

## **Suppl. Figure 1**

Overview graph table of overlapping differentially expressed genes (all regulated genes, FDR q-value:  $\leq 0.05$ ) between MGUS and SMM MSC (451), between MGUS and MM (209) and SMM and MM (253).

## **Suppl. Figure 2. Gene set enrichment analysis (GSEA) confirmed contributed cell processes in MGUS, SMM and MM MSC**

Gene set enrichment analysis of a pairwise comparison between healthy and each of the different patient group (MGUS, SMM or MM). Gene set enrichment analysis confirmed a significant overlap of deregulated genes with those involved strong enrichment for cell processes such as hematopoiesis, cell status or osteogenesis in MGUS, SMM and MM MSC. For all plots, the normalized enrichment score (NES), p-values and false discovery rate (FDR q-value) are given.

## **Suppl. Figure 3. Gene set enrichment analysis (GSEA) of MGUS, SMM and MM MSC for the gene sets ribosomes, mitochondrial gene expression and apoptosis**

(A) Waterfall plots from GSEA for the signatures ribosomes (GO\_RIBOSOME) and mitochondrial gene expression (GO\_MITOCHONDRIAL GENE EXPRESSION) for MGUS, SMM and MM MSC contrasted to healthy (HC) are given. For all plots, the normalized enrichment score (NES), p-values and false discovery rate (FDR q-value) are given.

(B) Waterfall plots from GSEA depicts enrichment signature for intrinsic- and extrinsic apoptotic signaling pathway for MGUS, SMM and MM MSC contrasted to healthy

(HC) are given. For all plots, the normalized enrichment score (NES), p-values and false discovery rate (FDR q-value) are given.

**Suppl. Table 1**

PDF table of unique differentially expressed genes  
in MGUS MSC (583, FDR q-value  $\leq 0.05$ ) within the comparison of all three MSC  
groups.

**Suppl. Table 2**

PDF table of unique differentially expressed genes in SMM MSC (513, FDR q-value  
 $\leq 0.05$ ) within the comparison of all three MSC groups.

**Suppl. Table 3**

PDF table of unique differentially expressed genes in MM MSC (3938, FDR q-value  
 $p \leq 0.05$ ) within the comparison of all three MSC groups.

