

SUPPLEMENTARY TABLE 1 hPSC lines used in various experiments

INDIVIDUAL/ EXPERIMENT	Ctrl hiPS cells (5 subjects, 6 lines)						TS hiPS cells (3 subjects, 7 lines)							hES cells
	2242-1	8858-1	8858-3	1205-4	6593-8	H20961	8303-1	8303-2	7643-1	7643-5	7643-32	9862-2	9862-61	H9
hSS qPCR characterization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
hSS ICC characterization	✓	✓		✓										✓
hSS IHC characterization	✓	✓			✓					✓		✓		✓
Single-cell analysis	✓	✓												
Calcium Imaging - Fura-2	✓	✓		✓					✓	✓		✓		✓
Calcium Imaging - Fluo-4	✓			✓	✓									✓
Dlxi1/2b::eGFP reporter characterization	✓	✓				✓								
hSS-hCS migration assays and pharmacology	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	
Dendritic branching	✓	✓			✓									
Array Tomography	✓	✓												
Slice physiology	✓	✓	✓	✓	✓									✓
hSS culture on mouse forebrain slices		✓		✓										

SUPPLEMENTARY TABLE 2 List of genes and sequences of primers used for RT-qPCR.

Gene	Forward primer	Reverse primer
<i>ASCL1</i>	TCTTCGCCCCGAAGTATGATGC	CAAAGCCCAGGTTGACCAACT
<i>BRACH</i>	TATGAGCCTCGAATCCACATAGT	CCTCGTTCTGATAAGCAGTCAC
<i>CALB1</i>	AGGGAATCAAATGTGTGGGAAA	TCCTTCAGTAAAGCATCCAGTTC
<i>CALB2</i>	TTTGCAGACAAGCCAGGATG	TGTTTCACCGTGAAGTGCAC
<i>CHAT</i>	ACATGATTGAGCGCTGCATC	ACTTGTCGTACCAGCGATTG
<i>CXCR4</i>	TGTTGGCTGAAAAGGTGGTC	AACACAACCACCCACAAGTC
<i>CXCR7</i>	ATCTTGAACCTGGCCATTGC	TGTGTGACTTTGCACGTGAG
<i>DARPP32</i>	ATCCTCACCTGTGTTTGTGC	AGGTGGGCAAACAAGCAAAC
<i>DLX1</i>	ATGCACTGTTTACACTCGGC	GACTGCACCGAACTGATGTAG
<i>DLX2</i>	ACGGGAAGCCAAAGAAAGTC	TTTTGGAAACGCCGCTGAAG
<i>DLX5</i>	TTCCAAGCTCCGTTCCAGAC	GAATCGGTAGCTGAAGACTCG
<i>EMX1</i>	CGCAGGTGAAGGTGTGGTT	TCCAGCTTCTGCCGTTTGT
<i>ERBB4</i>	AACAATGTGACGGCAGATGC	TTCATGCAGGCAAAGCAGTC
<i>FOXP1</i>	AACCTGTGTTGCGCAAATGC	AAACACGGGCATATGACCAC
<i>GAD1</i>	ATGCAACCAGATGTGTGCAG	TGCCCTTTGCTTTCCACATC
<i>GAPDH</i>	CATGAGAAGTATGACAACAGCCT	AGTCCTTCCACGATACCAAAGT
<i>GLI1</i>	ATGAACTGACTGCCGTTGG	ATGTGCTCGCTGTTGATGTG
<i>HOXB4</i>	TCCTCGTTTTTCAGCTTTGGC	TCATTTGTTAGCGGGTGTGCG
<i>LHX6</i>	TGAGAGTCAGGTACAGTGCG	GCCCATCCATATCGGCTTTGA
<i>LMX1B</i>	AAACCCACGCAAACACACAC	TCTCTTTCTGACAAGGCAGGAC
<i>MAFB</i>	TGGCCGGATGCATTTTGTAG	AAGCACCATGCGGTTTCATAC
<i>MEIS2</i>	ACAGCTGGAGTGGCAAAAAG	AAATTGTCAAGCCCCCGAAC
<i>NKX2-1</i>	AGCACACGACTCCGTTCTC	GCCCACTTTCTTGTAGCTTTCC
<i>NKX6-2</i>	AGCACAAACCCTCGAACTTG	CCCCCGGATTCTGCAAAAATAG
<i>NPY</i>	CGCTGCGACACTACATCAAC	CAGGGTCTTCAAGCCGAGTT
<i>OCT4</i>	CCCCAGGGCCCCATTTTGGTACC	ACCTCAGTTTGAATGCATGGGAGAGC
<i>OLIG2</i>	GGACAAGCTAGGAGGCAGTG	ATGGCGATGTTGAGGTCGTG
<i>PVALB</i>	GGACAAAAGTGGCTTCATCGAG	TCGTCAACCCCAATTTTGCC
<i>RAX</i>	GGCCATCCTGGGGTTTACC	GGTCGAGGGGCTTCGTACT
<i>RELN</i>	TTTTTGACGGCTTGCTGGTG	TCCCAAATCCGAAAGCACTG
<i>SIX3</i>	AGCAGAAGACGCATTGCTTC	ACCAGTTGCCTACTTGTGTG
<i>SLC17A7</i>	TGCGCAAGTTGATGAACTGC	TCACGTTGAACCCAGAGATGG
<i>SOX17</i>	GTGGACCGCACGGAATTTG	GGAGATTCACACCGGAGTCA
<i>SOX2</i>	TTCACATGTCCCAGCACTACCAGA	TCACATGTGTGAGAGGGGCAGTGTGC
<i>SOX6</i>	ATCAACAATGGCAGCTGCTG	ATTCCTGCCAAAACGGTCAC
<i>SST</i>	GCTGCTGTCTGAACCCAAC	CGTTCTCGGGGTGCCATAG
<i>TH</i>	TCAGAGCTGGACAAGTGTATC	AAGGCGATCTCAGCAATCAG
<i>VIP</i>	ACTTCAGCACCTAAGACAGCTC	TCTGGTGTCCATTTCTGTGC

