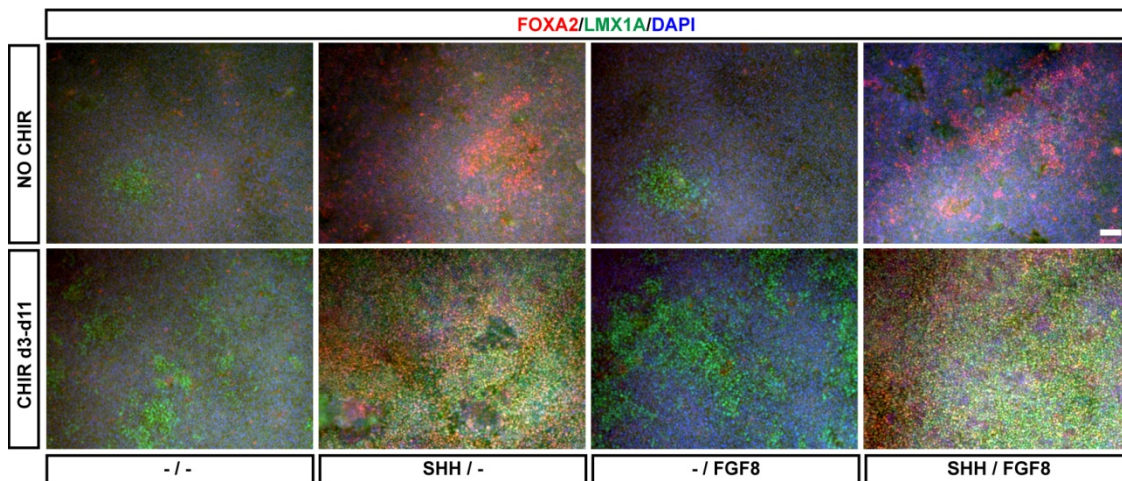
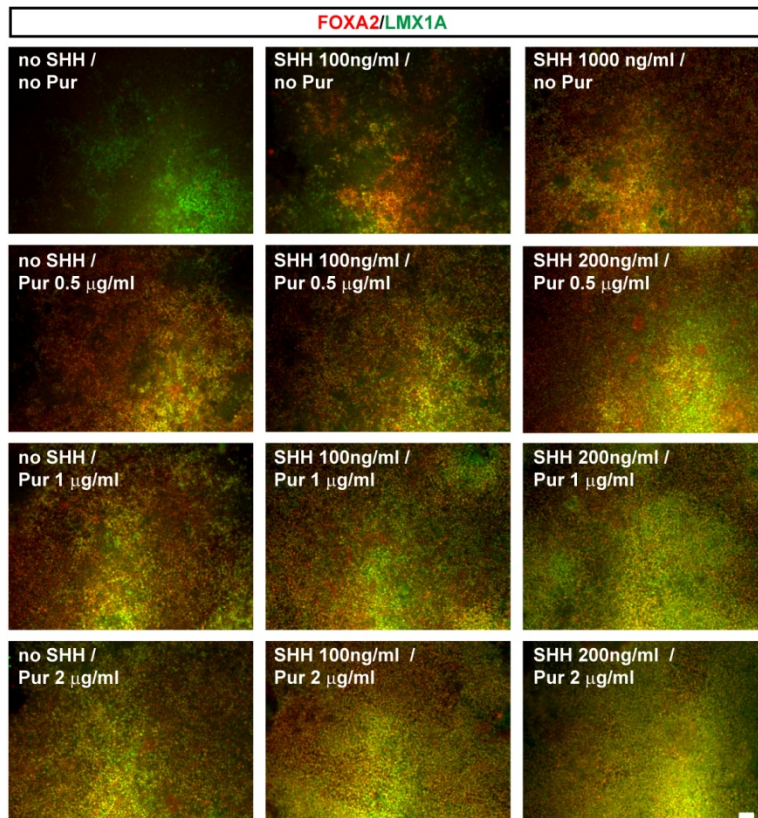


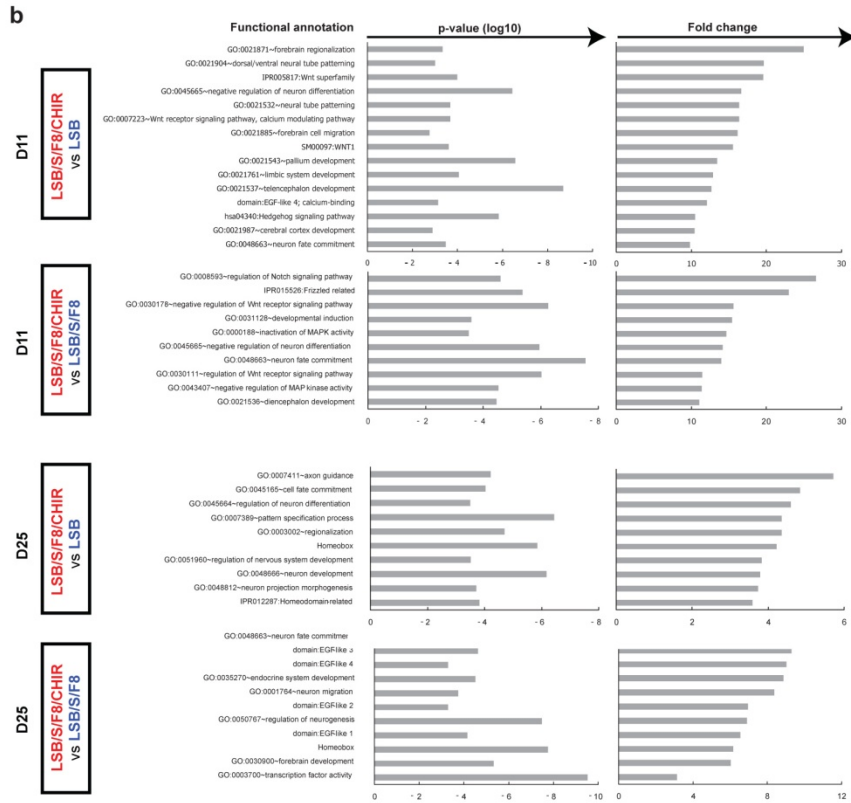
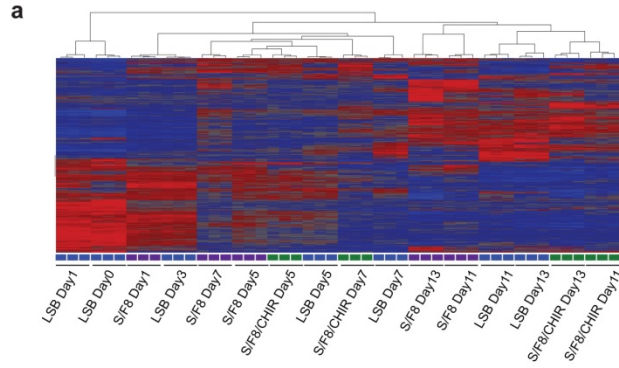
**Supplementary Figure 1: Timing of CHIR99021 exposure determines induction of FOXA2/LMX1A midbrain floor plate precursors.** **a)** Immunocytochemical analysis of FOXA2(red)/LMX1A(green) at day 11 of differentiation following LSB/S/F8 treatment alone or in combination with CHIR starting at the various time points indicated. **b)** Quantification of the percentage of FOXA2+, LMX1A+ and double labeled cells at day 11 of differentiation following differential onset of CHIR exposure as described in (a). Significance levels for individual markers are presented as compared to no CHIR condition: ANOVA; Dunnett test: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ). Scale bars correspond to 50  $\mu\text{m}$ .



**Supplementary Figure 2: FGF8 exposure does not play a major role in the induction of FOXA2/LMX1A midbrain floor plate precursors.** Representative images of FOXA2(red)/LMX1A(green) expression by immunocytochemistry at day 11 of differentiation. Cells were exposed to LSB/ CHIR in the presence or absence of SHH (purmorphamine + SHH C25II) and FGF8. Scale bars correspond to 50  $\mu$ m.

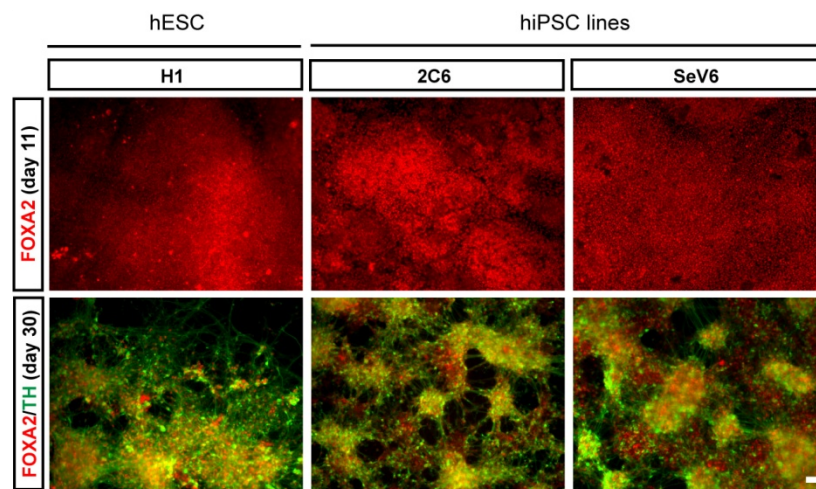


**Supplementary Figure 3: Exposure to high dose of SHH and/or a smoothed small molecule agonist (purmorphamine) is required for efficient midbrain floor plate induction in the presence of CHIR99021.** Representative images of FOXA2(red)/LMX1A(green) immunocytochemistry at day 11 of differentiation. Cells were treated with LSB/F8/CHIR in the presence of various concentrations of SHH (SHH-C25II) and smoothed agonist purmorphamine. Scale bars correspond to 50 µm.



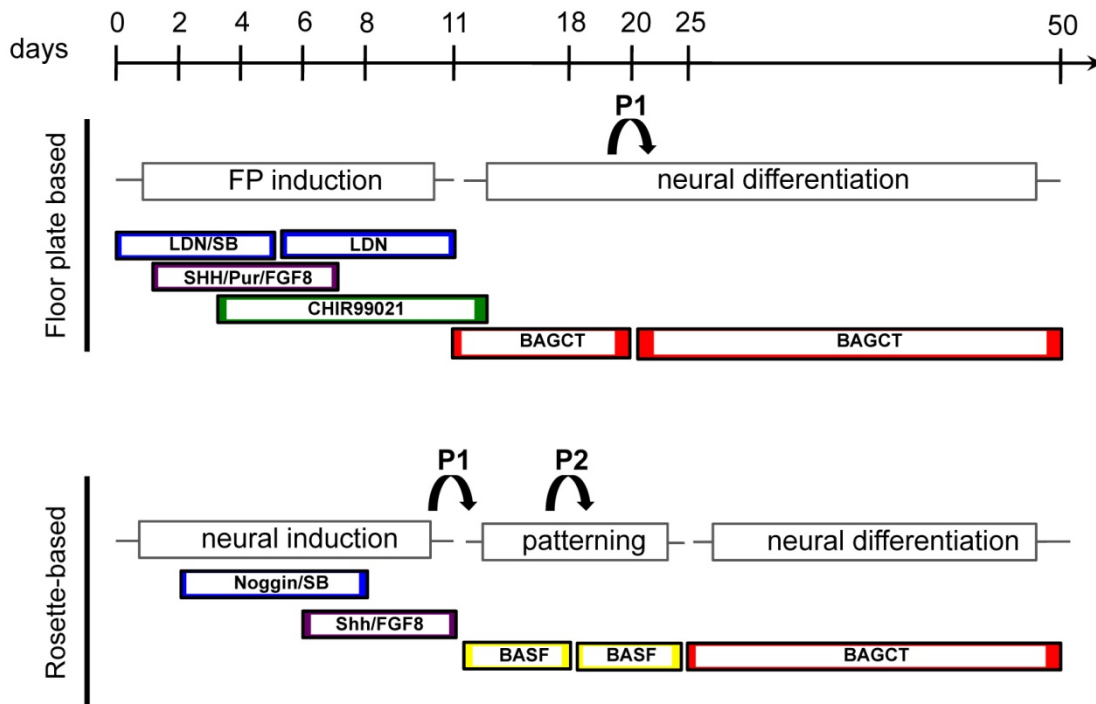
**Supplementary Figure 4: Analysis of genes differentially expressed in LSB/S/F8/CHIR treated versus LSB and LSB/S/F8 treated cultures at days 11 and 25 of differentiation.**

a) Hierarchical clustering of the global gene expression data obtained from all three conditions at days 0, 1, 3, 5, 7, 11 and 13 (samples were assessed in triplicates for each condition and each day). b) Gene enrichment analysis according to GO classes using DAVID; <http://david.abcc.ncifcrf.gov><sup>18</sup>. Comparisons at day 11 reveal enrichment for both SHH and WNT signaling in LSB/S/F8/CHIR condition in agreement with CHIR99021 mediated activation of canonical WNT signaling. Alternative cell fates such as “forebrain development” and “diencephalon” as well as “homeobox” are other GO terms highly enriched at days 11 and 25. c) Online validation using the Allen gene human expression data base (<http://human.brain-map.org>) for candidate markers enriched in midbrain DA neuron condition (LSB/S/F8/CHIR). TTF3, EBF1, EBF3 and TTR are expressed based on available human brain region specific microarray data. TTR, a classic transcriptional target of FOXA2 is only weakly expressed in adult substantia nigra, suggesting that its main role may be during development or that SHH treatment may cause artificially high TTR expression levels during *in vitro* differentiation.



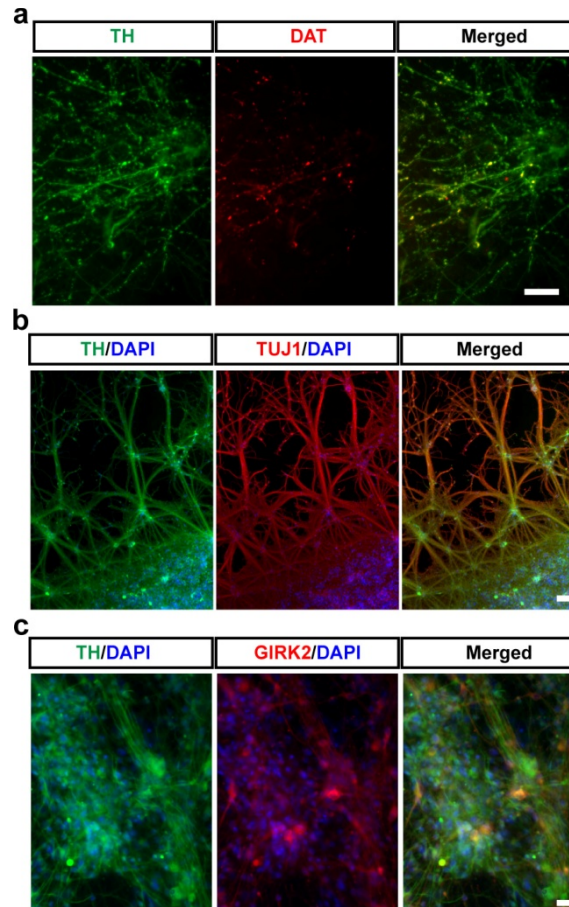
**Supplementary Figure 5: Validation of floor plate induction and midbrain DA neuron differentiation protocol in representative independent hESC and hiPSC lines.**

Data from the hESC line H1 and the hiPSC lines 2C6<sup>27</sup> (from a sporadic PD patient) and SeV6 (Sendai-based, integration-free) are presented. The FP based protocol described in **Figure 1d** and **Supplementary Figure 6**, was used followed by analysis of FOXA2 (red) expression at day 11 and TH(green)/FOXA2(red) at day 25 of differentiation.



**Supplementary Figure 6: Schematic summary of the differentiation conditions used for floor plate-derived and rosette-derived DA neuron cultures.**

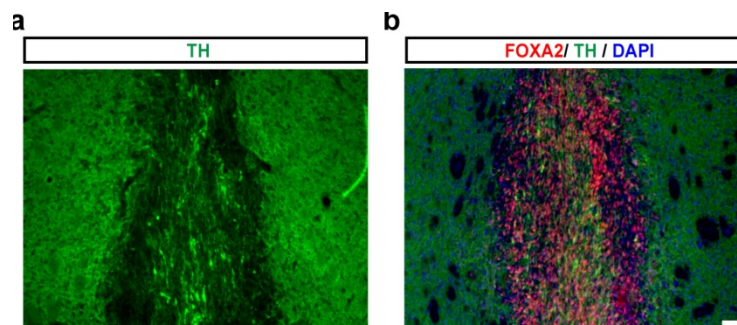
Both protocols used dual-SMAD inhibition<sup>13</sup> to accelerate neural fate acquisition. LDN was used for BMP inhibition in the FP protocol while the traditional noggin induction was used for rosette cultures. The abbreviations are: LDN: LDN193189, SB: SB431542, SHH (purmorphamine + SHH C25II), BAGCT<sup>2</sup>: BDNF + ascorbic acid + GDNF + dbcAMP + TGFβ3. SHH/FGF8 in the rosette protocol used SHH C25I alone in the absence of Purmorphamine following the initial recommendation for patterning of rosette-derived DA neuron cultures. Note: Purmorphamine treatment at rosette stage shows toxicity at concentration suitable for patterning FP cells. BASF: BDNF + ascorbic acid + SHH/FGF8.