# Supplemental Figures 1-3

## Suppl. Figure 1

## MGUS vs. SMM all regulated

|             |            |            |            |           |           |            |            |            |            |             |            |            |            |            |             |            |            |
|-------------|------------|------------|------------|-----------|-----------|------------|------------|------------|------------|-------------|------------|------------|------------|------------|-------------|------------|------------|
| HOXB7       | HOXB6      | UQCRRS1P1  | RMRP       | SOCS2     | HTRA3     | DSCC1      | SEMA3D     | FSCN1      | DHCR7      | PIP5KL1     | FBRS       | HSP90B3P   | C12orf45   | AC117409.1 | SLC7A14     | AKNA       | FTH1       |
| RPS3AP5     | MOCOS      | TBX15      | RPL4P5     | PIAS4     | LINCO2328 | GPM6B      | FRAS1      | NUDT11     | SETD1A     | TRHDE       | C15orf40   | WRB        | NPHP1      | AOC3       | MTA1        | PTMS       | MT-TC      |
| EEF1A1P5    | RPS27A     | BTG1       | ELN        | KDELR1    | LRFN4     | NDUFA11    | TMEM158    | GYPE       | MMP9       | RPS13       | MARCH4     | PTGER4     | PLRG1      | IL10RA     | THAP1       | NUDCD2     | ZNF571-AS1 |
| HOXB4       | AGPAT1     | ITG45      | ALDH3A2    | RPL9      | MBOAT7    | AL122020.1 | APOL3      | PTPRD-A51  | HOXA4-AS2  | TMEM120B    | PSAT1      | RPS18      | WDFY1      | APH1B      | MAP3K8      | CEBPA      | CD3C7      |
| ALDOA       | TNFRSF19   | SETP14     | HIC1       | GPR78     | EV15L     | ANKRD1     | PTPRD-A51  | HOXA4-AS2  | TMEM120B   | PSAT1       | RPS18      | CTNNB1     | MARCI1     | DCTPP1     | LTBP2       | MAP4K3-DT  | TMEM14B    |
| SHOX2       | MAP7D1     | DOCK10     | SPRED3     | PSMA1     | MPPED2    | EPN1       | NIPIP45    | SGCA       | PDCD1LG2   | WDR24       | TBX18      | OTOF       | AC004156.1 | NEK11      | SGC5        | HCK        | CRYZL1     |
| MAB21L2     | PTPRF      | DCLK10     | NRXN3      | APBA2     | OSR2      | RPLSP34    | COL9A2     | MRLP15     | DOP1B      | EMCG        | AC025164.1 | NDUFB1     | FAM160A1   | RAC2       | ETV5        | PCDH19     | HS65T1     |
| MT-TY       | SCRG1      | AC006970.2 | MYH13      | AN05      | FADD      | FBRSL1     | NCOR2      | RPS15A     | ARHGDIA    | ANKRD13A    | TNNNT3     | LYPD6      | ZNF664     | LST1       | TSC22D4     | RAB9A      | DKK2       |
| ZNF703      | SOX11      | TPM1       | FAM24B3    | NFIB      | ZBTB18    | SH3BP1     | C4orf48    | INHBA      | SMIM7      | PIGC        | PPP1R18    | VTYH3      | HNRNPA3P6  | TSPAN18    | CTBP1       | HDAC10     | CHCHD1     |
| AC027309.2  | ALDH1B1    | RPS3AP26   | TAPBP      | SOCS2-A51 | FOXCUT    | RPS23P8    | FLI1       | ZNF579     | FZD8       | CDC42EP2    | EPHB2      | CELSR1     | LINC01684  | PIGBOS1    | GATD3B      | TRMT6B1    | TLR2       |
| RPL18AP3    | GN65       | SALL1      | EEF1A1P19  | ENPP2     | PCED1B    | CCNJ1      | AL161909.1 | SAMD5      | MYPOP      | MARK4       | TRABD      | MFSD14A    | OClAD1     | PTGER1     | EMX2        | F10        | MAIP1      |
| FKBP1C      | ZBTB7A     | LINC00900  | DPH5       | CD84      | PRAG1     | BDNF       | P3H4       | CCSAP      | HEY2       | LYN         | MINK1      | ALDH2      | NF2        | POU2F2     | CD14        | TEMEM201   |            |
| RAB5IF      | PCBP1      | GALM       | ZMYND15    | RPS12     | NR2F1-A51 | TRIM67     | EEF1A1P6   | AC099380.1 | S100P      | MSX2        | AC104619.3 | FOXC2      | AC099560.2 | ARSJ       | AP152       | SF3A1      |            |
| NR2F1       | MTCO2P12   | RPS11P5    | ARHGAP1    | RPL15P3   | ZNF385D   | MTCL1      | FRMD5      | LTPB3      | HSP90B2P   | SH3RF2      | PHLDB1     | TENM3-AS1  | ARL14EP    | GKS3A      | CDK17       | CDH15      | SLC02B1    |
| AC016739.1  | ADH5       | RPL24P4    | PARP9      | STON2     | TNS1      | SGCG       | CYP19A1    | HOXA5      | ENGASE     | SLC44A3-AS1 | TMEM258    | CXL16      | MLY6P5     | AL359918.1 | TMED1       | ITGAM      | C15orf54   |
| TFAP2A      | MET        | NACA       | FAM189B    | SERpine1  | MDH2      | HSPE1      | MTCO1P40   | RPL31      | RPS21      | PPP2R3C     | SIRPB1     | DLX4       | NDNF       | ARHGAP23   | AP2A1       | SLC40A1    | C1Qa       |
| HOXB3       | PLPP4      | MYH9       | ZNF865     | STR46     | MDIN      | TATD3N     | EN1        | XPNPEP2    | RPS2P46    | OGFRL1      | LINC01629  | ADAMTS12   | MARVELD2   | DWTD1      | SMDT1       | PLA2G2A    |            |
| TMSB4XP4    | PAX9       | HOXB5      | ARRB1      | TLE5      | PROS1     | COX6A1     | DCBLD1     | FURIN      | GSTA4      | SRRM1       | RPL21      | ADPGK      | SCLC22A17  | HADHB      | DECRI       | CKAP4      |            |
| NPM1P27     | EHD2       | RPS3A      | ZNF628     | TMBS10P1  | LMO3      | PTPRE      | ADAMTS6    | RPS7       | HIKESHI    | SUMO2P1     | ATNX2      | CLDN23     | SNHG29     | PLEKHG4    | TMEM184B    | AC020916.1 |            |
| TP1P1       | PRR12      | SKAP2      | AC151223.1 | SELENOP   | INMT      | TNXB       | PAK4       | HIP1R      | OST4       | ACAT1       | GASK1B     | ANGPTL1    | IDNK       | SERP2      | WNT5B       | KIAA1522   |            |
