A1 | 0.20307 | 13.8576 | 302.4266 | 358.5979 |
| ENSECAG00000013693 | COL1A1 | 0.405052 | 207.2433 | 3608.946 | 1999.173 |
| ENSECAG00000024740 | COL1A2 | 0.014619 | 107.0841 | 3474.625 | 2141.162 |
| ENSECAG00000024769 | COL3A1 | 0.186386 | 100.7787 | 3627.521 | 2557.154 |
| ENSECAG00000019838 | COL4A1 | 3.981654 | 20.79152 | 692.1304 | 1026.265 |
| ENSECAG00000021314 | COL4A2 | 1.640945 | 18.47404 | 465.9649 | 769.154 |
| ENSECAG00000008499 | COL5A2 | 0.205441 | 13.30871 | 231.6077 | 137.3302 |
| ENSECAG00000022731 | COL6A1 | 0.065239 | 14.11733 | 262.393 | 371.9179 |
| ENSECAG00000019436 | COL6A2 | 0 | 37.85356 | 515.7353 | 692.2316 |
| ENSECAG00000020887 | COL6A3 | 0.010022 | 6.695119 | 264.6923 | 150.6227 |
| ENSECAG00000024332 | CST6 | 11.22323 | 295.5744 | 1673.887 | 1255.954 |
| ENSECAG00000020474 | CYP19A1 | 41.29326 | 199.5326 | 4776.234 | 25532.34 |
| ENSECAG00000020413 | DCN | 0 | 38.18658 | 1568.91 | 1315.349 |
| ENSECAG00000034702 | DEFB1 | 0.75462 | 5.591601 | 329.6 | 1265.402 |

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|--------------------|---------|----------|----------|----------|----------|
| ENSECAG00000016101 | DPT | 0 | 0.817539 | 111.9173 | 76.60914 |
| ENSECAG00000024259 | DQA | 0.633181 | 23.88557 | 228.4338 | 67.24034 |
| ENSECAG00000024045 | EFHD1 | 1.053612 | 445.9733 | 39.41051 | 49.68887 |
| ENSECAG00000021497 | EMP1 | 0.270124 | 1.041003 | 151.709 | 48.09835 |
| ENSECAG00000017628 | ENTPD3 | 0.410132 | 16.02239 | 276.0578 | 333.7244 |
| ENSECAG00000037715 | EQMHCB2 | 2.441705 | 565.4709 | 92.9092 | 154.2776 |
| ENSECAG00000035532 | EQMHCC1 | 0.061747 | 305.8154 | 34.37779 | 33.28539 |
| ENSECAG00000023416 | F3 | 5.842066 | 14.00224 | 763.2427 | 639.5067 |
| ENSECAG00000015990 | FABP1 | 19.16382 | 103.2099 | 4071.847 | 7297.309 |
| ENSECAG00000005226 | FFAR2 | 0.986339 | 104.8199 | 2.230089 | 0.100348 |
| ENSECAG00000010239 | FGB | 2.688302 | 0.100774 | 365.1548 | 0.327714 |
| ENSECAG00000008280 | FGG | 0.021618 | 0.009606 | 236.3481 | 0.132066 |
| ENSECAG00000000387 | FGL2 | 0 | 2.380784 | 188.3642 | 131.7381 |
| ENSECAG00000013089 | FKBP10 | 0.249731 | 4.783701 | 110.5797 | 93.74264 |
| ENSECAG00000017864 | FMOD | 0.349616 | 10.46486 | 169.9181 | 201.7876 |
| ENSECAG00000015262 | FOXO4 | 0.465463 | 258.6056 | 715.6538 | 1321.364 |
| ENSECAG00000008056 | FSCN1 | 1.851956 | 7.849601 | 194.12 | 203.292 |
| ENSECAG00000000698 | FXVD6 | 0 | 190.7508 | 0 | 0 |
| ENSECAG00000009806 | GCGR | 0.082478 | 53.48081 | 106.4566 | 166.5245 |
| ENSECAG00000024185 | GNG11 | 0 | 36.64183 | 304.3245 | 384.8262 |
| ENSECAG00000010025 | GPC3 | 0.058622 | 20.63408 | 1584.032 | 1456.438 |
| ENSECAG00000005327 | HAND1 | 0.1591 | 240.7392 | 239.206 | 299.7401 |
| ENSECAG00000038247 | HBA | 0.752971 | 256.8724 | 5642.713 | 1882.812 |
