

SUPPLEMENTAL TABLE S1

Gene Cluster

from Fig. 5	GO: Biological Process	GO: Cellular Component/Domain/Dip-value	Genes in cluster	
1	neuron differentiation	2.76E-05	46	
	cell adhesion	2.76E-05	38	
	transmission of nerve impulse	4.58E-03	32	
	neuron projection development	4.70E-03	32	
	regulation of membrane potential	8.65E-03	16	
	neuron projection	3.92E-08	39	
	synapse	1.11E-07	31	
	2	interphase of mitotic cell cycle	3.80E-10	38
		histone H3-K9 methylation	4.02E-10	16
		DNA replication initiation	1.11E-09	14
		G1/S transition of mitotic cell cycle	3.35E-09	24
			1.39E-07	13
3	regionalization	4.59E-04	33	
	anterior/posterior pattern specification	3.29E-16	21	
	neuron differentiation	8.38E-11	14	
		2.41E-05	16	
		1.33E-26	31	
4	calmodulin binding	5.04E-04	16	
	regulation of vesicle-mediated transport	5.28E-04	20	
	neuron projection development	7.16E-04	39	
	synapse	2.90E-05	32	
	Genes involved in NCAM signaling for neurite o	3.74E-04	10	
5	neuron development	1.71E-10	79	
	actin-myosin filament sliding	4.30E-09	14	
	cell projection organization	1.08E-07	75	
	axonogenesis	2.47E-07	52	
	extracellular matrix organization	2.47E-07	28	
	extracellular matrix	5.39E-15	50	
	contractile fiber part	9.10E-07	23	
	neuron part	9.11E-04	52	
	6	Golgi vesicle transport	1.58E-11	15
		activation of signaling protein activity involved in unfolded protein response	4.04E-06	28
		Golgi membrane	1.08E-08	24
		tube development	9.75E-08	23
negative regulation of transcription from RNA polymerase II promoter		4.77E-07	20	
7	negative regulation of cell differentiation	7.42E-07	24	
	embryonic morphogenesis	2.60E-06	12	
	abnormal fetal growth/weight/body size	9.03E-08	35	
	8	multicellular organismal signaling	2.11E-13	41
		neuron part	4.30E-11	26
dendrite		2.57E-05	10	
9	cell cycle phase	7.96E-40	99	
	DNA replication	3.93E-33	54	
		5.26E-18	20	
	condensed chromosome kinetochore	2.98E-14	19	
	protein-DNA complex	6.10E-09	18	
10	neuron projection morphogenesis	3.59E-07	61	
	axon guidance	6.32E-05	38	
	pattern specification process	6.38E-04	51	
	peptidyl-lysine acetylation	7.13E-04	17	
	nucleoplasm part	2.71E-05	59	
11	translation	1.76E-03	17	
	cellular respiration	7.39E-07	50	
		2.08E-04	22	
	mitochondrial part	1.66E-11	65	
	Genes down-regulated in brain from patients w	3.07E-11	77	
12	Rat Hypothalamic_Mansuy10_1931genes	5.04E-08	71	
	M phase of mitotic cell cycle	1.38E-37	55	
	microtubule cytoskeleton organization	6.49E-17	37	
	condensed chromosome	1.27E-21	28	

.1,EDNRB,SEMA6A,CRMP1,GRIN3A,ANK3,NTM,HDC,VSX2,IL1RAPL1,LBX1,CSPG5,CXCR4,EPHB1,PLXNA2,VWC2,LEP,SPP1,SEMA6C,CDH11,CDH8,RAPGEF4,MDGA2,STXBP5,PTPRM,SEMA3E,PTPRR
, CX3CL1,NLGN4X,IL1RAPL1,HAS2,EPHB1,PTPRT,VWC2,CNTNAP4,LEP,LAMA4,SULF1,SPP1,CDH10,CDH11,TRO,CDH8,PTPRM,SEMA3E
TAC1,SYAP1,NLGN4X,CSPG5,CXCR4,PLP1,EPHB1,GRM7,CDH8,RAPGEF4,STXBP5,GRM1
L1,CSPG5,CXCR4,EPHB1,PLXNA2,SPP1,SEMA6C,CDH11,CDH8,RAPGEF4,STXBP5,PTPRM,SEMA3E