| IGFBP1L     | AKR1C2     | Eif2sp24   | ZFPM1      | NTRK2     | PLSCR1    | PLTP       | LRFN3      | DCHS1      | ST6GAL2    | SCCPDH      | CITED4     | CBARP      | FPR3       | SYNGR1     | SS18L2      | IAH1       |            |
| LDHB        | IBSP       | PARP15     | PTM5AP     | CALR      | JTB       | FASN       | EPGN       | ZNF282     | RPLP0      | ECM2        | RAB3A      | DUSP6      | BAG6       | AC067852.2 | SCN9A       | GET4       |            |
| COL15A1     | EEF1A1P11  | CACNA2D3   | FOXE1      | MIPEP     | ZC3H18    | RAB11B     | MMP24OS    | PPP1R9B    | AC005912.1 | CLCN4       | LGALS3     | PCID2      | TEX41      | GUSB       | SMARCA5-AS1 | FNFL3      |            |
| MTCO1P12    | CDH2       | HSP90AB2P  | LYPD1      | RPL3P4    | EMB       | HMOX1      | TBPL1      | RPL14P1    | ABC413     | CES1        | CCDC85C    | DDAH1      | LAMTOR4    | SP1        | TPGS1       | ZNF771     |            |
| RASGRP1L    | AL590867.2 | PKMP1      | LIX1L      | SNHG25    | EEF1A1P34 | TBLNRD1    | POTE1      | PRDX3      | TMEM255A   | AC026271.1  | NFC4       | REXO1      | SIV1A      | TCEAL3     | ATP5F1E     | ABC9B      |            |
| RPSA        | AC008038.1 | ALX1       | BRD4       | TUSC1     | EEF1A1P29 | MB2        | SIC35E1    | AC079949.2 | STK17A     | AL450332.1  | CUTC       | TNL1       | SIPA1      | FCER1G     | SNX27       | TFP12      |            |
| IQCJ-SCHIP1 | ATP13A2    | PITX2      | MGMT       | BCKDK     | TAF4      | RPL7A      | HNRNPK2P   | ITGAE      | AC004086.1 | BAG3        | RPL10      | ATP5PO     | CAV2       | Z84468.2   | DOCK8       | MT-TS2     |            |
| RPS1B12P    | FYN        | GASS       | PPDPF      | GSC       | KRT81     | EEF1A1P16  | MEX3D      | ANAPC4     | TNFRSF21   | HOXA4       | DHX9P1     | BICRA      | EEF1A1P25  | MLPH       | SPATA20P1   | MAOA       |            |
| PTMP4A      | RPLP0P6    | SLC9A7     | ADAM19     | SASH1     | CLEC14A   | CAVIN1     | CX3CL1     | FLRT3      | TRIP4      | AP001000.1  | KLF4       | PTMAP9     | TMEM14C    | WF51       | TUBB1P      | TRIB1      |            |
| HOXB2       | ADGRD1     | RFLNB      | WDR61      | NKX6-1    | TOR3A     | SLC2A12    | GJA1P1     | ACTB       | AK1        | SNX9        | ERICH2     | NDUFB6     | PMPCB      | CAPS       | PAPPAA2     | C1QC       |            |
| APOL6       | PLPR2      | MT-TL1     | AC026877.1 | SCAF1     | TNFA1P6   | TAFA5      | AC011462.5 | TGFBR3L    | MIER2      | TMEM131L    | FGR3A3     | OBSCN      | PNMA2      | ADAMTS9    | SIPA1L3     | PSMC6      |            |
| MAB21L1     | AC093849.2 | PTPRD      | CLEC11A    | BCAR3     | GAPDH65   | LANCL3     | MPG        | MIR137HG   | TCEA1      | 4B4GALT3    | EEF1A1     | CA13       | KT12       | MEMO1      | AC144831.1  | AC00929.2  |            |
| FOXK1       | BMP8B      | TGFBI      | RPL7       | ATN1      | MGRN1     | LBH        | PEAR1      | CH3L1      | DNAJB4     | C5orf30     | GMDS       | AC018697.1 | LARS       | CA2        | AC25100.3   | SNHG15     |            |
| HAND2-A51   | C11orf87   | GAPDH60    | RPL39      | MGAT2     | ZNF668    | RPL10P9    | RPS8       | C2D74      | IER5L      | KCNB1       | C10B       | EGF        | TMOMS5     | ENDOG      | KCN53       | EMP1       |            |
| AKR1C1      | CNTNAP3B   | PRTFDC1    | HIVEP3     | NUDT10    | SLC16A2   | SCN3A      | HSCB       | SCARF2     | IFI35      | ELAC1       | LRRC47     | PRKACA     | PT53TG1    | FZD2       | MEPCE       | SCAF4      |            |
| AL135905.2  | PRR7       | AC004453.1 | COL4A4     | MIR9949H  | MORN2     | PP1AP22    | RPL29P11   | IRF2BP1    | ADGRA2     | KLHL21      | PTPN6      | SIM2       | CNN2       | ACTBP2     | S100A9      | ST32C      |            |
| HAND2       | SNRPE      | MAGED4B    | OTUD5      | IL18R1    | ARC       | ITGA3      | UBALD2     | ZNF414     | FBXL19     | ANXA1       | GPR158     | TRIR       | P116       | AL691447.2 | AP3D1       | CASP4      |            |
| LDHAP7      | AL590714.1 | PIP5K1C    | RPL34      | PSMA6     | ACTN1     | ST3GAL1    | AGAP2-AS1  | ZNF787     | MRPL1      | STK16       | PAD12      | DCLK1      | NCKAP1L    | SEMA5A     | ARHGAP21    | NMRAL2P    |            |
| CRSL1       | HNRNPPC2   | RSRC1      | XYLT2      | RPL23A    | GLC11     | PSMG2      | NACC1      | AC078817.1 | MYH1       | TBX4        | RANP1      | CHERP      | EIF3E      | LAMA2      | OSER1-DT    | MCF2L      |            |
| TIMP4       | IVD        | EPPK1      | RAB8A      | ERF       | DCDC1     | HOXB8      | NUDT3      | CHCHD2P2   | TRIAP1     | GLDN        | AC113403.4 | LINC01138  | NLRP3      | COTL1      | RGS3        | DBNDD1     |            |
| EXT1L       | ABC2A      | HOXA3      | PCGF2      | CDC5C1    | SDHD      | AMIGO2     | MAGE2L     | OPCM2      | PREX2      | MGARP       | LRCH4      | MAPK1IP1   | HOXA2      | ANXA2P3    | PLAAT4      | CASP1      |            |
| AF201337.1  | B3GALT2    | GMIP       | ANXA2P2    | ADAR81    | RPS29     | FAM22B     | LIMK1      | AC130371.2 | UBE2M      | MBOAT2      | PREL02     | ATP1A2     | L7Y5       | PLCXD1     | C8orf76     | OLF1M      |            |
| SMURF2P1    | PIM3       | PIGF       | TOR4A      | RAVER1    | CAP1P2    | ECHDC1     | CARHSP1    | UBTD1      | LINC00595  | PABPC3      | SPRYD7     | RPL13A5P5  | MAP3K10    | C8orf33    | PDCD4       | ATF5       |            |

