

Zebrafish Gonad Mutant Models Reveal Neuroendocrine Mechanisms of Brain Sexual Dimorphism and Male Mating Behaviors of Different Brain Regions

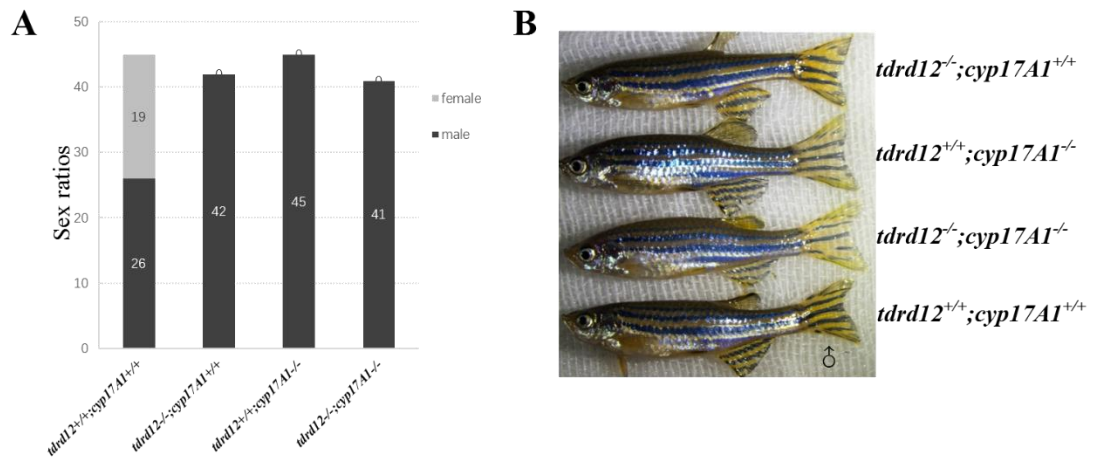


Figure S1. The male phenotypes of homozygous progenies from the in-cross of *tdrd12*^{+/-};*cyp17a1*^{+/-}. (A) The sex ratios of the homozygous progenies from the in-cross of *tdrd12*^{+/-};*cyp17a1*^{+/-} heterozygous mutant fish (90 dpf). Total number of progenies for this analysis is 674, among these progenies, all homozygous developed into males, mixed sex ratios of males and females were observed in WT. (B) The male phenotype of homozygous progenies. From the top to bottom, there were *tdrd12*^{+/-};*cyp17a1*^{+/-} (*tdrd12*^{+/-}), *tdrd12*^{+/-};*cyp17a1*^{+/-} (*cyp17a1*^{+/-}), *tdrd12*^{+/-};*cyp17a1*^{+/-} (double KO) and wild type male.

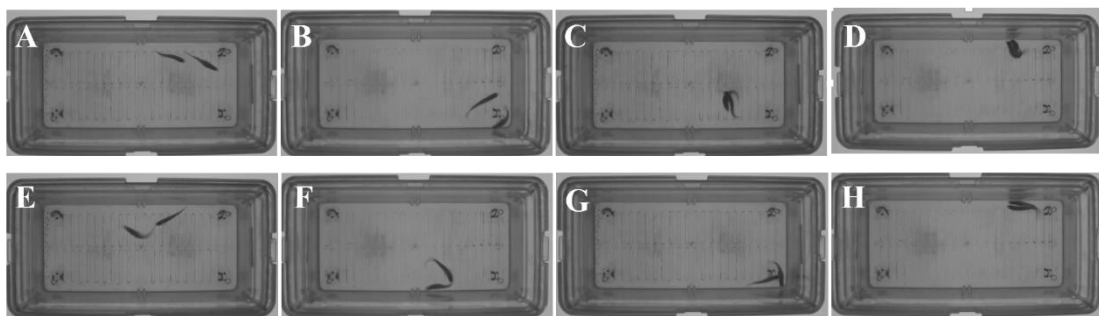


Figure S2. The representative courtship behaviors of control male individuals and *tdrd12*^{-/-} individuals with wild type female individuals. (A -D) Chasing the female, swimming around or in front of her in a tight circle, collision and parallel behaviors between wide type males and wide type females; (E-F) Chasing the female, swimming around or in front of her in a tight circle, collision and parallel behaviors between *tdrd12*^{-/-} fish and wide type females.

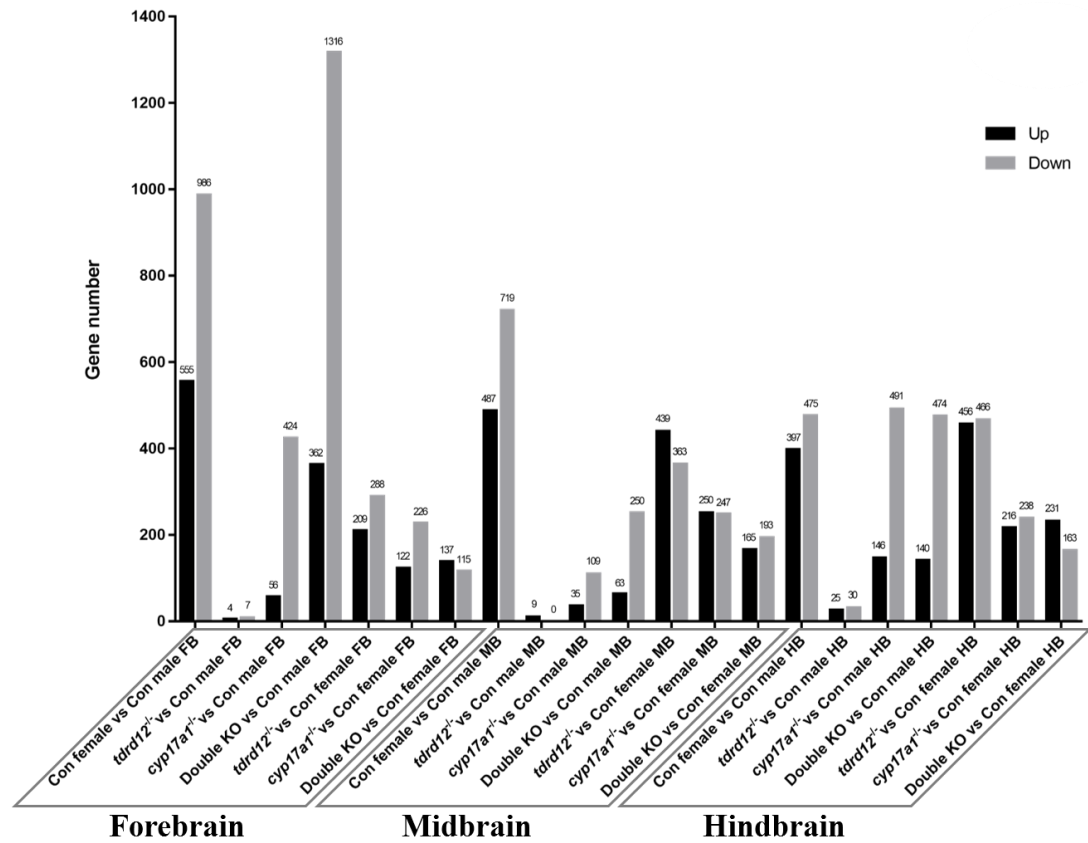


Figure S3. Statistics of significantly differentially expressed genes (DEGs) in different brain regions of *tdrd12*^{-/-} fish, *cyp17a1*^{-/-} fish, and double knockout (KO) fish compared with wild-type males and females at 4 months post-fertilization ($P < 0.05$, $|\text{fold change}| > 2$). FB: Forebrain; MB: Midbrain; HB: Hindbrain

