

## **Supplemental Material to:**

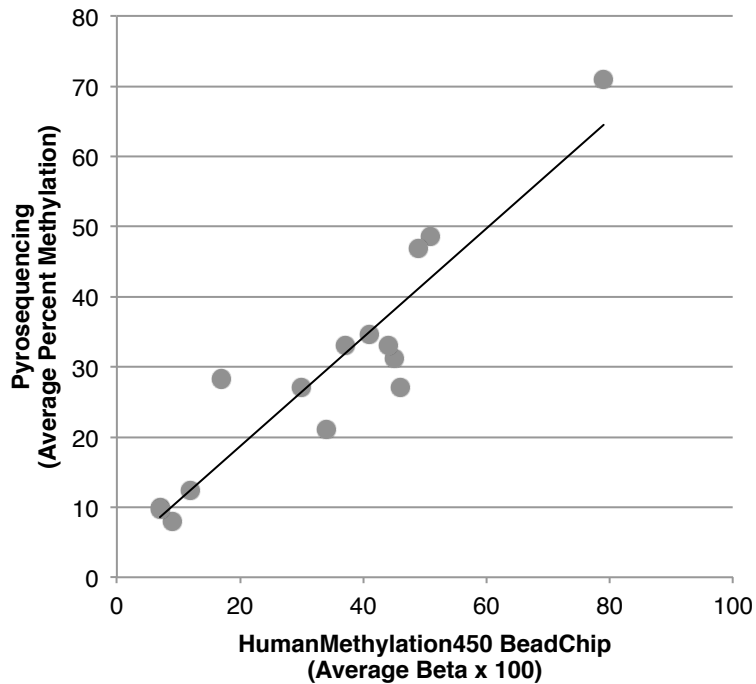
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**High-density array analysis of DNA methylation in  
tamoxifen-resistant breast cancer cell lines**

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article/27111/](http://www.landesbioscience.com/journals/epigenetics/article/27111/)**



**Supplementary Figure 1. Comparison of HM450 BeadChip and Pyrosequencing data shows correlation between analysis methods.**

CpG site methylation data from Table 4 were plotted to determine the correlation coefficient of the HM450 BeadChip (x-axis) and pyrosequencing (y-axis) data. All four ZNF350 and the single MAGED1 CpG sites are included on the graph. A single replicate was used for HM450 BeadChip data and the average of three replicates was used for pyrosequencing data. HM450 BeadChip beta value times 100 was calculated to compare with pyrosequencing percent. Pearson  $r = 0.931$ ,  $p\text{-value} = <0.0001$ .

**Supplementary Table 1. Hyper- and Hypomethylated Pathways shared by TMX2-11 and TMX2-28 Hypermethylated\***

<i>Pathway</i>	<i>Genes</i>	<i>p value</i>
sensory perception of smell	OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, OR4S2, OR52L1, OR8K3, OR5R1, OR5M1, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR5M8, CNGA2, OR1S1, OR5H14, OR8J1, OR52K1, OR5H15, OR8J3, OR13F1, OR2D3, OR2L8, OR2B3, OR8U8, OR2L13, OR1G1, OR6A2, OR2T33, OR5AS1, OR10C1, OR10W1, OR5P3, OR2AG1, OR7G1, OR5P2, OR5M10, OR52E4, OR6C75, OR5AC2, OR2M4, OR2M5, OR12D2, OR52M1, OR12D3, OR4A15, OR11H6, OR4A16, OR10A6, OR52A1, OR5H2, OR4K17, OR11A1, OR51Q1, OR9A4, OR5W2, OR13A1, OR14J1, OR5AN1, OR5I1, OR52B2, OR52B4, OR2W1, OR2H1, GRM8, OR5V1, GRM7, OR6Q1, OR5D14, OR5D16, OR8H3, OR5D18, OR1L3, OR5A1, OR5A2, OR9Q1, OR9Q2, OR13C3, OR9I1, OR10G9, OR5E1P, OR5B12, OR5AP2, OR13C8, OR5B17, OR9G9, OR1B1, OR5K4, OR9G1, OR9G4, OR5B2, OR5T2, OR5B3, OR5T1, OR4X1, OR13D1, OR10Q1, OR8H2	2.13E-34
cell surface receptor linked signal transduction	ADCY5, GPR123, LPHN2, HTR1B, S1PR1, GRIN2B, OR52L1, OR4S2, GAB1, ROS1, ADAM9, OR5R1, ATRNL1, OR1S2, OR4D6, OR1S1, VEGFC, GRB10, PPBP, OR52K1, F2, HTR6, OR13F1, ROR1, ROR2, ADAMTS1, OR2D3, OR2B3, GNAI1, OR8U8, AKAP12, EPHB1, GPR141, SORCS3, OR1G1, ITGBL1, HCRTR1, OR6A2, BAI3, FCER1A, GUCY2F, BMP2, OR5P3, OR2AG1, TCF7, OR7G1, OR5P2, SMAD5, MAML2, TAX1BP3, KCNK2, BTLA, OR12D2, OR52M1, OR12D3, SFRP2, NOTCH4, PTENP1, FGF5, OR10A6, OR52A1, FGF9, OR11A1, OR51Q1, SIRPB1, EDNRB, OR9A4, OR5W2, OR13A1, NMUR2, SPG21, OR5AN1, OR52B2, OR52B4, OR2W1, GRM3, CCND1, GRM2, DACT1, CHRDL1, GRM8, OR2H1, GRM7, OR5V1, WNT9B, NPPB, IL12B, RAPGEFL1, CXCL5, APC2, OR5D14, GPR63, OR5D16, CXCL2, FPR1, OR5D18, FPR2, OR5A1, OR5A2, OR9Q1, OR9Q2, OR13C3, DGKB, PTK2B, OR5E1P, OR5AP2, OR5B12, NPFFR2, OR13C8, OR5B17, OR1B1, DGKK, DGKI, GRIA4, PTGFR, OR5T2, OR5B2, OR5B3, OR5T1, OR13D1, MC4R, OR10Q1, IFT52, BAMBI, WNT7A, HTR2A, BMP10, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, MARCO, OR8K1, WNT2, TIAM1, OR8K3, INSR, IRS2, OR5M1, BAIAP2, OR5M3, FGF22, DLL1, SOCS5, OR4M1, OR5M9, FGF20, OR10AG1, OR5M8, NCAM1, GABRR3, OR5H14, OR8J1, OR8J3, OR5H15, GPR50, AKAP4, C3AR1, OR2L8, PKHD1, OR2L13, ITGB6, OR2T33, OR5AS1, OR10C1, ENTPD1, DEFB1, OR10W1, GABRE, OR5M10, GABRA4, GABRA3, GABRA6, OR52E4,	4.28E-33

