

<b>Sample</b>	<b>iP-F2</b>	<b>iP-F5</b>	<b>iP-F6</b>	<b>ISCS-B-F9</b>	<b>ISCS-B-F10</b>	<b>ISCS-B-F11</b>
Filtered paired reads	29,973,030	34,661,705	44,114,178	49,441,621	48,486,251	46,258,263
Left mapped reads	29,971,923	34,660,505	44,112,528	49,439,481	48,484,493	46,258,263
Left mapped reads (%)	100%	100%	100%	100%	100%	100%
Right mapped reads	29,947,938	34,633,262	44,085,777	49,400,296	48,454,937	46,228,550
Right mapped reads (%)	99.92%	99.92%	99.94%	99.92%	99.94%	99.94%

Supplementary Table S1. RNA-seq reads of each sample.

**Female**

Gene Symbol	ISCS9 (mean)	Variance	iP (mean)	Variance	Fold change:	
					ISCSB/iP	p-value (one-tail)
<i>Adcyap1r1</i>	1.927	0.063	1.495	0.238	1.289	0.001
<i>Adcy7</i>	0.54	0.01	0.57	0.01	0.946	0.183
<i>Slc5a7</i>	1.06	0.18	1.24	0.15	0.851	0.092
<i>Tacr1</i>	1.278	0.218	1.516	0.116	0.843	0.046
<i>Slc18a3</i>	0.906	0.108	1.262	0.277	0.718	0.011
<i>lhx8</i>	2.15	1.07	3.16	1.19	0.681	0.004
<i>Chat</i>	2.26	1.01	3.52	2.61	0.642	0.004
<i>Ngfr</i>	0.268	0.009	0.438	0.046	0.611	0.003
<i>Nap1L5</i>	1.27	0.02	1.01	0.03	1.252	0.000
<i>Snca</i>	1.78	0.13	1.09	0.03	1.631	0.000
<i>Ppm1K</i>	1.45	0.01	1.04	0.02	1.393	0.000
<i>Aqp1</i>	0.85	0.29	1.25	0.64	0.681	0.044

**Male**

	ISCS9 (mean)	Variance	iP (mean)	Variance	ld change: ISCSB,	p-value (one-tail)
<i>Adcyap1r1</i>	1.863	0.071	1.980	0.213	0.941	0.199
<i>Adcy7</i>	0.557	0.013	0.734	0.057	0.759	0.009
<i>Slc5a7</i>	1.165	0.446	3.408	6.201	0.342	0.002
<i>Tacr1</i>	1.214	0.197	2.515	0.905	0.483	0.000
<i>Slc18a3</i>	1.083	0.377	1.988	1.641	0.545	0.011
<i>Lhx8</i>	2.74	4.05	7.69	29.62	0.355	0.002
<i>Chat</i>	2.97	3.10	7.29	26.03	0.407	0.004
<i>Ngfr</i>	0.25	0.01	1.11	1.32	0.227	0.006
<i>Nap1L5</i>	1.01	0.06	1.05	0.12	0.965	0.356
<i>Snca</i>	1.31	0.03	1.04	0.07	1.263	0.001
<i>PpmiK</i>	1.47	0.03	1.08	0.12	1.371	0.000
<i>Aqp1</i>	2.38	3.79	1.33	1.38	1.786	0.030

Supplementary. Table S2. Gene expression in the Nac of both male and female rats using RT-qPCR

