

Supplementary Table 1. Patients and healthy controls donor information. CTRL#1 to #3 and BD#1 to #6 were previously characterized (Osete al., 2021).

Donor	Ethnicity	Gender	Age biopsy	Lithium responsive	Type of affective disorder	Clinical data
CTRL#4	European (caucasian)	Female	28	n.a.	n.a.	n.a.
CTRL#5	European (caucasian)	Male	22	n.a.	n.a.	n.a.
CTRL#6	European (caucasian)	Female	56	n.a.	n.a.	n.a.
CTRL#7	European (caucasian)	Female	35	n.a.	n.a.	n.a.
CTRL#8	European (caucasian)	Male	29	n.a.	n.a.	n.a.
CTRL#9	European (caucasian)	Male	19	n.a.	n.a.	n.a.
CTRL#10	European (caucasian)	Male	41	n.a.	n.a.	n.a.
Patient#7	European (caucasian)	Female	46	Li non-treated (Li-N)	Bipolar I disorder (BDI)	Psychotic and manic episodes. Treated with antipsychotics (risperidon) in periods.
Patient#8	European (caucasian)	Female	21	Li non-treated (Li-N)	Bipolar II disorder (BDII)	Several depressive and hypomanic episodes. Treated with antidepressants (mitrazapin) in periods.
Patient#9	European (caucasian)	Female	40	Li responsive (Li-R)	Bipolar I disorder (BDI)	Prescribed Li for 3 years and 3 months. Li daily dose:207.5 mg lithionit. Compliance is assumed to be good and serum level values are unknown. Patient stopped Li due to side-effects, not due to non-response. Several depressive and manic episodes. Treated with antipsychotics (olanzapin) and antidepressants (sertralin) in periods.
Patient#10	European (caucasian)	Male	49	Li responsive (Li-R)	Bipolar I disorder (BDI)	Prescribed Li for 6 months. Li daily dose: 83 mg. Compliance: 100%. Serum levels: 0.56 mmol/L. Prescribed quetiapine, pregabalin and bupropion in periods.
Patient#11	Latin American	Male	38	Li responsive (Li-R)	Bipolar NOS / Schizophrenia residual type	Prescribed Li for 10 months. Li daily dose: 166 mg. Compliance: 100%. Serum levels: 0.68 mmol/L. Prescribed quetiapine and valproate in periods.

Supplementary Table 2. RT-PCR primers used for iPSC characterization.

Gene	Forward primer	Reverse primer
OCT4	5'-GTACTCCTCGGTCCCTTTCC-3'	5'-CAAAAACCCTGGCACAAACT-3'
NANOG	5'-AATACCTCAGCCTCCAGCAGATG-3'	5'-TGCGTCACACCATTGCTATTCTTC-3'
SOX2	5'-TGCGAGCGCTGCACAT-3'	5'-TCATGAGCGTCTTGGTTTTCC-3'
GAPDH	5'-GTCAACGGATTTGGTCGTATTG-3'	5'-CATGGGTGGAATCATATTGGAA-3'

Supplementary Table 3. For cortical spheroids (hCS) characterization, a custom gene expression TaqMan array card was used, containing primers for the detection of the following genes.

Gene Symbol	Gene Name	Context Sequence	Assay ID
ACTB	actin beta	CCTTTGCCGATCCGCCGCCCGTCCA	Hs99999903_m1
RELN	reelin	CAATGTCCCCCTGGAGGCACGGATG	Hs01022646_m1
BCL11B	B-cell CLL/lymphoma 11B	GAACATTGCAGGTAAAGATGAGCCT	Hs01102259_m1
GAPDH	glyceraldehyde-3-phosphate dehydrogenase	GGGCGCCTGGTCACCAGGGCTGCTT	Hs99999905_m1
CUX1	cut like homeobox 1	AACAGCACACTCAAACAACCTGGAAG	Hs00738851_m1
SATB2	SATB homeobox 2	TAAAAGTCAGGGCTGGCTGTGTGAA	Hs01546836_m1
POU3F2	POU class 3 homeobox 2	GTGTTTTGACCTTTGCAGGCGAGTA	Hs00271595_s1
FOXG1	forkhead box G1	CATCAACAGCCTGGTGCCCGAGGCG	Hs01850784_s1
OTX1	orthodenticle homeobox 1	TGGGCTATCCGGCCACTCCGCGGAA	Hs00951099_m1
OTX2	orthodenticle homeobox 2	CCGAGTCGAGGGTGCAGGTATGGTT	Hs00222238_m1
TBR1	T-box, brain 1	GATAATTATGACACGATCTACACCG	Hs00232429_m1
MAP2	microtubule associated protein 2	GCCACAGGCCAGGTGGCGGACGTGT	Hs00258900_m1
EMX2	empty spiracles homeobox 2	TCACGGAAACTCAGGTAAAAGTATG	Hs00244574_m1
PAX6	paired box 6	CAACCTACGCAAGATGGCTGCCAGC	Hs01088114_m1
SYN1	synapsin I	CAAAGAAATGCTCAGCAGTACAACG	Hs00199577_m1
HMBS	hydroxymethylbilane synthase	ATGCGGCTGCAACGGCGGAAGAAAA	Hs00609297_m1

Supplementary Table 4. Primary and secondary antibodies used for IF and IHC.

Antibody	Species	Technique	Dilution	Company	Reference
Oct4	mouse	IF	1:200	Stem Cell Technologies	60093.1
Nanog	rabbit	IF	1:200	Stemgent	09-0020
Map2	chicken	IHC	1:10000	Abcam	ab5392
SV2A	rabbit	IHC	1:400	Cell Signaling technologies	66724
Anti-rabbit Alexa 488	goat	IF / IHC	1:200	Invitrogen	A32731
Anti-mouse Alexa 594	donkey	IF	1:200	Invitrogen	A21203
Anti-chicken Alexa 647	goat	IHC	1:200	Invitrogen	A21449

Supplementary Table 5. Genes excluded from the DE analysis, based on karyostat results.

ensembl_gene_id	external_gene_name	gene_biotype	chromosome	start_position	end_position	strand
ENSG00000263513	FAM72C	protein_coding	1	143955287	143971986	-1
ENSG00000143384	MCL1	protein_coding	1	150560895	150579738	-1
ENSG00000143420	ENSA	protein_coding	1	150600851	150629612	-1
ENSG00000143457	GOLPH3L	protein_coding	1	150646230	150697154	-1
ENSG00000163131	CTSS	protein_coding	1	150730079	150765957	-1
ENSG00000143387	CTSK	protein_coding	1	150794880	150809577	-1
ENSG00000143437	ARNT	protein_coding	1	150809713	150876708	-1
ENSG00000143379	SETDB1	protein_coding	1	150926263	150964744	1
ENSG00000143418	CERS2	protein_coding	1	150960583	150975003	-1
ENSG00000143409	MINDY1	protein_coding	1	150996549	151008376	-1
ENSG00000143363	PRUNE1	protein_coding	1	151008420	151035713	1
ENSG00000163141	BNIP1	protein_coding	1	151036321	151047720	1
ENSG00000143443	C1orf56	protein_coding	1	151047751	151051986	1
ENSG00000197622	CDC42SE1	protein_coding	1	151050971	151070325	-1
ENSG00000213190	MLLT11	protein_coding	1	151060397	151069544	1
ENSG00000143458	GABPB2	protein_coding	1	151070578	151125542	1
ENSG00000143434	SEMA6C	protein_coding	1	151131685	151146631	-1
ENSG00000163156	SCNM1	protein_coding	1	151156664	151170296	1
ENSG00000163155	LYSMD1	protein_coding	1	151159748	151165948	-1
ENSG00000163157	TMOD4	protein_coding	1	151169986	151176284	-1
ENSG00000163159	VPS72	protein_coding	1	151176304	151195321	-1
ENSG00000143398	PIP5K1A	protein_coding	1	151197949	151249536	1
ENSG00000159352	PSMD4	protein_coding	1	151254709	151267479	1
ENSG00000143373	ZNF687	protein_coding	1	151281618	151292176	1
ENSG00000143393	PI4KB	protein_coding	1	151291797	151327715	-1
ENSG00000143390	RFX5	protein_coding	1	151340640	151347326	-1
ENSG00000143416	SELENBP1	protein_coding	1	151364304	151372707	-1
ENSG00000159377	PSMB4	protein_coding	1	151399560	151401937	1
ENSG00000143442	POGZ	protein_coding	1	151402724	151459494	-1
ENSG00000143375	CGN	protein_coding	1	151510510	151538692	1
ENSG00000143367	TUFT1	protein_coding	1	151540305	151583583	1
ENSG00000143376	SNX27	protein_coding	1	151612006	151699091	1
ENSG00000159409	CELF3	protein_coding	1	151700058	151716803	-1
ENSG00000178796	RIIAD1	protein_coding	1	151710433	151729805	1
ENSG00000143436	MRPL9	protein_coding	1	151759647	151763496	-1
ENSG00000143450	OAZ3	protein_coding	1	151762899	151771334	1
ENSG00000182134	TDRKH	protein_coding	1	151770107	151791416	-1
ENSG00000143365	RORC	protein_coding	1	151806071	151831845	-1
ENSG00000159445	THEM4	protein_coding	1	151870866	151909637	-1
ENSG00000197747	S100A10	protein_coding	1	151982915	151993859	-1
ENSG00000163191	S100A11	protein_coding	1	152032506	152047907	-1
ENSG00000197956	S100A6	protein_coding	1	153534599	153536244	-1
ENSG00000196154	S100A4	protein_coding	1	153543613	153550136	-1
ENSG00000196754	S100A2	protein_coding	1	153561108	153567890	-1
ENSG00000188643	S100A16	protein_coding	1	153606886	153613145	-1
ENSG00000189171	S100A13	protein_coding	1	153618787	153631360	-1
ENSG00000160678	S100A1	protein_coding	1	153627926	153632039	1
ENSG00000160679	CHTOP	protein_coding	1	153633982	153646306	1
ENSG00000143553	SNAPIN	protein_coding	1	153658703	153661852	1
ENSG00000143621	ILF2	protein_coding	1	153661788	153671028	-1
ENSG00000169418	NPR1	protein_coding	1	153678688	153693992	1
ENSG00000143624	INTS3	protein_coding	1	153728050	153774808	1
ENSG00000143554	SLC27A3	protein_coding	1	153774354	153780157	1
ENSG00000143614	GATAD2B	protein_coding	1	153789030	153923360	-1
ENSG00000198837	DENND4B	protein_coding	1	153929501	153946718	-1
ENSG00000160741	CRTC2	protein_coding	1	153947669	153958615	-1
ENSG00000143570	SLC39A1	protein_coding	1	153959099	153968184	-1
ENSG00000143578	CREB3L4	protein_coding	1	153967534	153974361	1
ENSG00000143543	JTB	protein_coding	1	153974269	153977674	-1