**Supplementary Figure 7: *In vitro* maturation of floor plate-derived DA neuron cultures.**

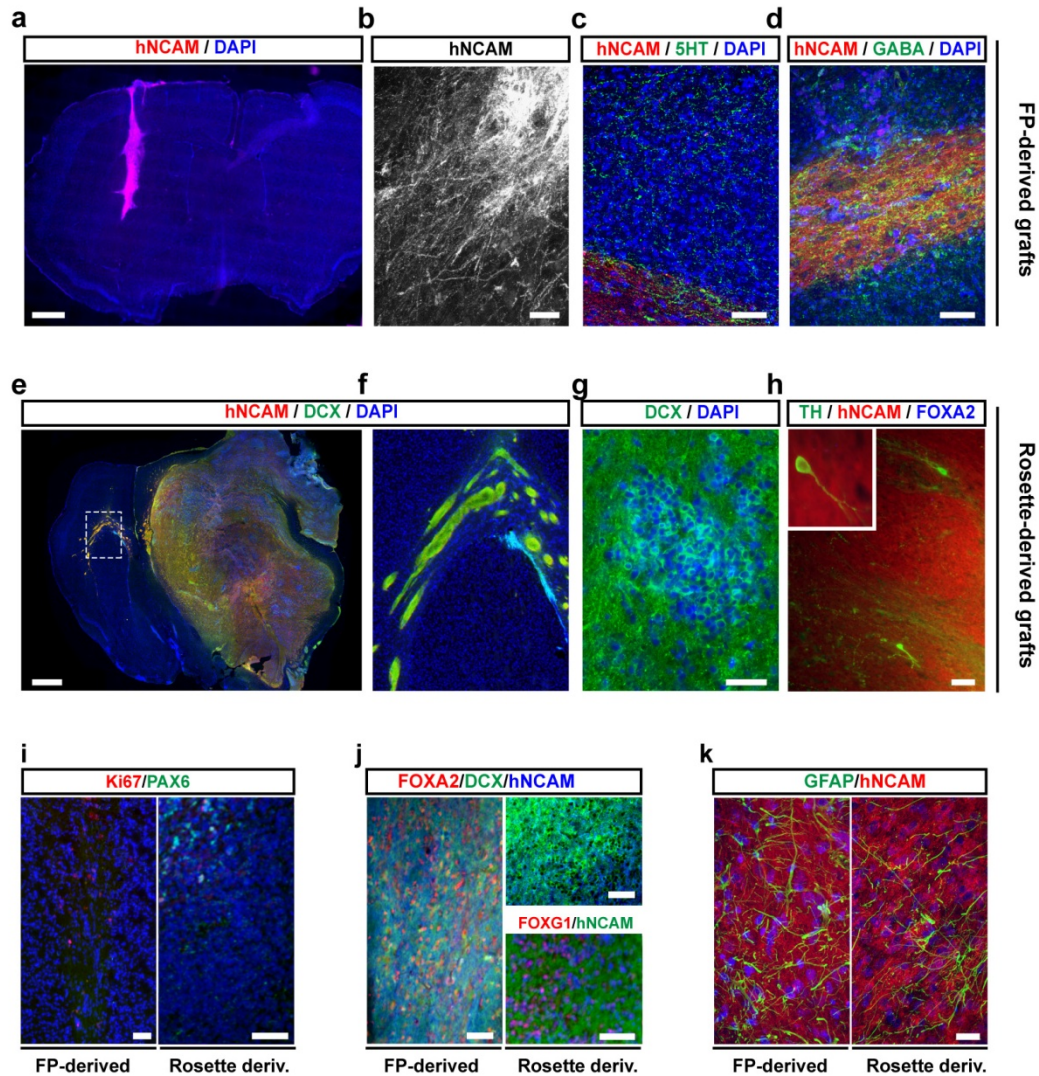
**a)** Immunocytochemical analysis of FP-derived TH neurons (green) for DAT expression (red; day 80). **b)** Extensive Tuj1+ (red) fiber tracts were observed by day 60 of differentiation extending over distances of > 2 mm. **c)** At day 80 of differentiation, co-expression of GIRK2 (red) in TH+ neurons (green). Scale bars correspond to 20  $\mu$ m in (a) 100  $\mu$ m in (b) and 20  $\mu$ m in (c)





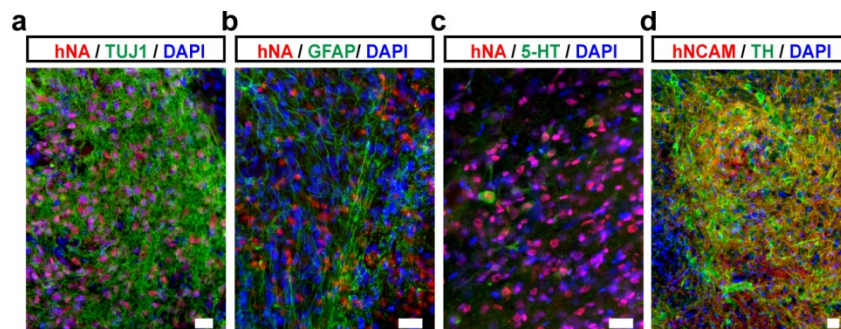
**Supplementary Figure 8: Immunohistochemical analysis of short-term (6 weeks) *in vivo* survival studies in adult intact (unlesioned) mouse striatum (*NOD-SCID IL2Rgc* null strain).**

**a,b)** Analysis of FP derived grafts (day 25 cells;  $150 \times 10^3$  cells/animal). **a)** Representative image of graft core showing TH+ cells surrounded by TH+ host fibers. An average of 6,200 TH+ cells (n=3) were present in the graft at 6 weeks after transplantation. **b)** FOXA2 expressing cells (red) were only found in the graft but not in the surrounding host striatum demonstrating graft origin and midbrain identity of the cells. Nearly all TH+ neurons (green) co-expressed FOXA2 (red). However, a considerable proportion of FOXA2+ cells did not co-express TH suggesting that these cells have not yet acquired a mature DA phenotype or represent another FOXA2+ neuronal population negative for DA neuron markers. Scale bars correspond to 50  $\mu\text{m}$ .

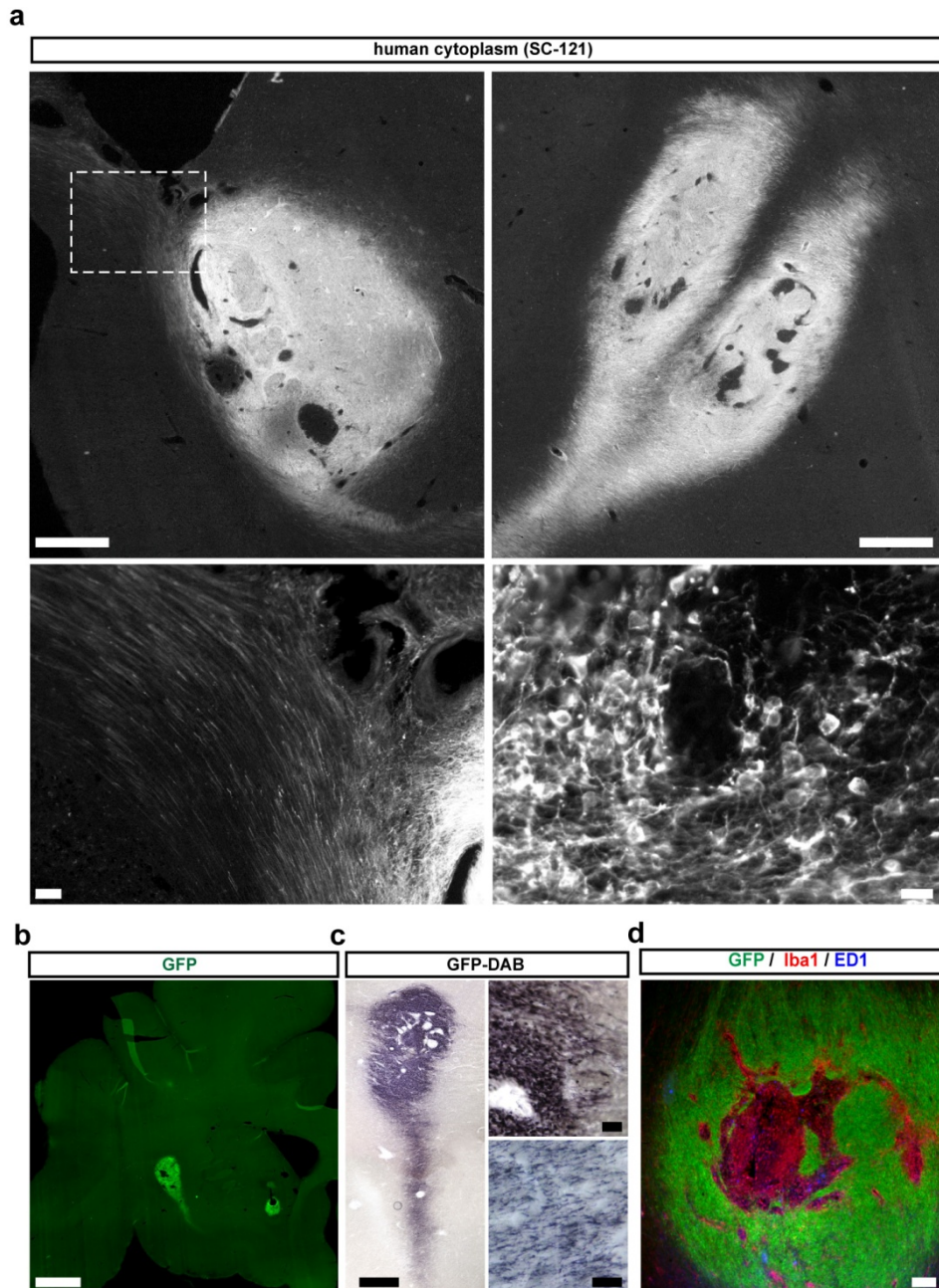


**Supplementary Figure 9: Histological analysis of long-term (4.5 months) grafted 6-OHDA lesioned mice (*NOD-SCID IL2Rgc* null strain) comparing behavior of floor plate- versus rosette-derived grafts. **a-d)** Analysis of FP-derived grafts. **a)** Example of one of the largest FP-derived grafts. The graft retains a well circumscribed hNCAM+ (red) cytoarchitecture. **b)** Robust hNCAM+ fiber outgrowth was observed at graft periphery. **c)** Serotonergic (5-HT+) fibers (green) in graft are largely negative for hNCAM (red) suggesting host origin. **d)** GABAergic neurons and fibers (green) in graft. **e-h)** Analysis of rosette-derived grafts: **e)** Neural overgrowth with compression of host brain tissue. The majority of cells were positive for both NCAM (red) and DCX (green) suggesting neuronal fate. **f)** NCAM+/DCX+ fibers extended to the non-transplanted contra-lateral side of the brain. **g)** Within the graft core we observed multiple DCX+ clusters. **h)** Only very few TH+ cells (green) and fibers were observed at graft periphery and**

nearly all rosette-derived TH<sup>+</sup> cells *in vivo* were negative for FOXA2 (blue). **i-k**) Immunohistochemical analysis of FP-derived versus rosette-derived grafts at 4.5 months. Representative images are presented for expression of the proliferation marker Ki67 (red) and the neural precursor marker PAX6 (green) (**i**), expression of FOXA2/DCX (**j**), FOXP1/hNCAM (**j**, inset), and the astrocytes marker GFAP (green) (**k**). Scale bars correspond to 500  $\mu\text{m}$  in (**a**), 50  $\mu\text{m}$  in (**b-d**), to 500  $\mu\text{m}$  in (**e**), 50  $\mu\text{m}$  in (**g-h**), 50  $\mu\text{m}$  in (**i**), 40  $\mu\text{m}$  in (**j**) and 20  $\mu\text{m}$  in (**k**).



**Supplementary Figure 10: Histological analysis of long-term (5 months) grafted 6-OHDA lesioned SD rats.** **a)** The large majority of hNA<sup>+</sup> (red) cells expressed Tuj1 (green) indicating neuronal fate identity. **b)** GFAP<sup>+</sup> fibers (green) within the graft did not co-express hNA (red) suggesting host origin. **c)** A few human serotonergic (5-HT<sup>+</sup>) cell bodies (green) were observed while most serotonergic fibers were host-derived similar to the data in mouse host (**Supplementary Figure 9C**). **d)** Additional example of TH<sup>+</sup> neurons (green) within graft characterized for expression of hNCAM (red) to confirm human identity of cells in host brain. Scale bars correspond to 25  $\mu$ m in all panels.



**Supplementary Figure 11: Histological analysis of floor plate-derived grafts in primate brain.** FP-derived DA neurons derived from H9 hESCs and from H9-GFP hESCs (day 25 cultures;  $1.25 \times 10^6$  cells/tract, 3 tracts/per hemisphere, 6 tracts in total) were grafted into the striatum of adult MPTP lesioned rhesus monkeys (=2). **a** Upper left and right panels: High resolution image reconstructions of representative graft sites (1 month after transplantation). Graft cytoarchitecture is illustrated by immunohistochemistry for the human specific marker SC-121 (no cross-reactivity with non-human primate tissues). Lower left panel: SC-121+ fibers extending

from graft core. Lower right panel: Higher resolution image of SC-121+ cells showing neuronal precursor morphologies. **b**) Analysis of GFP expression in graft cores further confirmed human identity of the cells complementing the SC-121 data. Note: For both animals, one hemisphere each was grafted with unmarked H9 derived cells while the other hemisphere received cells derived from H9-GFP cells (expression of GFP under control of EF1a promoter<sup>38</sup>). **c**) Higher resolution image of the GFP+ graft using DAB detection showing numerous GFP+ cells at graft periphery exhibiting neuroblast morphology. **d**) Immunohistochemical analyses of areas in the graft core negative for GFP and SC-121. These areas contained large numbers of host microglia based on Iba1 expression (red) as well as few ED1+ macrophages (blue), suggesting persistent inflammation despite cyclosporine immunosuppression. Scale bars correspond to 500  $\mu\text{m}$  in (**a**, top panel), 50  $\mu\text{m}$  in (**a**, lower left panel), 20  $\mu\text{m}$  in (**a**, lower right panel), 2mm in (**b**), 500  $\mu\text{m}$  in (**c**, left panel), 50  $\mu\text{m}$  (**c**, upper right panel), 100  $\mu\text{m}$  (**c**, lower right panel), 100  $\mu\text{m}$  (**d**).