<u>Ensemb ID</u>	<u>Gene symbol</u>	<u>Full name</u>	<u>Chromo some</u>	<u>BaseMean iP</u>	<u>BaseMean ISCS-B</u>	<u>FC 2</u>	<u>log2FC 2</u>	<u>pval</u>	<u>padj</u>
ENSRNOG00000010597	Slc5a7	solute carrier family 5 (sodium/choline cotransporter); member 7	chr9	1907.52	449.09	0.235	-2.09	0.00	0.000
ENSRNOG00000025012	Chat	choline O-acetyltransferase	chr16	944.03	235.43	0.249	-2.00	0.00	0.000
ENSRNOG00000019447	Ecel1	endothelin converting enzyme-like 1	chr9	2243.20	674.62	0.301	-1.73	0.00	0.000
ENSRNOG00000026091	Slc10a4	solute carrier family 10; member 4	chr14	719.90	180.36	0.251	-2.00	0.00	0.000
ENSRNOG00000062141	Slc18a3	solute carrier family 18 member A3	chr16	394.56	88.07	0.223	-2.16	0.00	0.000
ENSRNOG00000013953	Ntrk1	neurotrophic tyrosine kinase; receptor; type 1	chr2	502.74	129.07	0.257	-1.96	0.00	0.000
ENSRNOG00000015835	Cacna2d2	calcium channel; voltage-dependent; alpha 2/delta subunit 2	chr8	3379.89	1580.50	0.468	-1.10	0.00	0.000
ENSRNOG00000005392	Ngfr	nerve growth factor receptor	chr10	615.47	61.58	0.100	-3.32	0.00	0.000
ENSRNOG00000050841	Ache	acetylcholinesterase	chr12	2748.55	1127.17	0.410	-1.29	0.00	0.000
ENSRNOG00000008176	Nppa	natriuretic peptide A	chr5	171.07	423.32	2.475	1.31	0.00	0.000
ENSRNOG00000028348	Lhx8	LIM homeobox 8	chr2	511.42	95.09	0.186	-2.43	0.00	0.000
ENSRNOG00000021084	Mpeg1	macrophage expressed 1	chr1	1237.10	565.67	0.457	-1.13	0.00	0.000
ENSRNOG00000005996	Lhx6	LIM homeobox 6	chr3	1090.45	427.30	0.392	-1.35	0.00	0.000
ENSRNOG00000007581	Slc17a8	solute carrier family 17 (vesicular glutamate transporter); member 8	chr7	277.44	110.02	0.397	-1.33	0.00	0.000
ENSRNOG00000005853	Tacr1	tachykinin receptor 1	chr4	421.33	194.06	0.461	-1.12	0.00	0.000
ENSRNOG000000031397	Stk32b	serine/threonine kinase 32B	chr14	113.78	31.89	0.280	-1.84	0.00	0.000
ENSRNOG00000003066	Wnt9a	wingless-type MMTV integration site family; member 9A	chr10	163.63	353.69	2.162	1.11	0.00	0.000
ENSRNOG000000059714	Hsp90aa1	heat shock protein 90; alpha (cytosolic); class A member 1	chr6	397.27	193.89	0.488	-1.03	0.00	0.000
ENSRNOG00000028708	Ntsr1	neurotensin receptor 1	chr3	175.63	53.57	0.305	-1.71	0.00	0.000
ENSRNOG00000008855	Gjb2	gap junction protein; beta 2	chr15	243.93	687.01	2.816	1.49	0.00	0.000
ENSRNOG00000006120	Shh	sonic hedgehog	chr4	127.48	41.34	0.324	-1.62	0.00	0.000
ENSRNOG00000021745	Bhlhe22	basic helix-loop-helix family; member e22	chr2	175.92	477.28	2.713	1.44	0.00	0.000
ENSRNOG00000008697	Nov	nephroblastoma overexpressed	chr7	652.83	1675.98	2.567	1.36	0.00	0.000
ENSRNOG00000016057	Kcnj13	potassium channel; inwardly rectifying subfamily J; member 13	chr9	47.25	133.95	2.835	1.50	0.00	0.000
ENSRNOG00000021063	Grin2d	glutamate receptor; ionotropic; N-methyl D-aspartate 2D	chr1	551.57	233.09	0.423	-1.24	0.00	0.000
ENSRNOG00000003183	Fmod	fibromodulin	chr13	455.54	991.71	2.177	1.12	0.00	0.000
ENSRNOG00000046863	C1qI2	complement component 1; q subcomponent-like 2	chr13	141.25	52.60	0.372	-1.43	0.00	0.000
ENSRNOG00000053384	Bmp7	bone morphogenetic protein 7	chr3	155.33	396.83	2.555	1.35	0.00	0.000
ENSRNOG00000004372	Cbln4	cerebellin 4 precursor	chr3	323.56	130.42	0.403	-1.31	0.00	0.000
ENSRNOG00000005580	Itgb4	integrin; beta 4	chr10	221.95	498.72	2.247	1.17	0.00	0.000
ENSRNOG00000015957	F13a1	coagulation factor XIII; A1 polypeptide	chr17	57.84	143.34	2.478	1.31	0.00	0.000
ENSRNOG00000027220	Pcdhgb8	protocadherin gamma subfamily B; 8	chr18	218.08	104.31	0.478	-1.06	0.00	0.000