6 RFX5 METTL26 CTNNB1

|            |           |           |           |            |            |            |            |            |                 |             |            |
|------------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----------------|-------------|------------|
| H0X87      | AC0938402 | COL4AA4   | ARC       | MMP405     | RDX5       | MET11626   | CTNNB1     | SLC23A17   | ADAM57          | F5R14       | AC161633.1 |
| H0XB4      | PB884     | RPL4      | DCCD1     | CFS1R      | TMEM100    | KNCB1      | OTOF       | GARNL3     | BPI             | PAPP2A      | CASPI      |
| SH0X2      | C11orf187 | KYNU      | RPS29     | MEK3D      | AC024014   | CEP152     | NDFU19     | TNCX17     | C4Z             | AC245103    | A1691420.1 |
| MA2812L    | CNTNAP8   | PFCG2     | GRM468    | CX3CL1     | SLC11A1    | SCL442     | ELL        | LAMTOR3    | HFLPFL          | FAM4218     | HRGAH4     |
| MT-TY      | PRR7      | SOC52     | HSDL2     | FGG7P8     | TRH        | ISM1       | GPM35      | IRX6       | OSEGP           | KNC53       | SGCB24Z    |
| ZNF703     | IVD       | PCAT6     | NDUF11A   | RPS8       | OLFM24A    | GLDN       | LYPD4      | SIP1A      | FILIP1L         | BLOC155     | SHROO2M    |
| NR2F1      | 836GALT2  | PSM41     | ENTPD3    | HSC8       | HRGAHD4    | MGARP      | PARR14     | TMEM145C   | MACRN4          | VSTM2L      | CLCA2      |
| TFPA2A     | RSPQ9     | ANOE      | AOP1      | INSC       | F2D8       | IL27B      | NRN1       | WDR85      | PGK1            | URP10       | ZCHVAV11   |
| H0X83      | PIM3      | SSCS2-A51 | AC0123491 | UBALD2     | MYP09      | NDC1       | MFSDF1A    | PNM24A     | NOTCH1          | P2R8Y       | OLFM1      |
| SLC24A3    | TBX15     | ENP92     | AL122020  | CDC40EP6   | AC0938901  | UNG        | PXDC1      | ZFP42      | ALB19447        | HRGAH2P7    | POLR123    |
| TMNS4B9P   | DKL2      | MA2       | ANKRD1    | MAGE2L     | UNC0654    | ABCD1      | DDX60      | LARS       | FBLM1           | STBD1       | MT-TC      |
| GFBP1R1    | SALL1     | RPS12     | RLPR534   | UMK1       | RPS21      | RPS18      | TPSN15     | PLRA8      | LAMA2           | HRGAH2P1    | COX7C      |
| COL15A1    | LINC09090 | STK32A    | SH3BP1    | CHMP1B     | TBPX12     | CXCL16     | P16        | TNMD       | MIR210          | DTXL3       | TMBM14B    |
| RS456P1    | NACA      | STR46     | PRAG1     | NUDIT11    | ABC13A     | ADAMTTS5   | B5T1       | ADCP10V1   | AF33            | PDCD4       | TMBM14B    |
| AC022041   | H0X84     | TLES      | TRIM67    | GVP6       | TMEM250B   | AC0251641  | C1QTN1     | NLRP3      | TNDC5           | PTMS        | SAT2       |
| H0X83      | CAGNA2D3  | SELENO9   | MOX       | HoxA5-X2   | STX13A     | STYK1      | KNCN1      | H0XA2      | MAR93Q          | ZNF518B     | PCDH19     |
| AP061      | AUX1      | NTRK2     | HSP1E     | SGCA       | AC0040861  | TRABD      | ZNF710     | LYT5       | SPPL2A          | WWC1        | NTF3       |
| MA2812L    | PITX2     | ASPN      | CGX641    | NMB        | FAM87A     | P2RX5      | SLC12AB8   | DTX4       | USF2            | CEBPA       | HSS6T1     |
| HAND3-A51  | RFLN1B    | MIEP9     | PTPRE     | RPS15A     | TEC1A1     | CDKN2A1    | ATP50      | RNASE2     | TSC2D20         | LT4C        | CHHD1      |
| HAND2      | MT-TL1    | RPL39A    | TNFX      | ZNF579     | PAD1       | LYN        | CA13       | CANX       | CTBPI1          | HDA10       | KRT17      |
| TBL3       | PTRPO     | SNHG25    | RA811B    | B1A1P2L1   | RLTC       | TPSN15A    | AC0186971  | AC051635.1 | ALKH2B          | TRMT16B     | SFA1       |
| CA04M1     | TGEF81    | CPE       | MIB2      | H0XAS      | MYH1       | SHS1A1     | SLC25A1    | POLD4      | EMV2            | TC721A      |            |
| TIME4      | PDE1A     | SA5H51    | RPL7A     | RPL31      | PREX2      | MSK2       | TRIR       | PCDHB48    | KN02            | F10         |            |
| EKT1L      | PTRF0C1   | NKX6-1    | SLC21A2   | XPNP97R    | RPS13      | TMEM45B    | DCKL1      | AP1H8      | U0L2F           | R0519       |            |
| PT023337.1 | AC004453  | NUDT10    | LBN       | RPS7       | PSAT1      | UNC1629    | CHERP      | ZNF408     | F0X51           | SLC40A1     |            |
| H0X86      | SLC11A1   | I1R38J    | SCNA3     | HIP18      | CUC13      | TMEM200    | RASGRP3    | RAC2       | GATA6-A51       | PLA2G2A     |            |
| MCGOS      | H0X43     | RPL23A    | PSMG2     | DCH51      | EGNL1      | CITED4     | ATP1A2     | PIG051     | F5C28R          | F3          |            |
| TNFRSF19   | RASSF7    | ADA18R    | H0X88     | PCKS1N     | ERAP1      | TASP1      | AP000695.2 | PTGER1     | SH154A          | AC011325.3  |            |
| SMOC2      | GMIP      | RAVER1    | SEMA4D    | RPL14P1    | MARK4      | PCD9H      | C5orf146   | NF2        | CDEAP           | CD320       |            |
| FOX2       | P1GF      | HTR3A     | PLA2G4A   | TPSN151    | AM21       | PAPPA      | DLX3       | AP2A1      | COMM4D          |             |            |
| SOK11      | ELN       | MPPED2    | TMEM158   | F1R73      | HEV2       | AP000695.1 | AC004155.1 | SLC30A2    | SMDT1           | NIFl3       |            |
| LNDH8B     | ALDHA2B   | OSR2      | NPI9A5    | ACTG2      | BGN        | KIF4       | PLD1       | TN2K       | C09f64          | EFGf7       |            |
| SCARAF5    | NRXN3     | CNDK2B    | TFE8      | ACT8       | CRIM1      | AL591815   | FAM610A    | ST8S1      | TMEM184B        | ZNF711      |            |
| STEAP4     | MH33      | FOXCUT    | C4orf48   | P2RX1      | ECM2       | HSPB1      | ZNF664     | TUB        | PIK3R1          | TSC2201-AS1 |            |
| MTC02P2    | ZMNW102   | PECD18    | ASPA      | M2T2A      | GBGT1      | AC041601.3 | SBS3       | MCYBP2     | WTN58           | TPF12       |            |
| PUPP4      | PARP9     | NR2F1-A51 | BDFN      | MRI137H    | CLN1       | PTPN6      | NDFU9      | LVL1       | SIS1B           | MT-TS       |            |
| IL13RA2    | KLUH13    | ZNF385B   | FRM05     | C3H13      | AC026271.2 | GPR158     | UNCG186A   | RIM45      | ETV6            | MAOA        |            |
| PAX9       | LYPD1     | PROS1     | CY19A1    | IEP18      | AL50323-1  | DAID       | PITPNM1    | SYN61      | SMARCA5-ASTR1B1 |             |            |
| PRR12      | FBNL2     | LM03      | ANKR037   | ZNF414     | AC024162.4 | C1orf162   | CORO1A     | WDR12      | TPG51           | SRB01       |            |
| IBSP       | MGMF      | INMT      | NAMT      | ILN787     | H0X4A      | AC134003.3 | PDE11A     | TMU81      | ZNF521          | C2B         |            |
| IRAK3      | PPDPF     | JTB       | RFLNA     | CTXN1      | FAM229B    | SOK6       | CHEK2      | TECL13     | ATPF5-E         | EMP1        |            |
| FYN        | CLEC11A   | KRT81     | HRGHD1B   | AC130371.2 | NOVA1      | HSD1B1     | NDNF       | ZBA668Z    | CAP1            | SPRY3       |            |
| TMT1C      | SLC9A9    | CLEC1AA   | ADAMTS6   | UBTD1      | SNX9       | PTGER4     | MARVELD2   | SENCR      | BCL9L           | LMNTD2      |            |
| ADGRD1     | CD47      | TNFAIP6   | EPGN      | PDGFD      | FN3K       | CLIP3      | CLDN14     | GPB1P1     | SPATA20P1       | MCF2L       |            |