OR6C75, OR2M4, OR5AC2, OR2M5, OR4A15, OR11H6, OR4A16, CD274, ADRA1B, ADRA1A, MERTK, OR5H2, LEPR, PREX2, OR4K17, TAAR8, TAAR9, IAPP, RSPO3, HEY2, RSPO2, OR14J1, NRG1, GABRG1, OR5I1, GABRG3, CCDC88C, ARID5B, FSHR, ADRB2, CHRM2, OR6Q1, GAP43, GPRC5C, OR8H3, APH1B, GPR6, TAC1, OXTR, OR1L3, PF4, GPRC5B, MSX2, APLNR, HRH1, OR10G9, OR9I1, PTN, APC, OR9G9, PTPRD, FLT1, GNAO1, OR5K4, OR9G1, OR9G4, RGS13, OR4X1, OR8H2, BMPR1B, ADAMDEC1

neurological system process

RP1, SYT5, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, WNT2, OR8K1, CTTNBP2, HTR1B, BDNF, S1PR1, OR4S2, GRIN2B, OR52L1, OR8K3, CHRNA7, OR5R1, KCND2, OR5M1, TRPA1, SIX3, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR1S1, CNGA2, CTNNA2, OR5M8, GABRR3, LRAT, CAMK4, OR5H14, OR52K1, OR8J1, OR8J3, OR5H15, HTR6, OR13F1, OR2D3, OR2L8, OR2B3, OR8U8, ASZ1, RIMS1, OR2L13, OR1G1, KCNMB2, HCRT1, CRB1, OR6A2, OR5AS1, OR2T33, OR10C1, OR10W1, GUCY2F, OR2AG1, OR5P3, OR5P2, OR7G1, OR5M10, GABRA3, GABRA6, OR52E4, OR6C75, NR4A3, OR2M4, OR5AC2, OR2M5, FOXP2, OR12D2, OR12D3, OR52M1, OR4A15, OR11H6, OR4A16, ADRA1B, CHRND, CACNA1E, RIT2, MERTK, CACNA1C, PTENP1, OR10A6, OR52A1, OR5H2, OR4K17, OR11A1, OR51Q1, MBP, SLC1A4, KCNQ5, OR9A4, WDR36, OR5W2, IAPP, SLC24A2, OR13A1, NMUR2, CNTNAP2, OR14J1, IMPDH1, KCNQ1, USH2A, OR5AN1, GABRG1, OR52B2, OR5I1, GABRG3, OR52B4, RAX, NRXN3, NRXN1, OR2W1, GRM3, EYA1, GRM2, GRM8, OR2H1, SBF2, GRM7, OR5V1, PLLP, IL12B, OR6Q1, OAT, ABLIM1, OR5D14, OR8H3, OR5D16, TAC1, OR5D18, OXTR, OR1L3, COL2A1, OR5A1, OR5A2, OR9Q1, ESPN, OR9Q2, OR13C3, HRH1, OR10G9, OR9I1, OR5E1P, OR5AP2, OR5B12, PTN, SCNN1A, NEFL, OR13C8, SCNN1D, OR5B17, OR1B1, OR9G9, OR5K4, DLGAP2, OR9G1, TBX1, AFF2, OR9G4, GRIA4, OR5T2, OR5B2, OR5B3, OR5T1, OR4X1, GRIA2, GRIA1, OR13D1, OR10Q1, OR8H2, PBX3, APBB1, WNT7A, HTR2A

1.34E-32

sensory perception of  
chemical stimulus

OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, OR4S2, OR52L1, OR8K3, OR5R1, OR5M1, TRPA1, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR5M8, CNGA2, OR1S1, OR5H14, OR8J1, OR52K1, OR5H15, OR8J3, OR13F1, OR2D3, OR2L8, OR2B3, OR8U8, OR2L13, OR1G1, OR6A2, OR2T33, OR5AS1, OR10C1, OR10W1, OR5P3, OR2AG1, OR7G1, OR5P2, OR5M10, OR52E4, OR6C75, OR5AC2, OR2M4, OR2M5, OR12D2, OR52M1, OR12D3, OR4A15, OR11H6, OR4A16, OR10A6, OR52A1,

1.72E-32

OR5H2, OR4K17, OR11A1, OR51Q1, OR9A4, OR5W2, OR13A1, OR14J1, OR5AN1, OR5I1, OR52B2, OR52B4, OR2W1, OR2H1, GRM8, OR5V1, GRM7, OR6Q1, OR5D14, OR5D16, OR8H3, OR5D18, OR1L3, OR5A1, OR5A2, OR9Q1, OR9Q2, OR13C3, OR9I1, OR10G9, OR5E1P, OR5AP2, OR5B12, OR13C8, SCNN1A, SCNN1D, OR5B17, OR9G9, OR1B1, OR5K4, OR9G1, OR9G4, OR5B2, OR5T2, OR5B3, OR5T1, OR4X1, OR13D1, OR10Q1, OR8H2

G-protein coupled receptor protein signaling pathway

ADCY5, GPR123, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, LPHN2, HTR1B, S1PR1, OR4S2, OR52L1, OR8K3, INSR, OR5R1, ATRNL1, OR5M1, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR1S1, OR5M8, GABRR3, PPBP, OR5H14, OR52K1, OR8J1, OR8J3, OR5H15, HTR6, OR13F1, GPR50, OR2D3, OR2L8, C3AR1, OR2B3, GNAI1, OR8U8, PKHD1, AKAP12, OR2L13, GPR141, OR1G1, SORCS3, HCRTR1, OR6A2, OR5AS1, OR2T33, BAI3, OR10C1, ENTPD1, DEFB1, OR10W1, GABRE, OR2AG1, OR5P3, OR5P2, OR7G1, GABRA4, OR5M10, GABRA3, GABRA6, OR52E4, OR6C75, KCNK2, OR2M4, OR5AC2, OR2M5, OR12D2, OR12D3, OR52M1, OR11H6, OR4A15, OR4A16, ADRA1B, ADRA1A, OR10A6, OR52A1, OR5H2, PREX2, OR4K17, OR11A1, OR51Q1, TAAR8, TAAR9, EDNRB, OR9A4, OR5W2, IAPP, OR13A1, NMUR2, OR14J1, OR5AN1, GABRG1, OR52B2, OR5I1, GABRG3, OR52B4, FSHR, OR2W1, GRM3, ADRB2, GRM2, GRM8, CHRM2, OR2H1, GRM7, OR5V1, OR6Q1, RAPGEFL1, GAP43, GPRC5C, CXCL5, OR5D14, GPR63, OR8H3, OR5D16, CXCL2, FPR1, GPR6, TAC1, OR5D18, OXTR, PF4, OR1L3, FPR2, GPRC5B, OR5A1, OR5A2, OR9Q1, OR9Q2, APLNR, OR13C3, HRH1, DGKB, OR10G9, OR9I1, OR5E1P, OR5AP2, NPFFR2, OR5B12, OR13C8, OR5B17, OR1B1, OR9G9, GNAO1, OR5K4, DGKK, OR9G1, OR9G4, DGKI, PTGFR, OR5T2, OR5B2, RGS13, OR5B3, OR5T1, OR4X1, OR13D1, MC4R, OR10Q1, OR8H2, HTR2A