ENSRNOG00000020620	Ppp1r32	protein phosphatase 1; regulatory subunit 32	chr1	85.04	26.50	0.312	-1.68	0.00	0.000
ENSRNOG00000055049	Aldh1a2	aldehyde dehydrogenase 1 family; member A2	chr8	330.43	792.82	2.399	1.26	0.00	0.000
ENSRNOG00000004210	Osr1	odd-skipped related transcription factor 1	chr6	51.57	151.03	2.928	1.55	0.00	0.000
ENSRNOG00000019495	Gbx2	gastrulation brain homeobox 2	chr9	97.20	35.79	0.368	-1.44	0.00	0.000
ENSRNOG000000057092	Slfn3	schlafen 3	chr10	40.56	106.64	2.629	1.39	0.00	0.000
ENSRNOG00000026110	Scml4	sex comb on midleg-like 4 (Drosophila)	chr20	194.72	94.20	0.484	-1.05	0.00	0.000
ENSRNOG00000016957	Igfbp2	insulin-like growth factor binding protein 2	chr9	716.69	1576.29	2.199	1.14	0.00	0.000
ENSRNOG00000018715	Clec10a	C-type lectin domain family 10; member A	chr10	34.74	95.00	2.735	1.45	0.00	0.000
ENSRNOG00000032844	RT1-Da	RT1 class II; locus Da	chr20	42.83	124.97	2.918	1.55	0.00	0.000
ENSRNOG00000016085	Mpzl2	myelin protein zero-like 2	chr8	49.78	191.67	3.851	1.95	0.00	0.000
ENSRNOG00000004614	Lypd6b	LY6/PLAUR domain containing 6B	chr3	251.59	112.77	0.448	-1.16	0.00	0.000
ENSRNOG00000020369	Igf2	insulin-like growth factor 2	chr1	1486.36	2997.30	2.017	1.01	0.00	0.000
ENSRNOG000000056714	Sla	src-like adaptor	chr7	210.11	458.74	2.183	1.13	0.00	0.000
ENSRNOG00000015259	Pth2r	parathyroid hormone 2 receptor	chr9	65.84	20.82	0.316	-1.66	0.00	0.000
ENSRNOG00000015550	Ptgds	prostaglandin D2 synthase (brain)	chr3	13019.93	35901.42	2.757	1.46	0.00	0.000
ENSRNOG00000012727	Trpc7	transient receptor potential cation channel; subfamily C; member 7	chr17	237.69	111.63	0.470	-1.09	0.00	0.000
ENSRNOG00000000723	RT1-CE5	RT1 class I; locus CE5	chr20	62.06	134.65	2.170	1.12	0.00	0.000
ENSRNOG00000030763	Dpp4	dipeptidylpeptidase 4	chr3	48.24	118.80	2.463	1.30	0.00	0.000
ENSRNOG00000046848	PCOLCE2	procollagen C-endopeptidase enhancer 2	chr8	31.42	85.66	2.726	1.45	0.00	0.000
ENSRNOG00000004179	Nts	neurotensin	chr7	627.17	240.83	0.384	-1.38	0.00	0.000
ENSRNOG00000015071	Zim1	zinc finger; imprinted 1	chr1	237.23	65.66	0.277	-1.85	0.00	0.000
ENSRNOG00000019141	Ch25h	cholesterol 25-hydroxylase	chr1	51.27	121.82	2.376	1.25	0.00	0.000
ENSRNOG00000013369	Gbx1	gastrulation brain homeobox 1	chr4	52.01	15.92	0.306	-1.71	0.00	0.000
ENSRNOG00000030530	Gzmm	granzyme M (lymphocyte met-ase 1)	chr7	34.83	87.85	2.522	1.33	0.00	0.000
ENSRNOG00000018215	Slc22a6	solute carrier family 22 (organic anion transporter); member 6	chr1	193.48	524.39	2.710	1.44	0.00	0.000
ENSRNOG00000017409	Wnt6	wingless-type MMTV integration site family; member 6	chr9	59.52	188.51	3.167	1.66	0.00	0.000
ENSRNOG00000011648	Aqp1	aquaporin 1	chr4	53.34	178.68	3.350	1.74	0.00	0.000
ENSRNOG00000015668	Ccl19	chemokine (C-C motif) ligand 19	chr5	39.47	94.96	2.406	1.27	0.00	0.000
ENSRNOG000000049213	Npy2r	neuropeptide Y receptor Y2	chr2	126.61	56.71	0.448	-1.16	0.00	0.000
ENSRNOG00000018735	Cd74	Cd74 molecule; major histocompatibility complex; class II	chr18	128.83	375.80	2.917	1.54	0.00	0.000
ENSRNOG000000055705	Htr7	5-hydroxytryptamine (serotonin) receptor 7; adenylate cyclase-coupled	chr1	112.45	53.51	0.476	-1.07	0.00	0.000
ENSRNOG000000003172	Serpinf1	serpin peptidase inhibitor; clade F (alpha-2 antiplasmin; pigment	chr10	159.55	421.71	2.643	1.40	0.00	0.001
ENSRNOG00000026907	Zbtb37	zinc finger and BTB domain containing 37	chr13	61.34	22.85	0.373	-1.42	0.00	0.001