HL3 NKTR RPL5P34

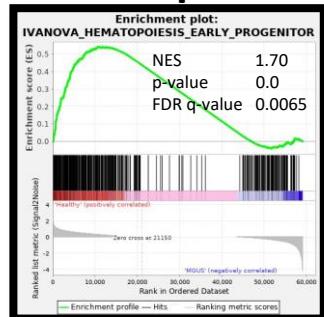
|            |             |            |          |                |            |                   |            |           |            |            |            |
|------------|-------------|------------|----------|----------------|------------|-------------------|------------|-----------|------------|------------|------------|
| H0X7       | KNC53       | NTW58      | LHS1     | UNI01629       | UCL3       | NTRK              | PLRP534    | CDB148    | RAB32      | PLR016-MT  | MROH1      |
| FTF2PA     | ENC1        | PTX1       | RGSL6    | ITGA9          | SASH1      | RP513             | GPM51      | MYO58     | SYNGR1     | ZRNAP3     | SEL113_MAF |
| H0X84      | POU2F2      | NFL3       | FAM110B  | NCKCAP5-AS2MAZ | BAA2P      | TNRFS25           | TMEM208    | HPCD      | HECWV      | KIAA0893   | RPLP34     |
| OC038892   | CHARSP1     | ADCY2      | PAX9     | ADRB2          | MYPDOP     | ADAMTS1           | TGBR1      | TNXB      | WFG        | WDRA5      | MGRPF8     |
| H0X83      | PRR7        | LRRAC4     | PCGF2    | EFB1Z          | SBS1L2     | ZNF579            | CH3L1      | BL1       | IL10       | PIG305     | CRABP2     |
| ADGRD1     | EN1         | IL20R      | RP529    | CEBPA          | TMEM5      | HOBX5-GLB12       | PLSMG3     | PSMGA02P  | ULBP1      | ARD        | NDUF1      |
| MAB21L2    | PTPRD       | MKS2       | LRX3     | DCLK1          | RP57       | SMDT1             | MEIS2P3    | VLDL      | FURT3      | TCETXID9   | WNT2       |
| H0X82      | SALL1       | LRN103     | MRKNS3   | SYND1          | BDNF       | NDNF              | PTPNE      | HCFC1     | PTPR       | STXB6      | STEAP3     |
| H0X6       | FYVE        | PTEN       | COA1     | SPANR1         | MEF2A      | SMN2              | PTPRJ      | EPHA1     | PTPRK      | PTPRM      | PTPRN      |
| IL18BR1    | RBM25       | LMR1       | PTENP1   | USP25          | LMRD3      | ZNFX1             | ZNFX1      | PTPRQ     | SLC14A1    | MT-TC      | ACHTN-361  |
| MOX5       | SLC12A7     | FTHD1      | PTMS     | FRMD4          | RA81B      | CLEN4             | LN016584   | PTPRM     | SLC14A9    | MT-TC      | ACHTN-361  |
| SC052-AS1  | DRP2        | H0X42      | DKBX81   | TMEM308        | UN0117     | DGAP2             | ASPL       | AL452032  | SELENOF    | MGAR3      | MGAR3      |
| MT-TY      | LBH         | SLC47A1    | TPM4     | PHD4-2         | LA8        | ME1               | CUP2       | TRIR      | ADAMT6     | AOX6       | CDH18      |
| SC052      | H0X45-AS3   | TCEA1      | MAPK10   | TREM1          | LYT5       | H0X49             | OTOF       | CBV56D2   | UBFD1      | SDA3       | RABEP2     |
| TMWS4P4X   | PRR12       | H0X8-AS3   | THRA1    | RP34           | EPGN       | PPDPB             | FVLCR2     | HDAC10    | ZNR1       | TMEN4C     | ITPR1      |
| TBX15      | PTPNM3      | NTW41P6    | CY19A9   | SNC3A          | H0X49      | ADAL              | CA13       | FRX3      | PRUNE2     | ATP5P1     | AL350919-2 |
| ZNF703     | PLPPA4      | AR14C      | SPF28    | RASPR1         | RF7        | SRM               | AP005212   | TMEM255A  | MB2        | CDA        | PDEB       |
| MAP3K8     | ELMN12      | ENP22      | EVA1A    | TMEM158        | YHBS8      | DAB2IP            | XPT0       | EFPR2B1   | TRIM       | SEMAD      | COL4A4     |
| B2GALT2    | UNC00869    | MPP2ED     | MARVELD2 | CASP1          | UB18D1     | ALDH2A2           | FOX1       | PTFRD1C   | IFNGR1     | QRSL1      | ITC396     |
| YEYA       | CHRMS       | SH3BP1     | ZN787    | RPLTA          | PREX2      | NMMN1             | CHTRC1     | TMEM184B  | YLPD8      | RP38       | NDUF11     |
| NR1H2      | FEY1        | OC05889-2  | DCGD1    | RK503          | RS20       | SPATA20P1         | AC004516.1 | AN10      | SPON1      | ST17KA     | MYL5       |