5.72E-30

cognition

RP1, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, BDNF, OR4S2, GRIN2B, OR52L1, OR8K3, CHRNA7, OR5R1, OR5M1, TRPA1, SIX3, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR1S1, CNGA2, OR5M8, LRAT, OR5H14, OR52K1, OR8J1, OR8J3, OR5H15, OR13F1, OR2D3, OR2L8, OR2B3, OR8U8, RIMS1, OR2L13, OR1G1, CRB1, OR6A2, OR2T33, OR5AS1, OR10C1, OR10W1, GUCY2F, OR5P3, OR2AG1, OR5P2, OR7G1, OR5M10, OR52E4, OR6C75, OR5AC2, OR2M4, OR2M5, FOXP2, OR12D2, OR52M1, OR12D3, OR11H6, OR4A15, OR4A16, ADRA1B, MERTK,

2.95E-27

CACNA1C, PTENP1, OR10A6, OR52A1, OR5H2, OR4K17, OR11A1, OR51Q1, SLC1A4, OR9A4, WDR36, OR5W2, IAPP, SLC24A2, OR13A1, OR14J1, IMPDH1, KCNQ1, USH2A, OR5AN1, OR52B2, OR5I1, OR52B4, RAX, OR2W1, EYA1, GRM8, OR2H1, OR5V1, GRM7, IL12B, OR6Q1, OAT, ABLIM1, OR5D14, OR8H3, OR5D16, OXTR, TAC1, OR5D18, OR1L3, COL2A1, OR5A1, OR5A2, OR9Q1, ESPN, OR9Q2, OR13C3, OR10G9, OR9I1, OR5E1P, OR5AP2, OR5B12, PTN, OR13C8, SCNN1A, SCNN1D, OR5B17, OR1B1, OR9G9, OR5K4, OR9G1, AFF2, TBX1, OR9G4, OR5T2, OR5B2, OR5B3, OR5T1, OR4X1, GRIA1, OR13D1, OR10Q1, OR8H2, APBB1, HTR2A

sensory perception

RP1, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, OR4S2, GRIN2B, OR52L1, OR8K3, OR5R1, OR5M1, TRPA1, SIX3, OR5M3, OR4M1, OR5M9, OR10AG1, OR4D6, OR1S2, OR1S1, CNGA2, OR5M8, LRAT, OR5H14, OR52K1, OR8J1, OR8J3, OR5H15, OR13F1, OR2D3, OR2L8, OR2B3, OR8U8, RIMS1, OR2L13, OR1G1, CRB1, OR6A2, OR2T33, OR5AS1, OR10C1, OR10W1, GUCY2F, OR5P3, OR2AG1, OR5P2, OR7G1, OR5M10, OR52E4, OR6C75, OR5AC2, OR2M4, OR2M5, OR12D2, OR52M1, OR12D3, OR11H6, OR4A15, OR4A16, MERTK, OR10A6, OR52A1, OR5H2, OR4K17, OR11A1, OR51Q1, OR9A4, WDR36, OR5W2, IAPP, SLC24A2, OR13A1, OR14J1, IMPDH1, KCNQ1, USH2A, OR5AN1, OR52B2, OR5I1, OR52B4, RAX, OR2W1, EYA1, GRM8, OR2H1, OR5V1, GRM7, IL12B, OR6Q1, OAT, ABLIM1, OR5D14, OR8H3, OR5D16, OR5D18, TAC1, COL2A1, OR1L3, OR5A1, OR5A2, OR9Q1, ESPN, OR9Q2, OR13C3, OR9I1, OR10G9, OR5E1P, OR5AP2, OR5B12, OR13C8, SCNN1A, SCNN1D, OR5B17, OR9G9, OR1B1, OR5K4, OR9G1, TBX1, OR9G4, OR5T2, OR5B2, OR5B3, OR5T1, OR4X1, OR13D1, OR10Q1, OR8H2, HTR2A

6.98E-26

ion transport

SLC9A9, SLC9A6, SCN3A, GABRB1, SLC26A2, KCNIP4, WNT2, MARCO, KCNQ5, CTTNBP2, ATP2B4, GRIN2B, SLC24A3, SLC24A2, NMUR2, SLC01C1, ANO2, ANO5, CHRNA7, ANO4, MCOLN2, KCNQ1, OCA2, GABRG1, GABRG3, SVOP, KCND2, ATP4B, TRPA1, CACNG3, CNGA2, GABRR3, ATP2C2, ATP2C1, RYR3, F2, CLIC6, RYR2, KCNH8, SCN11A, PLLP, KCNH5, SLC38A4, SLC39A12, KCNA4, ASZ1, KCNMB2, KCNS3, KCNS2, SLC01A2, CYP27B1, SCN9A, SCNN1A, SCNN1D, GABRQ, GABRE, TRPC4, SLC8A1, SLC12A1, GABRA4, GABRA3, KCNB2, GABRA6, ATP11B, GRIA4, CACNA2D3, KCNK2, KCNJ4, SLC01B3, SLC17A3, GRIA2, KCNJ9, SLC17A4, GRIA1, SLC5A8, CACNA1H, SCN4B, CHRND, HEPH, CACNA1E, KCTD16, CACNA1C,

5.82E-08

## CLCN7

cell-cell signaling	FGF5, SYT5, FGF9, FGF14, ILDR2, GDNF, MBP, WNT2, SLC1A4, KCNQ5, CTTNBP2, HTR1B, BDNF, GRIN2B, IAPP, NMUR2, LTBR, GABRG1, GABRG3, KCND2, NRXN3, SIX3, NRXN1, FGF20, CTNNA2, GABRR3, GRM3, GRB10, GRM2, CAMK4, GRM8, GRM7, HTR6, WNT9B, GPR50, CXCL5, ASZ1, TAC1, OXTR, RIMS1, EPHB1, HCRTR1, IL17A, HRH1, CRB1, IFNA7, FCER1A, BMP2, TRHDE, GABRA3, DLGAP2, GABRA6, GRIA4, TNFSF9, GRIA2, GRIA1, SALL1, MC4R, ADRA1B, ADRA1A, CACNA1E, RIT2, LRP2, MERTK, CACNA1C, WNT7A, HTR2A	4.29E-07
transmission of nerve impulse	SYT5, ASZ1, TAC1, OXTR, RIMS1, KCNMB2, MBP, WNT2, SLC1A4, CTTNBP2, KCNQ5, HCRTR1, HRH1, HTR1B, S1PR1, GRIN2B, NMUR2, CNTNAP2, GABRG1, GABRG3, KCND2, DLGAP2, NRXN3, GABRA3, GABRA6, GRIA4, NRXN1, CTNNA2, GABRR3, GRM3, GRM2, CAMK4, GRIA2, GRIA1, SBF2, GRM8, GRM7, HTR6, PLLP, CACNA1E, RIT2, CACNA1C, WNT7A, HTR2A	2.94E-06
synaptic transmission	SYT5, ASZ1, TAC1, OXTR, RIMS1, MBP, WNT2, SLC1A4, CTTNBP2, KCNQ5, HCRTR1, HTR1B, HRH1, GRIN2B, GABRG1, GABRG3, KCND2, NRXN3, GABRA3, DLGAP2, GABRA6, GRIA4, NRXN1, CTNNA2, GABRR3, GRM3, GRM2, CAMK4, GRIA2, GRM8, GRIA1, GRM7, HTR6, CACNA1E, RIT2, CACNA1C, WNT7A, HTR2A	1.13E-05
neuron differentiation	TUBB2B, HELT, RORA, PRKG1, GDNF, RTN1, EFHD1, BDNF, S1PR1, CNTNAP2, ROBO2, UNC5C, ROBO3, NRXN3, STMN2, BAIAP2, NRXN1, FGF20, CTNNA2, FARP2, SLITRK2, BTG4, RELN, CNTN4, GAP43, DCC, PKHD1, SOX5, BRSK1, EPHB1, ALDH1A2, CRB1, PTK2B, TNFR, GF11, OLFM3, DCX, NEFL, APC, GNAO1, BHLHE22, PTPRZ1, NTNG1, LMX1A, PBX3, BMPR1B, APBB1, WNT7A, PTENP1	1.83E-05
metal ion transport	SLC9A9, SLC9A6, SCN3A, KCNIP4, KCNQ5, ATP2B4, GRIN2B, SLC24A3, NMUR2, SLC24A2, CHRNA7, KCNQ1, KCND2, ATP4B, TRPA1, CACNG3, ATP2C2, ATP2C1, RYR3, F2, RYR2, SCN11A, KCNH8, KCNH5, SLC38A4, SLC39A12, KCNA4, KCNMB2, KCNS3, CYP27B1, KCNS2, SCN9A, SCNN1A, SCNN1D, SLC8A1, TRPC4, SLC12A1, KCNB2, CACNA2D3, KCNK2, KCNJ4, KCNJ9, SLC17A3, SLC17A4, SLC5A8, CACNA1H, SCN4B, CACNA1E, HEPH, KCTD16, CACNA1C	2.07E-05