ENSRNOG00000019118	Slc13a3	solute carrier family 13 (sodium-dependent dicarboxylate transporter);	chr3	808.48	1679.85	2.078	1.06	0.00	0.001
ENSRNOG00000027392	Ccdc187	coiled-coil domain containing 187	chr3	185.69	81.53	0.439	-1.19	0.00	0.001
ENSRNOG00000018251	Mrc1	mannose receptor; C type 1	chr17	153.15	311.13	2.031	1.02	0.00	0.001
ENSRNOG00000025670	Shisa3	shisa family member 3	chr14	110.59	384.35	3.475	1.80	0.00	0.001
ENSRNOG00000027935	Lrrc34	leucine rich repeat containing 34	chr2	60.78	19.72	0.324	-1.62	0.00	0.001
ENSRNOG00000008644	Nkx2-1	NK2 homeobox 1	chr6	145.37	47.39	0.326	-1.62	0.00	0.001
N/A	LOC310926	hypothetical protein LOC310926	chr1	47.59	225.83	4.746	2.25	0.00	0.001
ENSRNOG00000012995	Gpr165	G protein-coupled receptor 165	chrX	1103.53	295.73	0.268	-1.90	0.00	0.001
ENSRNOG00000013426	Mrgprf	MAS-related GPR; member F	chr1	33.28	84.71	2.545	1.35	0.00	0.001
ENSRNOG00000011642	Tfap2d	transcription factor AP-2 delta	chr9	25.23	64.33	2.550	1.35	0.00	0.002
ENSRNOG00000046972	Chrm2	cholinergic receptor; muscarinic 2	chr4	274.75	132.94	0.484	-1.05	0.00	0.002
ENSRNOG00000017459	C1q13	complement component 1; q subcomponent-like 3	chr17	211.42	427.34	2.021	1.02	0.00	0.002
ENSRNOG00000010128	Slc27a2	solute carrier family 27 (fatty acid transporter); member 2	chr3	170.64	55.36	0.324	-1.62	0.00	0.002
ENSRNOG00000014776	Adcy7	adenylate cyclase 7	chr19	345.31	152.71	0.442	-1.18	0.00	0.002
ENSRNOG00000012448	Chrn3	cholinergic receptor; nicotinic; beta 3 (neuronal)	chr16	23.14	59.53	2.573	1.36	0.00	0.002
ENSRNOG00000023576	RGD1305645	similar to RIKEN cDNA 1500015O10	chr9	51.08	140.24	2.746	1.46	0.00	0.002
ENSRNOG00000048924	Islr	immunoglobulin superfamily containing leucine-rich repeat	chr8	160.70	377.94	2.352	1.23	0.00	0.003
ENSRNOG00000039086	Ccdc153	coiled-coil domain containing 153	chr8	81.94	38.58	0.471	-1.09	0.00	0.003
ENSRNOG00000038600	Dnaaf3	dynein; axonemal; assembly factor 3	chr1	98.84	48.18	0.487	-1.04	0.00	0.003
ENSRNOG00000012608	Tmem212	transmembrane protein 212	chr2	35.00	1.44	0.041	-4.60	0.00	0.003
ENSRNOG00000011821	S100a4	S100 calcium-binding protein A4	chr2	47.94	112.81	2.353	1.23	0.00	0.003
ENSRNOG00000018087	Vim	vimentin	chr17	1688.49	3433.83	2.034	1.02	0.00	0.003
ENSRNOG00000031100	Klhl1	kelch-like family member 1	chr15	130.30	32.82	0.252	-1.99	0.00	0.003
ENSRNOG00000011184	Slc13a4	solute carrier family 13 (sodium/sulfate symporter); member 4	chr4	517.88	1270.80	2.454	1.30	0.00	0.004
ENSRNOG00000025691	Pla2g7	phospholipase A2; group VII (platelet-activating factor acetylhydrolase; serine rich and transmembrane domain containing 2	chr9	254.10	565.86	2.227	1.16	0.00	0.004
N/A	Sertm2		chrX	126.16	56.28	0.446	-1.16	0.00	0.004
ENSRNOG00000011823	Tfap2b	transcription factor AP-2 beta	chr9	38.77	108.85	2.808	1.49	0.00	0.004
ENSRNOG00000011251	Hcrtr2	hypocretin (orexin) receptor 2	chr8	89.96	37.48	0.417	-1.26	0.00	0.005
ENSRNOG00000060867	Rln1	relaxin 1	chr1	18.08	48.48	2.681	1.42	0.00	0.006
ENSRNOG00000028041	Tnnt1	troponin T type 1 (skeletal; slow)	chr1	162.73	76.38	0.469	-1.09	0.00	0.007
ENSRNOG00000035555	Mir384	microRNA 384	chrX	18.22	2.92	0.160	-2.64	0.00	0.007
ENSRNOG00000013720	Aebp1	AE binding protein 1	chr14	891.93	1813.33	2.033	1.02	0.00	0.007
ENSRNOG00000022957	Ctxn3	cortixin 3	chr18	293.69	135.06	0.460	-1.12	0.00	0.007