| PRAG1      | SERTAD4-AS1 | IGBP70     | KLF4     | AC00453.1      | CREBB      | CANCA203          | GPR150     | DRAD      | ARHGP21    | MT-ATP8    | PXNU4      |
| H0X43      | TRM67       | PTENP1     | MAB21L1  | PTENP1         | PTP1B      | MHS5              | FNMPLA8    | AC00771.1 | UN0117     | MT-ATP8    | CHDC1      |
| PTENP1     | PTENP1-AS1  | PTENP1     | PTENP1   | PTENP1         | PTP1B      | PTP1B             | PTP1B      | PTP1B     | PTP1B      | PTP1B      | PTP1B      |
| STRA5      | MIR1373G    | COK6A1     | THINX    | PTENP1         | PTENP1     | PTENP1            | PTENP1     | PTENP1    | PTENP1     | PTENP1     | PTENP1     |
| H0N25      | AS1-2       | UNC00090   | NE1      | TRAB8          | PTENP1     | PTENP1            | PTENP1     | PTENP1    | PTENP1     | PTENP1     | PTENP1     |
| MTCP2P12   | MAGE12      | NPIP5      | CKL16    | RP51A          | LPYD6      | SNHG25            | TRG51      | CDH8      | UARI5      | TANK       | ZNL743     |
| BMP8B      | OLFM4       | APH1B      | ALDH1B1  | BAVER1         | AC024251.5 | TP1F2             | NPRL1      | SNLNP1    | AKR1A1     | SPINDOC    | DEPPI      |
| H0XA-AS2   | FRAS1       | RP12       | NKX6-1   | ID2            | CCDC158    | SESN3             | AC010326.3 | ADAR81    | EMP1       | GPM6B      | PTPN6      |
| SOX11      | JTB         | FAT3       | CADM3    | SMARCA5-AS1    | WHA1       | PSM1A             | RPL14P1    | ACTB      | DUSP1      | ASB8       | SPRY2      |
| PTP01337.1 | STX16       | GHITM      | CNTN3P8  | PTEN           | SLC21A7    | AKNTRD02051CEP12B | RSR1       | UBTD1     | MT-DEM3    | SEAD3A     | XC3L1      |
| LYPD1      | ZMWN1D5     | PTK41P1    | SCNS3    | NUDT2          | SM006A     | TMEM258           | TPTEP1     | ANOS      | TEC13A     | ZNF654     | PLR5238    |
| LEPR       | IBSP        | CNTN1      | SLC44A3  | C06C           | TFP2A-051  | TSKS              | IARS       | F10       | RPLS       | EMX205     | EMX205     |
| PTX2       | WARS        | ELIN       | FOXP1    | CHERP          | CITED4     | MTF               | PTGER4     | EM20      | AC025164.1 | GVN1P1     | SLC6A9     |
| HAN02      | MT-TL1      | TSC22D4    | EPRI     | SLC1           | AC00458.1  | TRB1              | SNHG7      | TLES      | SCRN3      | PT051      | AC08038.2  |
| H0X85      | PSAT1       | SLC31A1    | NRN185   | TMEM100        | AC093890.1 | RBNK2             | TPSN23     | PLIN2     | UP16       | PLA2G2A    | PLA2G2A    |
| MGMT       | H0XAS       | ZNF3850    | FRMDS    | RGCC           | LRATD1     | NRN187            | FRD10      | HSG2      | CD2        | ZDHHC15    | AC098798.1 |
| MAOA       | URLC71      | LOFM1      | DLX2     | NRN187         | TMEM100    | ECEL1             | AC093897.1 | MT-ATP8   | AC004547.2 | AC004547.3 | AC004547.3 |
| PTENP1     | PTENP1      | PTENP1     | PTENP1   | PTENP1         | PTENP1     | PTENP1            | PTENP1     | PTENP1    | PTENP1     | PTENP1     | PTENP1     |
| NM42       | HPSE1       | COL15A1    | THBD     | GMIP           | CELC11A    | SID04A            | MPPEP      | EVA1      | ANRDX1     | NUP3       | EPB415     |
| H0X103     | TTC9        | R4C2       | MMP29A05 | PTENP2         | CNBH1      | SHOX2             | SERINC1    | F2B8      | PMG2       | ZB46842    | GAN117     |
| TGFBI      | TBX18       | PTENP19    | RPSS8    | SLC40A1        | HPSP9      | PAD2              | KREMBEN1   | SLC7A11   | TMEM141    | ABC143     | MDS144     |
| GYPF       | UN0165      | AC130371.2 | C4orf48  | ATRD1          | UN01956    | HS6571            | LAMTOR7A   | U10f07    | MEY2       | ATP5P9     | UGP2       |
| APO16      | AC251003.1  | P116       | SH5A2    | ID2-AS1        | PTGS2      | GLDN              | UNC02432   | CER53-AS1 | DCHS1      | GAMT       | FEMIAPI2   |