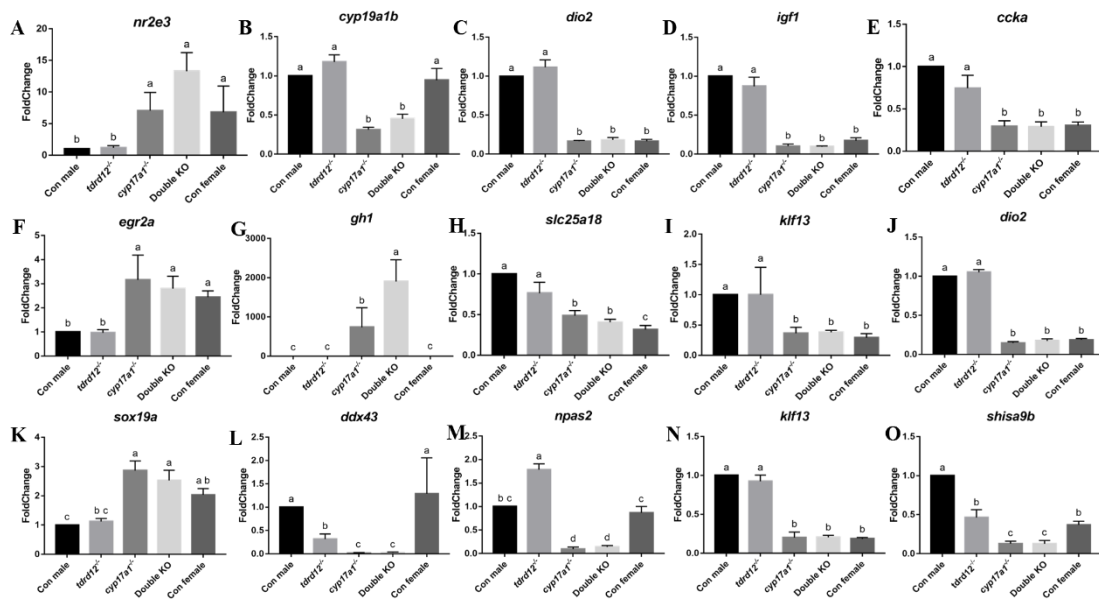


Figure S4. The fold changes (RNA-seq data) in the expression of genes of interest, as measured by RT-qPCR. (A-D) *nr2e3*, *dio2*, *cyp19a1b*, and *igf1* in the forebrain; (E-H) *egr2a*, *gh1*, *slc25a18*, *klf13*,

and *dio2* in the midbrain; (I-L) *sox19a*, *ddx43*, *npas2*, *klf3*, and *shisa19* in the hindbrain.

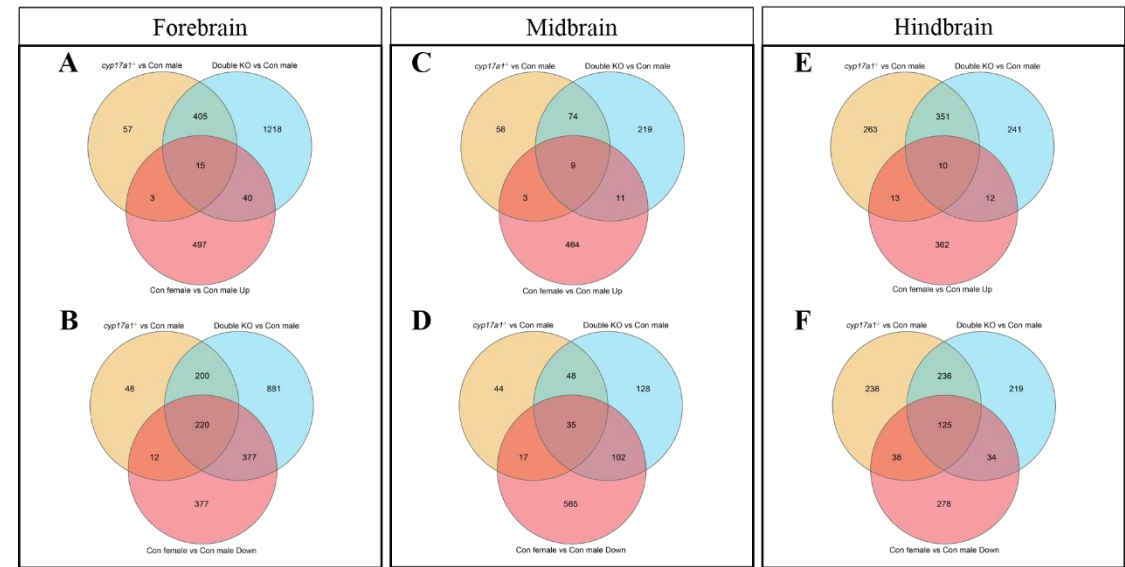


Figure S5. Venn diagram of DEGs in *cyp17a1*^{-/-} fish and double KO fish when compared with wild-type males, with female-biased or male-biased genes in the forebrain (A and B), midbrain (C and D), and hindbrain (E and F).

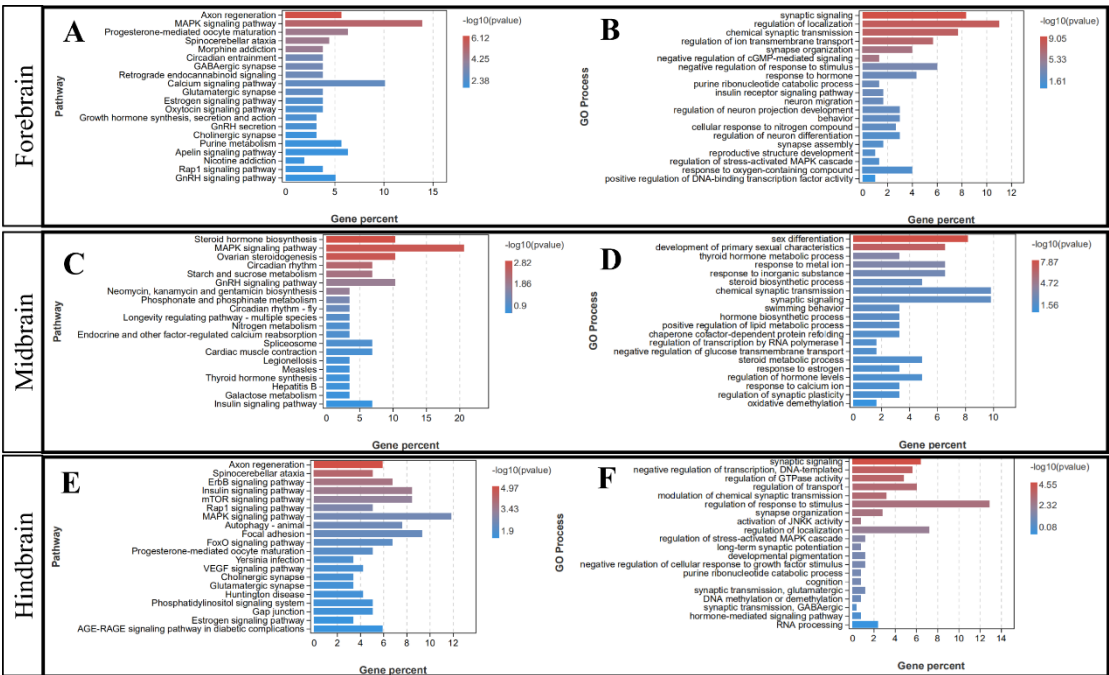


Figure S6. The molecular pathways involved in male mating behaviours. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) analyses were performed on altered genes in different brain regions of both *cyp17a1*^{-/-} and double KO fish compared with those of wild-type males. The top 20 KEGG pathways altered in the forebrain (A), midbrain (C) and hindbrain (E). Representative affected GO terms for biological processes in the forebrain (B), midbrain (D) and hindbrain (F).

Table 1 Oviposition of these mating females and fertilization rates from these mating groups.

Con male			<i>tdrd12</i> ^{-/-}			<i>cyp17a1</i> ^{-/-}			Double KO		
Total eggs	Fertilized eggs	Fertilization rate	Total eggs	Fertilized eggs	Fertilization rate	Total eggs	Fertilized eggs	Fertilization rate	Total eggs	Fertilized eggs	Fertilization rate
289	256	89%	231	0	0%	0	0		0	0	
219	199	91%	258	0	0%	0	0		0	0	
213	195	92%	198	0	0%	0	0		0	0	
193	181	94%	263	0	0%	0	0		0	0	
388	364	94%	347	0	0%	0	0		0	0	
305	280	92%	326	0	0%	0	0		0	0	
312	293	94%	319	0	0%	0	0		0	0	
362	336	93%	272	0	0%	0	0		0	0	
214	195	91%	302	0	0%	0	0		0	0	
336	317	94%	196	0	0%	0	0		0	0	
261	248	95%	254	0	0%	0	0		0	0	
187	172	92%	233	0	0%	0	0		0	0	
273.25	253	92%	266.58	0	0%	0	0	None	0	0	None

Note: the data shown in the table represent the average values after three mating experiments. Though egg-laying behaviours occurred in females from the mating between *tdrd12* mutant and wide type females, the fertilization rates were zero; on the contrary, *cyp17a1* and double KO mutants could not induce the females' egg-laying behavior.

Table 2. Primers used in this manuscript.

