**Extended Data Figure 1-1**. The data presented in table below supports Figure 1.

Bioinformatic analysis of miR-137 target genes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Term** | **P-value** | **Adjusted P-value** | **Z-score** | **Combined Score** | **Genes** |
| positive regulation of transcription from RNA polymerase II promoter | 2.08E-09 | 1.82E-06 | -7.74352 | 154.7926 | **KDM1A**, MAML1, MYT1L, RORA, ARID4B, IKZF1, AHR, RBPJ, IKZF4, GRIP1, MEF2A, ACVR1, ZBTB38, SOX11, MITF, PIAS2, RUNX2, RFX7, TBL1XR1, PHIP, ERG, ZFPM2, BLZF1, NOTCH1, KMT2A, TWIST1, GLIS2, NEUROD1, NEUROD2, PRDM16, PPARGC1A, RREB1, PPARGC1B, ESRRA, EGR2, JAG1, BCL11B, SMARCA5, NFATC2, ESRRG, FOXN3, GDF6, BMP7, FLI1, TADA2B, MRGBP, SP1, AGO1, SP4, AGO2, JMY, TCF4, SP9, BRWD3, ZNF496, ARF4, KDM5B, CALCOCO1, PHF20, CHD1, ING5, MED14, ING2, TEAD1, NCK1, NCOA1, SS18, NCOA2, KLF12, NCOA3, TCF12, PROX1, KLF15, TOX3, KAT2B, SFPQ, MTF1, KIT, TET3, ZNF516, PLCB1, VGLL2, CREB5, NFIX, HLF, PLAG1, RNF4, CAMKK2, ERBB4, ATOH8, DAB2IP, WNT7A, ZNF76, KLF4, USF2, TBX3, KLF2, SKI, KLF7, TEF, NFIA, NFIB, ASXL2, NAA15, PAXBP1, SSBP2, SSBP3 |
| negative regulation of transcription from RNA polymerase II promoter | 1.36E-09 | 1.58E-06 | -7.21284 | 147.2598 | KDM5B, **KDM1A**, MYT1L, WWC1, OTUD7B, ARID4B, IKZF1, PRDM1, AHR, RBPJ, CHD1, BACH1, IKZF4, IKZF5, MECP2, MED14, NIPBL, TRPS1, MEF2A, PIAS4, KLF11, KLF12, ZBTB38, TCF12, NRG1, SOX11, MITF, PROX1, HIC1, RUNX2, FOXP1, SFPQ, RFX7, TBL1XR1, MTF1, KIT, ERG, ZMYND11, PLCB1, ZFPM2, BLZF1, NFIX, NOTCH1, CTBP1, TWIST1, PRICKLE1, ZBTB4, GLIS2, MTDH, SCRT2, NEUROD2, HMBOX1, ATXN1, BTAF1, NACC2, ATOH8, PRDM16, BEND3, ZNF148, FNIP1, ZBTB7A, E2F6, MTA3, RREB1, FNIP2, ZBTB18, KDM4A, DR1, SMURF2, MBD2, DAB2IP, SMARCA5, ZNF76, WWP2, FOXN3, KLF4, BMP7, FLI1, TBX3, SKI, TADA2B, KLF7, MRGBP, TEF, NFIA, SP4, COPS2, JMY, ZNF217, BCOR, MXD1, SP9, TRIM33, BRWD3, EZH2 |
| phosphorylation of RNA polymerase II C-terminal domain | 3.14E-10 | 1.13E-06 | -5.84228 | 127.8334 | KDM5B, GSK3B, **KDM1A,** MAML1, MYT1L, TESK2, ARID4B, AHR, CHD1, MED14, STK11, ACVR1, MAP4K2, KLF12, CSNK2A1, TCF12, LMTK2, OXSR1, PRKAB1, RUNX2, BCR, LATS2, RFX7, MTF1, MAPKAPK2, KIT, BMP2K, FAM20C, TSSK6, ALPK3, SIK1, TNIK, ERG, SIK2, BLZF1, PRKAA1, BRSK2, CTBP1, CAMKK2, NEUROD2, MAPK8, STK38, STK38L, FNIP2, PAK2, MARK1, SRPK2, MAP3K1, CSNK1A1, PLK2, SMARCA5, ZNF76, CDC42BPA, FLI1, TBX3, TADA2B, MAPK10, ICK, KLF7, SNRK, CDK6, MRGBP, TEF, SP4, JMY, PKN2, SP9, BRWD3 |
| positive regulation of transcription from RNA polymerase II promoter involved in neuron differentiation | 8.95E-08 | 2.41E-05 | -6.66112 | 108.1011 | ARF4, WNT2B, **KDM1A**, MAML1, PHF20, MYT1L, RORA, IKZF1, AHR, RBPJ, IKZF4, MED14, NCK1, MEF2A, ACVR1, NCOA1, SS18, NCOA2, ZBTB38, NCOA3, TCF12, SOX11, MITF, PROX1, KLF15, RUNX2, KAT2B, SFPQ, TBL1XR1, MTF1, IL1RAPL1, TET3, PHIP, ERG, ZFPM2, VGLL2, BRSK2, NFIX, NOTCH1, HLF, KMT2A, PLAG1, TWIST1, RNF4, GLIS2, NEUROD1, PPARGC1A, RREB1, PPARGC1B, ESRRA, EGR2, JAG1, BCL11B, DAB2IP, WNT7A, DCLK2, FZD8, ATP2B2, KLF4, USF2, KLF2, SKI, PTPRD, KLF7, NFIA, SP1, NFIB, AGO1, AGO2, ASXL2, TCF4, PAXBP1, SSBP2, SSBP3 |
