

# **ANNEXURE-3**

**Annexure 3: Seed identification from the clusters generated for BaP affected proteins using MCODE**

| Cluster | Score  | Nodes | Edges | Seeds | Connectors | Node IDs  |
|---------|--------|-------|-------|-------|------------|---|
| 1       | 55.929 | 57    | 1566  | 14    | 43         | <b>SRSF3</b> , SNRPE, <b>XAB2</b> , CWC15, BCAS2, SNRPG, DDX42, CDC5L, <b>U2AF2</b> , PHF5A, SNRPB2, SNW1, SF3A3, PLRG1, SF3A1, SNRPB, <b>SNRPD1</b> , <b>SNRPA</b> , PRPF19, TXNL4A, <b>SRSF5</b> , SNRPD2, <b>SNRPA1</b> , <b>SF3B1</b> , PRPF6, SNRNP40, SF3B2, SF3A2, <b>SRSF4</b> , SF3B3, SNRPF, SNRPD3, RBM8A, DDX23, <b>TRA2B</b> , <b>SRSF7</b> , NHP2L1, PPIH, <b>SRSF2</b> , HNRNPM, PRPF3, <b>EFTUD2</b> , <b>SART1</b> , EIF4A3, CASC3, UPF3B, SF3B5, PRPF4, CDC40, SF3B6, PRPF31, MAGOH, CRNKL1, NCBP2, SNRNP200, SF3B4, PRPF8  |
| 2       | 25     | 25    | 300   | 1     | 24         | NDUFS5, NDUFS1, NDUFA13, MT-ND2, NDUFB6, NDUFA3, NDUFA6, NDUFB3, NDUFS4, NDUFB4, NDUFA10, MT-ND3, NDUFV2, NDUFS2, MT-ND5, NDUFS3, MT-ND4, NDUFA7, NDUFA1, <b>NDUFAB1</b> , NDUFS7, MT-ND1, NDUFA8, NDUFS6, NDUFB2   |
| 3       | 24.571 | 50    | 602   | 47    | 3          | <b>GNG2</b> , <b>RNF19B</b> , <b>HCAR3</b> , <b>GPSM1</b> , <b>RBBP6</b> , <b>FBXL8</b> , <b>CXCL8</b> , <b>MCHR2</b> , <b>GALR2</b> , <b>CCR9</b> , <b>ADCY7</b> , <b>C5</b> , <b>RNF213</b> , <b>HUWE1</b> , <b>APP</b> , <b>ANAPC10</b> , <b>ASB2</b> , <b>CXCR5</b> , <b>GNAI1</b> , <b>FBXO30</b> , <b>MYLIP</b> , <b>FBXO2</b> , <b>CXCL1</b> , <b>KLHL42</b> , <b>SMURF2</b> , <b>CCL5</b> , <b>CCR5</b> , <b>GNB1</b> , <b>GNG11</b> , <b>CCL1</b> , <b>FBXW10</b> , <b>GPR183</b> , <b>CXCR4</b> , <b>PDYN</b> , <b>GPR18</b> , <b>FBXL16</b> , <b>CUL5</b> , <b>FBXL5</b> , <b>KLHL21</b> , <b>ITCH</b> , <b>KLHL5</b> , <b>ASB11</b> , <b>CCR7</b> , <b>ASB14</b> , <b>CDC20</b> , <b>ASB5</b> , <b>CXCL10</b> , <b>HEBP1</b> , <b>FBXO22</b> , <b>CCL20</b> |
| 4       | 23.19  | 43    | 487   | 12    | 31         | RPS21, <b>PPIL6</b> , RPS10, <b>CD2BP2</b> , <b>SLU7</b> , <b>RPS27L</b> , RPS7, RPS6, <b>RPS11</b> , <b>NOP56</b> , POLR2H, POLR2L, <b>RPS25</b> , RPS4X, RPS18, RPS9, POLR2B, POLR2C, POLR2G, POLR2F, POLR2K, RPS14, RPS28, RPS2, <b>POLR2A</b> , RPS8, RPS20, SKIV2L2, <b>RCL1</b> , POLR2J, RPS15, RPS17, <b>SMG8</b> , RPS5, RPS26, RPS12, RPS13, RPS19, <b>HSPA8</b> , RPS16, RPS29, <b>RPL7</b> , POLR2E   |