# Supplemental Figures 1-3

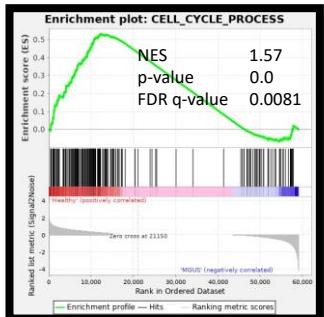
## Suppl. Figure 2

**A**

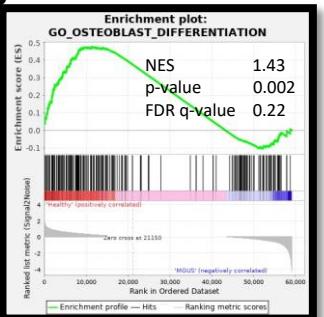
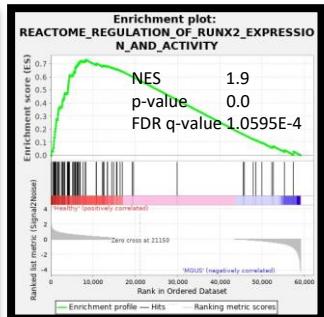
### Hematopoiesis



### Cell Status



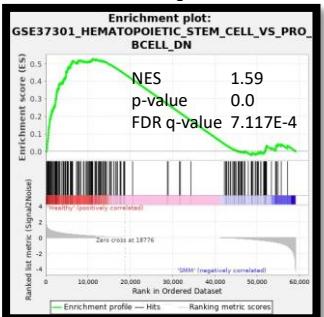
### Osteogenesis



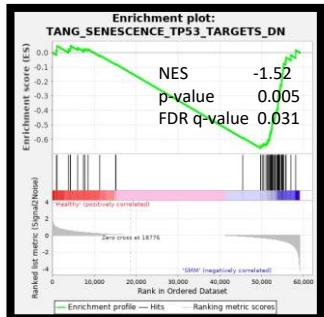
### Healthy vs. MGUS

**B**

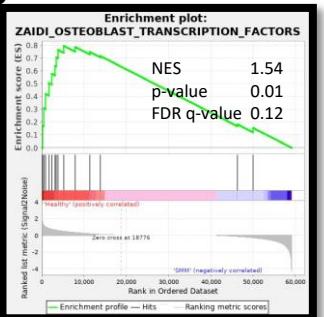
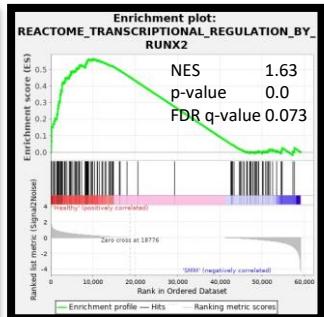
### Hematopoiesis



