**Supplemental Table S16.** Lists of all LASSO selected genes in Supplemental Table S15.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | LASSOa | Totalb | Gene symbol |
| **1 vs. 2,3,4c** | Known Markers | 47 | 56 | *NPPB, DMBX1, OLFM3, RGS4, NR5A2, LEFTY1, LEFTY2, MIXL1, TFCP2L1, MYO3B, MAP2, EOMES, HESX1, DPPA2, TM4SF1, SST, CLDN1, PDGFRA, CXCL5, ZFP42, CDH9, IL6ST, NKX2-5, CPLX2, POU5F1, DPPA5, T, FOXP2, GATA4, IDO1, SNAI2, HEY1, SDC2, KLF4, ALOX5, NODAL, HHEX, DRD4, TRIM22, PAX6, FGF4, GDF3, COL2A1, TBX3, KLF5, PAPLN, NOS2* |
| DE genes | 86 | 101 | *ID3, EBNA1BP2, EIF2B3, UQCRH, DHCR24, CNIH4, TSNAX, TBCE, VSNL1, SRSF7, TPRKB, TMSB10, TCF7L1, NUP35, AAMP, PSMD1, DTYMK, UBE2E1, DYNC1LI1, H2AFZ, MAD2L1, PPWD1, SEMA6A, TTC1, NELFE, COX7A2, COQ3, FBXO5, RAC1, YAE1D1, NDUFB11, ARMCX1, PLS3, LDOC1, FNTA, TCEA1, TMEM70, NUDCD1, GSDMD, CTSL, ERP44, ATP6V1G1, NDUFA8, SAPCD2, MINPP1, SCD, IFITM2, RRM1, COPB1, NUCB2, GANAB, DPP3, CORO1B, GSTP1, CLNS1A, RDX, SC5D, MGST1, RPAP3, MYL6, SNRPF, HMGB1, RFC3, EAPP, MBIP, LRR1, KLHDC2, C14orf1, EIF5, COPS2, UBL7, IDH3A, NDUFB10, HMOX2, QPRT, FAM96B, RNMTL1, PFN1, NME1, NOL11, ATP5H, H3F3B, FKBP1A, PSMA7, GADD45GIP1, EIF1AY* |
| **2 vs. 1,3,4** | Known Markers | 52 | 56 | *NPPB, LCK, DMBX1, OLFM3, RGS4, NR5A2, LEFTY1, LEFTY2, MIXL1, TFCP2L1, MYO3B, MAP2, EOMES, HESX1, DPPA2, TM4SF1, SOX2, SST, CLDN1, PDGFRA, CXCL5, ZFP42, CDH9, IL6ST, NKX2-5, CPLX2, POU5F1, DPPA5, T, FOXP2, GATA4, IDO1, SNAI2, SDC2, KLF4, ALOX5, NODAL, HHEX, UTF1, DRD4, TRIM22, PAX6, FGF4, GDF3, NANOG, COL2A1, TBX3, KLF5, PAPLN, NOS2, FOXA2, DNMT3B* |
| DE genes | 9 | 1355 | *YBX1, HSPE1, PRELID1, GNB2L1, MCUR1, HMGA1, NGFRAP1, FTH1, SERF2* |
| **3 vs. 1,2,4** | Known Markers | 52 | 56 | *NPPB, LCK, DMBX1, OLFM3, RGS4, NR5A2, LEFTY1, LEFTY2, MIXL1, TFCP2L1, MYO3B, MAP2, EOMES, HESX1, DPPA2, TM4SF1, SOX2, SST, CLDN1, PDGFRA, CXCL5, ZFP42, CDH9, IL6ST, NKX2-5, CPLX2, POU5F1, DPPA5, T, FOXP2, GATA4, IDO1, SNAI2, HEY1, SDC2, KLF4, ALOX5, NODAL, HHEX, UTF1, DRD4, TRIM22, PAX6, FGF4, NANOG, COL2A1, TBX3, KLF5, PAPLN, NOS2, FOXA2, DNMT3B* |
| DE genes | 56 | 1260 | *SLC9A1, SESN2, PABPC4, LRRC8B, ZC3H11A, RAB3GAP2, NUP210, VPRBP, SDAD1, IL15, TENM3, IRX4, TBC1D9B, WRNIP1, POM121, CDK6, CUX1, HIPK2, NLGN4X, WWC3, LDOC1, PLEC, FAM102A, SPTAN1, PRRX2, GPR107, SVIL, KIF5B, MARVELD1, B4GALNT4, ZDHHC5, ANKRD13D, TMEM126A, CLEC2A, ETV6, CCDC59, GIT2, NCOR2, EP400, UTP14C, IRS2, COL4A2, NIN, PLEKHG3, CASC4, UACA, IREB2, GSE1, CABLES1, GALNT1, BMP7, ZNF791, GSK3A, SCAF1, TBX1, ADRBK2* |
| **4 vs. 1,2,3** | Known Markers | 8 | 56 | *HESX1, ZFP42, POU5F1, HEY1, SDC2, UTF1, TRIM22, DNMT3B* |
| DE genes | 14 | 1707 | *AURKAIP1, MAD2L2, PTP4A2, NRBP1, NDUFS6, HSF2, EZR, FAM104B, SIVA1, SEC11A, PGP, ACLY, NMT1, SLC25A1* |
| **1 vs. 2** | Known Markers | 49 | 56 | *NPPB, LCK, DMBX1, RGS4, NR5A2, LEFTY1, LEFTY2, MIXL1, TFCP2L1, MAP2, EOMES, HESX1, DPPA2, TM4SF1, SOX2, SST, CLDN1, PDGFRA, CXCL5, ZFP42, CDH9, IL6ST, NKX2-5, CPLX2, POU5F1, DPPA5, T, GATA4, IDO1, SNAI2, SDC2, KLF4, ALOX5, NODAL, HHEX, UTF1, DRD4, TRIM22, PAX6, FGF4, GDF3, NANOG, COL2A1, TBX3, KLF5, PAPLN, NOS2, FOXA2, DNMT3B* |
| DE genes | 30 | 49 | *RCC2, WASF2, GTF3C2, USP34, ZIC1, LRBA, SFXN1, NUS1, TPD52L1, AKAP12, LSM5, AKAP9, SMIM19, TLE1, ZNF32, NRBF2, HELLS, PPP1R12A, NUDT15, USP8, C15orf40, XPO6, SUMO2, SYNGR2, P4HB, RRBP1, SALL4, CHAF1A, NUCB1, GGA1* |

a Total genes with LASSO coefficients different to 0

b Total gene-makers or total DE genes before LASSO variable selection procedure

c 2, 3, 4 represents cells from combining subpopulations two, three and four