behavior	HELT, LEPR, GDNF, BSX, EDNRB, HTR1B, BDNF, GRIN2B, NMUR2, SLC24A2, ROBO2, CHRNA7, ROBO3, GRM2, PPBP, GRM7, RELN, RASD2, CCL1, C3AR1, CXCL5, CXCL2, FPR1, ASTN1, TAC1, OXTR, PF4, FPR2, ESPN, PLCL1, HCRTR1, SCN9A, PTN, GF11, DEFB1, GNAO1, TBX1, AFF2, NR4A3, FOXP2, CXCL17, GRIA1, NLGN4X, ADRA1B, MC4R, CACNA1C, PBX3, APBB1, PTENP1, HTR2A	5.32E-05
cell motion	NEURL, ZEB2, PRKG1, GDNF, DSTN, WNT2, CTTNBP2, EDNRB, BDNF, DAB1, VNN1, ROBO2, ROBO3, UNC5C, NR2F2, NRXN3, ARID5B, NRXN1, CTNNA2, ELMO1, VEGFC, RELN, CNTN4, IL12B, GAP43, AKAP4, DCC, VIM, FPR1, ASTN1, ASZ1, PF4, CDH2, FPR2, EPHB1, PTK2B, TNR, CLASP2, DCX, APC, FN1, FLT1, TBX1, LMX1A, ETS1, BMPR1B, APBB1, SELE, PTENP1	1.41E-04
regulation of system process	KCNE1L, BMP10, LZTS1, TAC1, OXTR, CDH2, GDNF, KCNMB2, EDNRB, HTR1B, BDNF, GRIN2B, SLC24A2, NMUR2, LTB, KCNQ1, SLC8A1, GNAO1, FLT1, KCNB2, GRIA4, LAMA2, GRM3, ADRB2, GRIA2, CHRM2, GRM8, ADRA1B, CACNA1H, NPPB, RYR2, CNTN4, PBX3, CACNA1C, HTR2A	2.78E-04
cell adhesion	DLC1, COL21A1, MYBPC2, NELL1, SDC3, REG3A, ARHGAP6, DAB1, S1PR1, DGCR6, CNTNAP2, VNN1, ROBO2, ADAM9, CNTNAP5, NRXN3, SIGLEC12, NRXN1, BTBD9, CTNNA2, NCAM1, CD84, ARVCF, ATP2C1, LSAMP, ROR2, RELN, SGCE, CNTN4, CHL1, PARVA, DCHS2, CLDN17, PLXNC1, PKHD1, TNC, ASTN1, COL2A1, FPR2, CDH2, APLP1, ITGBL1, IGSF11, LAMB4, CDH7, COL6A6, FAT3, PTK2B, FAT4, TNR, HEPN1, ITGB6, DEFB118, COL8A1, ENTPD1, FN1, APC, TNXB, LAMA2, COL19A1, NLGN4X, COL29A1, BMPR1B, SELE	3.77E-04
biological adhesion	DLC1, COL21A1, MYBPC2, NELL1, SDC3, REG3A, ARHGAP6, DAB1, S1PR1, DGCR6, CNTNAP2, VNN1, ROBO2, ADAM9, CNTNAP5, NRXN3, SIGLEC12, NRXN1, BTBD9, CTNNA2, NCAM1, CD84, ARVCF, ATP2C1, LSAMP, ROR2, RELN, SGCE, CNTN4, CHL1, PARVA, DCHS2, CLDN17, PLXNC1, PKHD1, TNC, ASTN1, COL2A1, FPR2, CDH2, APLP1, ITGBL1, IGSF11, LAMB4, CDH7, COL6A6, FAT3, PTK2B, FAT4, TNR, HEPN1, ITGB6, DEFB118, COL8A1, ENTPD1, FN1, APC, TNXB, LAMA2, COL19A1, NLGN4X, COL29A1, BMPR1B, SELE	3.91E-04



neuron projection development	DCC, PKHD1, PRKG1, GDNF, EPHB1, EFHD1, BDNF, PTK2B, TNFR, ROBO2, UNC5C, ROBO3, DCX, NEFL, APC, GNAO1, NRXN3, PTPRZ1, BAIAP2, NTNG1, NRXN1, LMX1A, CTNNA2, SLITRK2, RELN, CNTN4, BMPR1B, APBB1, GAP43, PTENP1	4.75E-04
calcium ion transport	TRPC4, SLC8A1, TRPA1, CACNG3, CACNA2D3, ATP2C2, ATP2B4, CYP27B1, GRIN2B, SLC24A3, ATP2C1, RYR3, SLC24A2, NMUR2, F2, CACNA1H, RYR2, CHRNA7, CACNA1E, CACNA1C	5.98E-04

### Hypomethylated\*\*

<i>Pathway</i>	<i>Genes</i>	<i>p value</i>
fear response	BDNF, CCK, GRIK2	0.007256045
cell morphogenesis involved in differentiation	SEMA5A, BDNF, CCK, KAL1, C22ORF28, DCLK1	0.025362986
neuron development	SEMA5A, BDNF, CCK, KAL1, RORB, DCLK1, NTM	0.027953923
multicellular organismal response to stress	BDNF, CCK, GRIK2	0.028802466
neuron differentiation	SEMA5A, BDNF, CCK, KAL1, RORB, SMARCA1, DCLK1, NTM	0.029533905