## **Supplementary Table 1**

Column #	Column ID	Fold-Change	p-value
7304	FOXA1	22.5512	5.03E-16
7305	FOXA2	17.3328	5.70E-17
31270	SPON1	16.4393	2.14E-14
31684	SYT4	13.2693	9.61E-12
4334	COL22A1	8.54042	2.05E-17
6616	FBLN1	8.24162	4.97E-18
32035	TFF3	8.01805	1.08E-13
5324	DKK1	7.95664	1.19E-09
3244	CAPN6	7.58928	1.77E-08
2544	C20ORF56	7.58575	6.71E-15
27591	PKDCC	7.42271	2.02E-11
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5037	DDC	5.19301	2.09E-08
13598	LDB2	4.76303	2.92E-09
723	AMOT	4.58838	5.68E-08
4978	DBX1	4.40946	2.36E-09
31138	SOX8	4.32227	9.29E-08
30193	SILV	4.3198	2.52E-07
30148	SHISA2	4.31109	1.60E-07
31509	STK39	3.65624	2.90E-06
27661	PLCL2	3.63607	6.81E-11
24425	MGST1	3.59223	2.48E-11
32945	TSPAN7	3.57361	7.36E-07
29082	RHOU	3.51768	5.89E-06
9283	HS.19193	3.49663	6.24E-13
5478	DOCK10	3.43476	8.18E-07
25094	MMP11	3.40705	2.13E-08
29975	SERPINF1	3.36169	1.97E-10
29042	RGS4	3.33544	7.01E-06
926	APCDD1	3.33059	3.47E-10
12640	IRX3	3.32454	1.65E-05
26837	OSBPL10	3.3051	9.55E-07
32086	THBS4	3.29135	9.77E-07

14581	LOC100130506	3.1293	5.81E-09
4931	DAB2	3.02851	4.80E-09
12642	IRX5	2.95938	2.73E-08
13774	LMX1A	2.81057	1.42E-06
31516	STOM	2.76317	2.01E-07
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8210	GSC	2.75053	3.47E-07
26170	NRCAM	2.71264	1.82E-08
28414	PTCH1	2.63379	2.99E-08
31578	SULF2	2.59351	1.42E-07
7366	FREM1	2.5697	2.25E-07
13743	LITAF	2.55681	3.65E-08
26236	NTNG1	2.55383	1.78E-07
25869	NEUROG2	2.55012	5.05E-06
26132	NPY	2.54575	4.48E-06
25967	NKX2-1	2.52195	0.00023
27101	PCDH18	2.46481	1.69E-05
32557	TNFRSF19	2.45297	4.06E-08
5759	EFEMP1	2.44308	7.78E-09
31148	SP5	2.43459	5.34E-06
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30313	SLC20A2	2.40457	1.24E-06
30743	SNHG4	2.35277	8.69E-08
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25520	MYL4	2.3327	3.93E-08
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26006	NMD3	2.29039	3.18E-05
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19975	LOC646966	2.26444	6.23E-05
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6161	EYA2	2.23175	0.00024
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2764	C4ORF14	2.22128	5.73E-06
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30746	SNHG7	2.18224	4.35E-07
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30283	SLC16A3	2.16541	6.06E-05
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32180	TLE6	2.16433	6.35E-07
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30933	SNORD25	2.15953	0.000363
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20837	LOC649946	2.14098	8.39E-05
25756	NCRNA00219	2.12543	6.42E-07
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11495	HS.570308	2.08044	1.67E-06
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12635	IRS1	2.06435	0.000109
20404	LOC648343	2.05497	0.000791
29352	RPL15	2.05205	2.82E-06
33800	WNT5A	2.03874	1.08E-06
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22500	LOC728126	2.0183	1.16E-06
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12718	ITPR3	2.01384	1.67E-05
4004	CHN2	2.00649	7.18E-06

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482	ADSS	2.00282	0.000136
2196	C17ORF45	2.00241	6.15E-05
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27915	POU3F2	-2.00877	2.04E-07
23143	LOC729779	-2.01527	0.000972
23972	MAP1LC3A	-2.01892	3.37E-06
7611	GAS6	-2.02463	9.63E-08
17062	LOC399959	-2.02793	2.39E-05
29519	RSPO3	-2.03762	1.61E-05
29038	RGS20	-2.04076	3.60E-09
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1227	ASNS	-2.10169	8.03E-05
33804	WNT7B	-2.1052	3.00E-08
24064	MARS	-2.107	0.000146
33725	WDR72	-2.11201	0.000617
31295	SPRY1	-2.12339	2.43E-05
7495	GABARAPL1	-2.12367	1.70E-05
4331	COL1A2	-2.12521	1.97E-05
6821	FILIP1	-2.1288	0.00026

24246	METR	-2.13118	1.99E-05
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12980	KIAA0367	-2.15304	1.92E-05
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34064	ZFHX4	-2.23036	0.00046
28787	RASL11B	-2.23056	0.000115
5632	DUSP6	-2.23366	0.000732
3149	CACHD1	-2.23514	5.39E-05
3221	CAMKV	-2.25983	5.01E-08
7248	FLNC	-2.26856	1.13E-05
28307	PRSS8	-2.28456	1.35E-05
12662	ISYNA1	-2.29255	1.40E-05
7524	GADD45A	-2.2962	7.46E-07
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33806	WNT8B	-2.34155	3.96E-08
31388	SST	-2.34663	1.83E-06
3188	CALCB	-2.34833	3.49E-06
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31747	TAGLN	-2.36809	2.16E-05
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33801	WNT5B	-2.3794	3.01E-08
28590	RAB11FIP1	-2.40833	6.65E-07
23362	LOC730525	-2.41129	1.59E-06

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7000	FLJ32310	-2.42179	5.77E-06
3339	CBX4	-2.43314	1.13E-07
6073	ERRFI1	-2.44539	1.44E-05
32521	TMSB15A	-2.45505	1.31E-05
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26777	OR7E156P	-2.64884	3.51E-07
24377	MGC39900	-2.66479	1.46E-05
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27726	PLP1	-2.69279	9.13E-07
4350	COL4A6	-2.69704	1.17E-07
4320	COL11A1	-2.71039	1.79E-09
3127	CA2	-2.71276	2.35E-08
26151	NR2E1	-2.72059	4.25E-14
31267	SPOCK1	-2.7283	3.38E-05
13744	LIX1	-2.73818	9.34E-06
32038	TFPI	-2.77685	6.23E-05
32776	TRIM24	-2.79151	8.73E-08
32756	TRH	-2.79963	3.98E-07
32652	TOX3	-2.81075	9.35E-06
2405	C1ORF21	-2.81457	9.49E-09
5371	DMRT3	-2.82614	4.28E-09
32381	TMEM2	-2.83489	1.83E-05

2437	C1ORF61	-2.85324	3.53E-09
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1178	ARX	-2.87861	0.000122
26245	NUAK2	-2.95666	4.14E-08
33796	WNT2B	-2.96258	1.15E-10
28507	PTRF	-2.97439	2.07E-07
7662	GCNT1	-2.98108	1.49E-06
5930	EMP1	-2.9918	1.11E-06
31844	TBC1D9	-3.00324	2.53E-09
4352	COL5A2	-3.02084	1.26E-07
4699	CTNNA2	-3.04046	6.91E-09
2516	C20ORF177	-3.04277	4.86E-08
3518	CCL2	-3.04332	9.50E-11
34315	ZNF385B	-3.05084	5.56E-07
12058	HS.7023	-3.0642	3.72E-08
23661	LRIG1	-3.07681	3.30E-07
7813	GLI3	-3.07936	1.22E-08
31513	STMN2	-3.09098	4.93E-06
30023	SFRP1	-3.09686	1.13E-06
1128	ARMCX2	-3.09746	2.91E-06
4689	CTGF	-3.11416	4.47E-08
6365	FAM181A	-3.1422	2.56E-09
4121	CLDN1	-3.15492	1.93E-06
627	ALDH1A1	-3.15745	1.18E-12
629	ALDH1A3	-3.17887	4.46E-13
33501	VAT1L	-3.18253	1.21E-06
4912	CYR61	-3.18856	3.58E-07
12781	KANK4	-3.20054	7.99E-12
3067	C9ORF171	-3.24146	3.73E-11
12363	IGFBP3	-3.34999	1.02E-06
4533	CRIP1	-3.45501	6.62E-08
3740	CDH11	-3.48609	2.23E-08
816	ANKRD38	-3.48622	6.93E-12
12730	JAG1	-3.58463	3.83E-08
12271	ID4	-3.72402	1.78E-12
810	ANKRD34B	-3.76606	1.15E-11

12850	KCNJ13	-3.81092	2.16E-09
6112	ETV5	-3.81591	4.37E-10
9265	HS.181245	-3.86611	1.24E-09
633	ALDH2	-3.87108	1.97E-09
26180	NRIP3	-3.92066	6.08E-08
30413	SLC2A1	-4.11899	1.18E-05
5479	DOCK11	-4.35251	5.67E-09
25658	NAV1	-4.35259	1.02E-10
5349	DLL1	-4.47474	1.58E-07
34418	ZNF533	-4.49025	1.16E-09
327	ACTC1	-4.63509	7.37E-09
1037	ARHGAP15	-4.67561	9.89E-10
31132	SOX3	-4.72958	7.45E-09
26153	NR2F1	-4.73849	1.53E-09
3129	CA4	-4.7904	3.00E-09
33071	TTYH1	-4.79045	8.94E-14
5766	EFHD1	-4.86615	1.16E-09
867	ANXA1	-4.95401	1.41E-08
8500	HES4	-5.24189	1.63E-11
4299	CNTNAP2	-6.14001	2.94E-08
23947	MAMDC2	-6.36522	2.23E-10
7605	GAS1	-6.38074	2.63E-11
31151	SP8	-8.88965	4.42E-20
30024	SFRP2	-9.73482	4.24E-14
13677	LHX2	-10.9076	6.16E-11
5939	EMX2	-11.5085	1.34E-19
21068	LOC650757	-12.1496	7.71E-20
27068	PAX6	-15.7636	2.24E-22
5554	DRD4	-17.3929	3.17E-16
26065	NOS2A	-20.0139	2.83E-16
1501	BARHL1	-20.6077	2.59E-14
26064	NOS2	-25.1751	7.45E-17
8501	HES5	-38.4549	8.90E-22

**Supplementary Table 1:** Gene expression array data of significantly up-regulated and down-regulated genes at differentiation day 11 in SHH/FGF8/Chir treated Floor-plate based population over control LSB treated population



## **Supplementary Table 2**

Column #	Probeset ID	Fold-Change	p-value
31575	SYT4	14.8775	3.24E-12
7195	FOXA1	11.8929	2.65E-13
4225	COL22A1	8.26361	3.21E-17
5215	DKK1	6.39507	1.32E-08
7956	GPR177	5.98201	5.65E-12
13508	LEF1	5.07514	2.45E-11
2435	C20ORF56	5.02955	2.71E-12
4928	DDC	5.0147	3.23E-08
11952	HS.71947	4.81098	5.13E-09
13665	LMX1A	4.7485	3.59E-10
12427	INHBE	4.72434	3.41E-07
32562	TPBG	4.63162	1.44E-09
1152	ATF5	4.48583	0.000153048
5369	DOCK10	4.23427	4.29E-08
31414	STOX1	4.20695	3.94E-10
4869	DBX1	4.17519	5.31E-09
31977	THBS4	4.13195	3.66E-08
2694	C5ORF13	4.0095	7.84E-10
31469	SULF2	3.83814	8.51E-11
31468	SULF1	3.81974	3.96E-07
34285	ZNF503	3.81092	2.76E-08
12531	IRX3	3.73598	3.93E-06
4935	DDIT4	3.73152	3.78E-05
31369	STC2	3.70632	8.48E-08
27482	PKDCC	3.69823	2.20E-07
4257	COLEC12	3.6503	5.20E-06
31926	TFF3	3.62059	1.12E-08
25244	MSX1	3.60243	0.000146141
23475	LOC91461	3.58231	2.08E-06
26777	OTX2	3.47814	3.97E-09
13489	LDB2	3.44124	3.22E-07
13657	LMO3	3.29197	2.61E-12
817	APCDD1	3.21277	6.95E-10
4822	DAB2	3.18324	1.84E-09



25760	NEUROG2	3.16851	1.30E-07
31101	SPATS2L	3.15744	2.80E-06
1311	AXIN2	3.13274	1.80E-06
32448	TNFRSF19	3.11104	2.48E-10
4934	DDIT3	3.08248	4.83E-05
26776	OTX1	3.05293	6.14E-06
28360	PTPN13	3.03567	5.18E-06
994	ARL4A	2.98803	1.45E-07
26728	OSBPL10	2.94508	5.19E-06
32836	TSPAN7	2.86094	1.65E-05
5665	EFNB2	2.78085	0.000222563
8101	GSC	2.75066	3.46E-07
6426	FAM84B	2.74213	7.89E-07
29866	SERPINF1	2.73192	1.26E-08
924	ARHGAP10	2.72522	3.36E-07
31039	SP5	2.68162	9.57E-07
28210	PSAT1	2.64735	9.82E-06
28933	RGS4	2.6312	0.000148375
13547	LGI1	2.61567	1.30E-06
7369	FZD7	2.61404	2.46E-06
25351	MUSTN1	2.55841	4.85E-07
25411	MYL4	2.55345	4.77E-09
28424	PVRL3	2.55083	1.04E-07
299	ADAMTS9	2.53131	2.88E-08
1555	BMP4	2.52708	9.40E-05
31161	SPON1	2.5133	0.000145864
26265	ODZ4	2.50312	1.46E-05
33730	XBP1	2.50164	1.72E-06
28766	RBP1	2.49237	6.12E-05
12533	IRX5	2.48929	7.43E-07
1118	ASNS	2.47416	4.50E-06
2770	C6ORF160	2.40219	3.58E-05
12337	IL1RAPL1	2.40145	3.15E-06
12526	IRS1	2.3994	7.70E-06
7221	FOXJ1	2.39492	8.89E-05
28647	RARB	2.37013	9.11E-09

14472	LOC100130506	2.36331	1.36E-06
3979	CITED2	2.36201	2.92E-05
31430	STT3B	2.34069	1.29E-05
26023	NPY	2.3346	1.98E-05
6052	EYA2	2.3192	0.000136915
26991	PCDH17	2.31776	8.71E-05
26127	NTNG1	2.31615	1.30E-06
373	ADSS	2.29099	1.20E-05
6120	FAM107A	2.26256	0.000677009
28387	PTPRM	2.25934	1.41E-05
31572	SYT17	2.257	7.10E-05
7143	FLRT2	2.24042	1.35E-07
32372	TMEM88	2.2394	4.55E-05
27552	PLCL2	2.23488	1.24E-06
5681	EGLN3	2.23059	0.000841858
3837	CHAC1	2.22744	2.61E-05
26045	NR2F2	2.21836	1.71E-05
7196	FOXA2	2.21691	8.01E-05
12950	KIAA1324L	2.18683	6.09E-05
3667	CDK6	2.1717	0.00076066
9540	HS.36053	2.15618	5.44E-07
19012	LOC644860	2.15508	7.00E-06
4366	CPNE8	2.15418	9.80E-06
4936	DDIT4L	2.14147	0.000195501
29691	SDCBP	2.13721	3.10E-05
7144	FLRT3	2.11969	0.00033768
5851	ENPP2	2.10048	0.000485738
1558	BMP7	2.0876	0.000718573
23514	LPAR4	2.08062	1.96E-06
23554	LRIG3	2.07935	1.81E-06
5964	ERRFI1	2.07249	0.000220066
3623	CDCA7	2.07177	0.000280326
30635	SNHG5	2.0594	4.95E-06
32620	TRAM2	2.04784	0.000111169
12809	KCTD6	2.04602	0.000114945
28901	RGL1	2.04043	0.000167278

30628	SNHG1	2.03706	0.000252445
27947	PPPDE1	2.02017	2.69E-05
5434	DPYSL3	-2.00257	0.000139976
23863	MAP1LC3A	-2.00377	4.01E-06
24226	MGC18216	-2.01184	0.000204988
4818	D4S234E	-2.01244	8.77E-05
4825	DACH2	-2.01277	8.71E-07
4386	CPXM2	-2.02106	2.02E-05
32224	TMEM169	-2.02651	0.000222019
151	ACBD7	-2.03074	6.94E-05
8643	HOOK1	-2.03984	1.85E-05
4278	COPG2IT1	-2.04004	8.62E-07
32981	TUBB3	-2.04044	0.000989413
5887	EPHA1	-2.05082	1.41E-06
28929	RGS20	-2.06283	2.60E-09
28068	PRKCH	-2.06869	4.13E-06
33539	WBP2	-2.0692	0.000157614
23711	LY6E	-2.07026	8.93E-05
29803	SEPP1	-2.08034	2.48E-05
12713	KCND2	-2.08768	1.63E-08
34309	ZNF533	-2.08871	0.000231468
14009	LOC100129034	-2.09106	4.54E-07
25915	NMU	-2.09244	0.000184692
24132	MEST	-2.09269	2.92E-06
2715	C5ORF41	-2.09563	1.42E-05
27778	PON2	-2.09758	1.79E-05
24105	MEG3	-2.10214	5.69E-07
31812	TCF7L2	-2.10261	0.000153698
33783	YBX2	-2.1118	6.90E-06
28329	PTGIS	-2.11465	9.61E-06
6694	FHDC1	-2.11553	8.86E-06
24175	MFNG	-2.11579	2.95E-05
6640	FEZ1	-2.11631	2.58E-06
2407	C20ORF177	-2.12232	3.62E-05
26783	OVOL2	-2.12627	3.53E-07
28883	RFTN2	-2.13498	7.25E-08

19038	LOC644919	-2.13675	2.95E-06
30004	SH3BP4	-2.13785	0.000314453
31020	SOX2	-2.14642	0.000107169
16268	LOC284422	-2.16056	1.07E-05
4819	DAAM1	-2.16701	3.85E-05
32404	TMPRSS2	-2.1693	6.26E-07
26668	OR7E156P	-2.17193	1.53E-05
12609	ITPR3	-2.18226	3.09E-06
6372	FAM65B	-2.18271	1.37E-06
12635	JARID2	-2.18541	4.46E-05
25024	MOBK2B	-2.19737	5.45E-05
31567	SYT13	-2.19832	2.30E-05
25658	NDRG1	-2.20101	5.25E-07
24318	MGST3	-2.20252	3.24E-07
2147	C18ORF26	-2.2117	2.55E-06
31010	SOSTDC1	-2.21381	2.23E-08
4662	CXCL14	-2.21955	1.81E-08
33161	UCA1	-2.21966	2.19E-05
12176	IER3	-2.21992	2.75E-06
7171	FNBP1	-2.23104	1.98E-05
12199	IFITM3	-2.23167	4.22E-06
25635	NCRNA00153	-2.24173	2.01E-05
27531	PLAC9	-2.24346	9.11E-08
25743	NES	-2.2469	3.16E-06
31405	STMN3	-2.25856	0.000796798
7536	GCA	-2.27697	1.34E-05
12275	IGSF3	-2.28535	4.08E-06
17038	LOC401056	-2.2854	2.45E-09
4533	CSRP2	-2.28899	0.000244001
31606	TACSTD1	-2.28933	0.000115538
29372	RRAGD	-2.29258	0.000537359
5884	EPCAM	-2.29475	0.00099285
28398	PTRF	-2.29476	1.92E-05
12672	KANK4	-2.29735	1.73E-08
3505	CD200R1	-2.30795	3.06E-14
33264	UPK2	-2.30847	1.37E-10