ENSG00000143545	RAB13	protein_coding	1	153981617	153986358	-1
ENSG00000177954	RPS27	protein_coding	1	153990762	153992155	1
ENSG00000143549	TPM3	protein_coding	1	154155304	154194648	-1
ENSG00000163263	C1orf189	protein_coding	1	154199085	154206333	-1
ENSG00000143612	C1orf43	protein_coding	1	154206696	154220637	-1
ENSG00000143569	UBAP2L	protein_coding	1	154220179	154271510	1
ENSG00000143575	HAX1	protein_coding	1	154272589	154275875	1
ENSG00000143515	ATP8B2	protein_coding	1	154325525	154351304	1
ENSG00000160712	IL6R	protein_coding	1	154405193	154469450	1
ENSG00000169291	SHE	protein_coding	1	154469772	154502412	-1
ENSG00000160714	UBE2Q1	protein_coding	1	154548577	154559028	-1
ENSG00000160716	CHRNA2	protein_coding	1	154567778	154580013	1
ENSG00000160710	ADAR	protein_coding	1	154581695	154628013	-1
ENSG00000143603	KCNN3	protein_coding	1	154697455	154870281	-1
ENSG00000163344	PMVK	protein_coding	1	154924740	154936719	-1
ENSG00000163346	PBXIP1	protein_coding	1	154944076	154956123	-1
ENSG00000163348	PYGO2	protein_coding	1	154957026	154963853	-1
ENSG00000160691	SHC1	protein_coding	1	154962298	154974395	-1
ENSG00000173207	CKS1B	protein_coding	1	154974653	154979251	1
ENSG00000160688	FLAD1	protein_coding	1	154983338	154993111	1
ENSG00000163352	LENEP	protein_coding	1	154993586	154994315	1
ENSG00000160685	ZBTB7B	protein_coding	1	155002630	155018523	1
ENSG00000163354	DCST2	protein_coding	1	155018520	155033781	-1
ENSG00000143537	ADAM15	protein_coding	1	155050566	155062775	1
ENSG00000243364	EFNA4	protein_coding	1	155063737	155069553	1
ENSG00000143590	EFNA3	protein_coding	1	155078837	155087538	1
ENSG00000169242	EFNA1	protein_coding	1	155127876	155134899	1
ENSG00000169241	SLC50A1	protein_coding	1	155135344	155138857	1
ENSG00000179085	DPM3	protein_coding	1	155139891	155140595	-1
ENSG00000163463	KRTCAP2	protein_coding	1	155169408	155173475	-1
ENSG00000163462	TRIM46	protein_coding	1	155173787	155184971	1
ENSG00000185499	MUC1	protein_coding	1	155185824	155192916	-1
ENSG00000169231	THBS3	protein_coding	1	155195588	155209051	-1
ENSG00000173171	MTX1	protein_coding	1	155208695	155213824	1
ENSG00000177628	GBA	protein_coding	1	155234452	155244699	-1
ENSG00000160767	FAM189B	protein_coding	1	155247205	155255483	-1
ENSG00000116521	SCAMP3	protein_coding	1	155255979	155262430	-1
ENSG00000176444	CLK2	protein_coding	1	155262868	155278491	-1
ENSG00000143630	HCN3	protein_coding	1	155277463	155289848	1
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ENSG00000160753	RUSC1	protein_coding	1	155320894	155331114	1
ENSG00000116539	ASH1L	protein_coding	1	155335268	155563162	-1
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ENSG00000132676	DAP3	protein_coding	1	155687960	155739010	1
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ENSG00000132718	SYT11	protein_coding	1	155859567	155885199	1
ENSG00000143622	RIT1	protein_coding	1	155897808	155911404	-1
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ENSG00000116586	LAMTOR2	protein_coding	1	156054782	156058506	1
ENSG00000254726	MEX3A	protein_coding	1	156072013	156082465	-1
ENSG00000160789	LMNA	protein_coding	1	156082573	156140081	1
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ENSG00000198952	SMG5	protein_coding	1	156249224	156282825	-1
ENSG00000163472	TMEM79	protein_coding	1	156282935	156293185	1
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ENSG00000183856	IQGAP3	protein_coding	1	156525405	156572604	-1
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ENSG00000160856	FCRL3	protein_coding	1	157674321	157700769	-1
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ENSG00000143258	USP21	protein_coding	1	161159450	161165723	1
ENSG00000143224	PPOX	protein_coding	1	161166056	161178013	1
ENSG00000158850	B4GALT3	protein_coding	1	161171310	161177968	-1
ENSG00000158859	ADAMTS4	protein_coding	1	161184302	161199054	-1
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ENSG00000162745	OLFML2B	protein_coding	1	161983192	162023869	-1
ENSG00000198929	NOS1AP	protein_coding	1	162069691	162370475	1
ENSG00000239887	C1orf226	protein_coding	1	162378841	162386812	1
ENSG00000152332	UHMK1	protein_coding	1	162497251	162529631	1
ENSG00000117143	UAP1	protein_coding	1	162561506	162599842	1
ENSG00000162733	DDR2	protein_coding	1	162631373	162787405	1
ENSG00000132196	HSD17B7	protein_coding	1	162790702	162812823	1
ENSG00000185860	CCDC190	protein_coding	1	162824458	162868761	-1
ENSG00000117152	RGS4	protein_coding	1	163068775	163076802	1
ENSG00000143248	RGS5	protein_coding	1	163111121	163321791	-1
ENSG00000143228	NUF2	protein_coding	1	163266576	163355764	1
ENSG00000185630	PBX1	protein_coding	1	164555584	164899296	1
ENSG00000162761	LMX1A	protein_coding	1	165201867	165356715	-1
ENSG00000143171	RXRG	protein_coding	1	165400922	165445355	-1
ENSG00000143198	MGST3	protein_coding	1	165631213	165661796	1
ENSG00000143149	ALDH9A1	protein_coding	1	165662216	165698562	-1
ENSG00000143183	TMCO1	protein_coding	1	165724293	165827755	-1
ENSG00000143179	UCK2	protein_coding	1	165827614	165911618	1
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ENSG00000152382	TADA1	protein_coding	1	166856510	166876264	-1
ENSG00000143195	ILDR2	protein_coding	1	166895711	166975540	-1
ENSG00000143194	MAEL	protein_coding	1	166975582	167022214	1
ENSG00000198842	STYXL2	protein_coding	1	167094075	167129165	1
ENSG00000143190	POU2F1	protein_coding	1	167220876	167427345	1
ENSG00000198821	CD247	protein_coding	1	167430640	167518610	-1
ENSG00000143162	CREG1	protein_coding	1	167529117	167553805	-1
ENSG00000198771	RCSD1	protein_coding	1	167630093	167708696	1
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ENSG00000185842	DNAH14	protein_coding	1	224896262	225399292	1
ENSG00000143815	LBR	protein_coding	1	225401502	225428925	-1
ENSG00000154380	ENAH	protein_coding	1	225486829	225653142	-1
ENSG00000143742	SRP9	protein_coding	1	225777813	225790468	1
ENSG00000143819	EPHX1	protein_coding	1	225810124	225845563	1
ENSG00000196187	TMEM63A	protein_coding	1	225845536	225882380	-1
ENSG00000143811	PYCR2	protein_coding	1	225919877	225924340	-1
ENSG00000143768	LEFTY2	protein_coding	1	225936598	225941383	-1
ENSG00000143751	SDE2	protein_coding	1	225982702	225999343	-1
ENSG00000163041	H3-3A	protein_coding	1	226061851	226072019	1
ENSG00000182827	ACBD3	protein_coding	1	226144679	226186741	-1
ENSG00000183814	LIN9	protein_coding	1	226231149	226309869	-1