| ENSECAG00000031859 | HBA2 | 2.950226 | 287.2921 | 10400.33 | 3772.41 |
| ENSECAG00000016460 | HBZ | 0 | 415.3126 | 348.6805 | 0.166636 |
| ENSECAG00000032164 | HNRNPA0 | 1.292885 | 152.3709 | 104.7308 | 152.1772 |
| ENSECAG00000011561 | HPD | 0.484913 | 0.075153 | 123.124 | 0.120625 |
| ENSECAG00000009990 | HTRA1 | 0.556144 | 14.57595 | 295.1776 | 520.1919 |
| ENSECAG00000017172 | IFI27 | 0.711078 | 22.92072 | 205.7185 | 219.6982 |
| ENSECAG00000028346 | IGF2 | 0.32008 | 67.62779 | 245.2162 | 358.5024 |
| ENSECAG00000035279 | IGFBP2 | 0.078149 | 11.45059 | 153.3198 | 18.14688 |
| ENSECAG00000018104 | IGFBP3 | 0.047984 | 1.039042 | 105.6356 | 291.423 |
| ENSECAG00000013425 | IGFBP5 | 0.39704 | 7.549508 | 133.6254 | 282.3438 |
| ENSECAG00000013087 | IGFBP7 | 0.412973 | 15.97472 | 186.0923 | 280.893 |
| ENSECAG00000003260 | ITIH5 | 0 | 3.315328 | 130.8801 | 92.09892 |
| ENSECAG00000038226 | JUND | 0 | 166.7274 | 90.09443 | 81.64066 |
| ENSECAG00000007548 | LHB | 3.161184 | 1415.846 | 15.57107 | 6.18829 |
| ENSECAG00000011097 | LMNA | 1.043513 | 55.27162 | 176.4262 | 80.97421 |
| ENSECAG00000014771 | LOX | 0.122064 | 8.632241 | 165.9667 | 83.63258 |
| ENSECAG00000018248 | LUM | 0 | 20.19913 | 1077.11 | 569.1269 |
| ENSECAG00000008509 | MFAP2 | 0 | 98.80861 | 146.5884 | 142.9075 |
| ENSECAG00000010721 | MGP | 0 | 29.01509 | 244.475 | 438.3449 |

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|--------------------|----------|----------|----------|----------|----------|
| ENSECAG00000032745 | MHCB3 | 0.924489 | 140.4227 | 28.15138 | 9.599264 |
| ENSECAG00000000953 | MMP2 | 0.588427 | 6.533976 | 186.871 | 266.7409 |
| ENSECAG00000035932 | NR2F6 | 1.094938 | 114.2956 | 33.44165 | 45.83339 |
| ENSECAG00000013439 | OLFML3 | 0.26722 | 5.467469 | 129.7985 | 109.5347 |
| ENSECAG00000021766 | PCOLCE | 1.778908 | 14.85199 | 253.2664 | 149.8486 |
| ENSECAG00000006991 | PECAM1 | 0.085311 | 0.558317 | 108.9469 | 246.5406 |
| ENSECAG00000001603 | PEG10 | 0.812171 | 5.344492 | 177.7278 | 41.99115 |
| ENSECAG00000006973 | PHLDA2 | 1.634172 | 734.6585 | 392.7756 | 1299.971 |
| ENSECAG00000016608 | PLA2G10 | 0.366462 | 32.38915 | 520.3146 | 1164.914 |
| ENSECAG00000014867 | PLBD1 | 2.275346 | 157.2766 | 378.1325 | 889.1413 |
| ENSECAG00000013135 | PLS3 | 1.083953 | 56.19381 | 115.298 | 204.7869 |
| ENSECAG00000022390 | PLVAP | 0 | 0.898907 | 118.7607 | 227.7514 |
| ENSECAG00000009974 | PON3 | 0.309667 | 0.410808 | 102.1491 | 12.20454 |
| ENSECAG00000023841 | POSTN | 0 | 6.937389 | 378.0597 | 56.90407 |
| ENSECAG00000011290 | PPP1R14A | 1.087241 | 186.6233 | 19.93566 | 37.71059 |
| ENSECAG00000010085 | PRDX4 | 1.503076 | 9.576529 | 169.9726 | 100.2118 |
| ENSECAG00000003083 | PRR15 | 0 | 400.2776 | 86.13822 | 117.3682 |
| ENSECAG00000022776 | QPCT | 0.727941 | 210.2914 | 411.3767 | 1312.495 |