8911	HS.130036	-2.31161	3.95E-05
24978	MMD	-2.317	1.46E-05
6002	ETV4	-2.32842	6.04E-09
27655	PMP22	-2.33585	4.94E-12
5657	EFHD1	-2.33997	7.47E-05
31186	SPRY1	-2.34859	3.56E-06
3631	CDH11	-2.35006	1.77E-05
29555	SAT1	-2.35602	2.21E-05
33268	UPP1	-2.36162	5.38E-08
1968	C14ORF4	-2.36739	2.59E-06
9512	HS.34447	-2.37168	7.49E-08
16243	LOC283953	-2.38022	4.57E-07
3203	CAV2	-2.38208	1.09E-11
26223	NYNRIN	-2.40311	1.90E-05
22623	LOC728715	-2.41353	0.000504831
25084	MPPED2	-2.42024	6.42E-10
13403	LAMC2	-2.42245	5.32E-10
25083	MPPED1	-2.42332	3.73E-14
13402	LAMC1	-2.43845	7.40E-05
15722	LOC100134265	-2.44777	4.60E-06
5836	ENC1	-2.45175	1.84E-05
244	ACVR2A	-2.46307	1.87E-06
33616	WDR72	-2.46656	6.61E-05
28509	RAB31	-2.47199	1.57E-06
3629	CDH1	-2.4799	3.05E-06
28905	RGMA	-2.50113	4.45E-06
29475	S100A11	-2.50568	3.24E-06
8259	HAPLN1	-2.50809	7.14E-07
3942	CHST7	-2.51075	9.78E-08
12543	ISL1	-2.51716	2.76E-10
28305	PTCH1	-2.52418	7.32E-08
32541	TOX	-2.5288	5.34E-09
6067	F2RL1	-2.54309	2.36E-08
32334	TMEM54	-2.57701	2.04E-06
3436	CCND1	-2.58061	6.72E-05
707	ANKRD38	-2.58621	4.12E-09

5241	DLL3	-2.5911	8.77E-08
33424	VGf	-2.59836	0.000406676
23253	LOC730525	-2.61609	3.32E-07
31368	STC1	-2.63136	1.20E-05
31910	TFAP2C	-2.63773	4.72E-08
25012	MN1	-2.6469	8.33E-08
28419	PVALB	-2.67012	1.23E-10
6960	FLJ37644	-2.67066	1.78E-12
7417	GADD45G	-2.68804	2.14E-06
4709	CXXC4	-2.68958	5.39E-07
8050	GRHL3	-2.73097	4.15E-11
23990	MBIP	-2.73995	9.29E-07
5418	DPPA4	-2.75778	5.66E-08
32212	TMEM158	-2.77503	9.30E-06
5896	EPHB1	-2.77518	2.29E-06
31404	STMN2	-2.79651	2.03E-05
12454	INSM1	-2.81526	1.15E-09
13142	KLHL24	-2.81638	2.31E-07
9856	HS.475334	-2.82304	1.09E-05
33125	UBL3	-2.85607	2.77E-08
13655	LMO1	-2.90621	4.10E-06
6003	ETV5	-2.90987	5.54E-08
966	ARHGEF6	-2.92751	9.82E-11
31187	SPRY2	-2.94814	6.74E-09
28501	RAB25	-2.97139	5.77E-07
4675	CXCR7	-2.9864	6.13E-07
32652	TRIB2	-2.99455	8.47E-08
28397	PTPRZ1	-3.02099	8.00E-08
31158	SPOCK1	-3.02198	8.12E-06
25849	NKD2	-3.02555	4.12E-11
25471	MYT1	-3.03712	6.21E-09
6856	FLJ25404	-3.03813	1.95E-08
30304	SLC2A1	-3.05478	0.000275534
12256	IGFBP5	-3.06686	2.00E-06
23779	MAF	-3.07491	2.81E-08
28198	PRSS8	-3.08336	6.31E-08

9923	HS.509165	-3.09539	2.57E-07
4243	COL5A2	-3.10066	8.01E-08
3112	CAMKV	-3.10668	3.37E-11
29915	SFRP2	-3.13051	3.42E-07
13092	KIT	-3.13441	8.27E-12
6684	FGFR3	-3.13726	7.73E-09
8646	HOPX	-3.15424	1.07E-14
29497	S1PR3	-3.15587	8.43E-07
33399	VCAM1	-3.15952	2.02E-10
5240	DLL1	-3.18075	1.28E-05
28112	PRODH	-3.18595	2.33E-07
23200	LOC730278	-3.27115	1.92E-07
1202	ATP1B2	-3.29446	2.34E-08
6720	FJX1	-3.3039	6.85E-07
3609	CDC42EP4	-3.33348	2.25E-09
12198	IFITM2	-3.35237	3.41E-11
3679	CDKN1C	-3.37225	1.15E-09
3202	CAV1	-3.37517	5.73E-13
31171	SPRED1	-3.42954	3.76E-08
30010	SH3GL3	-3.43813	3.73E-11
8335	HDC	-3.45787	1.51E-12
8391	HES4	-3.49495	1.00E-08
33335	USP44	-3.50303	6.22E-11
1101	ASCL1	-3.54534	1.26E-11
29945	SFTA3	-3.5611	1.59E-07
13619	LIPA	-3.56979	1.34E-08
27178	PDPN	-3.72978	5.33E-12
7370	FZD8	-3.74383	7.14E-09
3647	CDH3	-3.80687	3.54E-09
2759	C6ORF141	-3.94476	5.10E-08
13595	LIMCH1	-3.94759	2.52E-11
13513	LEMD1	-3.98954	6.68E-08
5961	ERP27	-4.02755	8.38E-13
29666	SCRG1	-4.03799	1.96E-17
7286	FRZB	-4.04927	2.19E-05
12977	KIAA1598	-4.04996	4.12E-09

2380	C20ORF100	-4.16273	2.94E-12
25866	NKX6-2	-4.17171	1.46E-10
31030	SOX9	-4.21749	9.69E-10
27805	POU3F1	-4.22404	1.53E-11
7879	GPC4	-4.23918	8.64E-08
17977	LOC642590	-4.36113	1.29E-10
19608	LOC646347	-4.53146	1.77E-08
5238	DLK1	-4.62809	8.12E-05
8401	HEY1	-4.68961	2.52E-12
30592	SMS	-4.74656	5.18E-12
29914	SFRP1	-4.84227	1.53E-09
13376	LITD1	-4.85832	6.96E-08
7984	GPR56	-4.87971	1.88E-13
7367	FZD5	-5.00247	2.43E-11
25858	NKX2-1	-5.06868	2.84E-08
7801	GNG8	-5.39693	2.22E-13
9156	HS.181245	-5.99308	1.43E-12
32962	TTYH1	-6.33607	1.00E-15
5523	DUSP6	-6.34711	8.15E-10
6091	FABP7	-6.56016	2.28E-09
5248	DLX5	-6.56829	8.74E-13
12754	KCNK12	-6.912	1.07E-12
30165	SLC15A3	-7.17663	1.60E-19
6675	FGF8	-7.58196	1.32E-18
31023	SOX3	-7.63996	1.53E-11
8395	HESX1	-8.28818	3.36E-10
28692	RAX	-8.87763	6.24E-12
20959	LOC650757	-9.74543	1.18E-18
14470	LOC100130502	-10.333	1.53E-10
13568	LHX2	-14.1638	4.81E-12
30111	SIX3	-15.019	8.24E-13
12197	IFITM1	-16.4704	9.16E-16
25859	NKX2-2	-18.6642	7.93E-20
12254	IGFBP3	-19.1294	8.81E-16
8392	HES5	-33.7356	2.69E-21
30114	SIX6	-39.4411	2.59E-18



**Supplementary Table 2:** Gene expression array data of significantly up-regulated and down-regulated genes at differentiation day 11 in SHH/FGF8/Chir treated Floor-plate based population over SHH/FGF8 only treated population.

### **Supplementary Table 3**

Column #	Column ID	Fold-Change	p-value
1209	ASCL1	33.085	1.60E-09
3978	CHGA	28.1727	4.44E-13
31604	STMN2	20.9978	1.47E-08
32159	TH	15.2965	2.12E-08
31606	STMN4	15.2102	3.72E-09
7685	GAP43	12.5729	5.42E-09
4926	D4S234E	10.7914	4.91E-08
8593	HES6	10.6527	2.94E-09
4342	COL3A1	10.0606	3.86E-06
12149	HS.7023	9.60731	3.97E-08
5691	EBF3	9.28771	5.13E-11
29820	SCG2	9.22584	1.02E-06
12655	INSM2	9.01409	3.73E-12
27988	POSTN	8.79262	1.09E-10
28590	PTPRO	8.70512	3.13E-10
30386	SLC17A6	8.22904	2.02E-06
31767	SYT13	8.1735	3.63E-07
30390	SLC18A1	8.15448	6.47E-15
5689	EBF1	8.05344	2.30E-06
5029	DCX	8.00552	8.30E-08
2470	C1QL1	7.47022	8.68E-10
12609	INA	6.92121	5.72E-07
26250	NR4A2	6.75723	1.27E-13
29624	RTN1	6.6247	6.52E-07
9374	HS.19193	6.58382	1.95E-08
436	ADCYAP1	6.49154	9.75E-11
1607	BEX2	6.33986	8.93E-09
34098	ZCCHC12	6.19663	9.95E-07
7056	FLJ25404	6.19296	2.14E-06
31605	STMN3	6.17605	8.77E-07
7997	GNG3	6.1196	1.26E-06
25922	NEFM	6.11347	2.51E-04
12359	ID2	6.07844	1.32E-06

29017	REEP1	6.04393	2.25E-06
30810	SNAP25	6.03677	3.62E-06
25671	MYT1	5.86419	8.19E-06
33297	UBE2J1	5.76887	6.22E-08
5349	DLL3	5.76451	4.92E-08
29133	RGS4	5.69761	1.87E-06
28123	PPP2R2B	5.56067	2.80E-08
27287	PCSK1N	5.43156	3.22E-09
32126	TFF3	5.26964	3.17E-08
27288	PCSK2	5.22877	9.14E-10
4533	CRIP2	5.18375	8.40E-08
12506	IL13RA2	5.1246	1.31E-06
32417	TMEM163	5.01765	7.55E-09
30813	SNAP91	4.92061	4.28E-05
13260	KIF5C	4.86241	2.93E-06
15798	LOC100133923	4.83074	3.74E-07
32412	TMEM158	4.76646	4.81E-06
3770	CDK5R1	4.75524	1.18E-05
5739	EEF1A2	4.75232	9.53E-05
32697	TNRC4	4.75179	1.29E-05
5455	DNER	4.71709	1.52E-05
6700	FAT3	4.68785	1.91E-06
6197	ETS2	4.67343	1.08E-10
25753	NBEA	4.65265	6.99E-07
12944	KCNJ16	4.53077	3.54E-12
3979	CHGB	4.52218	7.76E-05
25562	MXD4	4.445	7.25E-07
3941	CGNL1	4.44195	7.24E-06
26499	ONECUT2	4.37403	2.39E-07
2867	C6ORF141	4.35252	2.58E-10
12362	ID4	4.32183	6.05E-05
26011	NHLH2	4.31928	5.91E-05
2035	C14ORF132	4.31666	9.46E-07
9428	HS.204481	4.29602	1.66E-09
8288	GRM8	4.17846	1.62E-06
7617	GADD45G	4.17663	2.21E-06

4298	CNTNAP2	4.13552	4.10E-05
1408	AUTS2	4.13111	2.79E-05
23822	LRRC4C	4.11703	1.27E-09
31454	SRRM4	4.11574	8.04E-07
4003	CHN2	4.09589	3.30E-07
27665	PITX2	4.08382	1.94E-11
13296	KLC1	4.0528	4.19E-06
27773	PLEKHA6	4.0464	2.57E-07
25618	MYLIP	3.99268	2.96E-06
5036	DDC	3.96553	8.46E-05
33181	TUBB3	3.93922	1.52E-04
24522	MIAT	3.93906	9.87E-05
27411	PEG10	3.9374	3.48E-05
32343	TMEFF2	3.92112	6.49E-07
29821	SCG3	3.92108	6.47E-06
31759	SYP	3.89869	2.51E-04
9425	HS.202577	3.89053	2.85E-07
33943	XKR4	3.87043	1.49E-06
33178	TUBB2A	3.86265	6.11E-05
12654	INSM1	3.84646	5.59E-05
13236	KIF1A	3.84543	3.27E-05
25721	NAPB	3.81995	3.50E-05
31765	SYT11	3.77827	1.14E-05
5877	ELAVL3	3.70028	9.69E-05
13858	LMO4	3.69359	2.09E-06
4103	CLASP2	3.64468	1.79E-05
2956	C7ORF41	3.63616	5.69E-05
33362	UCHL1	3.61003	5.64E-05
29645	RUNDC3A	3.54448	8.42E-05
24063	MAP1LC3A	3.53736	4.36E-06
5944	ENC1	3.51677	0.000141473
28730	RAB40B	3.48084	4.57E-07
25162	MLLT11	3.4633	3.13E-05
7469	FRMD4A	3.46181	7.40E-06
13070	KIAA0363	3.43032	6.39E-05
13342	KLHL24	3.41191	3.34E-05

7988	GNB3	3.38669	3.31E-09
31840	TAGLN3	3.36355	1.67E-03
12147	HS.66187	3.34592	0.000125172
4549	CRMP1	3.32015	2.42E-04
23453	LOC730525	3.31501	1.64E-03
31514	ST6GALNAC5	3.29449	1.19E-05
27054	PAFAH1B1	3.25816	1.30E-04
32432	TMEM170B	3.25165	2.44E-05
27686	PKIA	3.24255	4.29E-05
1748	BSN	3.2101	0.000169219
6213	EVL	3.17682	3.36E-05
34217	ZMIZ1	3.16249	3.29E-04
16419	LOC283514	3.15057	4.57E-06
32081	TERF2IP	3.13818	3.43E-05
4932	DACH1	3.11457	7.79E-06
5424	DNAJC19	3.09946	1.64E-09
8093	GPM6A	3.07619	1.59E-03
15034	LOC100131718	3.0686	4.01E-05
8706	HIST1H4K	3.06394	1.84E-06
28238	PRICKLE2	3.06341	1.98E-06
31429	SRGAP3	3.0575	7.84E-06
13760	LHFP	3.04812	0.000126565
3181	CADPS	3.03806	6.60E-06
3186	CALCA	3.03372	3.13E-08
1672	BMPR2	3.03171	9.26E-06
25861	NDRG4	3.00851	0.000239868
2265	C18ORF8	2.99462	9.07E-06
4698	CTNNA2	2.962	6.07E-05
1606	BEX1	2.96088	5.37E-05
32769	TPH1	2.96087	2.88E-07
31986	TCEAL7	2.95947	3.43E-05
3322	CBLN2	2.95729	1.12E-04
29639	RUFY3	2.95504	2.59E-05
3851	CELSR3	2.9545	6.27E-04
3177	CADM1	2.95335	1.81E-04
20895	LOC649841	2.94392	2.21E-05

13713	LEMD1	2.93152	9.17E-06
8184	GPR56	2.93095	3.08E-04
31935	TBC1D9	2.92862	6.60E-05
8046	GOLSYN	2.9099	2.80E-06
33004	TSHZ1	2.90158	2.76E-07
5876	ELAVL2	2.90115	0.00136166
12733	IRX5	2.88659	1.21E-04
1254	ATCAY	2.86583	7.41E-04
31763	SYT1	2.86449	1.02E-03
29193	RIMBP2	2.84834	6.29E-06
28741	RAB6B	2.84821	0.000698361
27533	PHF21B	2.8457	6.44E-05
24135	MAPT	2.83633	5.22E-04
10116	HS.505676	2.83499	1.50E-05
8712	HIST2H2BE	2.82687	0.000157254
24061	MAP1B	2.82235	0.000357426
13054	KIAA0182	2.8162	2.66E-04
34044	ZBTB20	2.81539	8.77E-08
29509	RPRM	2.81168	0.000475144
34007	YPEL5	2.81061	1.16E-04
13609	LANCL2	2.80004	8.07E-06
940	APLP1	2.77078	2.57E-05
29849	SCN3B	2.76654	7.14E-05
29201	RIMS3	2.76205	2.94E-04
27394	PDZD4	2.75594	0.000212095
1364	ATP6V1G2	2.75366	0.0012022
31778	SYT7	2.74946	4.15E-05
32351	TMEM106A	2.73965	0.000217998
7717	GATS	2.72521	3.10E-05
506	AGAP3	2.71696	2.07E-05
24141	MARCH4	2.70659	8.96E-04
5348	DLL1	2.7028	2.05E-04
6212	EVI5L	2.6886	6.79E-05
3196	CALM1	2.68129	8.50E-05
31386	SPRY1	2.67788	1.15E-03
33128	TTR	2.66999	2.76E-05