ENSRNOG00000013681	Kcns1	potassium voltage-gated channel; modifier subfamily S; member 1	chr3	39.16	79.33	2.026	1.02	0.00	0.008
ENSRNOG000000051684	St8sia6	ST8 alpha-N-acetyl-neuraminide alpha-2;8-sialyltransferase 6	chr17	24.96	6.40	0.256	-1.96	0.00	0.008
ENSRNOG000000008492	Ccdc19	cilia and flagella associated protein 45 (Cfap45)	chr13	46.23	17.71	0.383	-1.38	0.00	0.009
ENSRNOG000000002120	Spata18	spermatogenesis associated 18	chr14	47.73	5.79	0.121	-3.04	0.00	0.009
ENSRNOG000000013768	Defb1	defensin beta 1	chr16	21.26	52.43	2.466	1.30	0.00	0.009
N/A	Tnxa-ps1	tenascin XA, pseudogene 1	chr20	36.39	76.25	2.096	1.07	0.00	0.010
ENSRNOG000000006639	Scn9a	sodium channel; voltage-gated; type IX; alpha subunit	chr3	706.54	335.16	0.474	-1.08	0.00	0.010
ENSRNOG000000040287	Cyp1b1	cytochrome P450; family 1; subfamily b; polypeptide 1	chr6	31.89	87.04	2.730	1.45	0.00	0.010
N/A	Gstm2	glutathione S-transferase mu 2	chr2	50.33	156.58	3.111	1.64	0.00	0.011
ENSRNOG000000018346	Agtr1a	angiotensin II receptor; type 1a	chr17	31.96	67.92	2.125	1.09	0.00	0.012
ENSRNOG000000005781	Wnt16	wingless-type MMTV integration site family; member 16	chr4	52.20	107.93	2.068	1.05	0.00	0.012
ENSRNOG000000019358	Esr1	estrogen receptor 1	chr1	63.93	15.29	0.239	-2.06	0.00	0.013
ENSRNOG0000000052564	Gpx3	glutathione peroxidase 3	chr10	634.95	208.23	0.328	-1.61	0.00	0.014
ENSRNOG000000031211	Acsm5	acyl-CoA synthetase medium-chain family member 5	chr1	65.09	131.20	2.016	1.01	0.00	0.014
ENSRNOG000000047098	Hbb	beta-globin	chr1	55.03	198.24	3.602	1.85	0.00	0.014
ENSRNOG000000000451	RT1-Ba	RT1 class II; locus Ba	chr20	34.91	71.82	2.057	1.04	0.00	0.015
ENSRNOG000000061182	Gabre	gamma-aminobutyric acid (GABA) A receptor; epsilon	chrX	117.35	10.41	0.089	-3.49	0.00	0.017
ENSRNOG000000018316	Grap2	GRB2-related adaptor protein 2	chr7	17.10	42.76	2.500	1.32	0.00	0.017
ENSRNOG000000010253	Cd163	CD163 molecule	chr4	54.68	114.77	2.099	1.07	0.00	0.017
ENSRNOG000000002862	Clcn5	chloride channel; voltage-sensitive 5	chrX	207.26	81.64	0.394	-1.34	0.00	0.018
ENSRNOG000000030021	Ccl6	chemokine (C-C motif) ligand 6	chr10	22.10	51.16	2.315	1.21	0.00	0.018
ENSRNOG0000000059852	Rn5-8s	5.8S ribosomal RNA	chr14	2.95	21.96	7.453	2.90	0.00	0.019
ENSRNOG000000021225	Oxt	oxytocin/neurophysin 1 prepropeptide	chr3	446.57	1.17	0.003	-8.58	0.00	0.019
ENSRNOG000000041468	Mir1188	microRNA 1188	chr6	56.85	26.72	0.470	-1.09	0.00	0.020
ENSRNOG000000010362	Anxa2	annexin A2	chr8	215.47	450.40	2.090	1.06	0.00	0.022
ENSRNOG000000042139	Clec4a1	C-type lectin domain family 4; member A1	chr4	21.36	47.76	2.237	1.16	0.00	0.022
ENSRNOG000000009372	Tacr3	tachykinin receptor 3	chr2	132.52	58.11	0.439	-1.19	0.00	0.023
ENSRNOG000000020151	Cdh1	cadherin 1	chr19	97.64	284.01	2.909	1.54	0.00	0.023
ENSRNOG000000013838	Hcrtr1	hypocretin (orexin) receptor 1	chr5	51.93	23.47	0.452	-1.15	0.00	0.024
ENSRNOG000000019890	Folr2	folate receptor 2 (fetal)	chr1	10.67	31.06	2.911	1.54	0.00	0.024
N/A	Capns2	calpain, small subunit 2	chr19	50.67	23.19	0.458	-1.13	0.00	0.025
ENSRNOG000000028548	Ccl9	chemokine (C-C motif) ligand 9	chr10	9.81	33.78	3.442	1.78	0.00	0.025
ENSRNOG000000028015	Pf4	platelet factor 4	chr14	17.90	44.35	2.478	1.31	0.00	0.026

