Supplementary File 7. Characterization summary of stromal clusters.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cluster ID | Group ID | Annotation |  | Characterizations |
| CFU-F | In vitro differentiation capacity | Surface phenotype | Localization | Top-10 expressed genes |
| Osteo- | Adipo- | Chondro- |
| 3 | A | MSSC | +++ | + | + | + | CD45-CD235a-CD71-CD271+CD52-NCAM1-**CD81++** | Peri-vascular, peri-adipocytic and endosteal regions | CXCL12, CFD, IFTM3, IGFBP7, APOE, GAS6, B2M, MDK, PTGDS, DCN |
| 5 | HAGEP | ++ | + | + | (+) | CD45-CD235a-CD71-CD271+CD52-NCAM1-**CD81+** | SOCS3, FOS, FOSB, JUNB, EGR1, ZFP36, IFITM3, NNMT, APOE, CFD |
| 16 | Balanced prog. | +- |  |  |  | CD45-CD235a-CD71-CD271+CD52-NCAM1-**CD81+-** |  | CXCL12, APOE, CFD, LEPR, IFITM3, CHL1, CP, VCAN, DCN, PTGDS |
| 38 | Pre-osteoblast | +- |  |  |  | CD45-CD235a-CD71-CD271+CD52-NCAM1-**CD81-** |  | MALAT1, AC010970.1, AD000090.1, FOS, ZFP36L1, FOSB, EGR1, CXCL12, VCAN, CP |
| 29 | B | OC | + | ++ | - | ++ | CD45-CD235a-CD71-CD271+CD52-**NCAM1+** | Endosteal bone-lining areas | LUM, DCN, FOS, TPM1, CLEC11A, S100A13, VIM, IBSP, PCOLCE, COL1A2 |
| 23 | S100A13, EEF1A1, TPM1, TPT1, AC010970.1, ADIRF, FTH1, BGN, SPP1, AD000090.1 |
| 6 | C | Pre-fibroblast | +- | + | - | +- | CD45-CD235a-CD71-CD271+**CD52+**NCAM1- |  | CXCL12, APOE, CFD, IFITM3, PTGDS, IGFBP2, LEPR, NNMT, FOS, SOCS3 |
| 37 | PRTN3, AZU1, MPO, SRGN, ELANE, CTSG, APOE, GSTP1,CXCL12, CFD |
| 8 | S100A9, APOE, S100A8, CXCL12, CFD, IFITM3, LEPR, VCAN, FOS, PTGDS |