33765	WDR22	2.66565	2.95E-04
297	ACPL2	2.66551	1.52E-06
5325	DKK3	2.65119	5.63E-05
23853	LRRN3	2.64615	1.37E-03
32615	TMSL3	2.63733	4.56E-05
29822	SCG5	2.63452	1.42E-04
32000	TCF12	2.63327	1.80E-06
3497	CCDC92	2.6296	2.23E-05
5610	DUSP1	2.60841	1.78E-04
14524	LOC100130053	2.60135	4.53E-04
26279	NRSN1	2.59336	0.00111467
25711	NANOS3	2.58916	4.15E-06
5543	DPYSL4	2.58236	0.000223516
6231	EXOC7	2.58163	4.89E-06
24134	MAPRE3	2.57689	4.85E-05
9382	HS.193784	2.57602	2.18E-06
1608	BEX4	2.57251	9.83E-05
6514	FAM36A	2.56726	7.62E-05
13640	LBH	2.56551	1.34E-05
9920	HS.437111	2.55902	4.44E-05
33904	WSB2	2.55865	5.08E-04
9757	HS.369017	2.55838	4.25E-05
18920	LOC644250	2.55607	0.000475214
27311	PDCD4	2.55148	0.000139052
7562	FZD1	2.54808	2.48E-06
13191	KIAA1688	2.54643	9.31E-05
4292	CNTN2	2.53802	2.29E-04
32474	TMEM200A	2.53495	4.93E-07
6635	FAM89B	2.5341	1.64E-05
23500	LOC730990	2.53197	3.94E-05
1375	ATP9A	2.52973	1.09E-04
8126	GPR137C	2.52944	0.000217768
19248	LOC644936	2.52867	4.31E-04
4916	CYTH2	2.5213	6.31E-06
20654	LOC648921	2.51994	1.76E-03
2445	C1ORF71	2.50491	9.78E-04

21820	LOC652726	2.49851	5.58E-05
16100	LOC100134868	2.49288	0.00076351
27105	PAPSS2	2.49026	0.000148906
32246	TIMP2	2.48501	3.26E-05
27648	PIP5K2B	2.48028	0.000236563
12214	HSBP1	2.47723	1.82E-04
32754	TP53INP2	2.47324	2.42E-05
29037	REM2	2.46751	0.000170127
34742	ZNF84	2.46625	2.39E-04
3872	CENTA1	2.46106	3.74E-04
23918	LY6H	2.45793	0.000317539
29595	RSBN1	2.45785	8.01E-04
1733	BRP44L	2.45488	5.07E-04
2751	C3ORF70	2.45314	1.92E-06
12862	JUN	2.4481	4.37E-04
15357	LOC100132727	2.44481	0.00058635
13224	KIDINS220	2.43944	0.00068445
33183	TUBB4Q	2.43584	0.00171503
685	ALPP	2.43222	3.60E-05
14002	LOC100128274	2.43042	1.90E-04
20699	LOC649095	2.42655	0.00040167
7123	FLJ35390	2.39837	0.00162187
16740	LOC387856	2.39594	8.21E-04
7033	FLJ22184	2.3897	4.07E-04
20602	LOC648740	2.38616	8.38E-06
10392	HS.538962	2.38583	0.000324449
31615	STOX2	2.38135	4.42E-04
23592	LOC731895	2.3779	0.000838915
32863	TRIM2	2.37536	5.63E-04
30075	SERTAD4	2.36897	0.000363024
26135	NOL4	2.36463	0.000261492
27620	PIK3R1	2.35977	1.01E-07
27073	PAK3	2.34949	1.62E-04
27855	PMP22	2.34705	7.89E-06
27636	PINK1	2.34687	1.17E-05
3223	CAMSAP1	2.34021	1.96E-04



9323	HS.168950	2.33738	1.84E-04
17248	LOC401115	2.33367	0.000151535
6270	F3	2.32945	2.00E-08
2256	C18ORF32	2.32914	4.41E-04
777	ANKRD10	2.32837	2.48E-04
5372	DMRTA2	2.32784	5.27E-06
6347	FAM117B	2.32504	9.42E-04
731	AMY1A	2.3232	0.000158787
7610	GABRR1	2.31983	8.23E-08
1520	BAZ2B	2.30948	5.18E-04
7920	GLRA2	2.30858	6.83E-05
10190	HS.522924	2.30739	1.62E-03
7762	GDAP1	2.30342	6.22E-05
31325	SPHK2	2.29983	1.68E-04
31499	ST18	2.2969	9.74E-04
15124	LOC100131989	2.29335	1.57E-04
23665	LOC88523	2.29171	0.000476299
30325	SKP1	2.28675	1.76E-04
2743	C3ORF58	2.28463	0.000119256
27566	PHYHIPL	2.28388	1.72E-03
27332	PDE4D	2.28016	3.70E-05
760	ANK2	2.27803	3.84E-05
1101	ARL3	2.26792	1.03E-03
25218	MNX1	2.26631	4.41E-07
7255	FLJ44048	2.26493	6.84E-06
30029	SERINC1	2.26355	3.12E-04
34800	ZSWIM6	2.2634	3.19E-04
13943	LOC100128062	2.26302	0.000498795
18811	LOC644033	2.2611	5.93E-04
20075	LOC646996	2.25787	1.36E-04
7976	GNAO1	2.25676	0.00121073
22799	LOC728661	2.25642	0.000599836
979	APPBP2	2.25324	6.41E-04
25716	NAP1L3	2.24879	9.43E-04
14359	LOC100129502	2.24469	1.52E-04
25580	MYCBP2	2.24333	0.000445387

27083	PAM	2.23671	0.00170991
22583	LOC728105	2.2358	0.000601193
29747	SARM1	2.2285	5.83E-07
7602	GABRB3	2.22682	4.00E-04
30261	SIAH3	2.22476	1.89E-05
27664	PITX1	2.22382	0.00102378
19467	LOC645452	2.21703	0.000168591
6533	FAM46A	2.21591	1.24E-03
26308	NT5C2	2.21285	0.00159191
1086	ARID5B	2.21184	0.000139405
494	AFF3	2.21139	1.28E-03
29124	RGS16	2.21012	2.33E-05
10056	HS.475334	2.20669	1.41E-03
3738	CDH10	2.20522	0.000389319
9819	HS.388347	2.2022	2.82E-05
34703	ZNF786	2.20193	1.65E-03
8705	HIST1H4J	2.19897	4.86E-06
9740	HS.36053	2.19737	3.65E-05
651	ALG13	2.19414	4.86E-05
33588	VASH2	2.19373	0.000586609
28810	RALGPS1	2.19311	0.000999046
5774	EFNB3	2.191	0.000919096
1745	BSCL2	2.18758	8.17E-04
29151	RHBDL3	2.18758	4.86E-05
3740	CDH12	2.18674	0.000112317
24064	MAP1LC3B	2.18347	2.00E-04
32539	TMEM59	2.17758	1.77E-03
33171	TUBA3E	2.17556	2.58E-04
526	AGPAT4	2.17042	1.95E-04
27832	PLXNA1	2.16997	0.000477137
34219	ZMPSTE24	2.16821	0.00130116
34669	ZNF738	2.16494	0.00145642
28749	RAB9B	2.16376	1.41E-03
3350	CCBE1	2.16311	2.69E-04
5875	ELAVL1	2.15865	6.37E-04
13154	KIAA1370	2.15727	5.07E-05

9496	HS.233165	2.15522	0.000536209
1356	ATP6V1B2	2.15309	0.000839601
6457	FAM181B	2.15303	6.91E-04
25137	MKL2	2.14461	0.000214816
27876	PNMA1	2.14384	0.000290225
23806	LRRC37B2	2.14195	4.81E-04
6851	FGD3	2.139	1.84E-04
1746	BSDC1	2.13842	0.000430355
27997	POTEF	2.13305	0.000655028
2969	C7ORF55	2.12929	5.66E-05
29923	SEC11C	2.12843	8.11E-04
31488	SSX2IP	2.12215	5.19E-06
29277	RNF128	2.12203	5.41E-06
30348	SLC12A2	2.12048	0.000343525
8277	GRK5	2.11347	0.000106085
8573	HEPACAM2	2.11332	2.39E-09
1610	BEXL1	2.10951	2.62E-04
4229	CMIP	2.10246	0.000705627
30224	SHANK2	2.10164	0.000611099
23763	LRP1B	2.09999	4.76E-05
6724	FBXL16	2.09975	8.65E-04
26092	NLRP8	2.09701	0.00161834
17496	LOC440704	2.09699	0.0015232
2543	C20ORF56	2.09698	4.79E-07
32624	TMX4	2.09279	8.41E-04
20006	LOC646821	2.0917	5.47E-05
25809	NCOA6	2.09025	1.61E-03
2811	C5ORF28	2.08938	6.33E-04
3279	CASD1	2.0821	6.10E-05
28256	PRKAR1A	2.08207	0.00119569
6208	EVI1	2.07806	4.85E-05
6920	FJX1	2.07539	1.80E-03
31199	SORBS2	2.07266	7.37E-05
3968	CHD6	2.06939	4.92E-05
34605	ZNF652	2.06441	0.00172675
4838	CYCS	2.06436	1.39E-03

11686	HS.572642	2.06121	0.000136646
34025	ZADH2	2.05857	3.02E-05
17246	LOC401098	2.05589	1.58E-03
27462	PFN2	2.05533	1.58E-03
27137	PARP6	2.05441	5.65E-04
5651	DYNC1H1	2.04874	0.000834135
7587	GABARAPL2	2.04534	0.00165234
149	AASDHPPT	2.04017	7.58E-04
1970	C12ORF51	2.038	0.000668525
31721	SVOP	2.03603	7.00E-04
1389	ATXN1	2.03408	3.27E-05
20667	LOC648980	2.03345	0.00062575
24523	MIB1	2.03159	3.22E-04
31982	TCEAL3	2.03073	0.00151379
12229	HSD17B7	2.03003	1.50E-03
27402	PDZRN4	2.02983	2.33E-05
6395	FAM13B	2.02944	3.18E-04
1349	ATP6V0C	2.02572	1.08E-03
12828	JAKMIP2	2.01869	8.10E-04
34227	ZMYND11	2.01687	0.00171037
31603	STMN1	2.00603	0.000940483
29145	RHBDD2	2.00523	6.87E-04
25808	NCOA5	2.00244	0.000102715
30330	SLAIN1	2.00203	1.00E-03
2195	C17ORF45	-2.00166	0.00119767
23469	LOC730746	-2.00168	1.67E-03
30825	SND1	-2.00433	0.00128091
19456	LOC645436	-2.00559	1.69E-03
6242	EXOSC7	-2.00603	0.000798232
17727	LOC442232	-2.00726	7.96E-05
28062	PPIH	-2.00996	8.70E-04
23234	LOC729779	-2.01096	4.05E-04
33239	TYK2	-2.01275	0.000787726
27020	P4HA2	-2.01467	1.30E-03
4563	CRTAP	-2.01592	2.86E-06
29147	RHBDF1	-2.01731	9.21E-04

18367	LOC643007	-2.01867	0.000867101
2331	C1ORF106	-2.02039	2.06E-04
1332	ATP5G2	-2.02135	0.00169599
25354	MRPL45	-2.02158	0.00179523
11023	HS.552799	-2.02363	1.41E-04
17333	LOC402112	-2.02644	0.00178903
4341	COL2A1	-2.03118	0.00112645
14518	LOC100130009	-2.03222	1.54E-05
23928	LYN	-2.03236	0.000609191
20489	LOC648294	-2.0327	0.0004778
32244	TIMM9	-2.03469	0.0015035
29412	RPA1	-2.03493	1.70E-03
33756	WDR12	-2.03533	5.96E-04
25781	NCAPD2	-2.03535	0.00132141
19436	LOC645385	-2.03595	0.00151373
2095	C14ORF93	-2.04138	6.93E-06
33243	TYRO3	-2.04437	4.26E-04
13396	KNTC1	-2.04704	1.95E-05
19027	LOC644464	-2.051	0.000744833
1355	ATP6V1B1	-2.0528	0.000263628
32263	TKT	-2.05643	0.000380042
1039	ARHGAP19	-2.05734	6.74E-05
4923	CYYR1	-2.05748	1.68E-05
30076	SESN1	-2.05841	2.09E-04
5054	DDX10	-2.06089	0.000505
12782	ITGB3BP	-2.06492	6.73E-06
17492	LOC440589	-2.06666	4.64E-04
23246	LOC729816	-2.06873	0.000791801
24128	MAPKAPK3	-2.06933	0.00146997
12221	HSD17B11	-2.07106	2.25E-05
32916	TRIM71	-2.07489	2.28E-05
16186	LOC136143	-2.07533	4.81E-04
31614	STOX1	-2.07691	0.000191887
28717	RAB38	-2.07726	6.33E-04
21994	LOC653156	-2.07967	1.41E-03
29560	RPSA	-2.08096	0.000379606

17241	LOC401074	-2.08141	6.58E-08
8588	HES1	-2.08285	0.000819562
29494	RPLP1	-2.08688	1.30E-03
6884	FGFR3	-2.09082	5.89E-06
4977	DBX1	-2.09957	0.000222703
29544	RPS5	-2.10042	0.00138553
29213	RIPK2	-2.10641	0.000218454
14423	LOC100129685	-2.1066	1.19E-03
27816	PLOD3	-2.10673	0.000954258
8805	HNRNPA1	-2.10967	1.74E-05
6898	FHL3	-2.1127	5.26E-05
18250	LOC642741	-2.1147	1.02E-03
32523	TMEM45A	-2.1169	0.000464867
17691	LOC441876	-2.11785	1.02E-03
1488	BAIAP2L1	-2.11832	3.63E-05
4156	CLEC2D	-2.11902	0.000733653
6966	FLJ10986	-2.12606	0.000420546
14281	LOC100129237	-2.12997	4.96E-04
16802	LOC388556	-2.13532	6.52E-04
25385	MRPS30	-2.13565	3.28E-04
18023	LOC642250	-2.13595	0.00107704
31129	SNRPA	-2.13825	6.40E-04
3730	CDCA5	-2.14343	0.0016145
26121	NOB1	-2.14482	3.43E-06
3733	CDCA8	-2.14728	0.000158263
33839	WDYHV1	-2.14889	0.000901318
15213	LOC100132299	-2.14934	3.42E-05
23294	LOC729964	-2.14942	0.000145725
23388	LOC730246	-2.15222	5.52E-04
29474	RPL36	-2.15341	1.12E-03
20693	LOC649076	-2.15494	0.000533848
14136	LOC100128771	-2.15556	6.32E-05
29459	RPL27	-2.15569	8.13E-04
20894	LOC649839	-2.15637	0.000233819
5649	DYM	-2.15657	5.43E-04
6676	FANCG	-2.15913	2.75E-04

26223	NPY	-2.15981	4.99E-04
22700	LOC728428	-2.16464	0.00122727
27540	PHGDH	-2.17929	0.000926407
23875	LSM4	-2.18409	0.00036081
15295	LOC100132528	-2.18468	8.34E-04
14997	LOC100131609	-2.187	0.000875169
29442	RPL14L	-2.18734	4.55E-04
16653	LOC343184	-2.19197	6.17E-05
5697	EBPL	-2.19209	2.05E-05
2763	C4ORF14	-2.19304	0.00128088
4474	CPNE8	-2.19514	2.56E-04
17500	LOC440737	-2.19615	0.000989795
22974	LOC729102	-2.1963	0.000282713
21275	LOC651149	-2.19678	1.31E-03
17403	LOC440055	-2.19775	1.17E-03
29440	RPL13L	-2.19817	2.16E-05
27368	PDK3	-2.20067	3.05E-04
31760	SYPL1	-2.20452	0.000128778
14389	LOC100129585	-2.20627	8.87E-05
29490	RPL8	-2.20725	1.35E-04
15083	LOC100131866	-2.20753	2.67E-05
2915	C6ORF48	-2.20788	0.000428494
19976	LOC646766	-2.21365	0.00033802
28801	RAI14	-2.21753	0.000675636
18557	LOC643433	-2.21779	0.000542767
16862	LOC389141	-2.21829	0.000459763
5715	ECT2	-2.21838	1.41E-03
29558	RPS8	-2.22068	0.00161471
19556	LOC645691	-2.22442	0.00107987
16693	LOC347544	-2.22526	0.000534957
23972	MAD2L1	-2.22823	0.000457464
18286	LOC642817	-2.23024	0.00054939
31588	STK24	-2.23459	3.03E-04
31024	SNORD25	-2.236	5.13E-05
1282	ATIC	-2.24113	0.000182776
33110	TTK	-2.24337	4.48E-04