ENSRNOG00000023664	Lepr	leptin receptor	chr5	224.22	460.22	2.052	1.04	0.00	0.026
ENSRNOG00000012301	Cfap161	cilia and flagella associated protein 161	chr1	38.19	15.39	0.403	-1.31	0.00	0.029
ENSRNOG00000033734	Tnnt2	troponin T type 2 (cardiac)	chr13	132.76	334.28	2.518	1.33	0.00	0.029
ENSRNOG00000027658	Gpr101	G protein-coupled receptor 101	chrX	733.37	359.77	0.491	-1.03	0.00	0.030
ENSRNOG00000012450	Dynlrb2	dynein light chain roadblock-type 2	chr19	27.75	8.41	0.303	-1.72	0.00	0.031
ENSRNOG00000018445	Agt	angiotensinogen (serpin peptidase inhibitor; clade A; member 8)	chr19	6663.91	3223.93	0.484	-1.05	0.00	0.032
ENSRNOG00000007765	Frzb	frizzled-related protein	chr3	173.78	390.25	2.246	1.17	0.00	0.033
ENSRNOG00000022256	Cxcl10	chemokine (C-X-C motif) ligand 10	chr14	7.60	24.64	3.245	1.70	0.00	0.034
ENSRNOG00000020650	Slc17a7	solute carrier family 17 (vesicular glutamate transporter); member 7	chr1	6614.15	15565.80	2.353	1.23	0.00	0.036
ENSRNOG00000037060	Odf3b	outer dense fiber of sperm tails 3B	chr7	56.24	27.66	0.492	-1.02	0.00	0.036
ENSRNOG000000061299	LOC100134871	beta globin minor gene	chr1	200.83	761.83	3.793	1.92	0.00	0.037
ENSRNOG00000026150	Zar1	zygote arrest 1	chr14	43.63	19.11	0.438	-1.19	0.00	0.038
ENSRNOG00000007457	Serping1	serpin peptidase inhibitor; clade G (C1 inhibitor); member 1	chr3	218.89	470.52	2.150	1.10	0.00	0.041
ENSRNOG00000003357	Col3a1	collagen; type III; alpha 1	chr9	564.80	1146.39	2.030	1.02	0.00	0.044
ENSRNOG00000018693	Asgr1	asialoglycoprotein receptor 1	chr10	21.21	45.89	2.164	1.11	0.00	0.045
ENSRNOG00000014893	Wdr63	WD repeat domain 63	chr2	76.19	15.38	0.202	-2.31	0.00	0.045
ENSRNOG00000026661	Gpr81	G protein-coupled receptor 81	chr12	19.20	42.62	2.220	1.15	0.00	0.049
ENSRNOG00000002881	Ddr2	discoidin domain receptor tyrosine kinase 2	chr13	184.83	378.47	2.048	1.03	0.00	0.050
ENSRNOG00000018191	Oprm1	opioid receptor; mu 1	chr1	199.63	76.55	0.383	-1.38	0.00	0.053
ENSRNOG00000009197	Asb4	ankyrin repeat and SOCS box-containing 4	chr4	51.62	3.75	0.073	-3.78	0.00	0.054
ENSRNOG000000058105	Hbb-b1	hemoglobin, beta adult major chain	chr1	245.57	759.81	3.094	1.63	0.00	0.055
ENSRNOG00000017416	Ppic	peptidylprolyl isomerase C	chr18	47.06	107.02	2.274	1.19	0.00	0.056
ENSRNOG00000047763	Mir3547	microRNA 3547	chr10	102.89	35.15	0.342	-1.55	0.00	0.058
ENSRNOG00000019584	Dlk1	delta-like 1 homolog (Drosophila)	chr6	477.30	165.13	0.346	-1.53	0.00	0.070
ENSRNOG000000059469	Otx1	orthodenticle homeobox 1	chr14	23.65	48.43	2.047	1.03	0.00	0.071
ENSRNOG00000012843	Aspg	asparaginase	chr6	36.16	112.50	3.111	1.64	0.00	0.074
ENSRNOG00000016654	Galr1	galanin receptor 1	chr18	56.93	21.77	0.382	-1.39	0.00	0.075
ENSRNOG00000018290	Alx3	ALX homeobox 3	chr2	22.32	52.26	2.341	1.23	0.00	0.078
ENSRNOG00000016581	Serpinb1a	serine (or cysteine) proteinase inhibitor; clade B; member 1a	chr17	52.70	118.43	2.247	1.17	0.00	0.078
ENSRNOG00000016678	Angptl2	angiopoietin-like 2	chr3	70.74	158.80	2.245	1.17	0.01	0.083
ENSRNOG000000062013	Adprh1	ADP-ribosylhydrolase like 1	chr16	14.84	32.81	2.211	1.14	0.01	0.086
ENSRNOG00000002217	Plac8	placenta-specific 8	chr14	9.02	25.18	2.793	1.48	0.01	0.087
ENSRNOG000000028417	Neurod2	neuronal differentiation 2	chr10	179.69	362.67	2.018	1.01	0.01	0.087