SUPPLEMENTARY TABLE 3 List of the top differentially expressed genes in each of the 8 clusters in single cell gene expression (BD Resolve).

Cluster	Gene	P value	Cluster	Gene	P value	Cluster	Gene	P value	Cluster	Gene	P value		
#1	BCL11B (CTIP2)	0	#2	EOMES (TBR2)	0	#3	PTN	0	#4	ATP1A2	0	#1	Glutamatergic Neurons
#1	NEUROD2	0	#2	HES6	1E-151.02	#3	FABP7	1E-311.9	#4	CLU	0	#2	Intermediate Progenitors
#1	NTS	0	#2	INSM1	1E-137.3	#3	SFRP1	1E-273.91	#4	CRYAB	0	#3	Radial Glia
#1	SEZ6	0	#2	NHLH1	1E-88.21	#3	LHX2	1E-252.71	#4	GPM6B	0	#4	Astroglia
#1	SLA	0	#2	CENPF	1E-73.84	#3	FZD8	1E-234.43	#4	NTN1	0	#5	Ventral Progenitors
#1	SLC17A7 (VGLUT1)	0	#2	MKI67	1E-68.35	#3	PAX6	1E-234.17	#4	NTRK2	0	#6	GABAergic Neurons
#1	TBR1	0	#2	HMGB2	1E-66.49	#3	TOP2A	1E-200.86	#4	SPARC	0	#7	OPC
#1	THSD7A	0	#2	PRC1	1E-65.87	#3	B3GAT2	1E-199.62	#4	SPARCL1	0	#8	Choroid Plexus
#1	NEUROD6	0	#2	TOP2A	1E-64.15	#3	DMRTA2	1E-193.22	#4	SPON1	0		
#1	NFIB	0	#2	UBE2C	1E-61.08	#3	KIAA0101	1E-173.57	#4	EDNRB	1E-318.83		
#1	MEF2C	1E-298.02	#2	SMC4	1E-60.59	#3	MKI67	1E-164.83	#4	B2M	1E-318.61		
#1	LMO3	1E-264.36	#2	RRM2	1E-56.4	#3	CENPF	1E-148.21	#4	BCAN	1E-312.25		
#1	CNTNAP2	1E-258.91	#2	TUBA1B	1E-55.39	#3	EMX2	1E-146.41	#4	ANXA2	1E-304.37		
#1	MAP1B	1E-248.48	#2	FAM64A	1E-55.13	#3	SMC4	1E-136.64	#4	PI15	1E-291.42		
#1	LMO7	1E-242.97	#2	CENPE	1E-55.01	#3	VIM	1E-135.91	#4	TTYH1	1E-278.06		
#1	LPL	1E-233.35	#2	ASPM	1E-51.49	#3	SLC1A3 (GLAST-1)	1E-134.2	#4	RSP03	1E-277.86		
#1	FEZF2	1E-227.35	#2	HIST1H4C	1E-51.45	#3	C1orf61	1E-132.69	#4	PTGDS	1E-254.68		
#1	CRYM	1E-217.05	#2	MLF1IP	1E-47.6	#3	TUBA1B	1E-132.08	#4	PMP2	1E-248.93		
#1	BHLHE22	1E-193.34	#2	NUSAP1	1E-46.94	#3	NUSAP1	1E-130.69	#4	CRISPLD1	1E-241.34		
#1	NSG2	1E-167.71	#2	TPX2	1E-44.06	#3	HIST1H4C	1E-121.4	#4	VIM	1E-233.22		
#1	GAP43	1E-163.35	#2	DLL1	1E-43.19	#3	PRC1	1E-117.71	#4	MT3	1E-227.63		
#1	NRN1	1E-157.44	#2	PTTG1	1E-41.41	#3	FAM107A	1E-112.42	#4	MLC1	1E-220.67		
#1	STMN2	1E-155.89	#2	KIFC1	1E-39.23	#3	GINS2	1E-102.49	#4	RAB31	1E-217.47		