CRMP1,GRIN3A,SKOR1,ANK3,SORT1,NTM,SORBS2,HDC,TAC1,NLGN4X,SEPT6,IL1RAPL1,CXCR4,EPHB1,CNTNAP4,GRM7,CDH8,RAPGEF4,INA,GRM1
IS2,SYAP1,NLGN4X,SEPT6,IL1RAPL1,WLS,VWC2,GRM7,CDH8,RAPGEF4,STXBP5,GRM1

CMS,LIG1,CASP2,MCM7,ALMS1,FOXO1,MTBP,CCNE1,CLSPN,CDK2,TICRR,RRM2,PKD2,CDC6,PSME3,MASTL,PKMYT1

5,PSME3,PKMYT1

8,SPC24,WDHD1,CDT1,DMC1,MCM4,MCM3,MCM5,LIG1,MCM7,ASF1B,CLSPN,CDK2,CDC6,PSME3
IX3,IRX3

BX3,IRX3

2
,CAPRIN1,TNIK,MYH9,CRMP1,CACNB3,SHANK3,NCAM1,COL6A1,COL5A1,CAMK1D,ATCAY,DCLK1,ENAH,SPTAN1,LINGO1,LRP8,GPC1,RAB3A,SRC,RAB5C,SCN3B
M2,SHANK3,CBLN1,PRRT2,ATCAY,LRRC4B,CTNND2,ENAH,SPTAN1,LRP8,RAB3A,SRC,SYNGR1

.BCL11A,LDB2,MATN2,COL9A3,MEF2C,COL3A1,COL4A5,GABRA5,LGI1,CTNNA2,ARX,VCAN,NPTX1,THY1,PICALM,CAP2,NR2E1,CCSAP,NGEF,KCNQ3,SEZ6,SEMA3A,OPCML,RORB,NR4A3,LHX2,ITGAV,DLG2,DLX5,DMD,FZD8,ISLR2,GFAP,TSPO,STX3,CAMK2B,TBR1,LPAR1,CTHRC1,GAS7,NBL1,POSTN,B3GNT2,NE
4ATN2,COL9A3,COL3A1,COL4A5,LGI1,CTNNA2,ARX,VCAN,NPTX1,ULK4,TGFB3,THY1,KIT,PICALM,CAP2,NR2E1,NGEF,KCNQ3,CDC42EP5,SEZ6,SEMA3A,NR4A3,LHX2,ITGAV,DLX5,DMD,FZD8,ISLR2,GFAP,TSPO,STX3,CAMK2B,TBR1,LPAR1,CTHRC1,GAS7,NBL1,LMX1A,POSTN,B3GNT2,PXN,NEUROG2,EPHA5,EMX
.TNNA2,ARX,VCAN,NPTX1,THY1,PICALM,CAP2,NR2E1,KCNQ3,SEMA3A,NR4A3,LHX2,ITGAV,DLX5,FZD8,ISLR2,TSPO,TBR1,LMX1A,POSTN,B3GNT2,NEUROG2,EPHA5,EMX2,NFIB,BCL11B,STMN1,SEMA4D,KAZN,EGR2,EFNA1,EFNB2,FEZF2
E1,MFAP5,TNFRSF11B,LUM,ADAMTS3,LOX,POSTN,NPNT,ELN,EGFL6
COL4A6,COL8A1,COL3A1,COL4A5,MGP,MFAP2,MFAP4,MMP11,VCAN,SCARA3,DCN,TGFB1,TGFB3,MFAP5,TNFRSF11B,OGN,PCOLCE,ADAMTS9,CTHRC1,ADAMTS1,LUM,ADAMTS3,LOX,POSTN,NPNT,CILP,LGALS1,ELN,LAMA3,SPOCK1,FBN3,EGFL6,NOV
N,MYOZ3
4P11,NPTX1,TGFB3,THY1, RGS7,RGS10,PICALM,CCSAP,NGEF,KCNQ3,KCNJ4,SEZ6,SEMA3A,ITPR3,SLC17A7,PALMD,DLG2,GABRG2,PPP1R1B,DMD,STX3,LPAR1,MYO5B,CACNA1E,DDN,SYN2,EPB41L3,EPHA5,GPM6A,NFIB,NDRG2,SPOCK1,NOV,GRIN2C
ISR2,ARL1,SLC35E1,RAB5A,WIPI1,HYOU1,SRPR,KDELRL2,ALG3,SND1