| 5       | 16.136 | 45    | 355   | 22    | 23         | UBE2S, <b>SGOL1</b> , <b>UBE2K</b> , <b>STAG1</b> , RAD21, SMC3, <b>UBE2M</b> , <b>SPDL1</b> , <b>UBE2N</b> , FZR1, <b>PPP2R5C</b> , PPP2R1A, <b>UBE2C</b> , GSPT2, UPF2, UPF1, SMG7, ANAPC2, <b>SMG6</b> , SMC1A, PPP2CA, PABPC1, <b>UBE3D</b> , <b>RNF19A</b> , STAG2, <b>UBE2E2</b> , RANGAP1, <b>SH3RF1</b> , GSPT1, <b>ZWILCH</b> , ETF1, <b>SKP2</b> , UPF3A, UBE2D2, <b>TRAIP</b> , ANAPC11, <b>SKA2</b> , <b>SMG1</b> , <b>SPC24</b> , <b>SPC25</b> , CDC27, ANAPC4, <b>VPRBP</b> , <b>ZWINT</b> , SGOL2  |
| 6       | 15     | 15    | 105   | 2     | 13         | TAF4, TAF9, TAF1, TAF2, TAF11, <b>TAF13</b> , TAF7, TAF10, GTF2A2, TBP, TAF6, <b>TAF5</b> , TAF8, TAF12, GTF2A1   |
| 7       | 15     | 15    | 105   | 14    | 1          | <b>IFIT3</b> , <b>OAS2</b> , <b>GBP2</b> , RSAD2, IRF5, IFI27, IRF7, <b>IFITM1</b> , <b>MX1</b> , <b>IFITM2</b> , HLA-E, IRF9, ISG15, <b>MX2</b> , <b>IRF1</b>  |
| 8       | 12.976 | 42    | 266   | 36    | 6          | <b>POU2F1</b> , GTF2H3, <b>FAM20A</b> , <b>EGR2</b> , <b>PRSS23</b> , <b>GTF2H2</b> , MNAT1, PDIA6, ERCC1, CP, <b>HIST2H2BE</b> , <b>POLD4</b> , <b>IGFBP4</b> , <b>HIST1H2BO</b> , ERCC2, <b>APOL1</b> , <b>HIST1H2BK</b> , LGALS1, <b>IGFBP3</b> , <b>CDK9</b> , <b>RBBP5</b> , <b>SPP1</b> , GTF2H1, <b>IGFBP1</b> , <b>IGFBP7</b> , <b>HOXB2</b> , <b>ESR1</b> ,  |

|    |       |    |    |    |   |   |
|----|-------|----|----|----|---|---|
|    |       |    |    |    |   | <b>HIST1H2BD, HIST1H2AD, CYR61, JUN, GTF2H5, HIST1H2BJ, ERCC3, QSOX1, HOXC4, PAX6, IL6, GOLM1, GTF2H4, MXRA8, AFP</b> |
| 9  | 11    | 11 | 55 | 11 | 0 | <b>GPR68, F2R, F2RL2, PTGFR, P2RY6, F2RL1, PLCB4, MLN, GNRHR, NMB, GRP</b>  |
| 10 | 10    | 10 | 45 | 2  | 8 | <b>EXOSC2, EXOSC1, EXOSC8, EXOSC4, EXOSC6, EXOSC10, EXOSC9, EXOSC3, EXOSC7, EXOSC5</b>                                |
| 11 | 10    | 10 | 45 | 10 | 0 | <b>GPR45, GPR176, ADORA2B, PTH2R, CALCR, CGA, RAMP1, ADM, PTGER2, MC4R</b>  |