#1	SPHKAP	1E-142.74	#2	DMRTA2	1E-38.06	#3	CDK1	1E-92.44	#4	TIMP3	1E-212.34		
#1	CALB2	1E-122.07	#2	BIRC5	1E-37.16	#3	ASPM	1E-90.35	#4	PLTP	1E-211.2		
#1	MAPT	1E-120.18	#2	PRR11	1E-34.03	#3	ID4	1E-87.86	#4	AQP4	1E-210.63		
#1	RTN1	1E-119.37	#2	CCNB1	1E-33.88	#3	BIRC5	1E-83.98	#4	TAGLN2	1E-205.3		
#1	SYT1	1E-119.32	#2	SPC25	1E-33.14	#3	TPX2	1E-82.81	#4	VCAM1	1E-197.32		
#1	RUNX1T1	1E-107.32	#2	NUF2	1E-31.92	#3	HOPX	1E-79.05	#4	IGFBP5	1E-197.23		
#1	ID2	1E-103.53	#2	CCNB2	1E-31.34	#3	COL11A1	1E-78.85	#4	SLIT2	1E-194.6		
#1	GUCY1A3	1E-99.02	#2	KIAA0101	1E-31.23	#3	MCM4	1E-77.73	#4	AGT	1E-192.6		
#1	VSNL1	1E-87.21	#2	NDC80	1E-29.41	#3	KIF15	1E-77.65	#4	ZFP36L1	1E-190.28		
#1	ADCY1	1E-68.36	#2	RGS16	1E-29.05	#3	FAM64A	1E-77.17	#4	WLS	1E-189.03		
#1	ADRA2A	1E-59.03	#2	PLK1	1E-28.71	#3	AURKB	1E-75.02	#4	PPAP2B	1E-188.56		
#1	PGM2L1	1E-37.76	#2	CASC5	1E-27.17	#3	SMC2	1E-72.73	#4	SAT1	1E-176.28		
#1	NEUROD1	1E-32.18	#2	FOXM1	1E-26.42	#3	MLF1IP	1E-71.29	#4	FOS	1E-171.77		
#1	NHLH1	1E-29.96	#2	DLGAP5	1E-25.97	#3	PRR11	1E-70.38	#4	CHPF	1E-168.95		
#1	WNT7B	1E-24.81	#2	CENPW	1E-25.81	#3	PCNA	1E-69.44	#4	FGFR3	1E-167.7		
#1	CELF4	1E-20.11	#2	TACC3	1E-25.69	#3	MCM3	1E-67.88	#4	CDKN1A	1E-161.96		
#1	CPNE6	1E-19.68	#2	PAX6	1E-25.67	#3	KIFC1	1E-66.81	#4	SCD	1E-157.5		
#1	SERPINI1	1E-16.83	#2	CDK1	1E-25.02	#3	CDC20	1E-66.76	#4	CPXM2	1E-153.74		
#1	STMN4	1E-14.49	#2	NCAPG	1E-24.56	#3	SOX9	1E-63.72	#4	C1orf61	1E-151.62		
#1	OSTN	1E-13.98	#2	HES5	1E-24.04	#3	GTSE1	1E-63.62	#4	EGR1	1E-150.87		
#1	NDRG1	1E-13.02	#2	AURKB	1E-23.7	#3	KIF11	1E-63.32	#4	TNC	1E-147.16		
#1	CAV1	1E-12.61	#2	CKAP2L	1E-23.34	#3	UBE2C	1E-62.3	#4	SULF2	1E-145.19		
#1	MEG3	1E-10.89	#2	PPP1R17	1E-23.33	#3	MYBL2	1E-61.6	#4	NPTX2	1E-144.84		
#1	PDYN	1E-8.09	#2	CDCA8	1E-23.21	#3	PTTG1	1E-61.59	#4	FTL	1E-144.44		
#1	RP11-397G17.1	1E-8	#2	KIF15	1E-22.32	#3	CKAP2L	1E-61.59	#4	NES	1E-143.92		
#1	TAC3	1E-7.57	#2	GTSE1	1E-21.9	#3	NDC80	1E-61.33	#4	ALCAM	1E-141.54		
#1	NECAB1	1E-7.53	#2	CDCA5	1E-21.88	#3	PBK	1E-61.13	#4	PIFO	1E-139.94		