23352	LOC730107	-2.24665	0.000445574
8727	HJURP	-2.24769	2.63E-05
23237	LOC729789	-2.24864	3.21E-04
29503	RPP40	-2.25604	1.62E-04
17594	LOC441246	-2.25891	4.60E-04
17228	LOC400963	-2.26592	0.000542002
29521	RPS18	-2.26781	0.00151457
32392	TMEM144	-2.27099	5.66E-08
7652	GALK1	-2.27206	9.50E-04
27192	PCDH18	-2.27211	0.000113843
4297	CNTNAP1	-2.2794	2.43E-04
23041	LOC729279	-2.28142	5.88E-05
5840	EIF3H	-2.28165	0.000193064
8828	HNRPC	-2.28204	0.00128473
30493	SLC27A3	-2.29001	2.85E-04
5742	EEF1D	-2.29339	0.000126152
30601	SLC44A1	-2.29419	0.000172089
3866	CENPN	-2.2944	0.000143689
29449	RPL22	-2.29465	0.00105741
20804	LOC649447	-2.29999	0.000262246
28036	PPAT	-2.3009	0.000393145
25509	MTP18	-2.30185	3.55E-05
3538	CCNA2	-2.30784	0.000412267
33891	WNT5A	-2.3104	3.36E-04
28110	PPP1R3C	-2.31108	3.02E-06
1659	BMP2	-2.32278	2.31E-05
18725	LOC643863	-2.32406	1.02E-03
359	ADA	-2.3269	2.14E-05
13751	LGMN	-2.32715	4.54E-05
12250	HSP90AB1	-2.32781	1.49E-03
5850	EIF4B	-2.32818	1.13E-03
13724	LEPREL1	-2.32851	0.000169338
17534	LOC440991	-2.33062	1.54E-04
29559	RPS9	-2.33092	1.06E-04
3724	CDC7	-2.33576	0.000342965
27035	PABPC4	-2.33611	0.000164425



33241	TYMS	-2.34068	0.00106577
30229	SHC1	-2.34608	0.00105777
21754	LOC652624	-2.34734	2.21E-04
5846	EIF3M	-2.34987	0.00181367
15032	LOC100131713	-2.35114	0.000201749
29432	RPL10A	-2.35345	0.00131867
24235	MCM6	-2.35636	0.00108431
19046	LOC644511	-2.36244	0.000514797
5044	DDIT4L	-2.36718	0.000107365
545	AHCY	-2.3677	0.000431822
18592	LOC643531	-2.37199	1.01E-03
5744	EEF1G	-2.37611	0.000630065
5765	EFHD1	-2.38043	1.20E-03
32637	TNFRSF10B	-2.38066	1.53E-05
26099	NME1-NME2	-2.38426	4.44E-05
22757	LOC728564	-2.38494	3.69E-04
8826	HNRPA1P4	-2.38609	3.87E-05
17458	LOC440359	-2.38691	5.63E-04
28560	PTPN13	-2.39211	0.000413752
15180	LOC100132199	-2.39337	2.68E-05
4955	DARS	-2.39728	1.56E-03
1882	C11ORF1	-2.39828	2.51E-05
23282	LOC729926	-2.39973	7.65E-04
15041	LOC100131735	-2.40035	2.35E-05
22829	LOC728732	-2.40089	6.11E-05
3973	CHEK1	-2.40178	1.16E-06
600	AKR1A1	-2.40346	0.000695089
15586	LOC100133372	-2.40481	1.53E-04
31607	STOM	-2.40533	3.40E-07
22710	LOC728453	-2.40686	0.0001068
29457	RPL26	-2.4112	0.000285349
29921	SEC11A	-2.41182	0.00102718
16776	LOC388275	-2.41288	5.56E-06
29438	RPL13A	-2.41592	0.000922424
3795	CDKN3	-2.41856	0.000112421
30404	SLC20A2	-2.41879	6.23E-06

13757	LGTN	-2.42032	2.32E-05
32648	TNFRSF19	-2.42065	6.93E-05
31239	SP5	-2.42085	2.37E-09
23974	MAD2L2	-2.42585	0.000123115
12602	IMPA2	-2.42996	1.90E-06
17525	LOC440927	-2.43391	0.00119949
29414	RPA3	-2.43719	0.00177478
16156	LOC127295	-2.43999	5.06E-04
29565	RPUSD3	-2.44425	1.98E-07
16979	LOC390578	-2.44648	8.18E-08
15104	LOC100131940	-2.44655	2.19E-05
26103	NME4	-2.44757	0.00114224
8825	HNRPA1L-2	-2.45235	5.46E-04
1537	BCAR3	-2.45546	0.000368573
14206	LOC100129028	-2.45901	3.51E-04
16672	LOC345041	-2.46013	0.000101781
3125	CA14	-2.46417	0.000205741
32089	TET1	-2.46774	3.21E-05
12231	HSD17B8	-2.47022	0.000519001
4479	CPS1	-2.47967	2.21E-06
25464	MTA3	-2.48169	8.09E-05
5758	EFEMP1	-2.48833	1.42E-05
28160	PQLC3	-2.48845	0.000585543
30245	SHMT2	-2.48964	0.00117427
23103	LOC729423	-2.50041	6.49E-06
12741	ISG20L1	-2.50404	9.70E-05
29539	RPS3	-2.50954	0.000103446
22857	LOC728791	-2.5096	5.69E-06
23391	LOC730255	-2.50972	1.22E-03
24097	MAP4K2	-2.51767	5.17E-06
7686	GAPDH	-2.51826	0.00128279
2433	C1ORF57	-2.51861	1.49E-03
2262	C18ORF56	-2.51885	0.000156088
1792	BUB1	-2.52119	9.50E-06
5831	EIF2S3	-2.52373	3.38E-04
29039	RENBP	-2.53102	4.92E-07

29481	RPL39L	-2.53153	0.00013954
17141	LOC399804	-2.5389	3.38E-05
34552	ZNF581	-2.54051	9.37E-05
1156	ARRDC4	-2.54054	2.88E-05
8789	HMMR	-2.54277	8.17E-05
28953	RBMX	-2.5493	5.57E-05
32179	THEM2	-2.55298	5.30E-04
13239	KIF20A	-2.55316	1.13E-05
1403	AURKA	-2.55681	5.93E-05
27066	PAICS	-2.55763	0.00111653
5836	EIF3D	-2.56061	6.72E-05
13252	KIF2C	-2.56757	1.70E-06
14814	LOC100130980	-2.57639	4.33E-05
31821	TAFID	-2.57677	6.27E-06
27653	PIR	-2.58392	2.26E-06
7564	FZD2	-2.58518	0.000146094
28778	RAD51AP1	-2.59104	5.06E-06
14695	LOC100130562	-2.59563	3.41E-05
8547	HEATR1	-2.59617	5.95E-07
22591	LOC728126	-2.59998	3.37E-05
29483	RPL4	-2.62451	7.56E-05
25783	NCAPG	-2.62632	6.41E-05
20366	LOC647856	-2.6267	1.31E-05
29462	RPL29	-2.62809	4.36E-07
23274	LOC729903	-2.63121	4.28E-05
15975	LOC100134393	-2.6327	2.71E-04
9745	HS.363526	-2.6341	0.000643774
561	AIF1L	-2.63663	1.37E-04
8597	HEXB	-2.63709	1.51E-03
5993	EPDR1	-2.63912	0.00156376
7966	GMPS	-2.64155	1.99E-04
27563	PHYH	-2.64322	2.14E-05
4100	CKS1B	-2.64512	1.68E-04
7898	GLDC	-2.64809	0.00143371
5513	DPH5	-2.6481	2.11E-05
18914	LOC644237	-2.66097	0.0011589

4521	CREG1	-2.6618	6.73E-05
20185	LOC647285	-2.66563	1.82E-04
22536	LOC727984	-2.67684	0.000223687
8625	HIBADH	-2.68374	0.00144114
684	ALPL	-2.69266	2.39E-06
17636	LOC441506	-2.70546	6.10E-05
30602	SLC44A2	-2.70757	1.24E-03
16741	LOC387867	-2.71424	2.45E-05
23060	LOC729340	-2.7157	0.000999351
27743	PLCD1	-2.72	1.14E-07
22597	LOC728139	-2.72434	4.77E-05
28530	PTGR1	-2.72675	7.39E-05
5741	EEF1B2	-2.7289	4.84E-05
18360	LOC642989	-2.73236	0.000921883
20058	LOC646942	-2.74335	5.41E-05
16737	LOC387825	-2.74954	5.93E-06
16236	LOC148430	-2.76485	2.32E-05
29441	RPL14	-2.76505	4.49E-06
31176	SNX5	-2.77426	4.41E-08
13592	LAMA1	-2.77535	2.89E-07
16814	LOC388707	-2.77694	1.99E-06
29179	RHPN2	-2.78226	0.00110049
23133	LOC729500	-2.78295	8.63E-06
2524	C20ORF199	-2.79683	8.26E-05
27370	PDLIM1	-2.79852	0.000250318
27030	PABPC1	-2.7998	0.000107149
7486	FRZB	-2.81189	5.35E-04
17023	LOC391075	-2.82637	0.00139394
6705	FBL	-2.8276	2.59E-05
13708	LEF1	-2.83207	1.15E-05
4101	CKS2	-2.83376	0.000537912
13438	KRT19	-2.83803	2.34E-05
28410	PSAT1	-2.8451	8.29E-07
33979	YAP1	-2.84569	0.00106156
29435	RPL12	-2.85091	4.23E-05
22553	LOC728031	-2.85482	8.14E-05

29524	RPS2	-2.85918	1.32E-05
23861	LRTM1	-2.85972	1.48E-12
26404	NUSAP1	-2.86459	9.00E-05
20473	LOC648249	-2.86802	4.01E-06
23319	LOC730029	-2.87607	3.58E-05
24516	MGST1	-2.87812	2.82E-06
349	ACVR1	-2.88477	0.000447642
30500	SLC29A1	-2.91375	2.94E-06
17086	LOC391833	-2.91531	4.06E-05
20614	LOC648771	-2.91567	7.23E-05
27493	PGM1	-2.92082	0.000287518
30836	SNHG6	-2.92725	2.13E-05
20015	LOC646849	-2.95184	3.75E-05
16783	LOC388339	-2.95309	4.55E-05
3785	CDKN1A	-2.95807	0.000310093
29436	RPL12P6	-2.97114	2.40E-06
5258	DIMT1L	-2.97803	1.83E-06
15940	LOC100134304	-2.98223	4.08E-08
13733	LGALS1	-2.98473	0.00160731
27902	PODXL	-3.00627	2.35E-08
16630	LOC341315	-3.02065	1.10E-04
481	ADSS	-3.02244	4.06E-06
29557	RPS7	-3.06985	2.69E-06
1406	AURKB	-3.07612	5.67E-07
23373	LOC730187	-3.08276	4.32E-06
25214	MND1	-3.08698	3.39E-07
14412	LOC100129657	-3.08986	0.00120608
33282	UBE2C	-3.09218	4.69E-06
30114	SFRP1	-3.10477	0.000250519
17015	LOC391019	-3.10602	2.05E-05
28602	PTTG1	-3.11309	2.05E-05
17541	LOC441013	-3.11866	6.73E-07
20657	LOC648931	-3.12515	3.24E-09
31661	SUCLG2	-3.13505	5.75E-07
1559	BCL2L12	-3.13599	4.40E-07
32222	TIGA1	-3.13783	7.09E-05

7770	GDF15	-3.14204	1.42E-07
2878	C6ORF160	-3.15022	0.000111744
15382	LOC100132795	-3.21797	1.51E-05
4930	DAB2	-3.2203	2.91E-05
32933	TRIP6	-3.23132	1.32E-06
20091	LOC647030	-3.23731	4.86E-05
26048	NKD1	-3.24181	4.37E-06
6320	FAM107A	-3.24905	0.000449795
16552	LOC286444	-3.25137	6.05E-06
26390	NUP37	-3.26236	3.70E-05
19783	LOC646294	-3.28211	1.06E-06
2210	C17ORF61	-3.28907	2.68E-05
19553	LOC645688	-3.29172	3.95E-06
25847	NCRNA00219	-3.29327	7.23E-05
28663	QPRT	-3.29832	2.04E-05
31361	SPON1	-3.32269	5.27E-06
30835	SNHG5	-3.32459	0.000204237
4596	CSDA	-3.3629	0.000363294
455	ADM	-3.40482	4.11E-05
23228	LOC729768	-3.41997	2.20E-05
1753	BST2	-3.42742	1.17E-07
20685	LOC649049	-3.46913	1.63E-06
17292	LOC401537	-3.50501	3.79E-07
6707	FBLN1	-3.53279	3.88E-06
28241	PRIM1	-3.53892	1.17E-06
8754	HLA-E	-3.54293	2.03E-07
643	ALDOA	-3.55096	0.000184641
14422	LOC100129681	-3.55393	9.42E-07
8773	HMGB2	-3.56419	9.08E-05
32964	TRPM4	-3.5945	2.41E-06
12398	IFITM2	-3.59918	1.38E-03
32177	THBS4	-3.6116	6.59E-07
3540	CCNB1IP1	-3.62989	3.35E-08
5477	DOCK10	-3.64495	7.09E-07
28387	PRSS23	-3.67253	0.000258012
26369	NUDT7	-3.67565	7.62E-05

26207	NPM3	-3.69114	1.35E-06
23887	LTA4H	-3.69913	6.82E-05
12399	IFITM3	-3.70541	0.000779898
8769	HMGA1	-3.72752	3.30E-08
323	ACTA2	-3.74071	1.75E-04
1530	BBS9	-3.7636	3.82E-07
7501	FSTL1	-3.80754	0.000136961
27805	PLIN2	-3.82123	4.77E-10
28975	RBPMS2	-3.82727	3.95E-06
23218	LOC729742	-3.84552	7.82E-07
13597	LAMB1	-3.85107	1.24E-07
6291	FABP7	-3.85422	0.000335025
12606	IMPDH2	-3.85952	4.79E-06
13834	LITAF	-3.86	4.66E-05
3953	CHCHD10	-3.91295	4.20E-06
2439	C1ORF64	-3.9544	5.48E-10
8473	HAUS4	-3.96227	4.95E-12
925	APCDD1	-3.97854	6.09E-08
5952	ENO3	-4.00663	6.90E-09
27019	P4HA1	-4.01147	0.00032695
4724	CTSL2	-4.01208	1.47E-06
19348	LOC645173	-4.02454	2.71E-06
28605	PTTG3P	-4.02805	3.37E-06
4239	CMTM7	-4.08386	7.09E-09
8089	GPI	-4.08821	1.18E-05
1616	BGN	-4.11601	0.000348095
23196	LOC729679	-4.2525	4.55E-08
3694	CDC20	-4.28351	3.38E-06
32729	TOP2A	-4.29945	1.43E-06
30828	SNHG1	-4.38641	2.77E-06
3243	CAPN6	-4.44794	4.50E-07
30284	SILV	-4.59486	1.80E-07
15342	LOC100132673	-4.69254	2.18E-07
29716	SALL4	-4.95909	2.66E-08
3541	CCNB2	-5.23718	4.33E-08
30511	SLC2A3	-5.39887	5.64E-07

13691	LDHA	-5.76362	0.000569306
7500	FST	-5.82949	8.74E-09
1543	BCAT1	-6.13131	3.52E-06
5323	DKK1	-6.17493	4.94E-08
4343	COL4A1	-6.21986	6.18E-07
8078	GPC3	-6.35513	0.000466041
4333	COL22A1	-6.371	1.87E-08
32774	TPM2	-6.8139	1.85E-08
2430	C1ORF54	-7.81915	1.70E-07
965	APOE	-9.10671	6.03E-07
13804	LIN28	-26.8821	1.20E-13

**Supplementary Table 3:** Gene expression array data of significantly up-regulated and down-regulated genes at differentiation day 25 over day 13 in SHH/FGF8/Chir treated Floor-plate based population.