| 12 | 7.429 | 8  | 26 | 6  | 2 | <b>FADD, IKBKG, IKBKB, LY96, RIPK1, FAS, FASLG, CASP8</b>   |
| 13 | 7     | 7  | 21 | 1  | 6 | <b>MT-CYB, UQCR10, UQCRC1, UQCRFS1, UQCRC2, UQCRB, UQCRQ</b>  |
| 14 | 6.857 | 8  | 24 | 8  | 0 | <b>FCAR, CEACAM1, CD59, CD36, CYSTM1, PLAU, ITGAX, DEGS1</b>  |
| 15 | 6.727 | 12 | 37 | 12 | 0 | <b>LCN2, LRG1, CFP, FUCA1, PLAC8, GGH, QPCT, CAMP, HEXB, PRTN3, GNS, GLA</b>  |
| 16 | 6.667 | 7  | 20 | 7  | 0 | <b>HSPA1A, HSPA12A, HSPA1B, BAG2, HSPA4L, HSPA2, BAG3</b>   |
| 17 | 6.571 | 15 | 46 | 15 | 0 | <b>HGS, EGFR, CD4, CD3D, A2M, IGF1, PDGFB, SERPINE1, CTNNA1, CLTB, SERPING1, SRGN, IGF2, SLC2A8, BIN1</b>             |
| 18 | 6     | 6  | 15 | 6  | 0 | <b>VCAN, SERPINC1, SPARCL1, SCG3, TNC, SDC2</b>   |
| 19 | 6     | 6  | 15 | 6  | 0 | <b>TMC6, SCAMP1, SLC2A3, SLC2A5, SLCO4C1, STK10</b>   |
| 20 | 6     | 6  | 15 | 6  | 0 | <b>KRT18, KRT19, KRT15, KRT1, KRT37, KRT33A</b>   |
| 21 | 5.667 | 13 | 34 | 12 | 1 | <b>GNA13, CDH6, CDH24, CDH1, ITGB7, CDH7, CDH10, CTLA4, CTNNA1, ITGA2, ITGB8, ITGA11, ITGA1</b>                       |
| 22 | 5.667 | 7  | 17 | 7  | 0 | <b>TUBB, TUBA1A, SCLT1, TUBGCP3, TUBGCP6, SDCCAG8, RPGRIP1L</b>   |
| 23 | 5     | 5  | 10 | 5  | 0 | <b>MAD2L1, BUB1B, BUB3, PSMC4, PSME1</b>  |
| 24 | 5     | 5  | 10 | 5  | 0 | <b>MRPL18, MRPS11, MRPS6, MRPL27, MRPL49</b>  |
| 25 | 5     | 5  | 10 | 5  | 0 | <b>RAB38, RAB3B, RAB15, RAB31, RABGGTA</b>  |
| 26 | 4     | 4  | 6  | 2  | 2 | <b>TRRAP, SUPT3H, KAT2A, SUPT7L</b>   |
| 27 | 4     | 4  | 6  | 3  | 1 | <b>UBE2I, SMC1B, SUN1, SYNE2</b>  |
| 28 | 4     | 4  | 6  | 1  | 3 | <b>AKT3, AKT2, AKT1, GSK3B</b>  |
| 29 | 4     | 13 | 24 | 13 | 0 | <b>CYP3A7, CYP3A5, HBEGF, CYP2J2, ALOX15B, CYP2U1, HRAS, CYP2E1, PTGS2, CYP3A4, EREG, AOX1, HSP90AA1</b>              |
| 30 | 4     | 4  | 6  | 3  | 1 | <b>SMARCE1, SMARCA2, SMARCB1, SMARCC1</b>   |
| 31 | 4     | 4  | 6  | 4  | 0 | <b>CCND3, CDKN1C, CDKN1A, CDKN2B</b>  |
| 32 | 4     | 4  | 6  | 4  | 0 | <b>HLA-DOA, KIF5A, KIF3B, KIF3C</b>   |
| 33 | 4     | 4  | 6  | 4  | 0 | <b>MGST1, ARL8A, CEACAM6, GLIPR1</b>  |
| 34 | 4     | 4  | 6  | 4  | 0 | <b>SLIT2, SRGAP2, ROBO1, SRGAP1</b>   |
| 35 | 4     | 4  | 6  | 4  | 0 | <b>HMGCL, NOS2, DAO, AMACR</b>  |