SUPPLEMENTARY TABLE 3 cont.

Cluster	Gene	P value	Cluster	Gene	P value	Cluster	Gene	P value	Cluster	Gene	P value	#1	Glutamatergic Neurons
#5	L1TD1	0	#6	GAD1	0	#7	BCAS1	1E-138.7	#8	TTR	0	#2	Intermediate Progenitors
#5	LIN28A	0	#6	NEFM	0	#7	APOD	1E-113.52	#8	PMCH	1E-254.84	#3	Radial Glia
#5	CRABP1	0	#6	SCG2	0	#7	SOX10	1E-108.11	#8	RP11-395L1	1E-245.53	#4	Astroglia
#5	RPS6	0	#6	SST	0	#7	OLIG2	1E-103.87	#8	RBM47	1E-157.85	#5	Ventral Progenitors
#5	FTL	0	#6	STMN2	0	#7	OLIG1	1E-93.36	#8	SLC13A4	1E-157.15	#6	GABAergic Neurons
#5	PRTG	0	#6	NEFL	1E-275.05	#7	PDGFRA	1E-73.99	#8	IGF1	1E-151.66	#7	OPC
#5	PODXL	0	#6	NNAT	1E-210.32	#7	COL20A1	1E-68.55	#8	PCP4	1E-149.88	#8	Choroid Plexus
#5	TRIM71	0	#6	SLC32A1	1E-183.63	#7	SCRG1	1E-66.77	#8	TRPM3	1E-142.91		
#5	BST2	0	#6	DLX6-AS1	1E-173.88	#7	NNAT	1E-62.72	#8	FOLR1	1E-137.44		
#5	TPM2	1E-318.83	#6	CELF4	1E-141.76	#7	LHFPL3	1E-57.58	#8	CXCL14	1E-116.81		
#5	MDK	1E-318.61	#6	RELN	1E-133.28	#7	S100B	1E-55.81	#8	IGFBP7	1E-113.16		
#5	HMGB2	1E-312.25	#6	ZCCHC12	1E-127.14	#7	MBP	1E-51.61	#8	RP11-143M1	1E-110.99		
#5	MIR302B	1E-304.37	#6	DLX1	1E-122.56	#7	BCAN	1E-50.98	#8	CLIC6	1E-80.94		
#5	POU4F1	1E-291.42	#6	CHGB	1E-121.2	#7	SMOC1	1E-46.5	#8	TRH	1E-79.93		
#5	DPPA4	1E-278.06	#6	SIX3	1E-114.49	#7	PMP2	1E-45.46	#8	CA2	1E-77.96		
#5	IGDCC3	1E-277.86	#6	POU2F2	1E-107.03	#7	RAB31	1E-44.78	#8	LAMB1	1E-71.37		
#5	NMU	1E-254.68	#6	SCG5	1E-103.51	#7	GPR17	1E-44.7	#8	CCK	1E-71.13		
#5	QPRT	1E-248.93	#6	ONECUT2	1E-100.21	#7	EGFR	1E-31.51	#8	MSX1	1E-70.5		
#5	NR6A1	1E-241.34	#6	NPAS4	1E-99.56	#7	SEMA5A	1E-27.95	#8	AQP1	1E-67.35		
#5	ENO1	1E-233.22	#6	SPOCK2	1E-97.97	#7	TF	1E-27.29	#8	PTGDS	1E-67		
#5	IRX2	1E-227.63	#6	LHX8	1E-96.42	#7	PLP1	1E-26.55	#8	RSPO2	1E-65.45		
#5	LITAF	1E-220.67	#6	C22orf42	1E-87.13	#7	SOX6	1E-25.53	#8	HSD17B2	1E-65.4		
#5	PNP	1E-217.47	#6	BEX5	1E-84.59	#7	IGFBP5	1E-17.95	#8	HTR2C	1E-64.55		
#5	CRABP2	1E-212.34	#6	PCDH17	1E-82.4	#7	CLDN11	1E-17.09	#8	DLK1	1E-63.21		
#5	HMGGA2	1E-211.2	#6	SYT4	1E-82.28	#7	EGR1	1E-16.93	#8	SLC4A5	1E-62.71		
#5	DDIT4	1E-157.54	#6	ISL1	1E-78.88	#7	DLL1	1E-14.73	#8	CLDN19	1E-58.32		
#5	FAM60A	1E-151.54	#6	NEGR1	1E-78.17	#7	MAG	1E-14.6	#8	CP	1E-57.53		
#5	TUBA1C	1E-151.05	#6	FGF14	1E-75.11	#7	ENPP6	1E-14.46	#8	SULF1	1E-57.16		
#5	PRDX6	1E-149.54	#6	PBX3	1E-69.97	#7	CD9	1E-14.41	#8	KCNJ13	1E-54.24		
#5	RAB13	1E-144.7	#6	GAP43	1E-66.57	#7	ASIC4	1E-14.28	#8	LGI1	1E-53.63		
#5	DLK1	1E-138.65	#6	DLX5	1E-66.53	#7	ERBB3	1E-13.02	#8	SERPINF1	1E-51.23		
#5	CLDN6	1E-136.49	#6	TSHZ2	1E-64.75	#7	EYA2	1E-12.98	#8	TRIM67	1E-50.44		
#5	CDKN1C	1E-132.52	#6	TENM2	1E-62.47	#7	MX1	1E-11.7	#8	PLS3	1E-49.22		
#5	TPM1	1E-119.7	#6	STMN4	1E-62.43	#7	HES6	1E-11.52	#8	KRT18	1E-47.98		
#5	OLFML3	1E-119.1	#6	PGM2L1	1E-60.42	#7	SERPINE2	1E-11.37	#8	IFITM3	1E-47.34		
#5	ESRG	1E-114.75	#6	DIRAS3	1E-46.97	#7	PROX1	1E-11.27	#8	C1orf168	1E-44.85		
#5	PLA2G16	1E-113.52	#6	NHLH2	1E-46.29	#7	GPM6B	1E-10.33	#8	SPARC	1E-44.46		
#5	HSPA5	1E-111.48	#6	ONECUT3	1E-41.39	#7	EGR2	1E-9.01	#8	OTX2	1E-40.51		
#5	CCND1	1E-111.19	#6	PCP4	1E-40.9	#7	NPAS3	1E-8.55	#8	TPBG	1E-39.09		
#5	RBPMS	1E-108.44	#6	NSG2	1E-40.49	#7	EDNRB	1E-8.04	#8	ECEL1	1E-35.99		
#5	IFITM3	1E-105.56	#6	LHX6	1E-40.45	#7	NTRK2	1E-7.7	#8	RSPO1	1E-34.67		
#5	IFITM2	1E-104.7	#6	SPOCK3	1E-39.78	#7	ISG15	1E-7.63	#8	WLS	1E-34.66		
#5	FST	1E-104.15	#6	MAPT	1E-39.49	#7	RP11-93B14.5	1E-7.49	#8	AIFM3	1E-33.92		
#5	LDHA	1E-99.16	#6	ZIC1	1E-39.45	#7	SULF2	1E-7.39	#8	KRT8	1E-33.59		
#5	H19	1E-96.38	#6	RTN1	1E-39.1	#7	PLOD2	1E-7.14	#8	FAM89A	1E-33.37		
#5	SLC2A3	1E-93.54	#6	EBF1	1E-38.85	#7	ALCAM	1E-6.83	#8	COLEC12	1E-32.13		
#5	HIST1H2AC	1E-91.53	#6	TENM1	1E-37.95	#7	SOX9	1E-6.79	#8	NPC2	1E-30.04		
#5	CTSC	1E-91.07	#6	RP11-82C23.2	1E-37.79	#7	PCDH17	1E-6.78	#8	CLU	1E-30.04		
#5	FXYS5	1E-84.63	#6	NXPH1	1E-37.62	#7	RGS16	1E-6.75	#8	LMX1A	1E-30.01		
#5	TNNT1	1E-83.04	#6	RIT2	1E-37.15	#7	PTCH1	1E-6.39	#8	KCTD8	1E-29.04		