| ENSECAG00000010512 | RCN3 | 0.128525 | 11.90558 | 165.129 | 139.8898 |
| ENSECAG00000033199 | RF00001 | 0 | 398.3418 | 806.8434 | 359.4248 |
| ENSECAG00000031349 | RF00001 | 0 | 381.7223 | 733.8165 | 359.8345 |
| ENSECAG00000026611 | RF00006 | 0 | 4.198359 | 151.8022 | 0 |
| ENSECAG00000027316 | RF00019 | 0 | 0 | 228.3599 | 0 |
| ENSECAG00000035147 | RF00026 | 0 | 0 | 115.338 | 16.73055 |
| ENSECAG00000025992 | RF00133 | 0 | 4.979311 | 213.5455 | 0 |
| ENSECAG00000025364 | RF00282 | 0 | 122.5655 | 0 | 0 |
| ENSECAG00000028832 | RF01972 | 0 | 293970.3 | 942.6167 | 1521.645 |
| ENSECAG00000029827 | RF01973 | 116.8163 | 222221.7 | 0 | 0 |
| ENSECAG00000023894 | RTL5 | 2.031526 | 48.41134 | 216.3654 | 318.2372 |
| ENSECAG00000008401 | S100A6 | 59.96194 | 517.9324 | 6971.042 | 3122.703 |
| ENSECAG00000001342 | SCAND1 | 0.279322 | 243.7908 | 32.90956 | 44.59646 |
| ENSECAG00000013482 | SERPINA3 | 0.326061 | 15.55237 | 280.4251 | 25.72148 |
| ENSECAG00000016075 | SERPINE2 | 0.835961 | 188.5145 | 21.66739 | 70.68995 |
| ENSECAG00000022279 | SERPINF1 | 0.795167 | 10.5278 | 128.1567 | 182.3292 |
| ENSECAG00000004871 | SERPINH1 | 0.553242 | 29.46555 | 364.8696 | 343.7026 |
| ENSECAG00000012106 | SMARCA1 | 0.253082 | 1.369736 | 160.1668 | 49.75746 |
| ENSECAG00000006212 | SPAM1 | 1.062725 | 0.422765 | 396.9425 | 902.967 |
| ENSECAG00000013874 | SPARC | 8.151062 | 117.8422 | 3232.983 | 3779.961 |
| ENSECAG00000017191 | SPP1 | 0.309553 | 5.093993 | 327.4762 | 4281.828 |
| ENSECAG00000011268 | TAGLN | 4.34494 | 13.78035 | 616.2781 | 431.379 |
| ENSECAG00000019197 | TCF21 | 0 | 2.392101 | 105.7959 | 83.58197 |
| ENSECAG00000003072 | TCIM | 0.828728 | 86.28893 | 341.8383 | 122.6569 |

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|--------------------|--------|----------|----------|----------|----------|
| ENSECAG00000017555 | TF | 0.306282 | 0.334489 | 1020.785 | 0.824667 |
| ENSECAG00000015269 | TGFBR2 | 0.366285 | 1.013366 | 120.1052 | 236.0787 |
| ENSECAG00000006290 | TGM2 | 0.072892 | 6.096283 | 225.2797 | 152.04 |
| ENSECAG00000008923 | THBS1 | 2.94616 | 16.66076 | 494.6689 | 178.282 |
| ENSECAG00000018314 | TIMP3 | 0.580084 | 4.425461 | 146.056 | 179.035 |
| ENSECAG00000019071 | TM4SF1 | 0.517661 | 20.76331 | 522.6638 | 83.60317 |
| ENSECAG00000015875 | TTR | 0.085667 | 0.409059 | 763.679 | 0.650501 |
| ENSECAG00000019042 | UPK1B | 0.474047 | 3.656034 | 114.9842 | 31.08669 |
| ENSECAG00000009125 | UPK3A | 0.222233 | 18.12041 | 307.9703 | 25.60293 |
| ENSECAG00000027698 | - | 0 | 40190.81 | 0 | 0 |
| ENSECAG00000035471 | - | 0 | 3153.856 | 0 | 0 |
| ENSECAG00000037076 | - | 0 | 36.24775 | 1822.855 | 6159.304 |
| ENSECAG00000012269 | - | 0 | 454.7103 | 1293.395 | 2.110615 |
| ENSECAG00000030273 | - | 0 | 0.068075 | 545.8928 | 16071.06 |