<i>genes</i>	Primer Sequence	Length
<i>b-actin2</i>	F:CCAGCCTTCCTTCCTGGGTATG R:GTGGAAGGAGCAAGAGAGGTG	186bp
<i>dio2</i>	F:TGGCTTCTTCTCCAAGTCC R:CTTCGCCCAATTTACCTGTT	188bp
<i>ccka</i>	F:TGCTGGACAAATCAACCTGCT R:TCTGCGGTATGAGCCTTTGGT	109bp
<i>igf1</i>	F:CCCAGGACACCAAAGAAACC R:ATGCGATAGTTTCTGCCCCC	107bp

<i>cyp19a1b</i>	F:AATCAGCTCTTCCAGGTCCC R:GCTTAGTATAACAGTCTCTTCTCCA	164bp
<i>nr2e3</i>	F:CCCCGAACAGGTAGAGAACC R:ATAGTCTCCCAAACCTGGCAA	101bp
<i>klf13</i>	F:TAAGGACGCACACAGGAGAG R:GGCGTGCATGTTTCATCAGG	180bp
<i>slc25a18</i>	F:GGCCGAAAAGAACTGAGCC R:TGCCAAACAGTCCAGCATTC	157bp
<i>egr2a</i>	F:TCTGGATGAGATTCCCCCGT R:CTGCTCAGGCCACCTGC	102bp
<i>gh1</i>	F:GCGTGCTCATCAAGGGATGTCT R:GACTGGTCTCCCCTACGGTC	105bp
<i>sox19a</i>	F:AGGTGGAAGCCCGAGGAT R:CTGCTATAGGACATGGGGTTGTAG	195bp
<i>shisa9b</i>	F:TCGCTCAAGGCTGTTGCTGAA R:CTGGGCTGTATGGGTTGGTG	139bp
<i>npas2</i>	F:GAGGGAATGGGACACAAGCA R:TCTCGCCTCTTCTTCTCCGA	105bp
<i>trh</i>	F:GTTTCGTCTTGGCCTGCGTG R:CCAGTCCGGCTGATCGTTCTC	160bp
<i>ddx43</i>	F:TGGGTGAACTGGAGGAACAGA R:TTTCGCACCACCTCGACCTATT	195bp
<i>cyp17a1</i>	F-genotyping: GCAGTGCTGTTTCAGAAGAGCT R-genotyping: GGCAGTTCATTCTGCTCTGA	580bp
<i>tdrd12</i>	F-genotyping: TCCGTGTTTCAGATCGAGGA R-genotyping: CAGTCCCTCTTTCAGCTCCG	177bp

Table 3. Expression of Co-DEGs in the forebrain of behavior- defective mutants.

ID	Symbol	Description	Log ₂ (fc) of double KO vs WT male	Log ₂ (fc) of <i>cyp17a1</i> ^{-/-} vs WT male	Log ₂ (fc) of <i>tdrd12</i> ^{-/-} vs WT male	Log ₂ (fc) of WT female vs WT male
ENSDARG00000094857	<i>dio2</i>	iodothyronine deiodinase 2	-2.467351	-2.607247	0.155573	-2.6032
MSTRG.26937	<i>cyp19a1b</i>	cytochrome P450 19A1B	-6.122433	-6.383161	0.03328	0.194388
ENSDARG00000091377	<i>galn</i>	galanin/GMAP prepropeptide	-2.04218	-1.97625	-0.112948	-0.541917
ENSDARG00000023287	<i>hsd17b3</i>	hydroxysteroid (17-beta) dehydrogenase 3	-1.547689	-1.66322	0.088053	-2.423648
ENSDARG00000098290	<i>unc80</i>	unc-80 homolog (C. elegans)	-1.369823	-1.420413	-0.390258	-0.874142
ENSDARG00000094132	<i>igf1</i>	insulin-like growth factor 1	-3.408025	-3.273539	-0.19902	-2.52904
ENSDARG00000079348	<i>GRIN2B</i>	glutamate receptor ionotropic, NMDA 2B-like	-1.621188	-1.46489	-0.554448	-1.417438
ENSDARG00000059738	<i>ptpsa</i>	protein tyrosine phosphatase receptor type Sa	-1.152611	-1.024626	-0.189101	-0.581284
ENSDARG00000087709	<i>fat3b</i>	FAT atypical cadherin 3b	-1.765218	-1.396679	-0.305786	-1.564521
ENSDARG00000014717	<i>dync1h1</i>	dynein, cytoplasmic 1, heavy chain 1	-2.635649	-1.879402	-0.572146	-1.811159
ENSDARG00000014280	<i>dlgap1a</i>	discs, large (Drosophila) homolog-associated protein 1a	-2.293788	-1.530903	-0.490419	-2.003502
ENSDARG00000041926	<i>dlg4a</i>	discs, large homolog 4a (Drosophila)	-1.821377	-1.433972	-0.550865	-1.446456
ENSDARG00000060025	<i>nsmfa</i>	NMDA receptor synaptonuclear signaling and neuronal migration factor a	-1.599141	-1.907773	-0.205637	-1.964003
ENSDARG00000008398	<i>cacna1c</i>	calcium channel, voltage-dependent, L type, alpha 1C subunit	-1.467329	-1.279615	-0.386127	-1.038043
ENSDARG00000061368	<i>klf13</i>	Kruppel-like factor 13	-2.325825	-1.824743	-0.747381	-2.534131
ENSDARG00000103739	<i>bahcc1a</i>	BAH domain and coiled-coil containing 1a	-2.548527	-1.63813	-0.645151	-2.103527

ENSDARG00000096645	<i>si:ch211-131k2.2</i>	si:ch211-131k2.2	-4.500459	-3.605952	-0.002044	-4.454944
ENSDARG00000001857	<i>aff4</i>	AF4/FMR2 family, member 4	-1.598126	-1.366506	-0.598787	-1.867787
ENSDARG00000112909	<i>ZNF462</i>	zinc finger protein 462	-2.076351	-1.701792	-0.818553	-1.879435
ENSDARG00000074723	<i>myo10l1</i>	myosin X, like 1	-1.602948	-1.339052	-0.769968	-1.221258
ENSDARG00000098057	<i>dscaml1</i>	Down syndrome cell adhesion molecule like 1	-1.793935	-1.306985	-0.26811	-1.703338
ENSDARG00000076213	<i>DOCK4</i>	si:dkey-81e3.1	-1.983417	-1.249753	-0.78717	-1.640212
ENSDARG00000025108	<i>magixa</i>	MAGI family member, X-linked a	-2.085117	-1.79706	-0.584963	-1.726982
ENSDARG00000098631	<i>CABZ01044277.1</i>	XP_021336603.1 dystonin	-2.229913	-2.514216	-0.33165	-1.326937
ENSDARG00000001559	<i>csm2</i>	CUB and Sushi multiple domains 2	-1.387978	-1.070389	-0.454474	-1.21661
ENSDARG00000010042	<i>dnm1a</i>	dynammin 1a	-1.528124	-1.054002	-0.767234	-1.305732
ENSDARG00000070810	<i>ccka</i>	cholecystokinin a	-1.788161	-1.768324	-0.424532	-1.713843
ENSDARG00000032197	<i>klf12b</i>	Kruppel-like factor 12b	-2.6597	-1.889488	-0.685374	-2.889488
ENSDARG00000076697	<i>SIPA1</i>	zmp:0000001168	-2.730769	-1.77613	-0.80477	-1.941189
ENSDARG00000078902	<i>rim1b</i>	regulating synaptic membrane exocytosis 1b	-1.258096	-1.171987	-0.444651	-1.077621
ENSDARG00000063307	<i>sgsm2</i>	small G protein signaling modulator 2	-1.676795	-1.278528	-0.48228	-1.854739
MSTRG.26936	<i>cyp19a1</i>	cytochrome P450, family 19, subfamily A, polypeptide 1b isoform X1	-1.14543	-1.675251	0.23644	-0.0813
ENSDARG00000088898	<i>caln1</i>	calneuron 1	-1.95793	-1.443956	-0.687256	-1.904963
ENSDARG00000098683	<i>zmiz2</i>	zinc finger, MIZ-type containing 2	-1.059205	-1.061001	-0.430048	-1.547267
ENSDARG00000074258	<i>gramd1bb</i>	GRAM domain containing 1Bb	-1.602014	-1.467458	-0.645544	-2.143795
ENSDARG00000009738	<i>cacnb4a</i>	calcium channel, voltage-dependent, beta 4a subunit	-2.596886	-1.959028	-0.92106	-2.130397