SUPPLEMENTARY TABLE 4 List of genes enriched in clusters A, B and C in single cell RNA-seq experiments of *Dlx2i1/2b::eGFP+* in hSS-hCS assembled for 4 weeks (Smart-seq).

A vs B and C	
Gene Name	P value
<i>MEIS2</i>	<1E-16
<i>NEFL</i>	<1E-16
<i>HSPA8</i>	1.11E-16
<i>MAB21L2</i>	3.55E-15
<i>UCHL1</i>	2.04E-14
<i>SOX4</i>	3E-14
<i>PGAM1</i>	1.67E-13
<i>CDC42</i>	1.69E-13
<i>MAGED2</i>	4.02E-13
<i>JAK3</i>	4.49E-13
<i>CHN1</i>	1.47E-12
<i>PLD3</i>	2.27E-12
<i>VDAC2</i>	2.54E-12
<i>MDH1</i>	2.68E-12
<i>SORL1</i>	2.82E-12
<i>CPE</i>	9.2E-12
<i>COX5B</i>	1.05E-11
<i>RP11-82C23.2</i>	1.36E-11
<i>LRCH4</i>	1.43E-11
<i>TCF4</i>	1.65E-11
<i>MUC20</i>	1.67E-11
<i>DLX6-AS1</i>	1.94E-11
<i>PTPRB</i>	3.07E-11
<i>PARK7</i>	3.6E-11
<i>YWHAZ</i>	6.62E-11
<i>SST</i>	9.22E-11
<i>TTC39B</i>	1.2E-10
<i>DLX6</i>	2.1E-10
<i>ATP5O</i>	2.18E-10
<i>RDH13</i>	2.23E-10
<i>SLC25A53</i>	2.58E-10
<i>TMEM130</i>	2.61E-10
<i>DLX6-AS2</i>	2.7E-10
<i>CALM2</i>	3.02E-10
<i>SAP30L-AS1</i>	4.29E-10
<i>WDR31</i>	5.26E-10
<i>PLA2G4C</i>	5.57E-10
<i>PSMB5</i>	6.99E-10
<i>GNG3</i>	8.36E-10
<i>GATA3</i>	8.59E-10
<i>DLX5</i>	8.75E-10
<i>RP11-128A17.1</i>	8.95E-10
<i>CDH6</i>	1.08E-09
<i>PDE7B</i>	1.24E-09
<i>GTPBP2</i>	1.4E-09
<i>GOT1</i>	1.46E-09
<i>OPA3</i>	1.61E-09
<i>CISD2</i>	2.05E-09
<i>GATM</i>	2.07E-09
<i>NUDC</i>	2.14E-09