ENSG00000143799	PARP1	protein_coding	1	226360210	226408154	-1
ENSG00000203685	STUM	protein_coding	1	226548764	226609230	1
ENSG00000143772	ITPKB	protein_coding	1	226631690	226739323	-1
ENSG00000143801	PSEN2	protein_coding	1	226870184	226927726	1
ENSG00000163050	COQ8A	protein_coding	1	226940286	226987544	1
ENSG00000143776	CDC42BPA	protein_coding	1	226989865	227318492	-1
ENSG00000181450	ZNF678	protein_coding	1	227563543	227677443	1
ENSG00000143740	SNAP47	protein_coding	1	227728200	227781826	1
ENSG00000081692	JMJD4	protein_coding	1	227730425	227735411	-1
ENSG00000143816	WNT9A	protein_coding	1	227918656	227947932	-1
ENSG00000154342	WNT3A	protein_coding	1	228006998	228061271	1
ENSG00000143761	ARF1	protein_coding	1	228082660	228099212	1
ENSG00000143793	C1orf35	protein_coding	1	228100726	228105411	-1
ENSG00000162910	MRPL55	protein_coding	1	228106679	228109312	-1
ENSG00000143774	GUK1	protein_coding	1	228139962	228148984	1
ENSG00000198835	GJC2	protein_coding	1	228149930	228159826	1
ENSG00000181873	IBA57	protein_coding	1	228165804	228182257	1
ENSG00000154358	OBSCN	protein_coding	1	228208044	228378876	1
ENSG00000154370	TRIM11	protein_coding	1	228393673	228406835	-1
ENSG00000162931	TRIM17	protein_coding	1	228407935	228416861	-1
ENSG00000181218	H2AW	protein_coding	1	228434777	228457873	-1
ENSG00000196890	H2BU1	protein_coding	1	228458103	228463104	1
ENSG00000168159	RNF187	protein_coding	1	228487382	228499899	1
ENSG00000116574	RHOU	protein_coding	1	228735479	228746664	1
ENSG00000168118	RAB4A	protein_coding	1	229271062	229305894	1
ENSG00000154429	CCSAP	protein_coding	1	229321011	229343294	-1
ENSG00000143632	ACTA1	protein_coding	1	229430365	229434104	-1
ENSG000000069248	NUP133	protein_coding	1	229440259	229508341	-1
ENSG00000135776	ABCB10	protein_coding	1	229516582	229558707	-1
ENSG00000135801	TAF5L	protein_coding	1	229593121	229626047	-1
ENSG00000135763	URB2	protein_coding	1	229626247	229660200	1
ENSG00000143641	GALNT2	protein_coding	1	230057990	230282122	1
ENSG00000177614	PGBD5	protein_coding	1	230314490	230426332	-1
ENSG00000135775	COG2	protein_coding	1	230642481	230693982	1
ENSG00000135744	AGT	protein_coding	1	230690776	230745576	-1
ENSG00000119280	C1orf198	protein_coding	1	230837119	230869589	-1
ENSG00000143643	TTC13	protein_coding	1	230906243	230978875	-1
ENSG00000173409	ARV1	protein_coding	1	230978981	231000733	1
ENSG00000182118	FAM89A	protein_coding	1	231018958	231040254	-1
ENSG00000119283	TRIM67	protein_coding	1	231162058	231221565	1
ENSG00000143633	C1orf131	protein_coding	1	231223763	231241187	-1
ENSG00000116906	GNPAT	protein_coding	1	231241207	231277973	1
ENSG00000116903	EXOC8	protein_coding	1	231332753	231337852	-1
ENSG00000010072	SPRTN	protein_coding	1	231337104	231355023	1
ENSG00000135766	EGLN1	protein_coding	1	231363751	231422287	-1
ENSG00000116918	TSNAX	protein_coding	1	231528541	231566524	1
ENSG00000162946	DISC1	protein_coding	1	231626790	232041272	1
ENSG00000116991	SIPA1L2	protein_coding	1	232397965	232630571	-1
ENSG00000212916	MAP10	protein_coding	1	232805416	232809929	1
ENSG00000135778	NTPCR	protein_coding	1	232950605	232983882	1
ENSG00000135749	PCNX2	protein_coding	1	232983435	233295725	-1
ENSG00000143674	MAP3K21	protein_coding	1	233327724	233385148	1
ENSG00000135750	KCNK1	protein_coding	1	233614106	233672514	1
ENSG00000183780	SLC35F3	protein_coding	1	233904676	234324511	1
ENSG00000168275	COA6	protein_coding	1	234373456	234385080	1
ENSG00000059588	TARBP1	protein_coding	1	234391313	234479179	-1
ENSG00000168264	IRF2BP2	protein_coding	1	234604269	234610178	-1
ENSG00000173726	TOMM20	protein_coding	1	235109341	235128837	-1
ENSG00000188739	RBM34	protein_coding	1	235131183	235161283	-1
ENSG00000054267	ARID4B	protein_coding	1	235131634	235328219	-1
ENSG00000152904	GGPS1	protein_coding	1	235327350	235344532	1
ENSG00000285053	TBCE	protein_coding	1	235328570	235448952	1
ENSG00000284770	TBCE	protein_coding	1	235367360	235452443	1

ENSG00000162885	B3GALNT2	protein_coding	1	235447190	235504452	-1
ENSG00000168243	GNG4	protein_coding	1	235547685	235650754	-1
ENSG00000143669	LYST	protein_coding	1	235661041	235883640	-1
ENSG00000116962	NID1	protein_coding	1	235975830	236065109	-1
ENSG00000077585	GPR137B	protein_coding	1	236142505	236221865	1
ENSG00000086619	ERO1B	protein_coding	1	236214681	236282019	-1
ENSG00000186197	EDARADD	protein_coding	1	236348257	236502915	1
ENSG00000116977	LGALS8	protein_coding	1	236518000	236552981	1
ENSG00000119285	HEATR1	protein_coding	1	236549005	236604516	-1
ENSG00000077522	ACTN2	protein_coding	1	236664141	236764631	1
ENSG00000116984	MTR	protein_coding	1	236795260	236921278	1
ENSG00000198626	RYR2	protein_coding	1	237042184	237833988	1
ENSG00000133019	CHRM3	protein_coding	1	239386565	239915452	1
ENSG00000155816	FMN2	protein_coding	1	240014348	240475187	1
ENSG00000180875	GREM2	protein_coding	1	240489573	240612155	-1
ENSG00000182901	RGS7	protein_coding	1	240767636	241357374	-1
ENSG00000091483	FH	protein_coding	1	241497511	241519799	-1
ENSG00000117009	KMO	protein_coding	1	241532134	241595642	1
ENSG00000054277	OPN3	protein_coding	1	241590102	241677376	-1
ENSG00000203668	CHML	protein_coding	1	241628851	241640369	-1
ENSG00000174371	EXO1	protein_coding	1	241847967	241895148	1
ENSG00000197769	MAP1LC3C	protein_coding	1	241995490	241999098	-1
ENSG00000180287	PLD5	protein_coding	1	242082986	242524697	-1
ENSG00000143702	CEP170	protein_coding	1	243124428	243255348	-1
ENSG00000054282	SDCCAG8	protein_coding	1	243256034	243500091	1
ENSG00000117020	AKT3	protein_coding	1	243488233	243851079	-1
ENSG00000179456	ZBTB18	protein_coding	1	244048939	244057476	1
ENSG00000035687	ADSS2	protein_coding	1	244408494	244451909	-1
ENSG00000179397	CATSPERE	protein_coding	1	244454377	244641177	1
ENSG00000121644	DES12	protein_coding	1	244653103	244709033	1
ENSG00000203667	COX20	protein_coding	1	244835616	244845057	1
ENSG00000153187	HNRNPU	protein_coding	1	244840638	244864560	-1
ENSG00000203666	EFCAB2	protein_coding	1	244969682	245127164	1
ENSG00000162849	KIF26B	protein_coding	1	245154985	245709432	1
ENSG00000185420	SMYD3	protein_coding	1	245749342	246507312	-1
ENSG00000162851	TFB2M	protein_coding	1	246540561	246566261	-1
ENSG00000162852	CNST	protein_coding	1	246566444	246668595	1
ENSG00000143653	SCCPDH	protein_coding	1	246724409	246768137	1
ENSG00000153207	AHCTF1	protein_coding	1	246839098	246931948	-1
ENSG00000197472	ZNF695	protein_coding	1	246945547	247008093	-1
ENSG00000277462	ZNF670	protein_coding	1	247034637	247078811	-1
ENSG00000188295	ZNF669	protein_coding	1	247099962	247104372	-1
ENSG00000196418	ZNF124	protein_coding	1	247121975	247172020	-1
ENSG00000162714	ZNF496	protein_coding	1	247297412	247331867	-1
ENSG00000162711	NLRP3	protein_coding	1	247416156	247449108	1
ENSG00000162722	TRIM58	protein_coding	1	247857187	247880138	1
ENSG00000238243	OR2W3	protein_coding	1	247895587	247896531	1
ENSG00000203663	OR2L2	protein_coding	1	248030070	248042305	1
ENSG00000198128	OR2L3	protein_coding	1	248046836	248063407	1
ENSG00000196071	OR2L13	protein_coding	1	248095184	248101103	1
ENSG00000175137	SH3BP5L	protein_coding	1	248810446	248825915	-1
ENSG00000171161	ZNF672	protein_coding	1	248838210	248849517	1
ENSG00000171163	ZNF692	protein_coding	1	248850006	248859144	-1
ENSG00000185220	PGBD2	protein_coding	1	248906196	248919946	1
ENSG00000124786	SLC35B3	protein_coding	6	8411435	8435561	-1
ENSG00000137203	TFAP2A	protein_coding	6	10393186	10419659	-1
ENSG00000111846	GCNT2	protein_coding	6	10492223	10629368	1
ENSG00000137434	C6orf52	protein_coding	6	10671418	10694797	-1
ENSG00000111845	PAK1IP1	protein_coding	6	10694972	10709782	1
ENSG00000111843	TMEM14C	protein_coding	6	10722915	10731129	1
ENSG00000137210	TMEM14B	protein_coding	6	10747759	10852753	1
ENSG00000111837	MAK	protein_coding	6	10762723	10838553	-1
ENSG00000153157	SYCP2L	protein_coding	6	10886831	10979320	1