ENSRNOG00000004712	Angptl1	angiopoietin-like 1	chr13	23.35	52.25	2.237	1.16	0.01	0.089
ENSRNOG000000011568	Rspo3	R-spondin 3	chr1	70.86	151.03	2.131	1.09	0.01	0.094
ENSRNOG000000002385	Prg4	proteoglycan 4	chr13	131.08	284.57	2.171	1.12	0.01	0.095
ENSRNOG000000006146	Trim54	tripartite motif-containing 54	chr6	221.62	523.17	2.361	1.24	0.01	0.095
ENSRNOG000000011101	Twist1	twist family bHLH transcription factor 1	chr6	21.61	50.09	2.318	1.21	0.01	0.102
ENSRNOG000000019445	Msln	mesothelin	chr10	18.75	73.88	3.939	1.98	0.01	0.104
ENSRNOG000000053402	Gabrq	gamma-aminobutyric acid (GABA) A receptor; theta	chrX	79.36	11.11	0.140	-2.84	0.01	0.111
ENSRNOG000000005049	Tbr1	T-box; brain; 1	chr3	340.47	755.02	2.218	1.15	0.01	0.112
ENSRNOG000000049792	Gla3	glycine receptor; alpha 3	chr16	29.31	12.74	0.435	-1.20	0.01	0.117
ENSRNOG000000023991	Rab20	RAB20; member RAS oncogene family	chr16	15.18	33.24	2.190	1.13	0.01	0.118
ENSRNOG000000058560	Col2a1	collagen; type II; alpha 1	chr7	159.84	53.87	0.337	-1.57	0.01	0.122
ENSRNOG000000009005	Slco2a1	solute carrier organic anion transporter family; member 2a1	chr8	54.16	141.26	2.608	1.38	0.01	0.122
ENSRNOG000000047446	Foxc2	forkhead box C2	chr19	26.98	76.31	2.829	1.50	0.01	0.125
ENSRNOG000000010053	Calcr	calcitonin receptor	chr4	714.88	150.72	0.211	-2.25	0.01	0.130
ENSRNOG000000015599	Mall	mal; T-cell differentiation protein-like	chr3	19.45	40.46	2.080	1.06	0.01	0.136
ENSRNOG000000024172	T2	brachyury 2	chr1	52.76	24.64	0.467	-1.10	0.01	0.142
ENSRNOG000000010699	Trim43a	tripartite motif-containing 43A	chr8	29.84	13.86	0.465	-1.11	0.01	0.150
ENSRNOG000000039107	Mfrp	membrane frizzled-related protein	chr8	52.76	146.83	2.783	1.48	0.01	0.150
ENSRNOG000000005930	Nnmt	nicotinamide N-methyltransferase	chr8	14.25	29.90	2.098	1.07	0.01	0.151
ENSRNOG000000007027	Hgf	hepatocyte growth factor	chr4	44.24	89.90	2.032	1.02	0.02	0.166
ENSRNOG000000008394	Prg2	proteoglycan 2	chr3	8.53	20.60	2.415	1.27	0.02	0.179
ENSRNOG000000006090	Ucn	urocortin	chr6	6.04	16.31	2.702	1.43	0.02	0.179
ENSRNOG000000006204	Slc30a3	solute carrier family 30 (zinc transporter); member 3	chr6	825.69	1776.57	2.152	1.11	0.02	0.182
ENSRNOG000000001959	Mx1	myxovirus (influenza virus) resistance 1	chr11	21.67	78.82	3.638	1.86	0.02	0.186
ENSRNOG000000047917	Plscr5	phospholipid scramblase family; member 5	chr8	20.45	9.06	0.443	-1.17	0.02	0.189
ENSRNOG000000037149	Bcl2l15	BCL2-like 15	chr2	23.97	11.00	0.459	-1.12	0.02	0.191
ENSRNOG000000011160	Sv2b	synaptic vesicle glycoprotein 2b	chr1	4074.95	8335.78	2.046	1.03	0.02	0.195
ENSRNOG000000017783	Sfrp1	secreted frizzled-related protein 1	chr16	388.47	867.27	2.233	1.16	0.02	0.195
ENSRNOG000000005048	Trhr	thyrotropin releasing hormone receptor	chr7	167.52	73.43	0.438	-1.19	0.02	0.201
ENSRNOG000000032063	Gfral	GDNF family receptor alpha like	chr8	30.65	66.42	2.167	1.12	0.02	0.204
ENSRNOG000000036267	Mir341	microRNA 341	chr6	23.22	10.75	0.463	-1.11	0.02	0.204
ENSRNOG000000026055	Neurod6	neuronal differentiation 6	chr4	209.83	471.69	2.248	1.17	0.02	0.204
ENSRNOG000000021323	Car13	carbonic anhydrase 13	chr2	41.87	90.18	2.154	1.11	0.03	0.214