### Supplementary Table 4

Column #	Column ID	Fold-Change	p-value
32126	TFF3	25.0585	2.47E-14
1209	ASCL1	14.9328	1.97E-07
7395	FOXA1	12.9897	4.15E-14
29133	RGS4	11.0181	6.65E-09
27988	POSTN	8.20403	2.16E-10
7396	FOXA2	7.98132	1.60E-14
4342	COL3A1	7.58625	2.49E-05
12731	IRX3	7.42399	1.64E-06
9374	HS.19193	7.27196	7.36E-09
3978	CHGA	7.14305	2.77E-08
2470	C1QL1	7.1366	1.38E-09
30390	SLC18A1	7.04751	3.52E-14
22823	LOC728715	6.5801	8.79E-09
12456	IGFBP5	6.15962	3.65E-05
27665	PITX2	6.10679	6.79E-14
12655	INSM2	5.18438	1.70E-09
12944	KCNJ16	4.98753	8.89E-13
436	ADCYAP1	4.94597	2.43E-09
31361	SPON1	4.93795	4.69E-08
13857	LMO3	4.83578	7.25E-08
13865	LMX1A	4.63407	1.51E-06
2543	C20ORF56	4.4431	3.63E-13
12733	IRX5	4.2929	1.45E-06
7988	GNB3	4.13634	1.52E-10
32159	TH	4.08743	0.000370318
5346	DLK1	4.02203	1.73E-05
31775	SYT4	4.00669	0.000372793
9428	HS.204481	3.88697	6.71E-09
6197	ETS2	3.70155	3.07E-09
5036	DDC	3.61254	0.000194062
26250	NR4A2	3.55879	9.29E-10
2867	C6ORF141	3.48146	6.97E-09
26928	OSBPL10	3.27941	3.81E-07

5372	DMRTA2	3.26437	1.81E-08
33930	XBP1	3.2414	0.000921089
27664	PITX1	3.23009	1.10E-05
9819	HS.388347	3.14523	8.26E-08
30239	SHISA2	3.13411	4.23E-05
2743	C3ORF58	3.10109	1.50E-06
623	ALCAM	3.00487	0.000307411
6533	FAM46A	2.99243	3.45E-05
28590	PTPRO	2.94164	4.45E-05
18750	LOC643911	2.93448	1.14E-06
31669	SULF2	2.92397	8.02E-05
5348	DLL1	2.92274	8.36E-05
30066	SERPINF1	2.76873	0.000156193
5349	DLL3	2.75425	0.000173675
3186	CALCA	2.71125	2.10E-07
30590	SLC39A8	2.67444	2.25E-05
32000	TCF12	2.66777	1.46E-06
3941	CGNL1	2.63848	0.00120585
32769	TPH1	2.62647	1.95E-06
25941	NENF	2.55992	0.000599552
29509	RPRM	2.53138	0.00135525
32144	TGFBR3	2.46754	8.27E-07
13689	LDB2	2.40983	2.56E-05
2850	C6ORF117	2.4009	0.000508473
31806	TACSTD1	2.38661	0.00154495
24375	MFNG	2.31488	5.04E-05
5424	DNAJC19	2.30405	4.42E-07
12986	KCNS3	2.28802	0.000136062
27855	PMP22	2.27371	1.36E-05
4003	CHN2	2.26467	0.000550787
5691	EBF3	2.26453	0.000571924
3187	CALCB	2.11359	2.49E-06
28325	PROX1	2.08192	0.000135872
25218	MNX1	2.05528	3.37E-06
6270	F3	2.01261	5.71E-07
2245	C18ORF10	-2.00297	0.00129421

28546	PTN	-2.003	0.000354472
5920	EMID2	-2.00456	1.77E-05
24405	MGC11082	-2.00498	2.75E-05
5949	ENKUR	-2.00742	0.000107398
26398	NUP93	-2.01111	0.00124009
10837	HS.545615	-2.01378	2.65E-05
12688	IQCC	-2.01383	0.00019749
6196	ETS1	-2.01751	0.000848186
27290	PCSK5	-2.02079	0.00122771
16112	LOC100192378	-2.0216	4.35E-05
19806	LOC646345	-2.02311	0.000183202
23846	LRRIQ1	-2.02718	0.000541683
27746	PLCE1	-2.02761	0.000217281
2727	C3ORF39	-2.03023	0.000131521
26072	NLGN3	-2.03154	2.45E-05
2770	C4ORF22	-2.03489	0.00113778
3491	CCDC88C	-2.03515	0.00112864
25751	NAV3	-2.03716	8.63E-05
30413	SLC22A17	-2.03749	0.000703407
13014	KDELC2	-2.04133	0.00147391
27749	PLCH1	-2.0426	0.000234672
16489	LOC284988	-2.04353	0.000785305
9938	HS.440518	-2.04573	0.000285223
28076	PPM1H	-2.04637	0.00038276
429	ADCY3	-2.05728	0.000712376
31199	SORBS2	-2.05812	8.31E-05
17624	LOC441453	-2.0676	3.05E-06
13793	LIM2	-2.07092	0.00040641
33165	TUB	-2.07384	0.000187156
3462	CCDC65	-2.07613	0.00151516
4305	COBL	-2.07819	0.000485834
6912	FILIP1	-2.07924	9.69E-05
5195	DGCR6	-2.07943	0.000935686
33905	WSCD1	-2.08212	0.00033792
12933	KCNIP1	-2.08721	3.72E-05
4933	DACH2	-2.09051	9.24E-05

25960	NEUROG2	-2.09361	0.00111856
25930	NEK2	-2.09683	0.00144313
3288	CASP3	-2.09925	0.000130992
12971	KCNMB4	-2.09934	0.00140267
3125	CA14	-2.10277	0.00147559
17153	LOC399959	-2.10829	0.000816932
15855	LOC100134073	-2.10866	0.000366572
26322	NTM	-2.10973	0.000159062
7595	GABRA2	-2.11173	0.00169771
5618	DUSP18	-2.11289	8.90E-05
4289	CNTFR	-2.11375	0.00132713
3760	CDH8	-2.11381	7.41E-05
3196	CALM1	-2.11418	0.00157715
13615	LARGE	-2.11685	2.37E-05
32933	TRIP6	-2.11829	0.00047459
2242	C17ORF97	-2.12666	0.000851745
5478	DOCK11	-2.12763	0.000306132
7377	FNDC4	-2.13338	0.000482465
29672	RYR3	-2.13573	0.000392208
30669	SLC7A6	-2.13865	0.000299041
29816	SCD5	-2.14266	9.40E-05
12212	HS6ST2	-2.14751	0.00020473
4213	CLSTN2	-2.15117	2.14E-05
16924	LOC389816	-2.15626	4.60E-09
2102	C15ORF26	-2.15663	0.000242005
1103	ARL4C	-2.16184	0.00049625
31151	SNX10	-2.16614	0.000623725
16382	LOC255783	-2.17123	0.000592438
30372	SLC16A14	-2.17701	0.000382805
13177	KIAA1598	-2.1779	0.000634174
28587	PTPRM	-2.17848	0.000334455
8661	HIST1H2AC	-2.18157	0.00018782
30015	SEPT6	-2.18483	0.00101243
6572	FAM65B	-2.18593	1.46E-05
4614	CSMD2	-2.18777	0.000579739
19737	LOC646168	-2.18864	0.000417767

2429	C1ORF53	-2.19182	0.0017844
17855	LOC641785	-2.19315	0.000255891
5570	DSCR6	-2.20122	0.00137487
13835	LIX1	-2.20141	6.32E-06
23979	MAF	-2.20457	6.38E-05
4734	CTXN1	-2.21039	0.0007813
2049	C14ORF159	-2.2127	0.000171696
30388	SLC17A8	-2.21639	0.000916084
26228	NQO1	-2.21974	0.000753734
23817	LRRC46	-2.22159	0.000756129
32380	TMEM132D	-2.22662	0.000463067
2705	C3ORF15	-2.2299	0.000615847
27781	PLEKHG1	-2.23885	1.49E-05
29607	RSPH9	-2.24091	0.000109859
23965	MAB21L1	-2.24222	2.00E-05
25942	NEO1	-2.24511	2.27E-05
34157	ZFP106	-2.24688	0.00129693
33083	TTC29	-2.24927	0.000317648
3415	CCDC19	-2.25412	0.000638581
30209	SH3GL2	-2.2573	0.00175354
839	ANKS1B	-2.25784	6.46E-05
3472	CCDC74A	-2.25911	3.66E-05
27561	PHTF1	-2.26039	0.00113655
26505	OPCML	-2.26062	2.34E-05
23859	LRRTM4	-2.26387	0.00050229
27040	PACRG	-2.26701	8.08E-05
24318	MELK	-2.27019	0.000423662
10017	HS.452398	-2.27201	0.000477927
9237	HS.147562	-2.27279	0.000798954
26976	OTX1	-2.27327	0.000877908
8046	GOLSYN	-2.27724	0.000100581
1074	ARHGEF6	-2.27982	0.000748746
4639	CSRNP3	-2.28361	0.000213299
27547	PHLDA1	-2.28667	2.70E-05
3537	CCNA1	-2.28864	6.92E-05
26071	NLGN2	-2.29131	0.000215422

5325	DKK3	-2.29195	0.000372444
6326	FAM108C1	-2.29624	0.000567659
28721	RAB3B	-2.30577	0.000211905
2372	C1ORF158	-2.3174	0.00184147
32499	TMEM231	-2.32173	0.000378145
5550	DRD1IP	-2.3265	0.00129147
12785	ITGB5	-2.32837	0.00143999
30937	SNORA79	-2.32935	0.000394221
2538	C20ORF46	-2.34101	0.000827542
5939	EMX2OS	-2.34991	1.28E-05
3153	CACNA1E	-2.35127	0.000755994
28906	RBKS	-2.35486	1.25E-05
3806	CDRT4	-2.36622	0.000173226
32129	TFPI	-2.36876	0.000644776
5763	EFHC1	-2.36977	0.00112503
3746	CDH18	-2.37821	6.60E-06
33006	TSHZ3	-2.38415	0.00160322
6901	FHOD3	-2.38572	0.00106294
13805	LIN28B	-2.38688	0.000393414
1806	C10ORF107	-2.39735	0.000750154
32034	TCTEX1D1	-2.40988	0.00160003
31146	SNTN	-2.42893	0.000945171
30057	SERPINB6	-2.43305	1.01E-05
28580	PTPRD	-2.43513	6.24E-05
28210	PRDM8	-2.44594	0.000113613
2614	C22ORF15	-2.45467	0.000112958
12892	KBTBD9	-2.45472	2.16E-06
6246	EXT1	-2.4653	0.000117948
25946	NETO2	-2.46601	0.000568595
493	AFF2	-2.4707	0.0012124
31610	STOML3	-2.48765	0.000560404
31577	STIL	-2.49103	0.000199457
4826	CYB5D1	-2.49147	0.000128822
2078	C14ORF45	-2.49501	0.000787004
33501	USP13	-2.49771	6.06E-05
34226	ZMYND10	-2.50015	0.000105158

28507	PTCHD1	-2.50016	0.00120417
5322	DKFZP781N1041	-2.50483	0.000661286
3253	CAPSL	-2.50626	0.000844682
14289	LOC100129268	-2.508	0.000176359
17551	LOC441054	-2.5088	0.00166136
26395	NUP62CL	-2.51081	0.000373281
1776	BTG3	-2.51582	0.00131261
33005	TSHZ2	-2.51649	3.77E-05
4705	CTNND2	-2.52798	0.00038507
29792	SCARNA11	-2.53148	3.35E-06
4965	DBC1	-2.53221	0.000370596
32507	TMEM31	-2.53343	2.39E-06
1927	C11ORF75	-2.53649	0.000498243
6740	FBXO15	-2.54184	0.00139562
27370	PDLIM1	-2.54956	0.000681773
728	AMPH	-2.55801	6.39E-06
33718	VWC2	-2.56363	0.000340976
13724	LEPREL1	-2.56798	4.43E-05
1057	ARHGDIB	-2.573	5.20E-06
5765	EFHD1	-2.59294	0.000474204
3758	CDH6	-2.6075	0.000303268
7043	FLJ23152	-2.60944	0.000143522
31282	SPATA17	-2.61656	0.00020388
7106	FLJ33590	-2.61873	0.00025779
16264	LOC151162	-2.62005	0.000666466
32440	TMEM178	-2.62313	0.00011953
1987	C12ORF69	-2.62861	5.06E-06
2970	C7ORF57	-2.63494	0.000118643
23830	LRRC6	-2.63632	0.000197619
6173	ESM1	-2.63913	0.000368518
153	ABAT	-2.64114	3.81E-06
2793	C4ORF47	-2.64571	0.00134045
2301	C19ORF51	-2.64617	7.44E-05
34155	ZFHX4	-2.66127	5.12E-06
5762	EFHB	-2.66338	0.000148296
6920	FJX1	-2.66433	8.09E-05

12872	KANK4	-2.66744	0.000457332
26104	NME5	-2.66836	0.000118819
3148	CACHD1	-2.67846	0.000100474
25628	MYO16	-2.67972	8.67E-05
28838	RAPGEF2	-2.68049	7.06E-05
5553	DRD4	-2.68408	0.000500735
4087	CITED2	-2.68818	0.00192224
23790	LRRC26	-2.68889	2.44E-06
2631	C22ORF42	-2.69089	0.00039382
25564	MXRA5	-2.69302	0.00192861
12836	JAZF1	-2.70808	5.58E-05
13346	KLHL29	-2.71506	5.11E-06
25749	NAV1	-2.71696	0.000248061
29306	RNF175	-2.71799	3.04E-05
13815	LINGO2	-2.71868	2.30E-05
25208	MMRN1	-2.73481	0.000116097
3918	CFDP1	-2.73575	0.000150699
31242	SP8	-2.73862	5.04E-05
1311	ATP1B3	-2.7498	8.64E-05
25939	NELL1	-2.7509	0.00086776
32531	TMEM51	-2.77628	6.84E-06
15778	LOC100133887	-2.78135	1.17E-05
815	ANKRD38	-2.79552	0.000168264
33758	WDR16	-2.80194	0.000532777
12801	ITM2C	-2.81062	7.32E-05
32847	TRH	-2.84178	0.00148109
2881	C6ORF165	-2.84456	6.28E-05
15644	LOC100133542	-2.84572	9.65E-05
29811	SCARNA8	-2.84646	9.99E-06
33964	XPR1	-2.85352	5.49E-06
25940	NELL2	-2.86423	0.00024831
5455	DNER	-2.87832	0.00127284
33807	WDR63	-2.88707	4.43E-05
3038	C9ORF116	-2.89396	0.000215965
2553	C20ORF85	-2.89405	7.84E-05
5531	DPY19L1	-2.90287	0.000183171



31955	TBR1	-2.90815	7.60E-06
8655	HIST1H1C	-2.91043	9.46E-05
3401	CCDC146	-2.91057	0.000155147
31935	TBC1D9	-2.91662	6.93E-05
7421	FOXJ1	-2.94694	0.000577632
32783	TPPP3	-2.95648	0.000353912
5337	DLG2	-2.96987	1.13E-06
27810	PLK4	-2.98102	1.71E-06
24315	MEIS2	-3.03243	0.00109977
31243	SPA17	-3.03709	0.000523067
10979	HS.551307	-3.04712	1.13E-05
29794	SCARNA13	-3.05568	4.35E-05
32378	TMEM132B	-3.06408	1.54E-06
2690	C2ORF77	-3.07752	4.19E-05
27660	PITPNM1	-3.09871	2.62E-05
32963	TRPM3	-3.10437	0.000937085
3640	CD36	-3.10624	0.000121554
26070	NLGN1	-3.1408	9.93E-05
5749	EFCAB1	-3.15705	0.000423897
3121	CA10	-3.15947	0.000537722
3215	CAMK2N1	-3.16181	0.000561888
8016	GNRH1	-3.16554	1.25E-05
13037	KHDRBS3	-3.16572	0.000269437
5681	E2F7	-3.17981	2.36E-07
8174	GPR37	-3.18311	2.85E-05
29510	RPRML	-3.19177	0.000271322
4349	COL4A6	-3.1938	5.88E-05
27887	PNOC	-3.19863	4.88E-05
1543	BCAT1	-3.20615	0.000858798
28813	RALYL	-3.21662	0.000509498
30531	SLC32A1	-3.24737	0.0002618
25216	MNS1	-3.25707	0.000109366
3364	CCDC109B	-3.26787	0.000147649
4004	CHODL	-3.28962	0.00114785
965	APOE	-3.29237	0.00155578
5764	EFHC2	-3.29611	0.000143319

29002	RDH10	-3.30034	0.000369857
29600	RSHL3	-3.30753	6.17E-05
12317	HTRA1	-3.31522	0.000437969
2398	C1ORF194	-3.31829	1.21E-05
5895	ELMOD1	-3.32218	0.000142072
3066	C9ORF171	-3.33251	4.78E-05
33592	VAT1L	-3.3402	0.000247714
12399	IFITM3	-3.3542	0.0016376
28319	PROM1	-3.35504	5.84E-05
29034	RELN	-3.43956	1.30E-05
2397	C1ORF192	-3.45738	0.000124675
586	AKAP14	-3.46559	1.94E-05
5032	DDAH1	-3.46896	1.42E-05
3766	CDK2AP2	-3.4706	3.31E-06
3652	CD47	-3.47334	6.18E-05
4283	CNR1	-3.48521	9.70E-05
12694	IQCG	-3.4934	2.59E-05
10300	HS.537002	-3.49808	0.000142247
12506	IL13RA2	-3.50471	5.79E-05
28709	RAB31	-3.51372	7.79E-05
28536	PTH2	-3.54413	0.000188892
31283	SPATA18	-3.54742	5.71E-05
3071	C9ORF24	-3.55395	9.04E-05
7432	FOXN4	-3.57299	5.14E-09
27171	PBX3	-3.57487	0.000447274
32270	TLE4	-3.57637	7.16E-05
28981	RCAN2	-3.61105	0.000608261
32069	TEKT1	-3.61846	8.36E-05
17491	LOC440585	-3.62588	0.000175217
5660	DYNLRB2	-3.6297	6.28E-05
5938	EMX2	-3.66175	1.17E-06
24314	MEIS1	-3.68295	0.000402893
13856	LMO2	-3.74164	7.37E-06
6004	EPHB1	-3.77917	0.000119962
7504	FSTL5	-3.80048	0.000392914
1119	ARMC3	-3.82142	2.66E-05

31257	SPAG6	-3.86214	1.74E-05
7865	GJA1	-3.88524	0.000511853
3274	CASC1	-3.88963	2.00E-05
7696	GAS1	-3.95396	2.45E-07
7805	GFRA2	-4.00209	0.000116201
3050	C9ORF135	-4.09611	3.21E-05
23853	LRRN3	-4.2728	1.34E-05
29603	RSPH1	-4.35627	1.08E-05
6458	FAM183A	-4.40302	2.73E-05
3220	CAMKV	-4.47543	4.97E-05
27284	PCP4	-4.64191	1.37E-05
29723	SAMD3	-4.7132	2.41E-06
31223	SOX3	-4.74012	8.45E-06
29396	ROPNIL	-4.86578	3.17E-06
29972	SEMA3C	-5.03965	4.16E-05
3695	CDC20B	-5.17405	5.72E-07
4298	CNTNAP2	-5.33902	4.01E-06
2006	C13ORF30	-5.4414	1.12E-06
33600	VCAN	-5.47499	0.000917643
1936	C11ORF88	-5.55748	2.96E-06
30115	SFRP2	-6.27713	3.81E-08
27159	PAX6	-6.64236	3.94E-10
866	ANXA1	-7.3691	4.96E-06
3561	CCNO	-9.3158	2.19E-08
13768	LHX2	-9.53566	3.56E-05

**Supplementary Table 4:** Gene expression array data of significantly up-regulated and down-regulated genes at differentiation day 25 in SHH/FGF8/Chir treated Floor-plate based population over control LSB treated population.