B vs A and C	
Gene Name	P value
<i>SST</i>	<1E-16
<i>NNAT</i>	<1E-16
<i>SOX11</i>	<1E-16
<i>YWHAQ</i>	<1E-16
<i>CPE</i>	<1E-16
<i>MEIS2</i>	<1E-16
<i>TCF4</i>	1.44E-15
<i>SOX4</i>	3.66E-15
<i>TMSB4XP8</i>	5.33E-15
<i>TMSB4X</i>	5.88E-15
<i>VAT1L</i>	1.21E-14
<i>ERBB4</i>	1.17E-13
<i>SLC26A11</i>	1.46E-13
<i>PLCXD1</i>	2.16E-13
<i>SCG2</i>	2.17E-13
<i>RP11-55K13.1</i>	3.03E-13
<i>NCALD</i>	3.14E-13
<i>ATPIF1</i>	4.23E-13
<i>PLD3</i>	2.5E-12
<i>AP000350.4</i>	1.04E-11
<i>NEFL</i>	1.84E-11
<i>MTO1</i>	2.04E-11
<i>HAT1</i>	2.08E-11
<i>ZNF486</i>	2.38E-11
<i>PGAM1</i>	5.55E-11
<i>BCAS4</i>	5.97E-11
<i>PCDH9</i>	9.26E-11
<i>CEP41</i>	1.18E-10
<i>LHX6</i>	1.33E-10
<i>GNG3</i>	1.59E-10
<i>FAM189B</i>	5.7E-10
<i>ZNF114</i>	6.01E-10
<i>JUN</i>	7.41E-10
<i>BSCL2</i>	8.47E-10
<i>GREB1</i>	1.21E-09
<i>MUC20</i>	1.41E-09
<i>C16orf62</i>	2.66E-09
<i>TMSB4XP4</i>	3.15E-09
<i>MIF</i>	3.31E-09
<i>HRK</i>	3.79E-09
<i>JDP2</i>	3.98E-09
<i>AC009403.2</i>	4.13E-09
<i>IGF1</i>	5.7E-09
<i>ATP1B1</i>	6.48E-09
<i>TCTA</i>	6.93E-09
<i>SORL1</i>	8.69E-09
<i>TTC39B</i>	8.85E-09
<i>EIF2AK2</i>	9.74E-09
<i>KB-1107E3.1</i>	1.01E-08
<i>PLS3</i>	1.06E-08

C vs A and B	
Gene Name	P value
<i>NNAT</i>	<1E-16
<i>UBB</i>	7.68E-14
<i>RP11-138I1.4</i>	2.97E-13
<i>NDUFA4</i>	8.78E-13
<i>TMSB10</i>	1.27E-12
<i>TINCR</i>	1.33E-12
<i>LINC00689</i>	1.25E-11
<i>CALM2</i>	1.57E-11
<i>AC017104.2</i>	2.65E-11
<i>RP5-1065J22.8</i>	2.65E-11
<i>HSPA8</i>	4.45E-11
<i>DLX6</i>	4.78E-11
<i>STMN1</i>	5.32E-11
<i>SAP30L-AS1</i>	6.54E-11
<i>ATG2A</i>	1.12E-10
<i>SIX6</i>	1.82E-10
<i>SOX6</i>	2.14E-10
<i>DOCK5</i>	7.92E-10
<i>RASD1</i>	8.28E-10
<i>GHR</i>	9.24E-10
<i>DLX6-AS2</i>	1.35E-09
<i>ZFP64</i>	1.97E-09
<i>TRABD2A</i>	2.41E-09
<i>CHRNA1</i>	2.49E-09
<i>NFIA</i>	2.63E-09
<i>FOS</i>	2.8E-09
<i>LIPH</i>	3.05E-09
<i>RP11-814P5.1</i>	3.32E-09
<i>MALAT1</i>	3.72E-09
<i>RP11-379H18.1</i>	5.15E-09
<i>MPP3</i>	5.25E-09
<i>MAB21L2</i>	5.97E-09
<i>NGRN</i>	1.14E-08
<i>CTC-250I14.6</i>	0.000000018
<i>ZNF655</i>	2.12E-08
<i>CTD-2293H3.1</i>	2.46E-08
<i>NDC80</i>	2.55E-08
<i>MRPS33</i>	2.84E-08
<i>RNF152</i>	2.87E-08
<i>RBFOX2</i>	3.43E-08
<i>SUOX</i>	3.52E-08
<i>RORB</i>	4.28E-08
<i>GFRA1</i>	4.67E-08
<i>SCG2</i>	5.47E-08
<i>RGS16</i>	5.54E-08
<i>ROGDI</i>	0.000000067
<i>SOX4</i>	0.000000103
<i>HRK</i>	0.000000121
<i>NMS</i>	0.000000125
<i>EML6</i>	0.00000015