ENSDARG00000004789	<i>lrp1ba</i>	low density lipoprotein receptor-related protein 1Ba	-2.286304	-1.643856	-0.842956	-1.483985
ENSDARG00000016868	<i>rhobtb4</i>	Rho related BTB domain containing 4	-1.927991	-1.488257	-0.647297	-2.335079
ENSDARG00000078187	<i>slc12a5b</i>	solute carrier family 12 member 5b	-1.612559	-1.111715	-0.538921	-1.595779
ENSDARG00000075230	<i>tet1</i>	tet methylcytosine dioxygenase 1	-2.008613	-1.731727	-0.538488	-2.235813
ENSDARG00000088307	<i>mrtfba</i>	myocardin related transcription factor Ba	-2.395767	-1.818887	-0.865563	-2.363883
ENSDARG00000009459	<i>slc35e4</i>	solute carrier family 35 member E4	-1.419034	-1.600006	-0.755542	-1.710766
MSTRG.33980	<i>Insyn2b</i>	PREDICTED: mucin-5AC-like isoform X1	-1.348742	-1.1065	-0.589021	-1.473231
ENSDARG00000060941	<i>ANKFN1</i>	si:ch211-277e21.2	-2.188114	-1.932587	-0.520689	-3.173215
ENSDARG00000087260	<i>mtss1lb</i>	MTSS I-BAR domain containing 2b	-2.730834	-1.823943	-0.678654	-1.773317
ENSDARG00000097017	<i>mical3a</i>	microtubule associated monooxygenase, calponin and LIM domain containing 3a	-1.923121	-1.28844	-0.741775	-1.368834
ENSDARG00000016348	<i>dip2bb</i>	disco-interacting protein 2 homolog Bb	-1.62242	-1.289357	-0.575581	-1.075913
ENSDARG00000059888	<i>ago3a</i>	argonaute RISC catalytic component 3a	-2.099217	-2.080234	-1.024739	-2.67941
ENSDARG00000074819	<i>si:dkeyp-23e4.3</i>	si:dkeyp-23e4.3	-1.368114	-1.53906	0.409493	-2.844996
MSTRG.6383	<i>LBH</i>	protein LBH	-2.266028	-1.988831	-1.302438	-1.575649
ENSDARG00000077656	<i>arfgef3</i>	ARFGEF family member 3	-1.638056	-1.096118	-0.713442	-1.268681
ENSDARG00000054253	<i>sobpa</i>	sine oculis binding protein homolog (Drosophila) a	-2.165748	-1.745357	-0.836331	-2.087463
ENSDARG00000077905	<i>csmd3a</i>	CUB and Sushi multiple domains 3a	-1.488993	-1.467725	-0.369128	-1.240314
ENSDARG00000060875	<i>pde1a</i>	phosphodiesterase 1A, calmodulin-dependent	-1.677876	-1.283665	-0.629996	-1.292455
ENSDARG00000098511	<i>ntkr2b</i>	neurotrophic tyrosine kinase, receptor, type 2b	-3.204801	-1.861162	-0.915531	-2.373099
ENSDARG00000060539	<i>shank1</i>	SH3 and multiple ankyrin repeat domains 1	-2.013806	-1.521953	-0.462763	-1.661677
ENSDARG00000068286	<i>slc7a4</i>	solute carrier family 7 member 4	-2.021342	-1.783977	-1.045189	-1.845457

ENSDARG00000005670	<i>ttbk2a</i>	tau tubulin kinase 2a	-2.006848	-1.395504	-0.863231	-1.561554
ENSDARG00000029668	<i>crim1</i>	cysteine rich transmembrane BMP regulator 1 (chordin-like)	-1.383329	-1.254183	-0.470339	-0.799975
ENSDARG00000076702	<i>CABZ01068356.1</i>	PH and SEC7 domain-containing protein 1-like	-2.047148	-1.456134	-1.024931	-1.674352
ENSDARG00000061992	<i>dot1l</i>	DOT1-like histone H3K79 methyltransferase	-1.859325	-1.502724	-0.788008	-1.646714
ENSDARG00000052642	<i>shisa9b</i>	shisa family member 9b	-1.958363	-1.811842	-0.814091	-1.360195
ENSDARG00000102406	<i>si:ch211-165e15.1</i>	si:ch211-165e15.1	-2.694721	-2.275567	-0.533064	-1.218154
ENSDARG00000006923	<i>cacna1ab</i>	calcium channel, voltage-dependent, P/Q type, alpha 1A subunit, b	-1.386214	-1.207392	-0.652524	-0.604151
ENSDARG00000020718	<i>slc25a22a</i>	solute carrier family 25 member 22a	-1.969812	-1.273	-0.994888	-1.791962
ENSDARG00000002816	<i>rasgrf2b</i>	Ras protein-specific guanine nucleotide-releasing factor 2b	-2.193036	-1.443607	-0.838311	-1.621699
ENSDARG00000061541	<i>unc5db</i>	unc-5 netrin receptor Db	-1.522546	-1.230755	-0.564472	-2.18028
ENSDARG00000043332	<i>prkcz</i>	protein kinase C, zeta	-1.695413	-1.317477	-0.488534	-1.521335
ENSDARG00000073822	<i>IQSEC1</i>	IQ motif and Sec7 domain ArfGEF 1a	-2.033349	-1.689103	-0.772459	-2.240295
ENSDARG00000112431	<i>LO018598.1</i>	NP_001233205.1 reelin precursor	-2.2226	-2.057855	-0.45912	-1.171172
ENSDARG00000043226	<i>nfixa</i>	nuclear factor I/Xa	-2.627347	-1.846218	-1.119134	-2.640095
ENSDARG00000043646	<i>slc6a8</i>	solute carrier family 6 member 8	-2.171439	-1.755039	-0.63454	-2.305674
MSTRG.21108	<i>SHC3</i>	SHC-transforming protein 3	-1.488541	-1.030882	-0.571141	-1.710544
ENSDARG00000061042	<i>gabbr2</i>	gamma-aminobutyric acid (GABA) B receptor, 2	-1.703238	-1.022543	-0.588192	-1.57981
ENSDARG00000058284	<i>CT990561.1</i>	EPH receptor A5	-1.818582	-1.561194	-0.787915	-1.973092
ENSDARG00000102082	<i>nr3c2</i>	nuclear receptor subfamily 3, group C, member 2	-1.643035	-1.038829	-1.487618	-1.386855

ENSDARG00000055565	<i>cacnb2b</i>	calcium channel, voltage-dependent, beta 2b	-1.184525	-1.035968	-0.71122	-1.308634
ENSDARG00000102067	<i>grm5b</i>	glutamate receptor, metabotropic 5b	-2.73543	-1.876391	-1.018556	-2.267651
ENSDARG00000104810	<i>akt3a</i>	v-akt murine thymoma viral oncogene homolog 3a	-1.228075	-1.034433	-0.809057	-1.425662
ENSDARG00000045453	<i>f13a1a.1</i>	coagulation factor XIII, A1 polypeptide a, tandem duplicate 1	-9.291554	-9.291554	-1.773229	3.743474
ENSDARG00000017365	<i>slc23a2</i>	solute carrier family 23 member 2	-1.88907	-1.50462	-0.755852	-1.88907
ENSDARG00000005834	<i>gatad2b</i>	GATA zinc finger domain containing 2B	-2.055322	-1.088936	-0.75773	-1.721204
ENSDARG000000094512	<i>gabrz</i>	gamma-aminobutyric acid (GABA) A receptor, zeta	-2.075733	-1.606456	-0.683594	-2.119483
ENSDARG000000060597	<i>zgc:158659</i>	zgc:158659	-1.2205	-1.64291	-0.260764	-1.40874
ENSDARG000000063180	<i>dock3</i>	dedicator of cytokinesis 3	-1.840073	-1.138071	-0.631389	-1.837366
ENSDARG000000068582	<i>rnf44</i>	ring finger protein 44	-1.54407	-1.23588	-0.529246	-2.029146
ENSDARG00000110950	<i>CU929544.1</i>	receptor-type tyrosine-protein phosphatase delta-like	-1.424768	-1.401976	0.199474	-0.331372
ENSDARG000000053326	<i>gna11b</i>	guanine nucleotide binding protein (G protein), alpha 11b (Gq class)	-1.680233	-1.245697	-0.86605	-1.763792
ENSDARG00000005586	<i>zbtb20</i>	zinc finger and BTB domain containing 20	-4.18133	-2.944291	-0.789012	-3.596367
ENSDARG000000060148	<i>sh3pxd2aa</i>	SH3 and PX domains 2Aa	-1.397335	-1.049831	-0.717798	-1.00446
ENSDARG000000098906	<i>herc7</i>	hect domain and RLD 7	-3.525628	-3.729642	-1.278535	-2.085056
ENSDARG00000008575	<i>lyst</i>	lysosomal trafficking regulator	-1.466293	-1.061729	-0.463687	-1.334255
ENSDARG000000075271	<i>rapgef5a</i>	Rap guanine nucleotide exchange factor (GEF) 5a	-1.747234	-1.37468	-0.86509	-1.567528
ENSDARG00000105178	<i>erc2</i>	ELKS/RAB6-interacting/CAST family member 2	-2.375039	-1.547488	-0.865577	-2.08187
ENSDARG00000109726	<i>PLCB1</i>	si:ch1073-140o9.2	-2.039369	-1.527162	-0.586402	-0.827999