ENSG00000197977	ELOVL2	protein_coding	6	10980759	11044305	-1
ENSG00000224531	SMIM13	protein_coding	6	11093834	11138733	1
ENSG00000111859	NEDD9	protein_coding	6	11183298	11382348	-1
ENSG00000205269	TMEM170B	protein_coding	6	11537749	11583524	1
ENSG00000111863	ADTRP	protein_coding	6	11712054	11807046	-1
ENSG00000095951	HIVEP1	protein_coding	6	12008762	12164999	1
ENSG00000078401	EDN1	protein_coding	6	12290361	12297194	1
ENSG00000112137	PHACTR1	protein_coding	6	12716312	13290446	1
ENSG00000145979	TBC1D7	protein_coding	6	13266542	13328583	-1
ENSG00000145990	GFOD1	protein_coding	6	13357830	13487662	-1
ENSG00000124523	SIRT5	protein_coding	6	13574227	13615158	1
ENSG00000225921	NOL7	protein_coding	6	13615335	13632739	1
ENSG00000010017	RANBP9	protein_coding	6	13621498	13711835	-1
ENSG00000050393	MCUR1	protein_coding	6	13786557	13814568	-1
ENSG00000180537	RNF182	protein_coding	6	13924446	13980310	1
ENSG00000112149	CD83	protein_coding	6	14117256	14136918	1

Supplementary Table 6. Average values for electrophysiological properties of the iPSC-derived hCS (mean $\pm$ SE).

	IV curves	VI curves	Current, I _{max} (pA)		Voltage, V _t (mV)		Resting potential, RP (mV)		Input resistance, R _{in} (G Ω)		Threshold current, I _t (pA)	
	N (cells)	N (cells)	N (cells)	Current, pA	N (cells)	Voltage, mV	N (cells)	Voltage, mV	N (cells)	Resistance, G Ω	N (cells)	Current, pA
CTRL	29	14	29	-137.25 $\pm$ 22.26	29	-17.96 $\pm$ 2.29	14	-65.27 $\pm$ 1.21	12	0.27 $\pm$ 0.03	18	46.68 $\pm$ 9.96
CTRL + Li	29	18	29	-125.82 $\pm$ 18.58	29	-15.08 $\pm$ 1.92	22	-61.28 $\pm$ 1.07	19	0.26 $\pm$ 0.02	9	44.93 $\pm$ 5.90
Li-N	8	6	20	-148.99 $\pm$ 66.60	20	-10.30 $\pm$ 2.81	3	-57.85 $\pm$ 2.38	9	0.38 $\pm$ 0.05	10	42.01 $\pm$ 9.89
Li-N + Li	10	2	19	-245.83 $\pm$ 96.29	19	-22.14 $\pm$ 4.86	6	-60.96 $\pm$ 2.51	11	0.31 $\pm$ 0.02	10	35.53 $\pm$ 4.51
Li-R	20	10	8	-125.46 $\pm$ 26.13	8	-13.57 $\pm$ 2.31	8	-66.58 $\pm$ 2.06	4	0.28 $\pm$ 0.03	6	48.76 $\pm$ 8.85
Li-R + Li	19	10	10	-334.80 $\pm$ 99.03	10	-15.49 $\pm$ 2.10	11	-65.40 $\pm$ 2.09	1	0.35 $\pm$ 0.06	2	34.99 $\pm$ 10.84
BD	28	16	28	-132.18 $\pm$ 26.00	28	-12.64 $\pm$ 1.83	11	-65.02 $\pm$ 1.84	15	0.26 $\pm$ 0.03	16	46.23 $\pm$ 6.51
BD + Li	29	12	29	-304.12 $\pm$ 72.26	29	-17.78 $\pm$ 2.20	17	-63.00 $\pm$ 1.77	11	0.35 $\pm$ 0.06	12	35.08 $\pm$ 8.96

Supplementary Table 7. sEPSC distribution peak and mean amplitudes and frequencies.

	sEPSC distribution (pA)				
	N. (donors)	N. (cells)	Amplitude peak	Frequency peak	Amplitude mean $\pm$ SE
CTRL	10	47	4.91 ± 0.02	3.04 ± 0.03	5.68 ± 1.42
CTRL + Li	10	42	5.7 ± 0.02	3.48 ± 0.05	5.55 ± 1.2
Li-N	5	14	5.01 ± 0.04	2.64 ± 0.04	5.33 ± 0.54
Li-N + Li	4	13	6.51 ± 0.06	4.27 ± 0.06	6.48 ± 2.01
Li-R	5	23	7.23 ± 0.05	2.3 ± 0.03	6.6 ± 2.1
Li-R + Li	5	16	4.61 ± 0.11	3.995 ± 0.11	6.92 ± 2.15
BD	10	37	6.28 ± 0.06	2.42 ± 0.03	5.98 ± 1.59
BD + Li	9	29	5.58 ± 0.1	4.13 ± 0.06	6.72 ± 1.97

Supplementary Table 8. Biological functions of the 3 diagnosis-associated DEGs.

ensembl_gene_id	gene_name	gene_biotype	chromosome	go_id	Biological functions
ENSG00000120215	MLANA	protein_coding	9	GO:0042470	melanosome
ENSG00000120215	MLANA	protein_coding	9	GO:0005789	endoplasmic reticulum membrane
ENSG00000120215	MLANA	protein_coding	9	GO:0005794	Golgi apparatus
ENSG00000120215	MLANA	protein_coding	9	GO:0016021	integral component of membrane
ENSG00000120215	MLANA	protein_coding	9	GO:0005887	integral component of plasma membrane
ENSG00000120215	MLANA	protein_coding	9	GO:0005783	endoplasmic reticulum
ENSG00000120215	MLANA	protein_coding	9		
ENSG00000120215	MLANA	protein_coding	9	GO:0016020	membrane
ENSG00000120215	MLANA	protein_coding	9	GO:0005802	trans-Golgi network
ENSG00000120215	MLANA	protein_coding	9	GO:0005515	protein binding
ENSG00000196604	POTEF	protein_coding	2	GO:0005615	extracellular space
ENSG00000196604	POTEF	protein_coding	2	GO:0001895	retina homeostasis
ENSG00000196604	POTEF	protein_coding	2	GO:0072562	blood microparticle
ENSG00000196604	POTEF	protein_coding	2	GO:0005515	protein binding
ENSG00000196604	POTEF	protein_coding	2	GO:0070062	extracellular exosome
ENSG00000196604	POTEF	protein_coding	2	GO:0005737	cytoplasm
ENSG00000196604	POTEF	protein_coding	2	GO:0005938	cell cortex
ENSG00000129204	USP6	protein_coding	17	GO:0008234	cysteine-type peptidase activity
ENSG00000129204	USP6	protein_coding	17	GO:0005737	cytoplasm
ENSG00000129204	USP6	protein_coding	17	GO:0004197	cysteine-type endopeptidase activity
ENSG00000129204	USP6	protein_coding	17	GO:0006511	ubiquitin-dependent protein catabolic process
ENSG00000129204	USP6	protein_coding	17	GO:0004843	cysteine-type deubiquitinase activity
ENSG00000129204	USP6	protein_coding	17	GO:0055037	recycling endosome
ENSG00000129204	USP6	protein_coding	17	GO:0008233	peptidase activity
ENSG00000129204	USP6	protein_coding	17	GO:0005768	endosome
ENSG00000129204	USP6	protein_coding	17	GO:0036211	protein modification process
ENSG00000129204	USP6	protein_coding	17	GO:0016579	protein deubiquitination
ENSG00000129204	USP6	protein_coding	17	GO:0006508	proteolysis
ENSG00000129204	USP6	protein_coding	17	GO:0016787	hydrolase activity
ENSG00000129204	USP6	protein_coding	17		
ENSG00000129204	USP6	protein_coding	17	GO:0060627	regulation of vesicle-mediated transport
ENSG00000129204	USP6	protein_coding	17	GO:0003676	nucleic acid binding
ENSG00000129204	USP6	protein_coding	17	GO:0005515	protein binding

ENSG00000129204	USP6	protein_coding	17	GO:0005886	plasma membrane
ENSG00000129204	USP6	protein_coding	17	GO:0016020	membrane
ENSG00000129204	USP6	protein_coding	17	GO:0005096	GTPase activator activity
ENSG00000129204	USP6	protein_coding	17	GO:0005764	lysosome
ENSG00000129204	USP6	protein_coding	17	GO:0005516	calmodulin binding
ENSG00000129204	USP6	protein_coding	17	GO:0090630	activation of GTPase activity

Supplementary Table 9. DESeq2 DEGs associated to Li treatment independent of diagnosis.