.SLC35A2,FUT3,YKT6,COG6,ARF1,GOSR2,ARL1,WIPI1,ECE2,ICA1
2B,NR2F2,GBX2
2B,NR2F1,NR2F2

1,NR2F2,GBX2

3,NRXN1,GPM6B,GABRB1,GABRB3,JPH3,GRM3,ATP1A2,SLC1A3,LIN7B,SCN3B,GRIA2,TMOD2,SSTR2,GRIN1,ATP2B2
FHC2,GABBR2,ADORA1,GPM6A,NRXN1,GABRB1,GABRB3,BMPR2,GRM3,ATP1A2,CDH13,SLC1A3,LIN7B,NRSN1,GRIA2,FABP7,TMOD2,PTPRO,GRIN1,CHL1,ATP2B2
LC1A3,LIN7B,GRIA2,PTPRO,GRIN1,CHL1,ATP2B2

VLF1P,POLE2,POLA1,ASPM,PBK,RAD51C,MCM10,EXOSC10,HLTF,TRIP13,RBBP8,TIPIN,DNA2,GAS1,BUB1B,ATAD2,SGOL2,GMNN,SEH1L,KIF18A,RPL6,NUF2,SKA3,HNRNPA1,RPA3,PRIM1,NCAPG,GINS2,CKS1B,CKS2,NAE1,PCNA,LIN9,DCLRE1A,EZH2,CEP152,KIF23,MAD2L1,PLK4,CHEK2,CENPI,TAF5,NASP,WDI
MPS,RPA3,PRIM1,GINS2,CKS1B,NAE1,PCNA,LIN9,RMI2,MAD2L1,POLQ,GINS3,NAP1L1,DUT,BAZ1A,NASP,WDHD1,GINS4,RMI1,PSMC3IP,MCM4,MCM3,MCM6,MCM2,MCM7,SMC4,SMC2,SSBP1,CCNE2,DSCC1,RRM1,RNASEH2A,CDK1

IEF2A,COL4A1,COL4A2,FZD2,PLD3,NAV2,WASF2,RPS6KA3,PLXNA1,TADA2B,RXRA,CSNK2A2,BAIAP2,USP22,DCC,TUBB3,AKAP17A,ADNP,ARHGAP39,DYNC1H1,ULK1,ITGA5,KAT2A,SMURF1,MYH9,KIF1B,CYFIP2,PXDN,CNTNAP1,DPYSL2,MAP1S,LLGL1,EP300,CYFIP1,LAMA5,LAMA1,PTPN1,EGFR,CDH4,PTPRF
,CSNK2A2,USP22,DCC,TUBB3,AKAP17A,ARHGAP39,ITGA5,MYH9,CYFIP2,PXDN,CNTNAP1,DPYSL2,CYFIP1,LAMA5,LAMA1,PTPN1,EGFR,CDH4
S,ATP2A2,DDB1,NCLN,FAT4,TRRAP,ARID1A,FOXK1,DCC,SP8,FOXP4,B4GALT5,DYNC1H1,BRD3,ITGA5,BCOR,PBX1,MACF1,SHROOM3,KAT2A,NR2F2,PTBP1,LRP5,TCF7L1,HTT,CBL,LLGL1,EP300,PRPF8,VANGL2,PCGF2,PCIF1,AGAP1

C,FOXO3,CTBP1,YEATS2,TADA2B,FOS,PHF17,REER,MTA1,USP22,RBM14,TRRAP,FOXK1,SYMPK,FOXP4,AKAP17A,TOP3A,JARID2,TCF3,PBX1,GATAD2A,SRRM2,KAT2A,MYC,GTAF2A1,TCF7L1,GTFC3,1,SUPT5H,HCFC1,ZC3H3,EP300,NCOR2,ELF4,PRPF8,RCOR2,ELAVL1,CARM1,PCGF2,RPRD2,PELP1