ENSDARG00000079741	<i>CSRNP3</i>	cysteine-serine-rich nuclear protein 3	-1.986809	-1.623461	-0.575277	-1.67613
ENSDARG00000098349	<i>hdac4</i>	histone deacetylase 4	-1.358531	-1.202056	-0.592815	-1.631485
ENSDARG00000074064	<i>rem2</i>	RAS (RAD and GEM)-like GTP binding 2	-1.375367	-1.120294	-0.834746	-1.41329
ENSDARG00000075539	<i>snphb</i>	syntaphilin b	-1.480122	-1.006905	-0.41635	-0.639618
ENSDARG00000032039	<i>mxdl</i>	MAX dimerization protein 1	-2.487731	-1.500417	-1.008532	-2.298598
ENSDARG00000027497	<i>mast1a</i>	microtubule associated serine/threonine kinase 1a	-1.964587	-1.219922	-0.796271	-1.570203
ENSDARG00000016866	<i>fam102ab</i>	family with sequence similarity 102 member Ab	-1.298416	-1.205222	-0.511348	-1.781946
ENSDARG00000003989	<i>crhr1</i>	corticotropin releasing hormone receptor 1	-1.594111	-1.139694	-0.699756	-1.556072
ENSDARG00000063264	<i>pcdh9</i>	protocadherin 9	-1.609625	-1.138482	-0.617106	-1.778306
ENSDARG00000079756	<i>peak1</i>	pseudopodium-enriched atypical kinase 1	-1.719892	-1.231006	-0.93523	-1.410139
ENSDARG00000071230	<i>lrfr5a</i>	leucine rich repeat and fibronectin type III domain containing 5a	-1.70056	-1.129734	-0.693543	-1.622969
ENSDARG00000077920	<i>csmd3a</i>	CUB and Sushi multiple domains 3a	-1.378512	-1.442642	-0.616671	-1.281487
ENSDARG00000100007	<i>arhgap39</i>	Rho GTPase activating protein 39	-1.006789	-1.009266	-0.544885	-1.385177
ENSDARG00000092260	<i>si:ch73-290k24.6</i>	si:ch73-290k24.6	-1.074859	-1.055373	-0.285718	-1.029796
ENSDARG00000063732	<i>pde11a</i>	phosphodiesterase 11a	-1.59761	-1.204515	-0.453933	-1.885907
ENSDARG00000088967	<i>wnk4b</i>	WNK lysine deficient protein kinase 4b	-1.494987	-1.217109	-0.227083	-1.651204
ENSDARG00000008372	<i>spred2b</i>	sprouty related EVH1 domain containing 2b	-1.663737	-1.202972	-0.768522	-1.573687
ENSDARG00000067815	<i>CABZ01060891.1</i>	leucine-rich repeat and immunoglobulin-like domain-containing nogo receptor-interacting protein 3	-3.666542	-2.33918	-1.400109	-2.383235
ENSDARG00000098612	<i>chrm2a</i>	cholinergic receptor, muscarinic 2a	-2.685657	-2.617752	-0.7164	-3.568843
ENSDARG00000069262	<i>erich3</i>	glutamate-rich 3	-1.774565	-1.715023	-0.034765	-1.811507

ENSDARG00000091408	<i>mtcl1</i>	microtubule crosslinking factor 1	-2.249809	-1.759281	-0.826597	-1.911284
ENSDARG00000012823	<i>dlgap4b</i>	discs, large (Drosophila) homolog-associated protein 4b	-1.359013	-1.111156	-0.704275	-1.665044
ENSDARG00000003449	<i>pde10a</i>	phosphodiesterase 10A	-1.776638	-1.427053	-0.583993	-1.143726
ENSDARG00000003544	<i>adarb1b</i>	adenosine deaminase RNA specific B1b	-2.139064	-1.851901	-0.820575	-1.858956
ENSDARG000000091130	<i>kcnq2b</i>	potassium voltage-gated channel, KQT-like subfamily, member 2b	-1.907259	-1.226081	-0.761488	-1.469599
ENSDARG00000013020	<i>dtncb</i>	dystrobrevin, beta b	-1.868094	-1.199831	-0.767735	-1.809612
ENSDARG00000060372	<i>plxna2</i>	plexin A2	-2.193788	-1.145794	-0.629305	-1.60781
ENSDARG00000016536	<i>npas2</i>	neuronal PAS domain protein 2	-1.852652	-1.63026	-0.704056	-1.880133
ENSDARG00000075685	<i>tlr7</i>	toll-like receptor 7	-1.587848	-1.048363	-0.705915	-1.671075
ENSDARG00000071524	<i>insrb</i>	insulin receptor b	-1.497141	-1.036146	-0.44643	-1.448805
ENSDARG00000027423	<i>igf1ra</i>	insulin-like growth factor 1a receptor	-1.323276	-1.076058	-0.494887	-1.098958
ENSDARG00000114067	<i>tspan17</i>	tetraspanin 17	-1.097483	-1.014451	-0.779663	-1.218669
ENSDARG00000102584	<i>cpne7</i>	copine VII	-1.854617	-1.211138	-0.625505	-1.395471
ENSDARG00000069026	<i>adcy1a</i>	adenylate cyclase 1a	-2.22896	-1.380176	-1.092102	-2.009102
ENSDARG00000058598	<i>sox18</i>	SRY-box transcription factor 18	-1.52934	-1.108765	-0.003368	-1.659925
ENSDARG00000098215	<i>BICD2</i>	zgc:171572	-2.081233	-1.299739	-0.965567	-1.784594
ENSDARG00000036826	<i>ankrd52a</i>	ankyrin repeat domain 52a	-2.683411	-1.771638	-0.765154	-2.271433
ENSDARG00000036998	<i>arf3b</i>	ADP-ribosylation factor 3b	-2.711163	-1.488082	-0.895561	-2.164501
ENSDARG00000042518	<i>hipk2</i>	homeodomain interacting protein kinase 2	-2.027415	-1.455195	-0.807992	-2.243479
ENSDARG00000036848	<i>slc43a2a</i>	solute carrier family 43 member 2a	-1.931229	-1.341728	0.085042	-2.778681
MSTRG.15506	<i>AKAP9</i>	A-kinase anchor protein 9	-1.206243	-1.578211	0.041356	-0.366248
ENSDARG00000075296	<i>fam83c</i>	family with sequence similarity 83 member C	-2.217052	-1.383871	-0.732218	-1.973495

ENSDARG00000011809	<i>mical1</i>	microtubule associated monooxygenase, calponin and LIM domain containing 1	-1.263701	-1.019005	-0.760103	-0.906474
ENSDARG00000070620	<i>grin2db</i>	glutamate receptor, ionotropic, N-methyl D-aspartate 2D, b	-1.617811	-1.303247	-0.952915	-0.894551
ENSDARG00000009493	<i>MAP3K13</i>	si:ch211-45c16.2	-2.536571	-1.755211	-0.670322	-2.144254
ENSDARG00000078327	<i>CEP170B</i>	si:ch73-212j7.1	-1.578205	-1.1814	-0.802987	-1.608866
ENSDARG00000075139	<i>hdac5</i>	histone deacetylase 5	-1.83662	-1.041011	-0.703047	-2.079254
ENSDARG00000061635	<i>myo5aa</i>	myosin VAa	-2.418501	-1.323226	-0.919269	-2.224123
ENSDARG00000020057	<i>bmpr2b</i>	bone morphogenetic protein receptor, type II b (serine/threonine kinase)	-1.920131	-1.212625	-0.889757	-1.529276
ENSDARG00000035966	<i>pgr</i>	progesterone receptor	-2.600464	-2.389567	-0.044738	-0.366666
ENSDARG00000076292	<i>tns2a</i>	tensin 2a	-1.893085	-1.358048	-0.4168	-2.33787
ENSDARG00000104005	<i>slc4a3</i>	solute carrier family 4 member 3	-2.122995	-1.261174	-1.021883	-1.731804
MSTRG.14233	<i>UNC13C</i>	protein unc-13 homolog C-like isoform X2	-2.062736	-1.237176	-0.459192	-2.103378
MSTRG.18936	<i>Hcn2</i>	potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 2-like	-1.564905	-1.1976	-0.617056	-2.145605
ENSDARG00000104283	<i>cdc42bpaa</i>	CDC42 binding protein kinase alpha (DMPK-like) a	-2.707274	-1.66342	-1.547278	-1.857299
ENSDARG00000061231	<i>tinagl1</i>	tubulointerstitial nephritis antigen-like 1	-2.413703	-1.662298	-0.434121	-3.919765
ENSDARG00000055672	<i>map3k10</i>	mitogen-activated protein kinase kinase kinase 10	-1.576238	-1.133509	-1.015081	-1.610185
MSTRG.12484	<i>Dync1h1</i>	cytoplasmic dynein 1 heavy chain 1	-1.86342	-1.166615	-0.476487	-1.612579
ENSDARG00000017108	<i>kcna1b</i>	potassium voltage-gated channel, shaker-related subfamily, member 1b	-1.737974	-1.446634	-0.527158	-1.631059
ENSDARG00000061718	<i>znf704</i>	zinc finger protein 704	-2.779341	-3.57289	-2.309855	-1.738313
ENSDARG00000098857	<i>lifra</i>	LIF receptor subunit alpha a	-1.905028	-1.128584	-0.703394	-1.919057