ensembl_gene_id	external_gene_name	baseMean	log2FoldChange	pvalue	padj	gene_biotype	chromosome
ENSG00000131378	RFTN1	175 192 834 347 388	-0.555043555159832	3,95E+06	0.00053380011	protein_coding	3
ENSG00000103260	METRN	478 751 172 355 966	-0.557737726229716	7,60E+07	0.00441749474	protein_coding	16
ENSG00000177791	MYOZ1	155 962 344 305 493	-242 603 442 907 202	9,81E+07	0.00441749474	protein_coding	10
ENSG00000072954	TMEM38A	706 333 416 538 511	-0.474777718807413	1,90E+08	0.00630426161	protein_coding	19
ENSG00000036549	ZZZ3	579 791 648 389 521	0.165324943409407	2,33E+07	0.00630426161	protein_coding	1
ENSG00000104267	CA2	269 679 988 129 886	-0.841185912304932	3,19E+07	0.00719375853	protein_coding	8
ENSG00000172403	SYNPO2	147 657 553 550 535	-166 484 999 641 287	4,02E+08	0.00775716591	protein_coding	4
ENSG00000196972	SMIM10L2B	516 287 560 716 497	-0.563250422630353	4,83E+08	0.00816449965	protein_coding	X
ENSG00000197852	INKA2	181 009 515 517 406	-0.477644857224827	1,02E+09	0.01527166994	protein_coding	1
ENSG00000009830	POMT2	107 435 957 419 104	-0.292316956180705	1,26E+08	0.01597598978	protein_coding	14
ENSG00000186377	CYP4X1	256 464 960 504 147	-0.69696012077972	1,38E+09	0.01597598978	protein_coding	1
ENSG00000149809	TM7SF2	857 345 110 080 663	-0.423507428959903	1,47E+09	0.01597598978	protein_coding	11
ENSG00000027847	B4GALT7	44 041 085 752 189	-0.330501549995926	1,54E+09	0.01597598978	protein_coding	5
ENSG00000113494	PRLR	907 019 380 462 046	-0.858969292413332	1,71E+09	0.01649455511	protein_coding	5
ENSG00000108641	B9D1	918 789 657 817 158	-0.378649100279797	2,07E+08	0.01703579265	protein_coding	17
ENSG00000172426	RSPH9	12 843 651 358 131	-100 437 437 458 145	2,10E+09	0.01703579265	protein_coding	6
ENSG00000187094	CCK	101 870 095 992 394	-153 331 847 980 226	2,14E+08	0.01703579265	protein_coding	3
ENSG00000110195	FOLR1	116 361 072 925 286	-105 013 620 391 489	2,48E+09	0.01859071691	protein_coding	11
ENSG00000067334	DNTTIP2	440 009 072 062 087	0.208632244864113	2,81E+08	0.01910177715	protein_coding	1
ENSG00000136918	WDR38	629 495 811 555 246	-202 824 617 288 951	2,83E+09	0.01910177715	protein_coding	9
ENSG00000103249	CLCN7	76 751 496 632 884	-0.445155759843033	3,57E+09	0.02295595717	protein_coding	16
ENSG00000152465	NMT2	195 139 046 158 907	0.226210978006453	5,15E+09	0.02987193822	protein_coding	10
ENSG00000167280	ENGASE	42 031 596 923 198	-0.405537737182941	5,53E+09	0.02987193822	protein_coding	17
ENSG00000169116	PARM1	290 091 553 187 506	-0.546167994423913	5,67E+08	0.02987193822	protein_coding	4
ENSG00000066422	ZBTB11	292 854 477 589 332	0.191828588461687	5,77E+09	0.02987193822	protein_coding	3
ENSG00000127329	PTPRB	490 454 554 417 167	-200 165 982 476 825	5,96E+09	0.02987193822	protein_coding	12
ENSG00000163817	SLC6A20	185 977 348 911 689	-171 038 162 438 627	5,97E+09	0.02987193822	protein_coding	3
ENSG00000196504	PRPF40A	780 107 807 311 314	0.191795943250063	6,41E+09	0.03091240643	protein_coding	2
ENSG00000123360	PDE1B	172 112 806 835 114	-0.769134057629573	6,87E+09	0.03202344270	protein_coding	12
ENSG00000125817	CENPB	249 899 571 263 747	-0.282411865097923	8,34E+09	0.03740929273	protein_coding	20
ENSG00000011105	TSPAN9	172 596 040 736 509	-0.409505557463217	8,58E+09	0.03740929273	protein_coding	12
ENSG00000159792	PSKH1	10 463 431 859 635	-0.318313248070991	9,10E+09	0.03842522389	protein_coding	16
ENSG00000176102	CSTF3	379 563 014 332 337	0.206943128654847	1002051274	0.03992825593	protein_coding	11

ENSG00000161921	CXCL16	264 464 074 939 577	-0.547562968901328	10047818088	0.03992825593	protein_coding	17
ENSG00000083520	DIS3	472 313 955 116 344	0.20920554987262	0104130059	0.04019717820	protein_coding	13
ENSG00000136546	SCN7A	162 198 821 766 013	-136 911 729 892 876	1097722524	0.04119813619	protein_coding	2
ENSG00000115665	SLC5A7	117 779 074 179 562	-200 778 049 971 605	1279058717	0.04572325462	protein_coding	2
ENSG00000165732	DDX21	806 637 297 443 062	0.229443738384323	1285977111	0.04572325462	protein_coding	10
ENSG00000004838	ZMYND10	561 791 570 919 461	-0.690624054526208	1366714256	0.04644541931	protein_coding	3
ENSG00000178605	GTPBP6	348 970 962 824 335	-0.419685563727088	1375040169	0.04644541931	protein_coding	X
ENSG00000187783	TMEM72	129 448 945 206 322	-21 668 596 447 478	1447845364	0.04771180176	protein_coding	10
ENSG00000185909	KLHDC8B	123 762 049 968 987	-0.427559626101462	1537092136	0.04848717992	protein_coding	3
ENSG00000105048	TNNT1	401 827 937 735 273	-0.783106699685736	1653713860	0.04848717992	protein_coding	19
ENSG00000171551	ECEL1	421 925 318 214 486	-109 638 319 810 681	1676244264	0.04848717992	protein_coding	2
ENSG00000008283	CYB561	13 282 939 450 054	-0.452664326127894	1685245175	0.04848717992	protein_coding	17
ENSG00000174206	C12orf66	633 585 226 030 145	0.32488874979195	1685368496	0.04848717992	protein_coding	12
ENSG00000101892	ATP1B4	146 814 371 871 323	-734 756 448 677 438	1713152185	0.04848717992	protein_coding	X
ENSG00000164896	FASTK	54 003 970 921 767	-0.418893098514553	1722585031	0.04848717992	protein_coding	7
ENSG00000197619	ZNF615	16 667 451 720 834	0.254890273493428	1789710631	0.04934853131	protein_coding	19
ENSG00000013563	DNASE1L1	39 545 695 625 342	-0.622525268081986	2007084821	0.05423544604	protein_coding	X
ENSG00000129654	FOXJ1	23 370 630 210 202	-102 583 825 645 239	2056500607	0.05448113668	protein_coding	17
ENSG00000110002	VWA5A	176 670 596 890 687	-0.334107623858099	2130060197	0.05483524236	protein_coding	11
ENSG00000154319	FAM167A	722 522 257 847 183	-0.389712476742377	2151038298	0.05483524236	protein_coding	8
ENSG00000174417	TRHR	391 024 054 457 546	-144 709 257 584 596	2334056324	0.05839895369	protein_coding	8
ENSG00000167635	ZNF146	752 365 096 344 333	0.207170095939281	2608335098	0.06407493730	protein_coding	19
ENSG00000033800	PIAS1	579 586 798 944 208	0.135806953895471	2797933038	0.06723620217	protein_coding	15
ENSG00000139874	SSTR1	215 874 095 655 586	-0.699572282144335	2850982569	0.06723620217	protein_coding	14
ENSG00000011426	ANLN	127 227 196 474 462	0.499485612442429	2886314651	0.06723620217	protein_coding	7
ENSG00000108830	RND2	293 543 033 706 698	-0.437593739439257	2937522747	0.06726927092	protein_coding	17
ENSG00000165156	ZHX1	614 666 007 802 392	0.161840382124044	3458157593	0.07584010991	protein_coding	8
ENSG00000224383	PRR29	234 552 459 560 346	-0.877450746904662	3474446389	0.07584010991	protein_coding	17
ENSG00000182481	KPNA2	927 500 780 102 995	0.221559072951534	3637641989	0.07584010991	protein_coding	17
ENSG00000130935	NOL11	419 755 937 933 237	0.19113669712898	3643650423	0.07584010991	protein_coding	17
ENSG00000134042	MRO	931 736 727 094 177	-0.472611230153502	3646847063	0.07584010991	protein_coding	18
ENSG00000167778	SPRYD3	438 805 681 726 775	-0.226090289636429	3701154402	0.07584010991	protein_coding	12
ENSG00000185813	PCYT2	741 750 375 732 286	-0.273024043028528	3741371599	0.07584010991	protein_coding	17
ENSG00000277893	SRD5A2	475 739 250 870 509	-222 135 067 588 559	3760852167	0.07584010991	protein_coding	2
ENSG00000128602	SMO	107 388 226 521 979	-0.303402069141565	3977873817	0.07833798023	protein_coding	7
ENSG00000121871	SLITRK3	131 396 628 202 438	-0.48046860382266	4078132324	0.07833798023	protein_coding	3
ENSG00000221968	FADS3	320 661 789 409 149	-0.42947274776868	4106701601	0.07833798023	protein_coding	11