| 36 | 4     | 4  | 6  | 4  | 0 | <b>CNTN5, LYPD6B, LY6D, OTOA</b>  |
| 37 | 3.333 | 4  | 5  | 4  | 0 | <b>GBP7, GBP3, ICAM1, IFI30</b>   |
| 38 | 3.333 | 4  | 5  | 4  | 0 | <b>CDK4, PSMC3IP, RAD51C, DMC1</b>  |

|    |       |   |   |   |   |                                 |
|----|-------|---|---|---|---|---------------------------------|
| 39 | 3.333 | 4 | 5 | 4 | 0 | STMN1, TUBA8, TBCD, TUBB1       |
| 40 | 3.333 | 4 | 5 | 3 | 1 | VPS53, CCDC132, VPS51, VTI1A    |
| 41 | 3.333 | 4 | 5 | 4 | 0 | DSC3, CSTA, DSP, PERP           |
| 42 | 3.333 | 4 | 5 | 4 | 0 | BAMBI, GREM1, NOG, RGMB         |
| 43 | 3.333 | 4 | 5 | 4 | 0 | AK1, NTPCR, NME1, RRM2B         |
| 44 | 3     | 3 | 3 | 3 | 0 | TFDP1, TNRC6B, TNRC6C           |
| 45 | 3     | 3 | 3 | 3 | 0 | CYP1A2, CYP2S1, EPHX1           |
| 46 | 3     | 3 | 3 | 3 | 0 | HIST1H3G, HIST1H2AE, HIST1H3F   |
| 47 | 3     | 3 | 3 | 3 | 0 | NFE2L2, HMOX1, FXVD2            |
| 48 | 3     | 5 | 6 | 5 | 0 | INPP5D, GDNF, SHC1, IL4R, GFRA4 |
| 49 | 3     | 3 | 3 | 3 | 0 | CBR3, CBR1, CYP2D6              |
| 50 | 3     | 3 | 3 | 1 | 2 | APH1A, APH1B, PSENEN            |
| 51 | 3     | 3 | 3 | 3 | 0 | KLRC1, KLRD1, KLRC2             |
| 52 | 3     | 3 | 3 | 3 | 0 | CDK5RAP2, PRKAR2B, OPTN         |
| 53 | 3     | 3 | 3 | 3 | 0 | DMD, ARHGEF7, LAMA3             |
| 54 | 3     | 3 | 3 | 3 | 0 | CYP2B6, CYP1B1, CYP1A1          |
| 55 | 3     | 3 | 3 | 3 | 0 | PTS, AKR1B10, AKR1B1            |
| 56 | 3     | 3 | 3 | 3 | 0 | BAX, BCL2L11, MCL1              |
| 57 | 3     | 3 | 3 | 3 | 0 | TCF12, TCF4, TCF3               |
| 58 | 3     | 3 | 3 | 3 | 0 | SEC16B, TRAPPC9, SEC24D         |
| 59 | 3     | 3 | 3 | 3 | 0 | TPD52, TBC1D8B, SH3D19          |
| 60 | 3     | 3 | 3 | 3 | 0 | NFYA, GGPS1, NFYB               |
| 61 | 3     | 3 | 3 | 3 | 0 | MBL2, C4B, FCN2                 |
| 62 | 3     | 3 | 3 | 3 | 0 | PDE6C, CNGA3, PDE6H             |
| 63 | 3     | 3 | 3 | 3 | 0 | CLDN4, CLDN5, CLDN23            |
| 64 | 3     | 3 | 3 | 3 | 0 | CDC37L1, RARRES2, FAM3C         |
| 65 | 3     | 3 | 3 | 3 | 0 | TPH1, IL4I1, IDO1               |

**Pictorial Representation of clusters generated by MCODE for Bap**