ENSDARG00000073769	<i>magi2b</i>	membrane associated guanylate kinase, WW and PDZ domain containing 2b	-2.112768	-1.671578	-0.821663	-1.411426
ENSDARG00000059523	<i>rims4</i>	regulating synaptic membrane exocytosis 4	-1.918062	-1.314094	-0.477281	-1.71703
ENSDARG00000052604	<i>cpeb2</i>	cytoplasmic polyadenylation element binding protein 2	-1.659783	-1.285579	-0.444116	-1.402351
ENSDARG00000077582	<i>ank3b</i>	ankyrin 3b	-1.873376	-1.587152	-0.934776	-0.583869
ENSDARG00000055223	<i>ablim2</i>	actin binding LIM protein family, member 2	-1.334602	-1.070389	-0.437172	-1.012674
ENSDARG00000000563	<i>ttn.1</i>	titin, tandem duplicate 1	-1.662965	-1.925999	-0.247928	-1.925999
ENSDARG00000089292	<i>adgrl1a</i>	adhesion G protein-coupled receptor L1a	-1.716207	-1.289507	-0.833246	-1.156445
ENSDARG00000069560	<i>kcnh3</i>	potassium voltage-gated channel, subfamily H (eag-related), member 3	-1.875542	-1.146152	-0.829074	-1.906569
ENSDARG00000062134	<i>kcnab2b</i>	potassium voltage-gated channel, shaker-related subfamily, beta member 2 b	-1.421087	-1.231982	-0.151556	-1.829404
ENSDARG00000100032	<i>GABRB2</i>	gamma-aminobutyric acid type A receptor beta2 subunit	-2.509298	-2.139725	-1.388162	-2.223626
ENSDARG00000099841	<i>prkcb</i>	protein kinase C, alpha, b	-1.748193	-1.036698	-0.826947	-1.739204
ENSDARG00000078954	<i>rxrba</i>	retinoid x receptor, beta a	-1.256648	-1.004932	-0.212476	-1.408487
ENSDARG00000101019	<i>ext1b</i>	exostosin glycosyltransferase 1b	-1.792022	-1.38247	-0.675071	-2.349865
ENSDARG00000075383	<i>gramd1ba</i>	GRAM domain containing 1Ba	-1.396488	-1.274851	-0.23259	-1.671141
ENSDARG00000027903	<i>adamtsl3</i>	ADAMTS-like 3	-2.266787	-1.200697	-0.669851	-1.916289
ENSDARG00000101687	<i>CU929259.1</i>	microtubule-associated protein 4-like	-2.174912	-1.237556	-0.537774	-1.681334
ENSDARG00000060309	<i>srgap3</i>	SLIT-ROBO Rho GTPase activating protein 3	-1.736605	-1.033947	-0.852007	-1.258928
ENSDARG00000063730	<i>osbpl6</i>	oxysterol binding protein-like 6	-1.543543	-2.516576	-0.724569	-1.82852
ENSDARG00000060741	<i>syt17</i>	synaptotagmin XVII	-1.357261	-1.40576	-1.064236	-1.744743

ENSDARG00000098984	<i>pid1</i>	phosphotyrosine interaction domain containing 1	-1.771449	-1.216985	-0.78834	-1.997009
ENSDARG00000100620	<i>taok2b</i>	TAO kinase 2b	-1.572062	-1.172627	-0.558215	-1.619939
ENSDARG00000005394	<i>dnmt3aa</i>	DNA (cytosine-5-)-methyltransferase 3 alpha a	-2.004558	-1.325345	-0.749918	-2.13175
ENSDARG00000052766	<i>EVI5L</i>	si:ch211-239f4.1	-1.306941	-1.459432	-1.068972	-1.302563
ENSDARG00000052881	<i>dnajb5</i>	DnaJ heat shock protein family (Hsp40) member B5	-1.452739	-1.186975	-0.466246	-1.889803
ENSDARG00000005783	<i>ncanb</i>	neurocan b	-1.993746	-1.220305	-0.487434	-1.3581
ENSDARG00000058248	<i>si:dkeyp-77h1.4</i>	si:dkeyp-77h1.4	-1.89072	-1.231833	-0.801384	-1.283179
MSTRG.12423	<i>RYR3</i>	PREDICTED: ryanodine receptor 3-like	-1.150429	-1.284789	-0.568697	-0.59152
ENSDARG00000102142	<i>ece2b</i>	endothelin converting enzyme 2b	-2.130876	-1.231277	-0.663749	-1.976934
ENSDARG00000025206	<i>syt2a</i>	synaptotagmin IIa	-2.271688	-2.302882	-1.094068	-2.752493
ENSDARG00000092624	<i>sptbn4b</i>	spectrin, beta, non-erythrocytic 4b	-1.78182	-1.310929	-0.350267	-0.853159
ENSDARG00000076014	<i>ERC1</i>	si:dkey-222l13.1	-2.559792	-1.356975	-1.006942	-2.221623
ENSDARG00000104981	<i>SLC45A4</i>	solute carrier family 45 member 4-like	-3.045643	-1.829151	-1.080408	-2.759888
ENSDARG00000075532	<i>slc4a11</i>	solute carrier family 4 member 11	-1.244188	-1.027721	-0.808603	-1.643544
ENSDARG00000069608	<i>palm2akap2</i>	palm2 and akap2 fusion	-1.741688	-1.350497	-0.541671	-2.189761
MSTRG.29660	<i>SIFaR</i>	neuropeptide FF receptor 2-like	-1.502902	-1.46245	-0.580145	-1.957215
ENSDARG00000058015	<i>ano3</i>	anoctamin 3	-2.192983	-1.169728	-0.900201	-2.023058
MSTRG.15433	<i>RELN</i>	reelin precursor	-2.304087	-1.331206	-0.347725	-1.04981
ENSDARG00000005216	<i>zgc:158328</i>	zgc:158328	-3.512568	-1.982053	-1.340101	-3.559111
ENSDARG00000018896	<i>mmp24</i>	matrix metalloproteinase 24	-2.13593	-1.640835	-0.597185	-2.399477
MSTRG.16736	<i>ADGRB2</i>	adhesion G protein-coupled receptor B2-like isoform X2	-1.523365	-1.500928	-0.416612	-1.496482