N/A	Hist3h3	histone cluster 3, H3	chr10	18.49	7.54	0.408	-1.29	0.03	0.227
ENSRNOG00000016275	Ttr	transthyretin	chr18	7.60	40.13	5.284	2.40	0.03	0.227
ENSRNOG00000045989	Hba-a1	hemoglobin alpha; adult chain 1	chr10	38.67	123.04	3.182	1.67	0.03	0.234
ENSRNOG00000021513	Rtn4rl2	reticulon 4 receptor-like 2	chr3	127.60	297.42	2.331	1.22	0.03	0.239
ENSRNOG00000003620	Fmo3	flavin containing monooxygenase 3	chr13	18.03	44.58	2.472	1.31	0.03	0.244
ENSRNOG000000058827	Six2	SIX homeobox 2	chr6	15.94	42.57	2.671	1.42	0.03	0.245
ENSRNOG00000003959	Rgs18	regulator of G-protein signaling 18	chr13	10.77	24.83	2.306	1.21	0.03	0.245
ENSRNOG00000017672	Akr1c14	aldo-keto reductase family 1; member C14	chr17	85.10	197.81	2.324	1.22	0.03	0.249
N/A	RT1-CE16	RT1 class I; locus CE16	chr20	115.61	30.14	0.261	-1.94	0.04	0.275
ENSRNOG00000009434	RGD1310507	similar to RIKEN cDNA 1300017J02	chr8	32.93	67.66	2.055	1.04	0.04	0.276
ENSRNOG00000000167	Alas2	5'-aminolevulinatase synthase 2	chrX	88.95	214.99	2.417	1.27	0.04	0.284
ENSRNOG00000012827	Mlf1	myeloid leukemia factor 1	chr2	22.38	10.62	0.474	-1.08	0.04	0.286
ENSRNOG000000041300	Mir874	microRNA 874	chr17	4.51	0.58	0.129	-2.96	0.05	0.302
ENSRNOG00000015567	Slc9a2	solute carrier family 9; subfamily A (NHE2; cation proton antiporter 2);	chr9	254.20	536.38	2.110	1.08	0.05	0.303
ENSRNOG000000037687	Rspo2	R-spondin 2	chr7	31.80	79.86	2.511	1.33	0.05	0.307

Supplementary Table S3. Differentially expressed gene list.

**Top Regulator Effect Networks**

<b>ID</b>	<b>Diseases &amp; Functions</b>	<b>Consistency Score</b>
NGF,RAF1	Concentration of dopamine,Coordination	4.707
ASCL1, estrogen receptor, NCOA1 ,NGF, Pkc(s)	Cell movement of neurons	2.345
EBI3,IL27,JAK1/2,Pkc(s),SNCA	Formation of brain,Movement Disorders	0.765
IFN alpha/beta, IFN Beta, Ifnar, IFNL1	Glucose metabolism disorder	0.655
APP	Progressive neurological disorder	0.277

Supplementary Table S4. Significant top regulator effect networks

qRT-PCR

lc557-gapdh-f	GAAGCTCATTTCTGGTATGACAATG
lc558-gapdh-r	GGTTTCTTACTCCTTGGAGGCCATG
lc567-snca	AAGACTATGAGCCTGAAGCCTAAG
lc568-snca	AGTGTGAAGCCACAACAATATCC
LC631-rPpm1k-f	GCTGTGACTGAGCAGGCAATTCAG
LC631-rPpm1k-r	CTGGAGGCAAAGCTTCTGCTGAA
LC745 rNap1l5-f	AAGTGAGCACAGCAGCTGACAGACTTG
LC745 rNap1l5-r	GAGTTCTGTCTTAGCTTGGGTGTTAAGGTG
LC760 rCHAT-f	CCATTGACAACCATCTTCTGGCACTG
LC760 rCHAT-r	ATCTCCATGGTTGTGGGCACCTG
LC761 rSlc5a7-f	CCATTGGAGCCTCCACAGACTGG
LC761 rSlc5a7-r	GCAGCAGAAACAGCACCAAGCCC
LC762 rSlc18a3-f	GCCATAGCTGACATCTCCTATTCTGTGG
LC762 rSlc18a3-r	AGAAGAAGGACTGGTGCGTAGAGCAG
LC763 rLhx 8-f	CGGCGAGTCATACAGGTGTGGTTTC
LC763 rLhx 8-r	CTGGGGCACGTAGGCCGAATAAG
LC764 rNgfr-f	GCTTCAAGAGGTGGAACAGCTGC
LC764 rNgfr-r	TGCGTATGGGTCTGCTGGTCGTG
LC765 rAdcy7 -f	CTCCGAGTTGGCATAAACCACGG
LC765 rAdcy7-r	TTCCAAGCTCTCCGGTGTCTC
LC766 rTacr1-f	GTTGCCTCAACGACAGGTTCCGTC
LC766 rTacr1-r	TCCAGGCGGCTGACCTTGTACAC
LC767 rTacr1-3UTR-f1	GCATATTCAAGGCATGGCCTCTAGC
LC768 rTacr1-3UTR-r1	TGCCTTCTCCAGGTATGCCGATG
LC854 rAqp1-f	GACCAGAGCCTGGACAATCTGAAG
LC855 rAqp1-r	CCAGAGAGCTAAATGCAAGCCC

Adcyap1r1 promoter cloning

LC772 rAdcyap1r1Hind3R	TTACAAGCTTCGTCTGCTGTGCGCCACCCCG
LC773 rAdcyap1r1KpnF	ATAAGGTACCGGCTGTGAGGCAATCGGAAGAC
LC774 rAdcyap1r1_R	CCTGGAGACCTCTAGGCTGAAGGAG
LC775 rAdcyap1r1_F	CCAGGGACTCACCTTCAGCCATAG

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Supplementary Table S5. list of primer sequences.