<i>NFIB</i>	2.27E-09
<i>CRABP1</i>	2.34E-09
<i>RP11-977G19.11</i>	2.82E-09
<i>ZNF114</i>	2.87E-09
<i>RP11-55K13.1</i>	4.71E-09
<i>MIEF2</i>	4.97E-09
<i>PRRT3</i>	5.39E-09
<i>GHR</i>	5.91E-09
<i>DTWD2</i>	6.72E-09
<i>ANGPT2</i>	7.1E-09
<i>PLIN2</i>	7.18E-09
<i>ERBB4</i>	7.32E-09
<i>PDE4C</i>	8.23E-09
<i>DLX1</i>	8.38E-09
<i>AGT</i>	9.16E-09
<i>C19orf40</i>	9.41E-09
<i>RAB3B</i>	9.44E-09
<i>TCTA</i>	1.01E-08
<i>NACAD</i>	1.04E-08
<i>TMSB4X</i>	1.19E-08
<i>NGRN</i>	0.000000012
<i>PCDH9</i>	1.21E-08
<i>HOTAIRM1</i>	1.24E-08
<i>BSCL2</i>	1.42E-08
<i>PPP1R13L</i>	1.45E-08
<i>LHX5</i>	1.47E-08
<i>TES</i>	1.69E-08
<i>CADM2</i>	1.83E-08
<i>TXNRD2</i>	1.99E-08
<i>STK17B</i>	2.29E-08
<i>DLX2</i>	0.000000023
<i>TMED3</i>	2.43E-08
<i>SNAP25</i>	2.49E-08
<i>BTBD10</i>	2.75E-08
<i>NEFM</i>	2.78E-08
<i>PPP2R3B</i>	2.78E-08
<i>RWDD2A</i>	2.89E-08
<i>WDR19</i>	2.93E-08
<i>LINC00338</i>	3.21E-08
<i>ATG2A</i>	3.42E-08
<i>MTA3</i>	3.45E-08
<i>IFT20</i>	3.55E-08
<i>RWDD2B</i>	3.91E-08
<i>PSME2</i>	0.000000042
<i>AC040977.1</i>	4.34E-08
<i>SOX11</i>	4.36E-08
<i>RAB7L1</i>	4.42E-08
<i>GAS6-AS2</i>	4.88E-08
<i>ATP6V1D</i>	5.47E-08
<i>ZNF486</i>	5.53E-08
<i>APLP1</i>	6.22E-08
<i>CATSPER2</i>	6.35E-08
<i>CISD1</i>	6.81E-08
<i>AC004453.8</i>	6.94E-08

<i>TSPAN3</i>	1.11E-08
<i>ACBD4</i>	1.11E-08
<i>PTPRG</i>	1.11E-08
<i>PKM</i>	1.17E-08
<i>MTHFR</i>	1.21E-08
<i>ENO2</i>	1.32E-08
<i>MYO15A</i>	1.43E-08
<i>UCHL1</i>	1.45E-08
<i>STPG1</i>	1.47E-08
<i>GRIP2</i>	1.59E-08
<i>ZNF844</i>	1.87E-08
<i>CHN1</i>	1.89E-08
<i>STEAP4</i>	3.19E-08
<i>LINC00338</i>	3.22E-08
<i>PDE7B</i>	3.46E-08
<i>TMEM130</i>	3.49E-08
<i>CALCOCO2</i>	4.28E-08
<i>JAK3</i>	4.74E-08
<i>LGALS3BP</i>	0.000000054
<i>DENND2A</i>	6.41E-08
<i>CDH23</i>	6.48E-08
<i>SLC22A17</i>	6.59E-08
<i>MLTK</i>	6.97E-08
<i>GFRA1</i>	7.13E-08
<i>TTL</i>	7.31E-08
<i>CYCS</i>	7.32E-08
<i>AC104532.4</i>	8.76E-08
<i>FRMD4B</i>	9.97E-08
<i>TMEM42</i>	0.00000001
<i>AC137932.1</i>	0.000000103
<i>VDAC2</i>	0.000000106
<i>STMN4</i>	0.000000108
<i>RP11-82C23.2</i>	0.000000108
<i>NXPH1</i>	0.000000109
<i>CADM1</i>	0.000000136
<i>POC1B</i>	0.000000145
<i>LDHBP1</i>	0.000000145
<i>TACO1</i>	0.000000151
<i>DUSP28</i>	0.000000154
<i>TSPYL2</i>	0.000000155
<i>CTC-359D24.3</i>	0.000000162
<i>FKBP2</i>	0.000000169
<i>SLC16A3</i>	0.000000176
<i>PCDH9-AS1</i>	0.000000178
<i>APLP1</i>	0.000000187
<i>CALY</i>	0.000000188
<i>HYPK</i>	0.000000203
<i>EHD4</i>	0.000000215
<i>FOS</i>	0.000000218
<i>ERVMER34-1</i>	0.000000222
<i>SLC25A34</i>	0.000000258
<i>ZNF154</i>	0.000000295
<i>SFMBT2</i>	0.000000031
<i>RDH13</i>	0.000000322

<i>YBX1</i>	0.000000016
<i>SDCBP</i>	0.0000000161
<i>PPP1R17</i>	0.0000000212
<i>ZNF225</i>	0.000000024
<i>EP400NL</i>	0.0000000245
<i>VPS29</i>	0.0000000277
<i>TOX</i>	0.0000000319
<i>CYP20A1</i>	0.0000000364
<i>FTH1P16</i>	0.0000000403
<i>BIRC5</i>	0.0000000414
<i>ACTB</i>	0.0000000458
<i>NETO2</i>	0.0000000521
<i>TIPIN</i>	0.0000000555
<i>CRTC3</i>	0.0000000587
<i>EXOSC2</i>	0.0000000633
<i>CABP7</i>	0.0000000693
<i>ATXN2</i>	0.0000000822
<i>TMEFF2</i>	0.0000000886
<i>C8orf34</i>	0.0000000989