7,RPS24,RPS26,MTIF3,TCEAL8,TCEAL7,RPL26L1,MRPL22,MRPL15,RBM3,TCEAL1,DIO2,MRPL13,MRPS18C,MRPL42,MCTS1,HRSP12,MRPS28,MRPL39,GTFF2B,EEF1E1,MRPL33,MRPL47,RPSA,BZW1,SRP9,SRP19,MRPL1,MRPS14,MRPL20,NGDN,PPA2,CLK4
FB3,NDUFB9,NDUFB6,UQCR10
,MRPL27,COX17,MGST1,CYB5A,MRPS17,COX14,PIN4,ATP5C1,BAD,ATP5G3,MFF,FUNDC1,ATP5J,ATP5J,SLC25A17,CISD1,TOMM5,MRPL22,OAT,MRPL15,NDUFAF4,MINOS1,DLN,MRPL13,MRPS18C,MRPL42,HRSP12,CISD2,DECR1,MRPS28,TFAM,ACN9,MRPL39,C14orf2,NDUFA6,NDUFB1,NDUFA9,NDUFB3,N
IGP,LSM5,COX11,COX7B,RPL14,UQCRH,UBA3,PFN4,UCLH3,ERGC2,SLC25A14,ORC3,TASP1,LRRN3,TTC1,PDCC5,ATP5C1,RPS26,TXNDC9,ATP5G3,MFF,TMEM126B,ATP5J,CISD1,MRPL22,OAT,MRPL15,ZNHIT3,THYN1,MOB4,TCEAL1,DIO2,DLN,MRPL13,BCAP29,SEP15,CCDC53,MCTS1,HRSP12,SHFM1,MRPS
LSM5,COX7B,FAM92A1,MAGOH,UCLH3,KRCC1,NUDT5,UCLH5,KITLG,SNX7,TAF1D,PDCC5,PAK1IP1,UBE2T,NDUFAF4,COMMD8,MOB4,ANKRD49,NMD3,TCBE1,DLN,BCAP29,MRPL42,GEMIN6,CISD2,PCNA,CCDC47,ARV1,MAD2L1,HAT1,CHORDC1,EEF1E1,GTFF2H1,CCNC,MRPL47,MOSPD1,CLOCK,TAF9,PSMA3
IPA1,TIMELESS,OIP5,KIF14,BORA,KIF15,CDCA3,KIF23,MST4,KIF4A,AURKA,CDCA5,NUSAP1,CHEK2,PRC1,MDK,FAM83D,CCNB1,CCNA2,BIRC5,NEK2,PLK1,AURKB,TTK,BUB3,CEP55,CDCA8,KIF20A,CCNB2,CDC25A,CDC25C,UBE2C,SGOL1,CDC20,CDK1,ESPL1
PRC1,CCNB1,CCNA2,BIRC5,GPSM2,NEK2,PLK1,AURKB,TTK,BUB3,AUNIP,KIF20A,UBE2C,SGOL1,CDK1,ESPL1
2AFX,NEK2,PLK1,AURKB,BUB3,SGOL1,CDK20,MKI67

UROG2,EPHA5,EMX2,NEUROD2,LGALS1,GPM6A,NFIB,SPOCK1,BCL11B,STMN1,SEMA4D,KAZN,EGR2,EFNA1,EFNB2,FEZF2

{2,LGALS1,GPM6A,NFIB,SPOCK1,BCL11B,STMN1,SEMA4D,KAZN,EGR2,EFNA1,EFNB2,FEZF2

HD1,HELLS,SEN6,TTF2,GINS4,CBS,NUP107,PSMC3IP,MCM4,MCM3,MCM6,MCM2,KIF20B,MCM7,FANCI,SMC4,NEK1,FIGNL1,ZWINT,CENPM,NUP37,RFWD3,SMC2,EXO1,STMN1,RUVBL1,CCNE2,DSCC1,RRM1,ZWILCH,CDK1,SPC25,ALG8,MASTL,NUP85

,CELSR3

DUF89,MRPL47,NDUFB6,UQCR10,TIMM23,MRPL1,MRPS14,MRPL20,PPA2
28,PCNA,EEF1E1,C14orf2,NDUFB1,DCTN6,NDUFB3,RTN4,TAF9,C3orf14,CACYBP,CCNH,UQCR10,NME1,SRP19,MRPL20,PTS,NPY
!,SIVA1,CACYBP,DPH3,RABGGTB,CCNH,GPR19,SKA2,BZW1,SRP9,NME1,MRPS14,SEPT7,KPNA5