## **Supplementary Table 5**

Column #	Column ID	Fold-Change	p-value
32126	TFF3	24.0181	3.37E-14
1209	ASCL1	22.1637	1.69E-08
9374	HS.19193	14.7045	1.42E-11
7395	FOXA1	13.8748	2.30E-14
13865	LMX1A	10.953	4.33E-10
12456	IGFBP5	9.56964	1.58E-06
4342	COL3A1	9.49528	5.64E-06
12361	ID3	9.45077	3.33E-08
27988	POSTN	9.10453	7.82E-11
7396	FOXA2	8.85174	5.07E-15
3941	CGNL1	8.71553	1.37E-08
30390	SLC18A1	8.37911	4.77E-15
5689	EBF1	8.02385	2.37E-06
2470	C1QL1	7.76325	5.90E-10
22823	LOC728715	7.73246	1.77E-09
27665	PITX2	7.32855	7.16E-15
12655	INSM2	7.04572	4.97E-11
26250	NR4A2	6.75415	1.28E-13
8156	GPR177	6.28979	1.08E-05
13857	LMO3	6.20624	4.64E-09
33930	XBP1	5.8436	6.74E-06
12944	KCNJ16	5.71955	1.37E-13
27821	PLS3	5.62251	8.45E-07
5372	DMRTA2	5.61111	8.09E-12
7988	GNB3	5.55425	2.56E-12
31669	SULF2	5.51821	6.78E-08
33128	TTR	5.48234	2.88E-09
2543	C20ORF56	5.42131	2.00E-14
32762	TPBG	5.30583	7.23E-05
436	ADCYAP1	5.20834	1.29E-09
26977	OTX2	5.10526	6.89E-06
3978	CHGA	5.07311	7.78E-07
32000	TCF12	5.05883	1.27E-10

5348	DLL1	4.72226	3.78E-07
4003	CHN2	4.53859	9.76E-08
2867	C6ORF141	4.43629	1.97E-10
32417	TMEM163	4.40645	3.65E-08
26245	NR2F2	4.38488	8.32E-05
5036	DDC	4.37185	3.55E-05
6700	FAT3	4.28732	4.74E-06
9428	HS.204481	4.25031	1.93E-09
8288	GRM8	4.16549	1.67E-06
28590	PTPRO	4.13365	8.06E-07
32159	TH	4.10876	0.000355952
31361	SPON1	4.063	4.56E-07
34166	ZFP36L1	4.05459	0.000219198
13689	LDB2	3.9497	1.90E-08
32057	TEAD2	3.94608	6.68E-06
12731	IRX3	3.93674	0.000270763
28942	RBM47	3.91109	0.000154758
30066	SERPINF1	3.84276	3.72E-06
1666	BMP7	3.83782	1.66E-05
25444	MSX1	3.74709	3.45E-05
8593	HES6	3.66092	5.43E-05
12149	HS.7023	3.65165	0.000170814
30239	SHISA2	3.60636	8.64E-06
9819	HS.388347	3.52316	1.46E-08
7564	FZD2	3.48734	3.69E-06
26928	OSBPL10	3.44485	1.91E-07
27664	PITX1	3.40016	5.92E-06
2743	C3ORF58	3.31658	5.91E-07
30590	SLC39A8	3.30002	1.28E-06
32144	TGFBR3	3.28727	6.00E-09
18750	LOC643911	3.2583	2.43E-07
17491	LOC440585	3.24609	0.000469294
24375	MFNG	3.24122	3.31E-07
5346	DLK1	3.21349	0.000161289
7562	FZD1	3.15302	8.07E-08
3186	CALCA	3.14299	1.75E-08

27772	PLEKHA5	3.09727	0.000150905
26335	NUAK1	3.08699	1.10E-05
34155	ZFHX4	3.05463	6.49E-07
27855	PMP22	3.03785	1.12E-07
4491	CPVL	3.02972	0.000317992
7421	FOXJ1	3.01784	0.000461499
2850	C6ORF117	3.00725	3.47E-05
27105	PAPSS2	2.97981	1.49E-05
12358	ID1	2.94361	0.000160308
33004	TSHZ1	2.93637	2.29E-07
5691	EBF3	2.92465	2.26E-05
1086	ARID5B	2.92012	2.33E-06
32769	TPH1	2.88914	4.24E-07
5424	DNAJC19	2.87234	6.43E-09
6208	EVII	2.86069	2.04E-07
13858	LMO4	2.85216	4.81E-05
12733	IRX5	2.84963	0.000139911
5879	ELF1	2.78573	1.43E-06
23752	LRIG1	2.77491	0.000210665
23822	LRRC4C	2.77041	5.37E-07
4780	CXCR4	2.72468	5.12E-07
27696	PKNOX2	2.7166	1.59E-05
31514	ST6GALNAC5	2.70116	0.00012729
32854	TRIL	2.66182	5.76E-06
7617	GADD45G	2.62149	0.000385727
5349	DLL3	2.62131	0.000304562
8399	GULP1	2.58556	2.34E-07
16419	LOC283514	2.55654	7.18E-05
12986	KCNS3	2.51225	3.59E-05
6270	F3	2.50649	4.09E-09
32177	THBS4	2.48547	9.17E-05
6457	FAM181B	2.48092	0.0001071
12644	INPPL1	2.47363	7.08E-06
28624	PVRL3	2.47112	3.32E-05
2885	C6ORF173	2.45642	9.25E-05
25218	MNX1	2.44999	9.15E-08

3835	CEBPD	2.44764	0.000160544
6197	ETS2	2.43482	2.74E-06
8206	GPR98	2.37781	0.000437636
30664	SLC7A2	2.36837	5.80E-11
7853	GINS2	2.3541	7.75E-05
29887	SDC2	2.34674	3.00E-05
27402	PDZRN4	2.29374	2.31E-06
16112	LOC100192378	2.2867	4.57E-06
21088	LOC650494	2.27924	4.94E-06
8583	HERC5	2.27663	2.89E-07
1775	BTG2	2.27014	6.72E-06
30719	SLK	2.24997	3.57E-05
19806	LOC646345	2.232	3.69E-05
25137	MKL2	2.22229	0.00012672
7610	GABRR1	2.21011	2.33E-07
8573	HEPACAM2	2.17226	1.17E-09
29151	RHBDL3	2.16408	5.80E-05
27016	P2RY5	2.16065	5.91E-06
30261	SIAH3	2.14795	3.46E-05
30517	SLC2A8	2.13975	8.81E-05
7457	FREM1	2.12587	7.87E-08
1102	ARL4A	2.11255	0.000248586
29277	RNF128	2.07512	8.41E-06
29124	RGS16	2.06237	7.60E-05
8211	GPRC5C	2.04839	5.12E-05
26002	NGF	2.01869	9.29E-08
33375	UCP2	2.00568	0.000336807
11039	HS.553187	-2.00024	0.000182185
7972	GNAI1	-2.00345	0.000400577
1241	ASTN1	-2.00503	0.000267753
29957	SEL1L3	-2.00817	9.40E-06
9721	HS.348844	-2.06728	9.46E-05
403	ADAMTS5	-2.09516	8.41E-07
5268	DIRAS2	-2.10442	0.000137286
1042	ARHGAP22	-2.11082	9.20E-05
24440	MGC27121	-2.11477	1.75E-08

28124	PPP2R2C	-2.12982	0.000152152
2812	C5ORF30	-2.14976	2.66E-06
8046	GOLSYN	-2.15553	0.000225269
7626	GAGE12C	-2.16085	1.15E-07
728	AMPH	-2.19127	7.33E-05
28104	PPP1R1C	-2.2262	3.10E-07
28251	PRKACB	-2.27738	6.28E-05
26252	NR5A1	-2.3262	1.83E-08
153	ABAT	-2.33538	2.64E-05
28721	RAB3B	-2.33887	0.000174687
31151	SNX10	-2.35266	0.000210353
26936	OSBPL8	-2.36481	0.000356878
30232	SHC4	-2.36756	5.88E-06
28689	RAB15	-2.37701	4.57E-05
31222	SOX2OT	-2.37929	5.44E-06
10203	HS.525171	-2.37949	0.000112764
27287	PCSK1N	-2.39396	0.000122619
30200	SH3BGRL2	-2.39696	0.000352607
23918	LY6H	-2.3986	0.000426406
31543	STAMBPL1	-2.40424	0.000210764
12256	HSPA12A	-2.4161	5.00E-06
12209	HS3ST5	-2.42056	1.64E-08
1764	BTBD3	-2.43171	9.02E-05
32742	TOX2	-2.47449	6.41E-06
896	AP1S2	-2.4814	0.000411095
13764	LHFPL4	-2.49494	0.000177306
12801	ITM2C	-2.50635	0.000289334
1641	BLCAP	-2.52288	0.000363648
30231	SHC3	-2.53075	2.70E-06
33964	XPR1	-2.55331	2.67E-05
28266	PRKCE	-2.55567	1.75E-07
26521	OPTN	-2.57271	0.000282119
5325	DKK3	-2.57389	8.27E-05
33325	UBL3	-2.58024	0.000136606
6859	FGF13	-2.58447	3.31E-05
32210	THY1	-2.60259	0.000107047



30015	SEPT6	-2.63038	0.000101624
30351	SLC12A5	-2.64265	0.000195945
607	AKR1C4	-2.66634	0.000217452
7635	GAGE2B	-2.67196	4.87E-10
13177	KIAA1598	-2.67619	4.25E-05
1986	C12ORF68	-2.67913	0.000114615
25516	MTSS1	-2.69402	0.000290278
32535	TMEM55A	-2.70095	5.71E-06
25864	NDST3	-2.72344	9.29E-06
33591	VAT1	-2.74928	0.000228555
26498	ONECUT1	-2.77372	1.86E-05
12634	INPP1	-2.79095	5.83E-05
5703	ECEL1	-2.83259	0.000107266
16740	LOC387856	-2.84534	0.000116969
5631	DUSP6	-2.85825	8.35E-05
31568	STC1	-2.8677	0.000365825
227	ABLIM2	-2.8948	2.50E-06
27415	PELI2	-2.9135	2.07E-05
2538	C20ORF46	-2.92994	6.05E-05
4639	CSRNP3	-2.9364	6.80E-06
31628	STS-1	-2.94215	9.63E-07
30210	SH3GL3	-2.94559	0.000343973
10017	HS.452398	-3.01786	1.26E-05
4705	CTNND2	-3.02031	4.91E-05
24516	MGST1	-3.02712	1.36E-06
4283	CNR1	-3.13389	0.000271812
13313	KLF6	-3.16185	3.73E-05
7613	GAD1	-3.18763	0.000116615
29400	RORB	-3.1967	5.32E-08
27566	PHYHIPL	-3.21046	3.97E-05
25628	MYO16	-3.21287	9.14E-06
25284	MPPED2	-3.23371	0.000114488
30531	SLC32A1	-3.23601	0.000270573
29034	RELN	-3.32027	1.95E-05
26058	NKX2-1	-3.35392	4.84E-06
30114	SFRP1	-3.38198	0.00010787

4965	DBC1	-3.3928	1.25E-05
31763	SYT1	-3.47973	0.00017165
29624	RTN1	-3.48718	0.000208889
3121	CA10	-3.49466	0.000217475
24095	MAP4	-3.54296	0.000118613
9476	HS.223856	-3.61087	5.18E-05
32343	TMEFF2	-3.6559	1.52E-06
713	AMHR2	-3.65957	2.10E-08
28417	PSD2	-3.70127	0.000123589
7106	FLJ33590	-3.74166	4.19E-06
4386	COPG2IT1	-3.9994	7.98E-05
3207	CALY	-4.03219	3.21E-06
30824	SNCG	-4.48956	2.76E-06
5455	DNER	-4.58982	1.95E-05
5550	DRD1IP	-4.64486	5.89E-07
26253	NR5A2	-4.70942	1.65E-11
12954	KCNK12	-4.77483	2.25E-06
5352	DLX1	-4.89802	0.000316228
26332	NTS	-4.92922	0.000411631
33565	UTS2	-5.26698	2.91E-07
3220	CAMKV	-5.35563	1.08E-05
2631	C22ORF42	-5.4488	2.15E-07
29220	RIT2	-5.49937	9.53E-12
31359	SPOCK2	-5.66406	5.68E-06
12746	ISLR2	-5.6746	0.000247482
32591	TMOD1	-5.689	7.66E-12
3215	CAMK2N1	-5.84508	2.30E-06
33592	VAT1L	-6.26024	7.74E-07
27971	POMC	-6.74106	6.72E-05
26219	NPTX2	-7.85511	1.15E-05
25939	NELL1	-8.58778	1.80E-08
33624	VGf	-8.61516	1.37E-05
31223	SOX3	-10.3701	8.71E-09
30314	SIX6	-12.5834	1.04E-12
26965	OTP	-14.2469	6.08E-10
12743	ISL1	-21.0507	6.48E-05

31479 SST

-21.3179

0.000281588

**Supplementary Table 5:** Gene expression array data of significantly up-regulated and down-regulated genes at differentiation day 25 in SHH/FGF8/Chir treated Floor-plate based population over SHH/FGF8 only treated population.

**Supplementary Table 6**

<b>Antibody</b>	<b>Dilution</b>	<b>Source</b>	<b>Location</b>
Human nuclear antigen	1:100	Millipore	Billerica, MA
Human cell adhesion molecule	1:100	Santa Cruz	Santa Cruz, CA
Tyrosine Hydroxylase (TH)	1:1000 / 1:500	Pel-Freez / ImmunoStar	Rogers, AR / Hudson, WI
$\beta$ -tubulin III	1:500 / 1:2000	Covance	Littleton, CO / Princeton, NJ
Doublecortin	1:100	Millipore	Billerica, MA
Human specific Nestin	1:300	R&D	Minneapolis, MN
Nestin # 130	1:50	Gift: R. McKay	NINDS, NIH
FoxA2	1:100	Santa Cruz	Santa Cruz, CA
Pitx3	1:100	Millipore	Billerica, MA
$\beta$ -catenin	1:100	BD	Franklin Lakes, NJ
Collagen	1:100	Oncogene	LaJolla, CA
Cytokeratin	1:100	DAKO	Glostrup, DK
Oct-4	1:200	Santa Cruz	Billerica, MA
Ki-67	1:200 / 1:400	Zymed / DAKO	San Francisco, CA
GABA polyclonal	1:2000	Sigma	St Louis, MI
Serotonin (5-HT)	1:2000	Sigma	St Louis, MI
GFAP polyclonal	1:2000	DAKO	Glostrup, DK
Calbindin	1:300	Abcam	Cambridge, MA
VMAT2	1:200	Millipore	Billerica, MA
DAT	1:1000 / 1:2000	Millipore	Billerica, MA /
GFP	1:1000	Molecular Probes	Carlsbad, CA
Girk2	1:200	Abcam / Alomone	Cambridge, MA / Israel
FoxG1	1:100	NeuraCell	Rensselaer, NY
Pax6	1:100	Covance	Princeton, NJ
Otx2	1:2000	Strategic Diagnostics	Newark DE
Lmx1a	1:2000	Millipore	Pittsburgh, PA
Synapsin	1:1000	Sigma	St Louis, MI
Iba-1	1:200	Millipore	Billerica, MA
ED-1	1:200	Millipore	Pittsburgh, PA
Human NCAM (Eric-1)	1:100	Santa Cruz	Santa Cruz, CA
Human specific cytoplasmn (SC-121)	1:1000	Stem Cells Inc.	Newark, CA
Nurr-1	1:1500	Perseus Proteomics	Japan