YWHAB	6.96E-08
ZNF772	7.78E-08
RP5-1065J22.8	8.81E-08
POR	9.15E-08
ALDOC	9.49E-08
ZC3H12B	0.000000104
ARF5	0.000000104
SMTN	0.000000105
NDUFC1	0.00000011
ATRN	0.000000116
BEX5	0.000000124
LINC00689	0.000000137
ZNF385D	0.000000144
GPX3	0.000000147
LAMP5	0.000000151
JDP2	0.000000159
LINC01102	0.000000161
SEPT4	0.000000162
TACO1	0.000000163
ATP5G1	0.000000167
MICALL1	0.000000174
TUBA4A	0.000000179
CLTB	0.000000181
RP11-192H23.5	0.000000183
SEMA4C	0.000000187
MEIS1	0.000000192
DYNLT1	0.000000199
HSPA9	0.000000202
TMSB4XP8	0.000000215
CYCS	0.000000239
TMEM120A	0.000000241
ACTA2	0.000000268
SPOCK3	0.000000276
SUMF2	0.000000286
PBX3	0.000000288
DOCK5	0.000000295
ZNF225	0.000000297
TMSB10	0.000000304
RNF181	0.000000321
AC027763.2	0.000000338
C14orf166	0.000000358
FAIM2	0.00000037
CDH13	0.000000387
PSTPIP2	0.000000405
RP11-178G16.4	0.000000409
MGST3	0.00000041
IDH3B	0.000000414
GULP1	0.000000415
TMEM216	0.000000417
PARVA	0.000000417
GS1-72M22.1	0.000000418
TMEM205	0.00000043
NAP1L5	0.000000436
C21orf33	0.000000437

PARK7	0.00000035
RBP1	0.00000035
JUND	0.000000368
CLSPN	0.000000375
SPARC	0.000000376
LRCH4	0.000000401
APAF1	0.000000413
ZBTB3	0.000000421
TWSG1	0.000000438
LINC00689	0.000000441
PAWR	0.000000479
CAPZA1	0.000000513
TAPBP	0.000000529
MAB21L1	0.000000563
AHI1	0.000000565
TMEM205	0.00000057
LIPH	0.000000591
ARHGAP44	0.000000598
SRP14-AS1	0.000000662
CDC42	0.000000697
RP11-192H23.5	0.000000707
DYNC111	0.000000791
PTPRF	0.000000816
CLU	0.000000818
PURB	0.00000083
PRRT3	0.000000831
PGRMC1	0.000000852
TES	0.00000089
GOT1	0.000000899
CX3CL1	0.000000981

<i>TMEM132B</i>	0.000000447
<i>WDR55</i>	0.000000475
<i>PSMD12</i>	0.000000479
<i>STMN4</i>	0.000000483
<i>CHRD</i>	0.000000506
<i>MOAP1</i>	0.000000509
<i>CTB-60E11.9</i>	0.000000524
<i>ATF7IP2</i>	0.000000535
<i>RNF5</i>	0.000000536
<i>LRRC36</i>	0.000000541
<i>MRPL22</i>	0.000000545
<i>OTUD6B</i>	0.000000557
<i>TMEM106A</i>	0.000000566
<i>PSMB1</i>	0.000000581
<i>SUMF1</i>	0.000000585
<i>PSMD13</i>	0.000000611
<i>RAB3C</i>	0.00000062
<i>PGM2L1</i>	0.000000633
<i>DNAJC17</i>	0.000000639
<i>ZCCHC17</i>	0.000000643
<i>PPA2</i>	0.000000665
<i>RBP1</i>	0.000000668
<i>PDP2</i>	0.000000668
<i>MLEC</i>	0.000000694
<i>CARD14</i>	0.000000696
<i>ATP1B1</i>	0.000000702
<i>NDE1</i>	0.000000709
<i>TMED9</i>	0.000000735
<i>KB-1107E3.1</i>	0.000000743
<i>CCDC167</i>	0.000000758
<i>ATP6V1A</i>	0.00000077
<i>B3GNT1</i>	0.000000774
<i>MATR3</i>	0.000000808
<i>TUBB2A</i>	0.000000884
<i>DNAH9</i>	0.00000089
<i>GPRC5A</i>	0.000000903
<i>USP11</i>	0.000000935
<i>TUBB4A</i>	0.000000984

SUPPLEMENTARY TABLE 5 Electrical properties of neurons

	RMP*	Rheobase	Threshold	Max Spike/Sec	Overshoot	Half- Width	EPSPs/min	IPSPs/min	n
DIxi1/2b::eGFP neurons in hSS	-61.8±3.2	6.1±0.7	-46.8±4.2	3.1±0.6	8.6±1.6	4.2±0.3	2.0±0.7	8.7±1.6	11
DIxi1/2b::eGFP neurons in hCS	-66.4±4.7	5.6±0.7	-49.3±5.0	6.8±1.0	15.6±2.1	3.8±0.2	15.5±2.2	3.6±1.0	11
DIxi1/2b::eGFP neurons in unfused	-63.4±2.9	6.2±0.9	-42.5±3.2	2.8±0.5	12.2±1.6	3.9±0.4	0.4±0.2	5.5±1.8	15
hCS neurons in fused	-61.2±4.3	6.6 ±1.1	-41.7±3.9	4.5±1.0	10.8±0.8	5.8±0.7	11.0±1.7	6.8±2.3	9
hCS neurons in unfused	-59.8±3.9	8.8±1.4	-44.7±4.3	4.2±0.7	10.5±1.2	6.2±0.8	8.3±2.0	0.2±0.2	6

*Resting Membrane Potential