| ENSECAG00000027688 | - | 0 | 466.2461 | 0 | 0 |
| ENSECAG00000035834 | - | 0 | 450.739 | 7.742763 | 5.181219 |
| ENSECAG00000027686 | - | 0 | 130.1966 | 417.5393 | 0 |
| ENSECAG00000027690 | - | 0 | 409.523 | 0 | 0 |
| ENSECAG00000040447 | - | 0 | 19.02462 | 353.009 | 1413.953 |
| ENSECAG00000008979 | - | 0 | 2.650048 | 312.8636 | 66.92195 |
| ENSECAG00000037816 | - | 0 | 14.26984 | 256.7016 | 654.281 |
| ENSECAG00000030471 | - | 0 | 5.91382 | 256.1877 | 178.4864 |
| ENSECAG00000001424 | - | 0 | 240.7518 | 1.116296 | 3.023835 |
| ENSECAG00000033991 | - | 0 | 223.1475 | 0.11579 | 0 |
| ENSECAG00000024790 | - | 0 | 3.588002 | 193.367 | 103.6135 |
| ENSECAG00000032517 | - | 0 | 169.7777 | 0 | 0 |
| ENSECAG00000029565 | - | 0 | 4.282142 | 137.5322 | 417.0389 |
| ENSECAG00000035548 | - | 0 | 121.5905 | 2.111219 | 3.876276 |
| ENSECAG00000035178 | - | 0 | 103.0611 | 0 | 0 |
| ENSECAG00000010020 | - | 0.31285 | 2.826405 | 13550.34 | 4993.248 |
| ENSECAG00000013027 | - | 0.247918 | 841.0072 | 5307.3 | 1565.195 |
| ENSECAG00000032123 | - | 0.188171 | 248.149 | 3560.671 | 3.886726 |
| ENSECAG00000011581 | - | 0.027961 | 2.751408 | 283.7298 | 729.1596 |
| ENSECAG00000016325 | - | 0.204274 | 53.43003 | 1169.645 | 3025.365 |
| ENSECAG00000028933 | - | 0.093058 | 20.70416 | 358.0988 | 1509.706 |
| ENSECAG00000040209 | - | 0.039109 | 0.614224 | 102.2335 | 4.597792 |
| ENSECAG00000039383 | - | 0.261776 | 328.6646 | 362.9294 | 3.995007 |
| ENSECAG00000036997 | - | 2.550486 | 88.1995 | 3093.983 | 197.3737 |
| ENSECAG00000029071 | - | 0.206059 | 84.48935 | 225.2811 | 28.93534 |
| ENSECAG00000027765 | - | 0.345716 | 3.261273 | 344.8214 | 1058.726 |
| ENSECAG00000004696 | - | 0.262842 | 3.197218 | 170.0618 | 348.3718 |
| ENSECAG00000010083 | - | 0.210491 | 0.01286 | 130.2349 | 0 |

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|---------------------|---|----------|----------|----------|----------|
| ENSECAG00000001476 | - | 0.502775 | 880.6945 | 214.5386 | 1936.08 |
| ENSECAG000000012906 | - | 0.516879 | 0.311531 | 191.9462 | 1243.059 |
| ENSECAG000000028507 | - | 1.135285 | 37.57824 | 410.5859 | 3361.012 |
| ENSECAG000000027768 | - | 0.635883 | 0.016252 | 144.402 | 0.134965 |
| ENSECAG000000019318 | - | 0.656126 | 214.107 | 127.5349 | 108.9126 |
| ENSECAG000000032286 | - | 11.21844 | 510.4096 | 2153.344 | 2832.527 |
| ENSECAG000000024654 | - | 0.939199 | 7.232781 | 148.3091 | 214.7148 |
| ENSECAG000000030973 | - | 0.887102 | 34.34041 | 117.4037 | 129.2617 |
| ENSECAG000000031569 | - | 2.013221 | 56.14786 | 243.2883 | 181.0546 |
| ENSECAG000000013020 | - | 4.108227 | 2.894965 | 482.1328 | 0 |
| ENSECAG000000013303 | - | 1.178281 | 237.2535 | 50.50676 | 44.35348 |
| ENSECAG00000002083 | - | 0.716759 | 132.4994 | 15.84617 | 26.08243 |
| ENSECAG000000027964 | - | 1.085271 | 582.6062 | 0 | 0 |