ENSG00000138639	ARHGAP24	265 889 980 560 231	-0.969205541514586	4116643176	0.07833798023	protein_coding	4
ENSG00000102452	NALCN	762 075 530 525 032	-0.453673331171091	4311881228	0.08091364898	protein_coding	13
ENSG00000205593	DENND6B	569 632 750 189 857	-0.437828507310755	4412862155	0.08167421996	protein_coding	22
ENSG00000118307	CFAP94	470 671 967 368 374	-0.438434610623538	4545859844	0.08284450038	protein_coding	12
ENSG00000196586	MYO6	470 793 495 556 247	0.241351564340256	4622516551	0.08284450038	protein_coding	6
ENSG00000159423	ALDH4A1	585 070 733 607 868	-0.43422144896364	4693164093	0.08284450038	protein_coding	1
ENSG00000119333	DYNC2I2	422 840 612 222 333	-0.363330076571515	4721357804	0.08284450038	protein_coding	9
ENSG00000131747	TOP2A	106 534 852 480 994	0.350456386070379	4800399450	0.08315153458	protein_coding	17
ENSG00000176383	B3GNT4	18 419 743 203 715	-0.57278881140249	5014460421	0.08526568256	protein_coding	12
ENSG00000088727	KIF9	517 839 931 879 325	-0.506431852500873	5048667459	0.08526568256	protein_coding	3
ENSG00000078596	ITM2A	620 753 255 178 548	-0.927457089221854	5298199597	0.08790716655	protein_coding	X
ENSG00000162607	USP1	55 148 432 136 513	0.225420718601539	5335199213	0.08790716655	protein_coding	1
ENSG00000007516	BAIAP3	339 096 585 245 266	-0.679522262491014	5430965585	0.08840695906	protein_coding	16
ENSG00000237172	B3GNT9	370 660 232 358 058	-0.506546356366944	5534072999	0.08901292892	protein_coding	16
ENSG00000025770	NCAPH2	125 876 233 936 673	-0.220942446100909	6030915622	0.09586317761	protein_coding	22
ENSG00000215375	MYL5	279 914 002 804 856	-0.636609219533869	6106638684	0.09593813403	protein_coding	4
ENSG00000131899	LLGL1	358 661 950 419 902	-0.258186387733719	6467659258	0.09995112372	protein_coding	17
ENSG00000270885	RASL10B	125 121 814 981 415	-0.284875359663121	6511495099	0.09995112372	protein_coding	17
ENSG00000120647	CCDC77	721 488 515 991 683	0.265043229372791	6584005633	0.09995112372	protein_coding	12

Supplementary Table 10. Limma DEGs associated to Li treatment independent of diagnosis.

ensembl_gene_id	external_gene_name	logFC	AveExpr	P.Value	adj.P.Val	gene_biotype	chromosome
ENSG00000136546	SCN7A	-19 193 116 578 872	-0.0686384617416382	2,64E+07	0.00387211215078049	protein_coding	2
ENSG00000172426	RSPH9	-0.948280658087842	0.589128250863159	2,57E+07	0.0187894869450047	protein_coding	6
ENSG00000177791	MYOZ1	-256 731 391 268 648	-11 521 022 158 116	8,55E+08	0.0287910849891555	protein_coding	10
ENSG00000170968	PLAC1	-24 792 658 633 818	-440 840 504 545 152	9,48E+08	0.0287910849891555	protein_coding	X
ENSG00000131378	RFTN1	-0.630963465715523	486 641 375 263 335	9,83E+08	0.0287910849891555	protein_coding	3
ENSG00000185274	GALNT17	-0.515180695582278	415 771 956 946 294	1,41E+09	0.0300849052630678	protein_coding	7
ENSG00000103260	METRN	-0.574961637885102	299 399 840 225 313	1,58E+08	0.0300849052630678	protein_coding	16
ENSG00000140288	FGF7	-154 160 084 759 888	-0.15314019024482	1,64E+09	0.0300849052630678	protein_coding	15
ENSG00000120728	MYOT	-313 723 876 164 916	-188 997 974 652 946	2,26E+09	0.0367101699384282	protein_coding	5
ENSG00000172403	SYNPO2	-198 408 812 622 453	-0.127251804354953	3,22E+09	0.0432443071451568	protein_coding	4
ENSG00000011108	TSPAN9	-0.453302918529912	492 125 113 119 313	3,25E+09	0.0432443071451568	protein_coding	12
ENSG00000161398	PGAP3	-0.36419308830981	29 829 915 102 989	4,02E+09	0.0471786374460244	protein_coding	17
ENSG00000126778	SIX1	-254 045 024 414 143	-281 566 052 280 724	4,38E+09	0.0471786374460244	protein_coding	14
ENSG00000180772	AGTR2	-268 725 211 281 566	-393 507 583 258 528	4,51E+09	0.0471786374460244	protein_coding	X
ENSG00000106003	LFNG	-0.603068503886395	230 112 921 840 937	5,56E+09	0.0521090163755627	protein_coding	7
ENSG00000148341	SH3GLB2	-0.295366546158792	471 945 165 011 894	5,69E+09	0.0521090163755627	protein_coding	9
ENSG00000078596	ITM2A	-112 240 164 144 308	204 447 038 200 547	6,83E+09	0.0529864323856416	protein_coding	X
ENSG00000106333	PCOLCE	-0.911414462865161	11 525 748 139 363	6,91E+09	0.0529864323856416	protein_coding	7
ENSG00000123360	PDE1B	-0.702724588305611	149 576 945 746 264	7,50E+09	0.0529864323856416	protein_coding	12
ENSG00000197594	ENPP1	-173 871 741 560 702	-14 793 514 284 152	7,62E+09	0.0529864323856416	protein_coding	6
ENSG00000006128	TAC1	-123 453 720 284 489	180 211 096 664 434	7,87E+09	0.0529864323856416	protein_coding	7
ENSG00000172830	SSH3	-0.67654100415467	1 039 469 041 569	7,96E+09	0.0529864323856416	protein_coding	11
ENSG00000198542	ITGBL1	-176 369 918 290 496	-379 923 124 889 736	8,68E+09	0.0550608050165492	protein_coding	13
ENSG00000196972	SMIM10L2B	-0.586686696052038	309 968 927 657 468	9,02E+09	0.0550608050165492	protein_coding	X
ENSG00000139874	SSTR1	-0.894024828620342	151 322 013 836 659	9,82E+09	0.0575244793636911	protein_coding	14
ENSG00000136918	WDR38	-181 187 303 124 367	-232 811 318 976 396	0.000105430.0593957585814828	0.000105430.0593957585814828	protein_coding	9
ENSG00000134516	DOCK2	-205 717 533 716 147	-453 770 414 587 903	0.000117960.0615355281515627	0.000117960.0615355281515627	protein_coding	5
ENSG00000153012	LG12	-0.910044659911718	35 184 400 753 378	0.000118310.0615355281515627	0.000118310.0615355281515627	protein_coding	4
ENSG00000106018	VIPR2	-0.969790320260204	181 097 535 432 488	0.000123540.0615355281515627	0.000123540.0615355281515627	protein_coding	7
ENSG00000196666	FAM180B	-208 860 355 481 051	-391 885 222 378 908	0.000126030.0615355281515627	0.000126030.0615355281515627	protein_coding	11
ENSG00000184388	PABPC1L2B	-0.973111026405018	0.127283376413454	0.000138840.0644507035579898	0.000138840.0644507035579898	protein_coding	X
ENSG00000105048	TNNT1	-0.938424491410847	251 092 621 929 549	0.000140800.0644507035579898	0.000140800.0644507035579898	protein_coding	19
ENSG00000184254	ALDH1A3	-177 726 339 222 715	-316 008 604 235 663	0.000171590.0748268239003454	0.000171590.0748268239003454	protein_coding	15

