**Supplementary Table 3: Activated biological functions in UM cells as compared with NCM**

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| --- | --- | --- | --- | --- | --- |
| **Categories** | **Diseases or Functions Annotation** | **p-Value** | **Activation z-score** | **Molecules** | **# Molecules** |
| Cell Signalling, Post-Translational Modification | tyrosine phosphorylation of protein | 1.75E-03 | 2.164 | APP,BSG,FN1,ITGB1,THBS1 | 5 |
| Cell-mediated Immune Response, Cellular Movement, Hematological System Development and Function, Immune Cell Trafficking | T cell migration | 2.56E-04 | 2.395 | DPP4,FN1,ICAM1,ITGA3,ITGB1,THBS1 | 6 |
| cell movement of T lymphocytes | 1.16E-03 | 2.181 | DPP4,ICAM1,ITGA3,ITGB1,THBS1 | 5 |
| Cell-To-Cell Signalling and Interaction | activation of cells | 3.12E-08 | 2.042 | ALB,APP,C3,CYR61,DPP4,DUSP3,FN1,GC,  ICAM1,ITGA3,LGALS3,MMP1,PLAT,PMEL,  PVRL2,RAB27A,THBS1,TNC | 18 |
| adhesion of connective tissue cells | 2.56E-08 | 2.393 | COL1A1,CTGF,CYR61,FN1,ICAM1,ITGB1,  TGFBI,TNC | 8 |
| adhesion of leukaemia cell lines | 1.00E-03 | 2.192 | FN1,ICAM1,ITGA3,ITGB1,TNC | 5 |
| attachment of cells | 2.40E-04 | 2.19 | BCAP31,FN1,ITGA3,ITGB1,TGFBI | 5 |
| adhesion of carcinoma cell lines | 4.89E-06 | 2.174 | BSG,CTSB,ICAM1,ITGB1,THBS1 | 5 |
| attachment of tumour cell lines | 2.62E-04 | 2 | BCAP31,FN1,ITGA3,ITGB1 | 4 |
| Cell-To-Cell Signalling and Interaction, Embryonic Development | adhesion of embryonic cell lines | 1.21E-08 | 2.164 | C3,FN1,ICAM1,ITGA3,ITGB1,POSTN,TIMP1 | 7 |
| Cell-To-Cell Signalling and Interaction, Hair and Skin Development and Function | adhesion of epithelial cell lines | 1.85E-08 | 2.2 | C3,FN1,ICAM1,ITGA3,ITGB1,POSTN,TIMP1 | 7 |
| Cell-To-Cell Signalling and Interaction, Hematological System Development and Function, Immune Cell Trafficking, Inflammatory Response | activation of myeloid cells | 1.09E-04 | 2.393 | APP,C3,GC,PLAT,PVRL2,THBS1 | 6 |
| activation of phagocytes | 3.47E-04 | 2.393 | APP,C3,GC,PLAT,PVRL2,THBS1 | 6 |
| Cellular Assembly and Organisation, Cellular Function and Maintenance | organisation of cytoskeleton | 5.94E-04 | 2.78 | ACTN1,ANXA1,APP,BSG,CAP1,FN1,ICAM1,  ITGA3,ITGB1,LAMB1,NUMA1,PLAT,PTK7,  SEPT7,SNCA,STK24,THBS1 | 17 |
| Cellular Assembly and Organisation, Cellular Function and Maintenance | microtubule dynamics | 2.04E-04 | 2.744 | APP,BSG,CAP1,FN1,ICAM1,ITGA3,ITGB1,  LAMB1,NUMA1,PLAT,PTK7,SEPT7,SNCA,  STK24,THBS1 | 15 |
| Cellular Development | differentiation of cells | 1.31E-07 | 2.225 | ALB,ANXA1,APP,BDH2,COL18A1,COL4A1,  COL6A1,CTGF,CTSB,CYR61,DPP4,FN1,  HSPE1,IGFBP5,ITGB1,LAMA4,LOXL2,NID2,  NOV,PLAT,SERPINE2,SNCA,TIMP1,TNC,  TPM4,VCAN | 26 |
| Cellular Growth and Proliferation | outgrowth of cells | 2.89E-09 | 2.233 | A2M,APP,CYR61,FKBP4,FN1,HSP90AA1,  ITGA3,ITGB1,THBS1,TNC | 10 |
| Cellular Movement | cell movement | 4.71E-16 | 2.639 | A2M,ALB,ANXA1,APP,BCAN,BSG,C3,  C4A/C4B,CAP1,CAPN1,COL18A1,COL1A1,  COL4A1,COL4A2,CSPG4,CTGF,CTSB,  CYR61,DPP4,FLNB,FN1,GC,HEBP1,  HSP90AA1,ICAM1,IGFBP2,IGFBP5,IGSF8,  ITGA3,ITGB1,LAMB1,LGALS3,LGMN,LOX,  LOXL2,LTBP2,MMP1,MYH10,NOV,PLAT,  POSTN,PPIA,SERPINE1,STK24,TGFBI,  THBS1,THBS2,TIMP1,TNC,VCAN | 50 |
| migration of cells | 1.35E-14 | 2.426 | A2M,ALB,ANXA1,APP,BSG,C3,C4A/C4B,  COL18A1,COL1A1,COL4A1,COL4A2,CTGF,  CTSB,CYR61,DPP4,FLNB,FN1,HEBP1,  HSP90AA1,ICAM1,IGFBP2,IGFBP5,IGSF8,  ITGA3,ITGB1,LAMB1,LGALS3,LGMN,LOX,  LOXL2,LTBP2,MMP1,MYH10,NOV,PLAT,  POSTN,PPIA,SERPINE1,STK24,TGFBI,  THBS1,THBS2,TIMP1,TNC,VCAN | 45 |
| cell movement of carcinoma cell lines | 2.15E-05 | 2.913 | BSG,CTGF,CTSB,CYR61,FN1,ITGB1,MMP1,  NOV,POSTN,TGFBI | 10 |
| invasion of breast cancer cell lines | 9.75E-05 | 2.036 | BSG,CTSB,FN1,HSP90AA1,ITGA3,LOX,  LOXL2,MMP1,TIMP1,TNC | 10 |
| migration of carcinoma cell lines | 1.51E-04 | 2.607 | BSG,CTSB,CYR61,ITGB1,MMP1,NOV,  POSTN,TGFBI | 8 |
| invasion of carcinoma cell lines | 1.78E-03 | 2.401 | BSG,CTSB,CYR61,ITGB1,NOV,POSTN,  TGFBI | 7 |
| migration of melanoma cell lines | 1.31E-04 | 2.15 | BSG,COL1A1,CTGF,ITGB1,LTBP2,VCAN | 6 |
| Free Radical Scavenging | metabolism of reactive oxygen species | 9.15E-04 | 2.576 | ALB,APP,ARHGDIA,CBR1,COL18A1,ITGB1,  PARK7,PPIA,PXDN | 9 |