### Cell Status



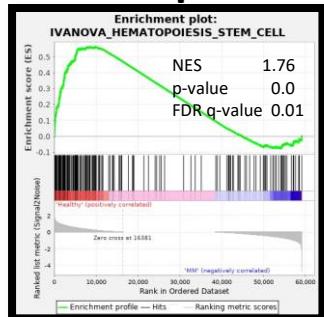
### Osteogenesis



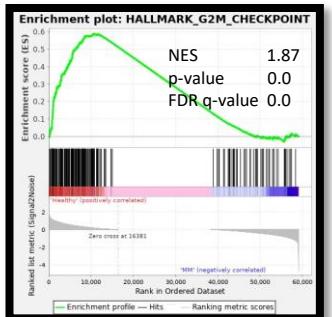
### Healthy vs. SMM

**C**

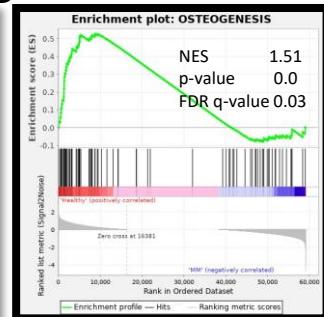
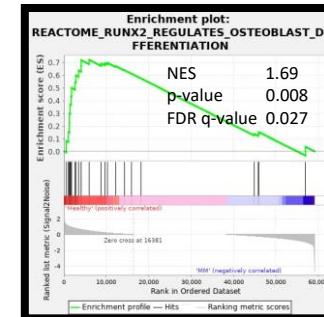
### Hematopoiesis



### Cell Status



### Osteogenesis

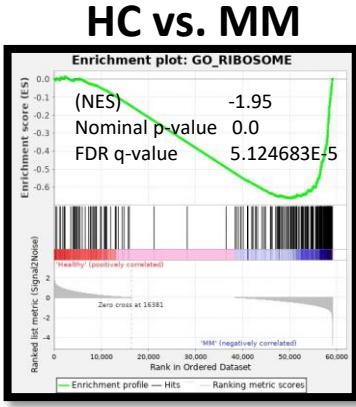
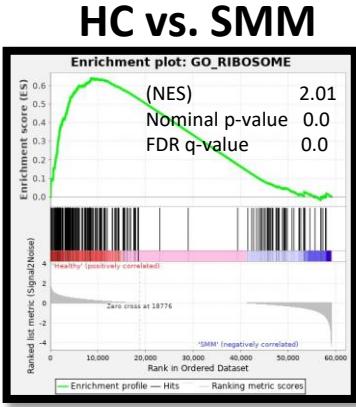
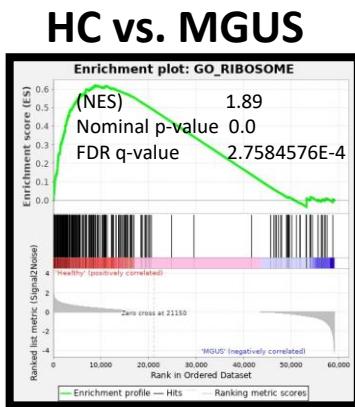


### Healthy vs. MM

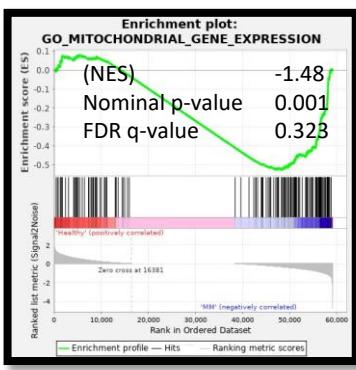
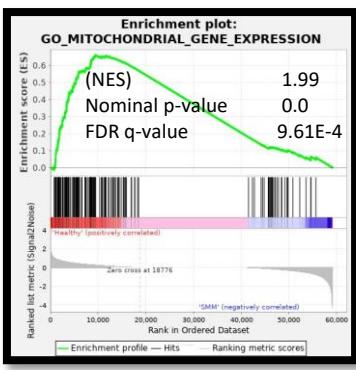
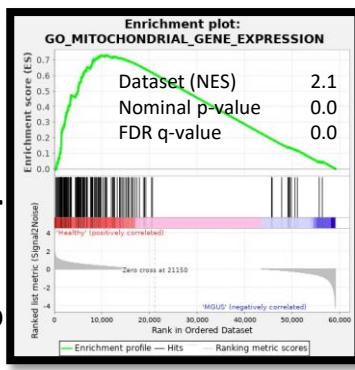
# Supplemental Figures 1-3

A

**GO Ribosome**

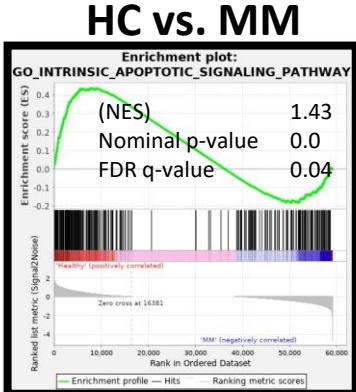
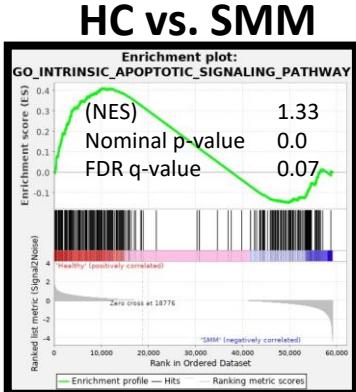
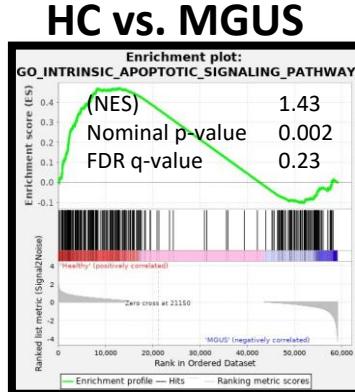


**GO Mitochondrial gene expression**



B

**Intrinsic apoptosis**



**Extrinsic apoptosis**