\*Top 20 hypermethylated pathways \*\*Top 5 hypomethylated pathways

**Supplementary Table 2. Hypermethylated Pathways shared by TMX2-11 and TMX2-28 in the promoter**

<i>Pathway</i>	<i>Genes</i>	<i>p value</i>
sensory perception of smell	OR10A6, OR5H2, OR5L1, OR11A1, OR2J2, OR1J4, OR51Q1, OR4D10, OR52D1, OR8K1, OR9A4, OR4S2, OR5W2, OR13A1, OR8K3, OR5AN1, OR52B2, OR5I1, OR52B4, OR5M1, OR4M1, OR4D6, OR1S2, OR1S1, OR5M8, CNGA2, OR5H14, OR52K1, GRM8, OR5V1, OR5H15, OR2D3, OR2L8, OR2B3, OR8U8, OR8H3, OR1L3, OR5A2, OR2L13, OR9Q1, OR1G1, OR9Q2, OR13C3, OR9I1, OR10G9, OR5E1P, OR5AP2, OR2T33, OR5B12, OR5AS1, OR10C1, OR10W1, OR5B17, OR9G9, OR5P3, OR2AG1, OR7G1, OR5P2, OR5K4, OR9G1, OR6C75, OR2M4, OR5B3, OR2M5, OR4X1, OR52M1, OR11H6, OR13D1, OR4A16, OR8H2	6.50E-32
sensory perception of chemical stimulus	OR10A6, OR5H2, OR5L1, OR11A1, OR2J2, OR51Q1, OR1J4, OR4D10, OR52D1, OR8K1, OR9A4, OR4S2, OR5W2, OR13A1, OR8K3, OR5AN1, OR52B2, OR5I1, OR52B4, OR5M1, OR4M1, OR4D6, OR1S2, OR1S1, OR5M8, CNGA2, OR5H14, OR52K1, GRM8, OR5V1, OR5H15, OR2D3, OR2L8, OR2B3, OR8U8, OR8H3, OR1L3, OR5A2, OR2L13, OR9Q1, OR1G1, OR9Q2, OR13C3, OR9I1, OR10G9, OR5E1P, OR5AP2, OR2T33, OR5B12, OR5AS1, OR10C1, SCNN1A, SCNN1D, OR10W1, OR5B17, OR9G9, OR5P3, OR2AG1, OR7G1, OR5P2, OR5K4, OR9G1, OR6C75, OR2M4, OR5B3, OR2M5, OR4X1, OR52M1, OR11H6, OR13D1, OR4A16, OR8H2	8.96E-31
G-protein coupled receptor protein signaling pathway	OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, HTR1B, S1PR1, OR4S2, OR8K3, OR5M1, ATRNL1, OR4M1, OR4D6, OR1S2, OR5M8, OR1S1, GABRR3, PPBP, OR5H14, OR52K1, HTR6, OR5H15, OR2D3, C3AR1, OR2L8, OR2B3, OR8U8, AKAP12, GPR141, OR2L13, OR1G1, OR2T33, OR5AS1, OR10C1, DEFB1, OR10W1, GABRE, OR5P3, OR2AG1, OR7G1, OR5P2, GABRA3, GABRA6, OR6C75, OR2M4, OR2M5, OR52M1, OR11H6, OR4A16, OR10A6, OR5H2, OR11A1, OR51Q1, EDNRB, TAAR9, OR9A4, OR5W2, OR13A1, OR5AN1, GABRG1, OR5I1, OR52B2, OR52B4, FSHR, GRM3, CHRM2, GRM8, OR5V1, GAP43, CXCL5, GPR63, CXCL2, OR8H3, GPR6, FPR1, TAC1, OR1L3, PF4, FPR2, OR5A2, OR9Q1, OR9Q2, HRH1, OR13C3, DGKB, OR9I1, OR10G9, OR5E1P, OR5B12, OR5AP2, OR5B17, OR9G9, GNAO1, OR5K4, OR9G1, DGKK, OR5B3, RGS13, OR4X1, OR13D1, OR8H2	5.19E-26

neurological system process	OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, CTTNBP2, BDNF, HTR1B, S1PR1, OR4S2, OR8K3, OR5M1, SIX3, OR4M1, OR4D6, OR1S2, OR5M8, CNGA2, OR1S1, GABRR3, OR5H14, OR52K1, HTR6, OR5H15, OR2D3, OR2L8, OR2B3, OR8U8, ASZ1, RIMS1, OR2L13, KCNMB2, OR1G1, CRB1, OR2T33, OR5AS1, OR10C1, OR10W1, OR5P3, OR2AG1, OR7G1, OR5P2, GABRA3, GABRA6, OR6C75, OR2M4, OR2M5, OR52M1, OR11H6, OR4A16, CHRND, PTENP1, OR10A6, OR5H2, OR11A1, OR51Q1, SLC1A4, OR9A4, WDR36, OR5W2, OR13A1, CNTNAP2, KCNQ1, OR5AN1, GABRG1, OR5I1, OR52B2, OR52B4, NRXN1, GRM3, GRM8, OR5V1, OR8H3, TAC1, OR1L3, OR5A2, OR9Q1, OR9Q2, HRH1, OR13C3, OR9I1, OR10G9, OR5E1P, OR5B12, OR5AP2, SCNN1A, SCNN1D, OR5B17, OR9G9, OR5K4, DLGAP2, OR9G1, GRIA4, OR5B3, OR4X1, GRIA1, OR13D1, OR8H2, APBB1	2.31E-22
sensory perception	OR10A6, OR5H2, OR5L1, OR2J2, OR11A1, OR51Q1, OR1J4, OR4D10, OR52D1, OR8K1, OR9A4, WDR36, OR4S2, OR5W2, OR13A1, OR8K3, KCNQ1, OR5AN1, OR52B2, OR5I1, OR52B4, OR5M1, SIX3, OR4M1, OR4D6, OR1S2, OR1S1, OR5M8, CNGA2, OR5H14, OR52K1, GRM8, OR5V1, OR5H15, OR2D3, OR2L8, OR2B3, OR8U8, OR8H3, TAC1, OR1L3, RIMS1, OR5A2, OR2L13, OR9Q1, OR1G1, OR9Q2, OR13C3, CRB1, OR9I1, OR10G9, OR5E1P, OR5AP2, OR2T33, OR5B12, OR5AS1, OR10C1, SCNN1A, SCNN1D, OR10W1, OR5B17, OR9G9, OR5P3, OR2AG1, OR7G1, OR5P2, OR5K4, OR9G1, OR6C75, OR2M4, OR5B3, OR2M5, OR4X1, OR52M1, OR11H6, OR13D1, OR4A16, OR8H2	6.40E-21
cognition	OR10A6, OR5H2, OR5L1, OR2J2, OR11A1, OR51Q1, OR1J4, OR4D10, OR52D1, OR8K1, SLC1A4, BDNF, OR9A4, WDR36, OR4S2, OR5W2, OR13A1, OR8K3, KCNQ1, OR5AN1, OR52B2, OR5I1, OR52B4, OR5M1, SIX3, OR4M1, OR4D6, OR1S2, OR1S1, OR5M8, CNGA2, OR5H14, GRM8, OR52K1, OR5V1, OR5H15, OR2D3, OR2L8, OR2B3, OR8U8, OR8H3, TAC1, OR1L3, OR5A2, RIMS1, OR2L13, OR9Q1, OR1G1, OR9Q2, OR13C3, CRB1, OR9I1, OR10G9, OR5E1P, OR5AP2, OR2T33, OR5B12, OR5AS1, OR10C1, SCNN1A, SCNN1D, OR10W1, OR5B17, OR9G9, OR5P3, OR2AG1, OR7G1, OR5P2, OR5K4, OR9G1, OR6C75, OR2M4, OR5B3, OR2M5, OR4X1, OR52M1, GRIA1, OR11H6, OR13D1, OR4A16, OR8H2, APBB1, PTENP1	6.69E-21
cell surface receptor linked signal	BMP10, OR5L1, OR2J2, OR1J4, OR4D10, OR52D1, OR8K1, MARCO, HTR1B, S1PR1, OR4S2, OR8K3, IRS2, OR5M1, ATRNL1, FGF22, SOCS5, OR4M1, OR4D6, OR1S2,	2.52E-20