| protein phosphorylation | 4.84E-10 | 1.13E-06 | -4.87693 | 104.6033 | CHRM3, GSK3B, MAML1, TESK2, NAGPA, STK11, SERP1, PPP4R2, AKT2, ACVR1, CSNK1G3, MAP4K2, EPHA7, CSNK2A1, LMTK2, OXSR1, PRKAB1, BCR, LATS2, PIK3CA, MAPKAPK2, BMP2K, FAM20C, TSSK6, ALPK3, SIK1, TNIK, ERG, TOP1, SIK2, PRKAA1, BRSK2, CTBP1, CAMKK2, MAPK8, STK38, STK38L, FNIP2, PAK2, MARK1, SRPK2, SLC35A1, MAP3K1, CSNK1A1, PLK2, WWP2, CDC42BPA, MAPK10, ICK, SNRK, CDK6, PKN2 |
| protein autophosphorylation | 7.38E-10 | 1.29E-06 | -4.80401 | 101.015 | GSK3B, PRKAA1, BRSK2, MAML1, CTBP1, SRC, TESK2, CAMKK2, STK11, MAPK8, ERBB4, STK38, STK38L, PAK2, FNIP2, MARK1, ACVR1, SRPK2, EPHA4, MAP4K2, PDGFRA, MAP3K1, CSNK2A1, EPHA8, CSNK1A1, PLK2, LMTK2, OXSR1, CDC42BPA, PRKAB1, MAPK10, BCR, ICK, SNRK, LATS2, CDK6, KIT, MAPKAPK2, BMP2K, ULK2, FAM20C, TSSK6, ALPK3, SIK1, PKN2, SIK2, TNIK, ERG |
| peptidyl-tyrosine phosphorylation | 3.42E-10 | 1.13E-06 | -4.5271 | 98.672 | GSK3B, PRKAA1, BRSK2, MAML1, CTBP1, SRC, TESK2, CAMKK2, STK11, MAPK8, ERBB4, STK38, STK38L, PAK2, FNIP2, MARK1, ACVR1, SRPK2, EPHA4, MAP4K2, PDGFRA, MAP3K1, CSNK2A1, CSNK1A1, PLK2, LMTK2, OXSR1, CDC42BPA, PRKAB1, MAPK10, BCR, ICK, SNRK, LATS2, CDK6, KIT, MAPKAPK2, BMP2K, FAM20C, TSSK6, ALPK3, SIK1, PKN2, SIK2, TNIK, ERG |
| peptidyl-serine phosphorylation | 1.27E-09 | 1.58E-06 | -4.5745 | 93.68908 | GSK3B, PRKAA1, BRSK2, MAML1, CTBP1, TESK2, CAMKK2, STK11, MAPK8, AKT2, STK38, STK38L, RICTOR, PAK2, FNIP2, MARK1, ACVR1, SRPK2, MAP4K2, CSNK1G3, MAP3K1, CSNK2A1, CSNK1A1, PLK2, DCLK2, LMTK2, OXSR1, CDC42BPA, PRKAB1, MAPK10, BCR, ICK, SNRK, LATS2, CDK6, SBK1, MAPKAPK2, BMP2K, FAM20C, TSSK6, ALPK3, SIK1, PKN2, SIK2, TNIK, ERG, TOP1 |
| JUN phosphorylation | 3.72E-09 | 2.45E-06 | -4.42182 | 85.82599 | GSK3B, PRKAA1, BRSK2, MAML1, CTBP1, TESK2, CRKL, CAMKK2, STK11, MAPK8, DUSP10, STK38, STK38L, PAK2, FNIP2, MARK1, ACVR1, SRPK2, MAP4K2, MAP2K4, MAP3K1, CSNK2A1, CSNK1A1, PLK2, LMTK2, OXSR1, CDC42BPA, PRKAB1, MAPK10, BCR, ICK, SNRK, LATS2, CDK6, MAPKAPK2, BMP2K, FAM20C, TSSK6, ALPK3, SIK1, PKN2, SIK2, TNIK, ERG |
| positive regulation of transcription from RNA polymerase II promoter in response to acidic pH | 1.64E-06 | 0.000127 | -6.319 | 84.17358 | ARF4, **KDM1A**, MAML1, PHF20, RORA, AHR, IKZF1, RBPJ, IKZF4, MED14, CHORDC1, NCK1, MEF2A, ACVR1, NCOA1, SS18, NCOA2, ZBTB38, NCOA3, TCF12, SOX11, MITF, PROX1, KLF15, KAT2B, SFPQ, TBL1XR1, MTF1, TET3, PHIP, ERG, ZFPM2, VGLL2, NFIX, NOTCH1, HLF, KMT2A, PLAG1, TWIST1, RNF4, GLIS2, NEUROD1, PPARGC1A, RREB1, PPARGC1B, ESRRA, EGR2, JAG1, BCL11B, DAB2IP, WNT7A, KLF4, USF2, KLF2, RAB11B, SKI, KLF7, NFIA, NFIB, SP1, AGO1, AGO2, ASXL2, TCF4, PAXBP1, SSBP2, SSBP3 |