ENSG00000112936	C7	-156 180 692 682 313	-197 246 428 346 232	0.00017618 0.0748268239003454	protein_coding	5
ENSG00000163623	NKX6-1	-190 956 361 279 494	-411 875 112 851 978	0.00018350 0.0748268239003454	protein_coding	4
ENSG00000137672	TRPC6	-183 082 111 157 521	-157 814 635 619 727	0.00018391 0.0748268239003454	protein_coding	11
ENSG00000215379	MYL5	-0.694683262896901	213 934 046 048 849	0.00019287 0.0758019522446452	protein_coding	4
ENSG00000129009	ISLR	-0.910164331591023	160 241 445 759 256	0.00019665 0.0758019522446452	protein_coding	15
ENSG00000164879	CA3	-116 276 412 728 465	-13 674 563 058 688	0.00021937 0.0807126790889217	protein_coding	8
ENSG00000106809	OGN	-140 783 877 355 265	0.679925271969245	0.00022170 0.0807126790889217	protein_coding	9
ENSG00000103249	CLCN7	-0.430936415706777	381 379 374 212 332	0.00023103 0.0807126790889217	protein_coding	16
ENSG00000197852	INKA2	-0.536147061993593	498 951 668 298 113	0.00023144 0.0807126790889217	protein_coding	1
ENSG00000149972	CNTN5	-10 128 668 387 008	0.890153343153212	0.00024393 0.0815515616203357	protein_coding	11
ENSG00000138639	ARHGAP24	-105 168 730 353 882	131 482 226 148 008	0.00024498 0.0815515616203357	protein_coding	4
ENSG00000171700	RGS19	-0.651796298114682	0.351475571268373	0.00026408 0.0831367880183973	protein_coding	20
ENSG00000145536	ADAMTS16	-0.923588314069969	0.854158782923852	0.00026919 0.0831367880183973	protein_coding	5
ENSG00000144579	CTDSP1	-0.350152954432486	349 135 977 673 045	0.00026928 0.0831367880183973	protein_coding	2
ENSG00000151062	CACNA2D4	-249 714 790 846	-497 525 645 600 014	0.00027244 0.0831367880183973	protein_coding	12
ENSG00000153531	ADPRHL1	-18 172 034 514 103	-0.170329652354852	0.00028784 0.0860412079069843	protein_coding	13
ENSG00000243056	EIF4EBP3	-136 940 243 878 432	-214 291 711 734 009	0.00031080 0.0910465109169024	protein_coding	5
ENSG00000197444	OGDHL	-0.583166536997694	295 900 016 321 581	0.00031786 0.0912907753661035	protein_coding	10
ENSG00000110680	CALCA	-18 701 765 301 674	-387 916 856 438 467	0.00033084 0.0928769189029955	protein_coding	11
ENSG00000178609	GTPBP6	-0.46535810665651	262 525 843 271 969	0.00034366 0.0928769189029955	protein_coding	X
ENSG00000074803	SLC12A1	-129 762 539 098 225	-1 995 900 460 749	0.00034412 0.0928769189029955	protein_coding	15
ENSG00000128928	IVD	-0.278544938687537	52 312 389 922 567	0.00034875 0.0928769189029955	protein_coding	15
ENSG00000103528	SYT17	-0.627320419536548	250 261 790 724 108	0.00036971 0.0945420709588773	protein_coding	16
ENSG00000186897	C1QL4	-111 383 490 045 622	-0.172459804798097	0.00037000 0.0945420709588773	protein_coding	12
ENSG00000123609	NMI	-110 001 308 254 406	-0.514656576430908	0.00037955 0.0945420709588773	protein_coding	2
ENSG00000128602	SMO	-0.289554957029797	419 616 190 470 849	0.00038082 0.0945420709588773	protein_coding	7
ENSG00000115694	STK25	-0.263703378138167	575 744 769 154 945	0.00039620 0.0954820998309771	protein_coding	2
ENSG00000115669	SLC5A7	-227 089 890 608 776	-246 985 871 736 078	0.00039813 0.0954820998309771	protein_coding	2
ENSG00000174417	TRHR	-154 415 496 122 971	-161 036 533 315 012	0.00041785 0.0954820998309771	protein_coding	8
ENSG00000064659	EYA2	-0.87176645685881	0.277518742980199	0.00042587 0.0954820998309771	protein_coding	20
ENSG00000239474	KLHL41	-234 535 315 205 956	119 995 198 520 988	0.00042668 0.0954820998309771	protein_coding	2
ENSG00000108830	RND2	-0.47640180836585	543 726 306 433 616	0.00042969 0.0954820998309771	protein_coding	17
ENSG00000174206	C12orf66	0.317331356083567	356 400 043 417 408	0.00043024 0.0954820998309771	protein_coding	12
ENSG00000103154	NECAB2	-0.553685628892386	327 820 611 575 989	0.00044899 0.0981554797356248	protein_coding	16

Supplementary Table 11. Gene ontology (GO) pathway enrichment analysis of Li associated DEGs independent of diagnosis.

ID	Description	GeneRatio	BgRatio	pvalue	p.adjust	geneID	Count
GO:0055078	sodium ion homeostasis	5/116	54/18862	2,01E+09	0.0404565529546236	TAC1/SLC12A1/C7/SCN7A/AGTR2	5
	positive regulation of branching involved in						
GO:0090190	ureteric bud morphogenesis	3/116	17/18862	0.0001447227966810	0.0551733175662849	SIX1/SMO/AGTR2	3
GO:0001657	ureteric bud development	5/116	86/18862	0.000188914553525	0.0551733175662849	SIX1/SMO/FOXJ1/ADAMTS16/AGTR2	5
GO:0072163	mesonephric epithelium development	5/116	87/18862	0.000199458688885	0.0551733175662849	SIX1/SMO/FOXJ1/ADAMTS16/AGTR2	5
GO:0072164	mesonephric tubule development	5/116	87/18862	0.000199458688885	0.0551733175662849	SIX1/SMO/FOXJ1/ADAMTS16/AGTR2	5
GO:0060993	kidney morphogenesis	5/116	88/18862	0.000210445632930	0.0551733175662849	SIX1/SMO/FOXJ1/ADAMTS16/AGTR2	5
	regulation of morphogenesis of a branching						
GO:0060688	structure	4/116	48/18862	0.000214450029277	0.0551733175662849	SIX1/SMO/FGF7/AGTR2	4
	regulation of branching involved in ureteric bud						
GO:0090189	morphogenesis	3/116	20/18862	0.000239379927085	0.0551733175662849	SIX1/SMO/AGTR2	3
GO:0001823	mesonephros development	5/116	91/18862	0.000246187336686	0.0551733175662849	SIX1/SMO/FOXJ1/ADAMTS16/AGTR2	5
GO:0044458	motile cilium assembly	3/116	23/18862	0.000366911184333	0.0628661026334277	ZMYND10/FOXJ1/RSPH9	3
GO:0055002	striated muscle cell development	5/116	103/18862	0.000437118714506	0.0628661026334277	TNNT1/SIX1/SMO/MYOZ1/KLHL41	5
GO:1905330	regulation of morphogenesis of an epithelium	4/116	61/18862	0.000540885853740	0.0641745157055443	SIX1/SMO/FGF7/AGTR2	4
GO:0090183	regulation of kidney development	3/116	30/18862	0.000815190034165	0.0745271698571588	SIX1/SMO/AGTR2	3
GO:0008306	associative learning	4/116	68/18862	0.0008166727077210	0.0745271698571588	TAC1/PIAS1/PDE1B/CCK	4
GO:0048147	negative regulation of fibroblast proliferation	3/116	31/18862	0.000898504791117	0.0745271698571588	B4GALT7/AGTR2/C1QL4	3
GO:0048741	skeletal muscle fiber development	3/116	31/18862	0.000898504791117	0.0745271698571588	SIX1/SMO/KLHL41	3

Supplementary Table 12. DESeq2 DEGs associated to Li treatment in CTRL hCS.

ensembl_gene_id	external_gene_name	log2FoldChange	pvalue	padj	gene_biotype	chromosome
ENSG0000016591	RAPSN	-214 702 950 048 087	1,59E+02	2,28E+06	protein_coding	11
ENSG0000010326	METRNL	-0.731690315758422	3,03E+07	0.00217840541200	protein_coding	16
ENSG0000008751	TFAP2C	0.576066268253775	1,75E+08	0.00813620971451	protein_coding	20
ENSG0000017100	HS6ST2	-0.411491841628401	2,69E+08	0.00813620971451	protein_coding	X
ENSG0000013137	RFTN1	-0.712550415422766	3,51E+08	0.00813620971451	protein_coding	3
ENSG0000017779	MYOZ1	-277 220 522 669 059	3,78E+08	0.00813620971451	protein_coding	10
ENSG0000019697	SMIM10L2B	-0.666158538488588	4,42E+08	0.00813620971451	protein_coding	X
ENSG0000012543	HS3ST3B1	-0.74973644649467	4,53E+08	0.00813620971451	protein_coding	17
ENSG0000013654	SCN7A	-179 509 710 897 342	5,21E+08	0.00830946316163	protein_coding	2
ENSG0000010245	NALCN	-0.733625754993478	7,98E+08	0.01076373453355	protein_coding	13
ENSG0000012258	NXPH1	-0.927892655364668	8,24E+08	0.01076373453355	protein_coding	7
ENSG0000017616	FOXG1	0.404791519515822	1,52E+09	0.01814785672447	protein_coding	14
ENSG0000013404	MRO	-0.611722407832637	1,77E+08	0.01955366673264	protein_coding	18
ENSG0000015382	KCNJ16	-0.610700108464302	2,67E+09	0.02642975047053	protein_coding	17
ENSG0000020332	ZNF525	0.379056606346496	2,76E+09	0.02642975047053	protein_coding	19
ENSG0000017894	SMIM10L2A	-0.412549493788672	2,96E+09	0.02657954237532	protein_coding	X
ENSG0000019681	CHRNA7	-126 249 027 592 034	3,24E+09	0.02722995271986	protein_coding	2
ENSG0000011698	HPCAL4	-0.436911509923494	3,41E+09	0.02722995271986	protein_coding	1
ENSG0000010324	CLCN7	-0.522262346388195	4,07E+09	0.03078054502107	protein_coding	16
ENSG0000017743	NAP1L5	-0.336669469269114	4,47E+09	0.03212377217140	protein_coding	4
ENSG0000018267	TTC3	0.34044489066442	6,34E+09	0.03971195519352	protein_coding	21
ENSG0000015532	GRAMD2B	-0.999105511733691	6,45E+09	0.03971195519352	protein_coding	5
ENSG0000014552	CDH18	-0.887314647989896	6,46E+09	0.03971195519352	protein_coding	5
ENSG0000006430	CDON	0.447895846939786	6,76E+09	0.03971195519352	protein_coding	11
ENSG0000013174	TOP2A	0.320489082143432	7,01E+08	0.03971195519352	protein_coding	17
ENSG0000015418	ANGPT1	-0.70440194351079	7,36E+09	0.03971195519352	protein_coding	8
ENSG0000015301	LGI2	-0.847911246332731	7,47E+09	0.03971195519352	protein_coding	4
ENSG0000010868	ASIC2	-102 571 309 873 294	7,76E+08	0.03980158529954	protein_coding	17
ENSG0000018590	KLHDC8B	-0.414893529863307	8,25E+09	0.04084666207975	protein_coding	3
ENSG0000015276	DYNLT5	-157 980 589 343 649	8,59E+09	0.04110259453452	protein_coding	1
ENSG0000016579	NDRG2	-0.490872099248556	9,04E+09	0.04169615754514	protein_coding	14
ENSG0000014594	MYLK4	-135 109 570 778 256	9,29E+09	0.04169615754514	protein_coding	6
ENSG0000015464	CHODL	-0.714118833117481	9,93E+09	0.04241825226597	protein_coding	21