ENSDARG00000023914	<i>mark4a</i>	MAP/microtubule affinity-regulating kinase 4a	-1.79185	-1.030362	-0.618222	-2.116233
ENSDARG00000035308	<i>grb10b</i>	growth factor receptor-bound protein 10b	-1.418373	-1.510296	-0.76387	-1.234661
ENSDARG00000037069	<i>zdhhc14</i>	zinc finger DHHC-type containing 14	-1.59323	-1.136515	-0.767515	-1.338511
ENSDARG00000020242	<i>fermt2</i>	fermitin family member 2	-1.953206	-2.577057	-0.479889	-1.984233
ENSDARG00000075815	<i>slc12a5a</i>	solute carrier family 12 member 5a	-2.819624	-1.545524	-0.825516	-2.229444
ENSDARG00000018096	<i>scap</i>	SREBF chaperone	-1.406715	-1.171611	-0.493539	-1.700199
ENSDARG00000078011	<i>NAV1</i>	neuron navigator 1a	-1.596734	-1.113525	-0.735013	-1.553078
ENSDARG00000062550	<i>rc3h1a</i>	ring finger and CCCH-type domains 1a	-1.6537	-1.099388	-0.703282	-1.643985
ENSDARG00000031702	<i>prkg1b</i>	protein kinase cGMP-dependent 1b	-1.096488	-1.056457	-0.305413	-1.392021
ENSDARG00000053804	<i>osbpl2a</i>	oxysterol binding protein-like 2a	-2.252463	-1.913375	-1.051366	-2.258642
ENSDARG00000007398	<i>lrrk1</i>	leucine-rich repeat kinase 1	-1.32061	-1.627791	-0.777984	-0.64007
ENSDARG00000086977	<i>atxn1l</i>	ataxin 1-like	-3.115477	-3.06301	-1.128898	-2.089005
ENSDARG00000022614	<i>ddx43</i>	DEAD (Asp-Glu-Ala-Asp) box polypeptide 43	-4.336283	-3.995246	-1.024005	-0.093427
ENSDARG00000070504	<i>trpc5a</i>	transient receptor potential cation channel, subfamily C, member 5a	-2.10172	-1.391227	-0.71387	-2.010954
ENSDARG00000059939	<i>dab1a</i>	DAB adaptor protein 1a	-1.641106	-1.272383	-0.487122	-1.788419
ENSDARG00000042492	<i>si:dkey-250d21.1</i>	si:dkey-250d21.1	-2.551796	-1.647823	-1.003733	-1.573822
ENSDARG00000017742	<i>grm6a</i>	glutamate receptor, metabotropic 6a	-2.140481	-1.683436	-0.140481	-1.608958
ENSDARG00000061248	<i>xylt1</i>	xylosyltransferase I	-1.79023	-1.103311	-0.942515	-1.081428
ENSDARG00000012833	<i>foxn3</i>	forkhead box N3	-1.65238	-1.185681	-0.848847	-1.749056
MSTRG.15448	<i>RELN</i>	reelin precursor	-1.379493	-1.10164	-0.548621	-1.171766
ENSDARG00000043835	<i>rab3ab</i>	RAB3A, member RAS oncogene family, b	-2.146299	-1.014114	-0.895853	-2.018145
ENSDARG00000041239	<i>wdr20b</i>	WD repeat domain 20b	-2.079289	-1.726715	-0.067114	-0.742763
ENSDARG00000058848	<i>mcoln1b</i>	mucolipin 1b	-1.67553	-1.492569	-0.911191	-1.460704

ENSDARG00000080006	<i>tmem41b</i>	transmembrane protein 41B	-1.409032	-1.594844	-0.482803	-1.522332
ENSDARG00000102610	<i>r3hdm2</i>	R3H domain containing 2	-1.810649	-1.367042	-0.292617	-2.075993
ENSDARG00000011703	<i>clocka</i>	clock circadian regulator a	-1.48134	-1.045034	-0.738672	-1.216719
ENSDARG00000078839	<i>LRRTM4</i>	si:dkey-28o19.1	-2.450329	-1.454873	-1.189565	-1.768859
ENSDARG00000017220	<i>otud7b</i>	OTU deubiquitinase 7B	-1.534963	-1.219367	-0.13714	-1.732128
ENSDARG00000093091	<i>iqsec3b</i>	IQ motif and Sec7 domain ArfGEF 3b	-1.675423	-1.181184	-0.660842	-1.294159
ENSDARG00000036626	<i>sema6ba</i>	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6Ba	-2.452512	-1.607683	-0.833161	-2.208587
ENSDARG00000090421	<i>SH2B2</i>	SH2B adaptor protein 2	-1.563235	-1.152246	-0.440807	-1.18174
ENSDARG00000032761	<i>pde4d</i>	phosphodiesterase 4D, cAMP-specific	-2.006826	-1.344478	-1.002921	-1.938113
ENSDARG00000013828	<i>snx13</i>	sorting nexin 13	-1.388442	-1.137309	-0.578187	-1.091106
ENSDARG00000005126	<i>large1</i>	LARGE xylosyl- and glucuronyltransferase 1	-2.025535	-1.597674	-0.484162	-1.991588
ENSDARG00000116353	<i>lrp4</i>	low density lipoprotein receptor-related protein 4	-1.395833	-1.080119	-0.729734	-1.797421
ENSDARG00000090617	<i>ctif</i>	CBP80/20-dependent translation initiation factor	-1.843791	-1.483322	-0.866011	-1.244203
ENSDARG00000019963	<i>sfxn1</i>	sideroflexin 1	-1.996238	-1.457079	-0.460963	-1.796566
ENSDARG00000103420	<i>si:dkey-56m15.5</i>	si:dkey-56m15.5	-1.832123	-1.922321	-0.327053	-1.467126
ENSDARG00000077686	<i>aak1b</i>	AP2 associated kinase 1b	-2.344019	-1.057629	-0.917257	-2.268949
ENSDARG00000077761	<i>nlgn4xb</i>	neuroligin 4 X-linked b	-1.775568	-2.103623	-0.429393	-1.692427
ENSDARG00000101280	<i>vat1l</i>	vesicle amine transport 1-like	-1.499791	-1.088259	-0.462265	-1.371594
ENSDARG00000018967	<i>gabbr1a</i>	gamma-aminobutyric acid (GABA) B receptor, 1a	-1.443319	-1.78001	-0.9366	-0.851843
ENSDARG00000036985	<i>plxnb2b</i>	plexin b2b	-1.177787	-1.011998	-0.442174	-0.510738

ENSDARG00000063332	<i>shank3a</i>	SH3 and multiple ankyrin repeat domains 3a	-1.605721	-1.838606	-0.651236	-1.035771
ENSDARG00000079805	<i>tagln3a</i>	transgelin 3a	-2.039803	-1.324229	-0.741926	-1.386669
ENSDARG00000025797	<i>abhd2a</i>	abhydrolase domain containing 2a	-2.130288	-1.580949	-0.395083	-2.902878
ENSDARG00000041086	<i>LO018380.1</i>	sodium/potassium/calcium exchanger 3-like	-1.655314	-1.338624	-0.502123	-0.660075
ENSDARG00000087596	<i>si:ch73-95l15.5</i>	si:ch73-95l15.5	-1.110703	-1.745186	0.251375	-1.29956
ENSDARG00000094327	<i>SPATA1</i>	si:dkey-205k8.5	-1.223576	-1.048134	0.118115	-1.647856
ENSDARG00000100163	<i>tox4b</i>	TOX high mobility group box family member 4 b	-1.376902	-1.593036	-0.909509	-1.779449
ENSDARG00000019588	<i>chico</i>	chico	-1.859908	-1.328103	-0.778378	-2.174168
MSTRG.4521	<i>TMEM63B</i>	CSC1-like protein 2 isoform X3	-3.104941	-1.95099	-0.902177	-2.085576
ENSDARG00000078775	<i>RASA2</i>	RAS p21 protein activator 2	-2.255712	-1.364184	-0.867896	-1.438759
ENSDARG00000091619	<i>mvp12ba</i>	multivesicular body subunit 12Ba	-1.584146	-1.379002	-0.737783	-1.29843
ENSDARG00000063079	<i>ago3b</i>	argonaute RISC catalytic component 3b	-1.651654	-1.023896	-0.897111	-1.136615
MSTRG.1594	<i>Sstr5</i>	somatostatin receptor type 5-like isoform X2	-1.556072	-1.072945	-0.673338	-1.239517
ENSDARG00000061471	<i>sema5ba</i>	sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5Ba	-1.697542	-1.043186	-0.424091	-1.509609
ENSDARG00000013491	<i>map3k9</i>	mitogen-activated protein kinase kinase kinase 9	-1.792684	-1.190119	-0.652582	-0.736572
ENSDARG00000062195	<i>fbxo31</i>	F-box protein 31	-1.168673	-1.008933	-0.519671	-0.873264
ENSDARG00000102095	<i>si:ch73-233f7.5</i>	si:ch73-233f7.5	-1.958015	-1.03137	-0.760652	-2.124623
ENSDARG00000062305	<i>rims3</i>	regulating synaptic membrane exocytosis 3	-2.484162	-1.449186	-1.164005	-2.683143