transduction	OR1S1, OR5M8, GABRR3, VEGFC, GRB10, PPBP, OR5H14, OR52K1, HTR6, F2, OR5H15, ADAMTS1, OR2D3, C3AR1, OR2L8, OR2B3, OR8U8, AKAP12, GPR141, OR2L13, OR1G1, OR2T33, OR5AS1, OR10C1, DEFB1, OR10W1, GABRE, BMP2, OR5P3, OR2AG1, TCF7, OR7G1, OR5P2, GABRA3, GABRA6, SMAD5, OR6C75, TAX1BP3, OR2M4, OR2M5, OR52M1, SFRP2, OR11H6, OR4A16, PTENP1, OR10A6, OR5H2, OR11A1, OR51Q1, TAAR9, EDNRB, OR9A4, OR5W2, OR13A1, OR5AN1, GABRG1, OR52B2, OR5I1, OR52B4, FSHR, GRM3, DACT1, CHRDL1, GRM8, CHRM2, OR5V1, GAP43, CXCL5, APC2, GPR63, OR8H3, CXCL2, GPR6, FPR1, TAC1, PF4, OR1L3, FPR2, OR5A2, OR9Q1, OR9Q2, HRH1, OR13C3, DGKB, OR9I1, OR10G9, PTK2B, OR5E1P, OR5AP2, OR5B12, APC, OR5B17, OR9G9, GNAO1, OR5K4, OR9G1, DGKK, GRIA4, RGS13, OR5B3, OR4X1, OR13D1, OR8H2, IFT52	
defense response to bacterium	DEFB121, PPBP, DEFB125, DEFB118, DEFB128, DEFB116, DEFB115, DEFB1, CTSG, DMBT1, DEFB119	0.001357161
gamma-aminobutyric acid signaling pathway	GABRG1, GABRE, GABRR3, GABRA3, GABRA6	0.002200012
ion transport	SLC9A6, GABRB1, SLC39A12, ASZ1, SLC26A2, KCNIP4, KCNMB2, KCNS3, MARCO, CTTNBP2, SLC24A3, SCN9A, SLC01C1, ANO5, MCOLN2, ANO4, KCNQ1, SCNN1A, SCNN1D, GABRG1, GABRE, SLC8A1, SVOP, GABRA3, GABRA6, GRIA4, CNGA2, GABRR3, KCNJ4, ATP2C2, KCNJ9, GRIA1, F2, SLC5A8, SCN4B, CHRND, HEPH	0.002297548
transmission of nerve impulse	GABRG1, DLGAP2, GABRA3, GABRA6, ASZ1, TAC1, NRXN1, GRIA4, RIMS1, KCNMB2, SLC1A4, CTTNBP2, GABRR3, GRM3, HRH1, HTR1B, S1PR1, GRM8, GRIA1, HTR6, CNTNAP2	0.00257108
regulation of cell migration	BMP10, IRS2, ONECUT1, TAC1, LAMA2, VEGFC, S1PR1, SERPINE2, PTK2B, UNC5C, HDAC9, PTENP1, APC	0.003347862
behavior	CCL1, C3AR1, HELT, CXCL5, CXCL2, FPR1, TAC1, PF4, FPR2, EDNRB, PLCL1, BDNF, HTR1B, SCN9A, ROBO2, GFII1, DEFB1, GNAO1, CXCL17, PPBP, GRIA1, NLGN4X, APBB1, PTENP1, RASD2	0.004200034
synaptic transmission	GABRG1, DLGAP2, GABRA3, GABRA6, ASZ1, TAC1, NRXN1, GRIA4, RIMS1, SLC1A4, CTTNBP2, GABRR3, HRH1, HTR1B, GRM3, GRM8, GRIA1, HTR6	0.005334357
chemotaxis	CCL1, C3AR1, EDNRB, CXCL17, PPBP, CXCL5, CXCL2, FPR1, ROBO2, PF4, FPR2, DEFB1	0.006194279

taxis	CCL1, C3AR1, EDNRB, CXCL17, PPBP, CXCL5, CXCL2, FPR1, ROBO2, PF4, FPR2, DEFB1	0.006194279
cell-cell signaling	CXCL5, ASZ1, TAC1, RIMS1, SLC1A4, CTTNBP2, HTR1B, HRH1, BDNF, IL17A, IFNA7, CRB1, GABRG1, BMP2, TRHDE, DLGAP2, GABRA3, GABRA6, SIX3, GRIA4, NRXN1, GABRR3, GRB10, GRM3, GRM8, GRIA1, SALL1, HTR6, LRP2	0.007381335
regulation of locomotion	BMP10, IRS2, ONECUT1, TAC1, LAMA2, VEGFC, S1PR1, SERPINE2, PTK2B, UNC5C, HDAC9, PTENP1, APC	0.009085341
response to drug	GABRE, NES, SLC8A1, GNAO1, ASZ1, ADIPOQ, CTTNBP2, CYP7B1, BDNF, PTK2B, SLC18A1, LRP2, PTENP1, APC	0.009175427
regulation of cell motion	BMP10, IRS2, ONECUT1, TAC1, LAMA2, VEGFC, S1PR1, SERPINE2, PTK2B, UNC5C, HDAC9, PTENP1, APC	0.009446985