ENSG0000018581	PCYT2	-0.430416730704238	0.000101744	0.04241825226597	protein_coding	17
ENSG0000013264	BTBD3	-0.397957910160837	0.000103365	0.04241825226597	protein_coding	20
ENSG0000018646	NAP1L2	-0.476759546506481	0.000125339	0.04800015154064	protein_coding	X
ENSG0000011535	TACR1	-0.914107500616397	0.000125923	0.04800015154064	protein_coding	2
ENSG0000000828	CYB561	-0.691717423929374	0.000126993	0.04800015154064	protein_coding	17
ENSG0000008255	OPRK1	-110 152 619 815 561	0.000135605	0.04880501422313	protein_coding	8
ENSG0000017441	TRHR	-18 386 853 595 956	0.000135918	0.04880501422313	protein_coding	8
ENSG0000019812	MB	-202 846 634 247 946	0.000144865	0.05074902525909	protein_coding	22
ENSG0000017445	VWC2L	-137 558 895 103 269	0.000151151	0.05169016702849	protein_coding	2
ENSG0000010315	NECAB2	-0.590564965744378	0.000182785	0.06002485718963	protein_coding	16
ENSG0000016611	SVOP	-0.421858260739423	0.000183881	0.06002485718963	protein_coding	12
ENSG0000015607	WIF1	-100 885 112 895 343	0.000199142	0.06329461211479	protein_coding	12
ENSG0000010009	HPS4	0.200958433374421	0.000202711	0.06329461211479	protein_coding	22
ENSG0000017446	ZCCHC12	-0.48032622203781	0.000228207	0.06753650371389	protein_coding	X
ENSG0000014404	TEX261	-0.400320558381968	0.000229622	0.06753650371389	protein_coding	2
ENSG0000007295	TMEM38A	-0.511541017482356	0.000233619	0.06753650371389	protein_coding	19
ENSG0000007075	PABPC1	0.236901784707127	0.000243889	0.06753650371389	protein_coding	8
ENSG0000013691	WDR38	-307 552 241 631 526	0.000244215	0.06753650371389	protein_coding	9
ENSG0000010578	RUNDC3B	-0.400350680871509	0.000244510	0.06753650371389	protein_coding	7
ENSG0000010143	CST3	-0.486273304553553	0.000253999	0.06883392095285	protein_coding	20
ENSG0000015402	AK5	-0.551564630829809	0.000265025	0.07049200041724	protein_coding	1
ENSG0000002235	GABRA1	-0.868386373104339	0.000275197	0.07094521276154	protein_coding	5
ENSG0000019615	FAT4	0.404024471009851	0.000278066	0.07094521276154	protein_coding	4
ENSG0000010592	ATP6V0A4	335 482 226 858 317	0.000281548	0.07094521276154	protein_coding	7
ENSG0000018418	KCNJ12	-0.708886036383159	0.000319954	0.07743212697807	protein_coding	17
ENSG0000016515	PGAP4	-0.347119734517395	0.000323043	0.07743212697807	protein_coding	9
ENSG0000017787	CCDC184	-0.48086346770791	0.000324567	0.07743212697807	protein_coding	12
ENSG0000005480	CBLN4	-110 073 337 947 398	0.000328856	0.07743212697807	protein_coding	20
ENSG0000019621	ZNF766	0.313098553860097	0.000348930	0.08047682752601	protein_coding	19
ENSG0000010668	LHX2	0.361920845894342	0.000352993	0.08047682752601	protein_coding	9
ENSG0000027288	DCP1A	0.251142262230047	0.000359894	0.08076829334004	protein_coding	3
ENSG0000018213	KCNIP1	-0.717739265319535	0.000384003	0.08485297045474	protein_coding	5
ENSG0000018709	CCK	-150 230 728 769 794	0.000405475	0.08635815123137	protein_coding	3
ENSG0000016895	STXBP6	-0.597710005460222	0.000409553	0.08635815123137	protein_coding	14
ENSG0000017234	RCAN2	-0.620897617553006	0.000410218	0.08635815123137	protein_coding	6
ENSG0000017604	TMPRSS7	-41 596 710 364 357	0.000418462	0.08635815123137	protein_coding	3
ENSG0000016730	MYO5B	0.448595463047258	0.000420877	0.08635815123137	protein_coding	18

ENSG0000016563	VSTM4	-0.837622931898523	0.000477986	0.09669458507049	protein_coding	10
ENSG0000010042	MLC1	-0.424128651707446	0.000500917	0.09828164306313	protein_coding	22
ENSG0000019610	SPOCK3	-0.692975098797375	0.000506072	0.09828164306313	protein_coding	4
ENSG0000012606	TMEM115	-0.292368064519487	0.000506359	0.09828164306313	protein_coding	3

Supplementary Table 13. DESeq2 DEGs associated to Li treatment in Li-N hCS.

ensembl_gene_id	external_gene_name	log2FoldChange	pvalue	padj	gene_biotype	chromosome
ENSG00000120215	MLANA	228 950 036 679 754	6,84E+01	1,00E+04	protein_coding	9
ENSG00000002822	MAD1L1	-220 450 436 302 945	4,82E+02	3,53E+06	protein_coding	7
ENSG00000119614	VSX2	-212 173 375 558 471	2,86E+03	1,08E+07	protein_coding	14
ENSG00000135373	EHF	-212 348 945 811 129	2,95E+03	1,08E+07	protein_coding	11
ENSG00000118492	ADGB	-210 923 849 649 311	8,27E+03	2,20E+07	protein_coding	6
ENSG00000149452	SLC22A8	-21 049 169 217 603	9,03E+03	2,20E+07	protein_coding	11
ENSG00000284862	CCDC39	-205 790 789 713 924	1,56E+04	3,05E+07	protein_coding	3
ENSG00000163394	CCKAR	-204 111 544 148 032	1,66E+04	3,05E+07	protein_coding	4
ENSG00000177575	CD163	-195 336 127 213 678	1,04E+04	1,70E+08	protein_coding	12
ENSG00000146618	FERD3L	-192 227 415 057 425	1,29E+04	1,88E+08	protein_coding	7
ENSG00000165816	VWA2	-196 599 792 281 815	1,41E+05	1,88E+08	protein_coding	10
ENSG00000095585	BLNK	-196 038 174 212 619	1,57E+05	1,92E+08	protein_coding	10
ENSG00000110777	POU2AF1	-194 130 464 367 819	2,25E+05	2,54E+08	protein_coding	11
ENSG00000175518	UBQLNL	-189 686 816 823 836	5,18E+05	5,42E+08	protein_coding	11
ENSG00000165376	CLDN2	-188 463 050 641 213	6,48E+05	5,93E+08	protein_coding	X
ENSG00000283361	CFAP97D2	-188 463 050 641 213	6,48E+05	5,93E+08	protein_coding	13
ENSG00000134240	HMGCS2	-180 977 222 060 672	2,50E+05	2,16E+09	protein_coding	1
ENSG00000114487	MORC1	171 477 218 227 274	9,62E+06	7,83E+09	protein_coding	3
ENSG00000235718	MFRP	-169 316 677 547 397	1,85E+07	0.00014256291	protein_coding	11
ENSG00000100867	DHRS2	-178 071 322 002 389	2,72E+09	0.01993940271	protein_coding	14
ENSG00000104368	PLAT	224 265 073 204 449	2,97E+09	0.02071602721	protein_coding	8
ENSG00000123119	NECAB1	-11 202 253 300 374	4,03E+09	0.02682836121	protein_coding	8
ENSG00000131095	GFAP	-105 727 956 114 053	4,67E+08	0.02974151831	protein_coding	17
ENSG00000168078	PBK	0.671895697840797	5,10E+08	0.03076275101	protein_coding	8
ENSG00000101335	MYL9	-689 720 409 504 656	5,25E+09	0.03076275101	protein_coding	20
ENSG00000137573	SULF1	-240 887 154 196 444	5,60E+09	0.03154666441	protein_coding	8
ENSG00000164007	CLDN19	-870 770 422 988 925	7,01E+08	0.03804524321	protein_coding	1
ENSG00000006468	ETV1	0.561599375922872	0.0001099383711	0.05750954761	protein_coding	7
ENSG00000250120	PCDHA10	19 398 247 530 297	0.0001857232071	0.09380302831	protein_coding	5