**Supplementary Table 3. Hypermethylated Pathways shared by TMX2-11 and TMX2-28 in the gene body**

<i>Pathway</i>	<i>Genes</i>	<i>p value</i>
ion transport	SLC9A9, KCNIP4, WNT2, KCNQ5, GRIN2B, NMUR2, SLC24A2, ANO2, CHRNA7, KCNQ1, OCA2, GABRG3, KCND2, ATP4B, TRPA1, CACNG3, CNGA2, ATP2C1, RYR3, CLIC6, RYR2, PLLP, SCN11A, KCNH8, KCNH5, SLC38A4, SLC39A12, SCN9A, SCNN1A, GABRQ, GABRE, TRPC4, SLC12A1, GABRA4, KCNB2, GABRA3, ATP11B, GRIA4, CACNA2D3, KCNK2, SLC01B3, GRIA2, GRIA1, SLC17A4, CACNA1H, SCN4B, CACNA1E, HEPH, KCTD16, CACNA1C, CLCN7	7.35E-09
metal ion transport	SLC9A9, SLC38A4, SLC39A12, KCNIP4, KCNQ5, GRIN2B, SLC24A2, NMUR2, SCN9A, CHRNA7, KCNQ1, SCNN1A, TRPC4, SLC12A1, KCND2, ATP4B, KCNB2, TRPA1, CACNG3, CACNA2D3, KCNK2, ATP2C1, SLC17A4, RYR3, CACNA1H, SCN4B, RYR2, HEPH, SCN11A, CACNA1E, KCNH8, KCTD16, CACNA1C, KCNH5	4.77E-07
cell adhesion	DLC1, DCHS2, PLXNC1, PKHD1, NELL1, ASTN1, COL2A1, FPR2, CDH2, SDC3, APLP1, ITGBL1, REG3A, IGSF11, ARHGAP6, COL6A6, FAT3, DGCR6, VNN1, CNTNAP2, COL8A1, ENTPD1, ADAM9, NRXN3, CNTNAP5, NRXN1, BTBD9, CTNNA2, NCAM1, LAMA2, COL19A1, ATP2C1, LSAMP, NLGN4X, ROR2, RELN, SGCE, CNTN4, COL29A1, SELE, CHL1, PARVA	2.95E-06
biological adhesion	DLC1, DCHS2, PLXNC1, PKHD1, NELL1, ASTN1, COL2A1, FPR2, CDH2, SDC3, APLP1, ITGBL1, REG3A, IGSF11, ARHGAP6, COL6A6, FAT3, DGCR6, VNN1, CNTNAP2, COL8A1, ENTPD1, ADAM9, NRXN3, CNTNAP5, NRXN1, BTBD9, CTNNA2, NCAM1, LAMA2, COL19A1, ATP2C1, LSAMP, NLGN4X, ROR2, RELN, SGCE, CNTN4, COL29A1, SELE, CHL1, PARVA	3.02E-06
cell-cell signaling	FGF9, FGF14, ILDR2, RIMS1, EPHB1, WNT2, KCNQ5, BDNF, GRIN2B, NMUR2, LTB, BMP2, GABRG3, KCND2, TRHDE, NRXN3, GABRA3, GRIA4, NRXN1, FGF20, TNFSF9, CTNNA2, CAMK4, GRIA2, GRM8, GRIA1, GRM7, ADRA1B, WNT9B,	1.78E-05

	ADRA1A, GPR50, CACNA1E, RIT2, LRP2, CACNA1C, WNT7A	
cation transport	SLC9A9, SLC38A4, SLC39A12, KCNIP4, KCNQ5, GRIN2B, SLC24A2, NMUR2, SCN9A, CHRNA7, KCNQ1, SCNN1A, TRPC4, SLC12A1, KCND2, ATP4B, KCNB2, TRPA1, CACNG3, CACNA2D3, KCNK2, ATP2C1, SLC17A4, RYR3, CACNA1H, SCN4B, RYR2, HEPH, SCN11A, CACNA1E, KCNH8, KCTD16, CACNA1C, KCNH5	1.96E-05
multicellular organismal response to stress	EDNRB, BDNF, GRIN2B, NMUR2, GRM7, TRPA1, SCN9A, RELN	7.55E-05
transmission of nerve impulse	GABRG3, KCND2, GABRA3, NRXN3, NRXN1, GRIA4, RIMS1, CTNNA2, WNT2, KCNQ5, CAMK4, GRIA2, GRIN2B, GRM8, SBF2, GRIA1, NMUR2, GRM7, CNTNAP2, PLLP, CACNA1E, RIT2, CACNA1C, WNT7A	8.78E-05
neurological system process	WNT2, KCNQ5, BDNF, GRIN2B, SLC24A2, NMUR2, CNTNAP2, CHRNA7, KCNQ1, IMPDH1, USH2A, GABRG3, OR5R1, KCND2, RAX, OR5M1, NRXN3, TRPA1, OR5M3, NRXN1, OR5M9, CTNNA2, CNGA2, OR5M8, EYA1, LRAT, CAMK4, SBF2, OR2H1, GRM8, GRM7, PLLP, ABLIM1, OR8U8, COL2A1, RIMS1, OR9Q1, OR5AP2, NEFL, SCNN1A, GUCY2F, OR9G9, OR5M10, GABRA3, OR9G1, TBX1, AFF2, GRIA4, FOXP2, GRIA2, GRIA1, ADRA1B, CACNA1E, RIT2, CACNA1C, PBX3, WNT7A	1.01E-04
appendage development	MSX2, ALDH1A2, RAX, FGF9, PRRX1, COL2A1, ZBTB16, ASPH, SP8, MECOM, NR2F2, WNT7A	1.10E-04
limb development	MSX2, ALDH1A2, RAX, FGF9, PRRX1, COL2A1, ZBTB16, ASPH, SP8, MECOM, NR2F2, WNT7A	1.10E-04
calcium ion transport	TRPC4, TRPA1, CACNG3, CACNA2D3, GRIN2B, ATP2C1, RYR3, SLC24A2, NMUR2, CACNA1H, RYR2, CACNA1E, CHRNA7, CACNA1C	1.33E-04
cell surface receptor linked signal transduction	FGF9, GPR123, LEPR, ADCY5, PREX2, WNT2, EDNRB, GRIN2B, NMUR2, GAB1, RSPO2, HEY2, NRG1, INSR, ADAM9, GABRG3, OR5R1, OR5M1, CCDC88C, BAIAP2, ARID5B, DLL1, OR5M3, FGF20, OR5M9, OR5M8, NCAM1, CHRDL1, GRM8, OR2H1, GRM7, WNT9B, ROR1, GPR50, ROR2, GAP43, AKAP4, GPRC5C, OR8U8, PKHD1, GNAI1, APH1B, AKAP12, FPR2, EPHB1, OR9Q1, ITGBL1, SORCS3, MSX2, APLNR, DGKB, OR5AP2, BAI3, ENTPD1, GUCY2F, GABRE, OR9G9, PTPRD, BMP2, FLT1, GABRA4, OR5M10, GABRA3, MAML2, SMAD5, OR9G1, DGKK, DGKI, GRIA4,	1.35E-04

	PTGFR, KCNK2, BTLA, NOTCH4, ADRA1B, ADRA1A, BAMBI, WNT7A, ADAMDEC1	
response to pain	EDNRB, GRIN2B, NMUR2, TRPA1, SCN9A, RELN	1.60E-04
neuron differentiation	PKHD1, RORA, PRKG1, RTN1, EPHB1, EFHD1, ALDH1A2, BDNF, CNTNAP2, ROBO3, OLFM3, NEFL, NRXN3, STMN2, PTPRZ1, BAIAP2, NTNG1, NRXN1, LMX1A, FGF20, CTNNA2, BTG4, CNTN4, RELN, PBX3, WNT7A, GAP43	1.66E-04
muscle organ development	POU6F1, ARID5B, UTRN, MYL1, MOV10L1, TBX1, FOXP2, LAMA2, COL19A1, HLX, CACNA1H, VGLL2, ZFPM2, SGCE, NRG1, NR2F2, TCF12	2.15E-04
cell motion	ASTN1, ZEB2, CDH2, FPR2, PRKG1, EPHB1, DSTN, WNT2, EDNRB, BDNF, VNN1, CLASP2, ROBO3, NR2F2, FLT1, NRXN3, ARID5B, TBX1, NRXN1, LMX1A, ELMO1, CTNNA2, ETS1, CNTN4, RELN, SELE, GAP43, AKAP4	2.50E-04
regulation of system process	LZTS1, FLT1, KCNB2, CDH2, GRIA4, LAMA2, EDNRB, BDNF, GRIA2, GRIN2B, GRM8, NMUR2, SLC24A2, ADRA1B, CACNA1H, RYR2, CNTN4, PBX3, CACNA1C, KCNQ1, LTB	3.11E-04
di-, tri-valent inorganic cation transport	TRPC4, TRPA1, CACNG3, CACNA2D3, GRIN2B, ATP2C1, RYR3, SLC24A2, NMUR2, CACNA1H, RYR2, CHRNA7, CACNA1E, HEPH, CACNA1C	3.26E-04
synaptic transmission	GABRG3, KCND2, GABRA3, NRXN3, NRXN1, GRIA4, RIMS1, CTNNA2, WNT2, KCNQ5, CAMK4, GRIA2, GRIN2B, GRM8, GRIA1, GRM7, CACNA1E, RIT2, CACNA1C, WNT7A	5.24E-04



**Supplementary Table 4. Genes with two or more hypermethylated CpG sites in the promoter in both TMX2-11 and TMX2-28 in order of decreasing number of hypermethylated CpGs**

Official Gene Symbol	Number of hypermethylated CpGs	Average fold change TMX2-11	Average fold change TMX2-28
EDNRB	11	2.44	3.19
SORBS2	7	4.98	7.95
EVX2	6	3.05	3.70
ZBTB20	6	4.19	5.56
CXorf67	5	3.34	3.08
MIR568	5	4.33	5.19
ZNF350	5	4.63	3.82
BMP2	4	9.09	9.55
COL21A1	4	4.62	7.30
CSGALNACT1	4	2.88	5.56
CXCL2	4	6.35	16.98
FMO6P	4	2.24	2.52
RGS13	4	3.00	3.50
ZNF385B/MIR1258	4	5.90	9.33
ASZ1	3	2.44	2.94
C18orf20	3	2.67	3.05
CHRD1	3	2.30	2.55
COL29A1	3	5.17	4.29
COX7B2	3	2.67	3.98
DGKK	3	2.39	2.70
ELAVL4	3	3.66	5.16
FAM55D	3	4.69	9.05
GFI1	3	4.98	7.07
HDAC9	3	2.56	3.92
HOXB9	3	2.67	3.94
LOC284688	3	3.39	3.93
LZTS1	3	3.49	4.67
MAGEA5	3	3.44	5.32
MIR452	3	4.03	2.87
MIR54814	3	3.35	5.59
MOV10L1	3	2.32	4.45
OR2M5	3	2.63	6.26
PAK3	3	2.63	2.75
PRKCDBP	3	2.26	2.36
VANGL2	3	5.57	7.40
ZNF215	3	4.96	10.56
ZNF22	3	3.51	3.87
ACTL9	2	3.00	3.49
AKAP12	2	2.30	2.40
ALDH3A1	2	2.06	2.95
ASCL2	2	2.18	3.45
BMP15	2	3.96	4.14
C6orf64	2	3.49	4.92
CDC14C	2	4.28	4.25
CDKL2	2	2.49	2.38
CEACAM18	2	3.03	6.18
CNGA2	2	6.83	7.06
COL6A6	2	3.55	3.12
CXCL5	2	2.96	2.76
DEFB115	2	2.86	4.38
DEFB116	2	4.44	8.06
DEFB118	2	2.18	2.53
FAM151B	2	2.25	2.83
FAM19A4	2	5.55	4.79
FAM55A	2	3.18	6.89
FPR2	2	2.44	3.61
FSHR	2	2.66	2.74
GABRE	2	2.97	2.77
GAP43	2	4.87	4.37
GLYATL1	2	2.17	3.45

GRB10	2	3.40	5.56
GRM3	2	3.19	3.93
GRM8	2	2.15	3.38
GRXCR1	2	2.61	3.76
GUCY1A2	2	5.19	8.96
HCG4	2	2.60	3.36
HELT	2	4.80	3.55
HS3ST1	2	5.88	10.5
IL17A	2	2.38	2.55
IL17F	2	2.23	2.41
KCNIP4	2	2.75	3.93
KCNJ4	2	2.20	2.44
KRTAP11-1	2	2.80	4.67
KRTAP27-1	2	2.44	4.55
LOC441666	2	2.19	2.14
LOC728640	2	2.29	2.80
LRP2	2	4.87	3.04
MAGEA10	2	2.82	3.87
MAGED1	2	3.56	5.58
MAP3K15	2	6.48	5.50
MAPRE2	2	2.67	2.85
METTL11B	2	2.88	3.12
MIR105-1	2	6.28	6.03
MIR548F3	2	3.81	5.46
MIR592	2	3.42	4.53
MIR921	2	2.66	3.32
MOXD2	2	3.11	4.64
MS4A13	2	2.17	3.31
MS4A4A	2	2.06	3.14
MS4A6A	2	2.15	3.14
MTUS2	2	3.09	4.55
OR1S1	2	5.29	6.93
OR2J2	2	2.73	3.15
OR4D6	2	2.59	3.37
OR5AS1	2	2.18	4.25
OR5B12	2	11.67	17.35
OR5E1P	2	3.25	6.42
OR5H15	2	2.69	4.28
OR5P3	2	4.93	10.71
OR5V1	2	3.80	6.60
OR5W2	2	3.06	2.57
OR8H3	2	2.92	2.70
PPBP	2	2.78	4.04
PRKG2	2	2.85	3.59
REG1A	2	2.31	4.19
REG1B	2	3.44	5.86
RORA	2	3.00	2.46
SGIP1	2	2.10	3.13
SIX3	2	3.26	7.35
SLC1A4	2	7.09	9.10
SLC35F4	2	2.88	5.10
SLC46A1	2	2.16	2.22
SSRP1	2	3.29	6.83
TAC1	2	2.30	3.36
TCF12	2	2.77	4.32
TIGIT	2	2.70	2.45
UNC5D	2	2.15	2.52
ZNF396	2	4.21	4.36
ZNF615	2	2.56	4.01
ZSCAN18	2	2.45	2.23

\* Average fold change is calculated from all CpG sites with a fold change >2 and an average beta value of >0.3 within the promoter region.