ENSDARG00000090496	<i>thsd7ab</i>	thrombospondin, type I, domain containing 7Ab	-2.530515	-1.86755	-0.405819	-1.591915
ENSDARG00000009899	<i>znf385a</i>	zinc finger protein 385A	-1.481996	-1.205319	-0.199672	-1.859822
ENSDARG00000100908	<i>lcor</i>	ligand dependent nuclear receptor corepressor	-2.641106	-1.989029	-1.396798	-2.59048
ENSDARG00000075754	<i>mri1</i>	methylthioribose-1-phosphate isomerase 1	-1.480884	-1.057727	-0.602276	-2.181934
ENSDARG00000107408	<i>TCF4</i>	transcription factor 4	-1.924925	-1.299698	-0.73846	-1.835861
ENSDARG00000036546	<i>pdxkb</i>	pyridoxal (pyridoxine, vitamin B6) kinase b	-1.864039	-1.248163	-0.99561	-1.775366
ENSDARG00000068421	<i>ttc9b</i>	tetratricopeptide repeat domain 9B	-1.339052	-1.26559	-0.646252	-1.36732
ENSDARG00000075567	<i>fbxl20</i>	F-box and leucine-rich repeat protein 20	-1.30956	-1.512293	-0.566449	-1.078397
ENSDARG00000013072	<i>mmp15b</i>	matrix metalloproteinase 15b	-2.182443	-1.616464	-0.606941	-2.211012
ENSDARG00000012699	<i>bbx</i>	BBX high mobility group box domain containing	-1.768292	-1.612774	-0.719285	-1.550935
ENSDARG00000036999	<i>DISP3</i>	si:dkey-32e23.6	-1.289507	-1.128226	-0.546349	-1.500739
ENSDARG00000105389	<i>mmel1</i>	membrane metallo-endoropeptidase-like 1	-2.469485	-1.688798	-0.830075	-1.947533
ENSDARG00000077710	<i>nlgn1</i>	neuroligin 1	-1.735018	-1.005859	-0.674276	-1.713287
ENSDARG00000059719	<i>fam169aa</i>	family with sequence similarity 169 member Aa	-3.109918	-3.062612	-0.650486	-1.509014
ENSDARG00000102424	<i>ARHGAP44</i>	si:ch211-114m9.1	-1.611504	-1.189785	-0.598172	-1.866144
ENSDARG00000089297	<i>si:dkeyp-115d7.2</i>	si:dkeyp-115d7.2	-3.243703	-2.413628	-1.813715	-3.506737
ENSDARG00000043627	<i>tbc1d9</i>	TBC1 domain family, member 9 (with GRAM domain)	-1.481471	-1.023297	-0.686681	-1.37061
ENSDARG00000090255	<i>phlpp2</i>	PH domain and leucine rich repeat protein phosphatase 2	-2.658211	-2.468387	-0.448758	-1.215268

ENSDARG00000079064	<i>CABZ01079080.1</i>	XP_021322214.1 LOW QUALITY PROTEIN: cGMP-dependent 3',5'-cyclic phosphodiesterase, partial	-1.659141	-1.084125	-0.671684	-1.340309
ENSDARG00000068468	<i>dnah3</i>	dynein axonemal heavy chain 3	-1.064955	-1.1836	-0.479993	-0.82103
ENSDARG00000061268	<i>ago2</i>	argonaute RISC catalytic component 2	-1.856034	-1.273761	-0.454154	-2.584963
ENSDARG00000063361	<i>si:ch211-1e14.1</i>	si:ch211-1e14.1	-1.627273	-1.274757	-0.666444	-1.326104
ENSDARG00000101419	<i>drp2</i>	dystrophin related protein 2	-2.841302	-1.444412	-0.786261	-1.667819
ENSDARG00000069484	<i>dab2ipa</i>	DAB2 interacting protein a	-1.822002	-1.062034	-0.59777	-1.698619
ENSDARG00000033251	<i>osbpl3a</i>	oxysterol binding protein-like 3a	-2.438573	-2.328949	-0.155119	-3.364572
ENSDARG00000110874	<i>ELFN2</i>	protein phosphatase 1 regulatory subunit 29-like	-2.018664	-1.603626	-0.818991	-1.924146
ENSDARG00000060865	<i>scai</i>	suppressor of cancer cell invasion	-2.044854	-1.28828	-1.270414	-1.893611
ENSDARG00000091433	<i>abhd17aa</i>	abhydrolase domain containing 17Aa	-2.504305	-1.572394	-1.277534	-1.604937
ENSDARG00000007561	<i>cdh23</i>	cadherin-related 23	-2.410284	-2.014355	-0.635844	-1.613817
ENSDARG00000043220	<i>kcnh5a</i>	potassium voltage-gated channel, subfamily H (eag-related), member 5a	-1.929227	-2.057551	-0.83996	-1.126264
ENSDARG00000100167	<i>CSDC2</i>	cold shock domain containing C2, RNA binding b	-1.725035	-1.172494	-0.858302	-0.829125
ENSDARG00000088842	<i>KCNB2</i>	si:dkey-192j17.1	-1.939535	-1.074887	-0.749416	-1.997196
ENSDARG00000090642	<i>si:dkey-54n8.4</i>	si:dkey-54n8.4	-1.43119	-1.012842	-0.548547	-1.237882
ENSDARG00000075972	<i>csrnp2</i>	cysteine-serine-rich nuclear protein 2	-1.854044	-1.21874	-0.849094	-1.244503
ENSDARG00000098702	<i>zgc:165603</i>	zgc:165603	-2.331206	-2.263034	-1	-1.156119
ENSDARG00000076787	<i>angpt4</i>	angiopoietin 4	-1.459432	-1.259617	-0.152214	-1.975499
ENSDARG00000092644	<i>ago1</i>	argonaute RISC component 1	-1.913412	-1.858446	-0.533824	-2.156969

ENSDARG00000075505	<i>si:ch211-132g1.7</i>	si:ch211-132g1.7	-1.039035	-1.262442	-0.480695	-1.872496
ENSDARG00000027564	<i>pak6a</i>	p21 protein (Cdc42/Rac)-activated kinase 6a	-1.887973	-1.359373	-0.934312	-1.871485
ENSDARG00000112056	<i>CABZ01066921.1</i>	XP_005172563.1 FERM, RhoGEF and pleckstrin domain-containing protein 1-like isoform X1	-1.912733	-2.219064	-0.86948	-1.085798
ENSDARG00000099304	<i>si:ch211-51f19.1</i>	si:ch211-51f19.1	-1.661349	-1.687158	-1.02941	-1.681959
ENSDARG00000087247	<i>kcnab2a</i>	potassium voltage-gated channel, shaker-related subfamily, beta member 2 a	-1.40408	-1.226799	-0.899321	-1.428742
ENSDARG00000078016	<i>dtx4b</i>	deltex 4, E3 ubiquitin ligase b	-2.026575	-1.01813	-0.860105	-1.618613
ENSDARG00000011855	<i>aak1a</i>	AP2 associated kinase 1a	-1.445	-1.498638	-0.526224	-2.142152
ENSDARG00000077994	<i>b4galt2</i>	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 2	-1.92208	-1.110906	-0.547005	-1.732785
ENSDARG00000009870	<i>mapk8b</i>	mitogen-activated protein kinase 8b	-2.115477	-1.061029	-0.772848	-1.900309
ENSDARG00000102064	<i>kcna2b</i>	potassium voltage-gated channel, shaker-related subfamily, member 2b	-1.422691	-1.13179	-0.73252	-1.333424
ENSDARG00000060103	<i>cpeb3</i>	cytoplasmic polyadenylation element binding protein 3	-1.750262	-1.189246	-0.614379	-1.508912
ENSDARG00000091061	<i>slc38a3b</i>	solute carrier family 38 member 3b	-1.273952	-1.297347	-0.008019	-1.734835
MSTRG.18702	<i>JCAD</i>	Junctional protein associated with coronary artery disease	-1.841302	-1.178337	-0.82338	-1.915303
ENSDARG00000075960	<i>cdh24a</i>	cadherin 24, type 2a	-1.821887	-1.124071	-0.484142	-1.502233
ENSDARG00000090727	<i>celf5b</i>	cugbp, Elav-like family member 5b	-2.427223	-2.225589	-0.520332	-2.172802
ENSDARG00000108787	<i>TRIM67</i>	tripartite motif containing 67	-2.95156	-1.560539	-0.904693	-2.859301

ENSDARG00000060085	<i>kcnq3</i>	potassium voltage-gated channel, KQT-like subfamily, member 3	-1.525527	-1.021285	-0.621447	-0.854295
ENSDARG00000017234	<i>npy8ar</i>	neuropeptide Y receptor Y8a	-2.029519	-1.589535	-1.363614	-2.067288
ENSDARG00000079056	<i>si:ch211-194c3.5</i>	si:ch211-194c3.5	-1.151935	-1.23517	-0.44598	0.370135
ENSDARG00000103518	<i>abhd8a</i>	abhydrolase domain containing 8a	-2.237478	-1.406197	-0.532221	-1.400784
ENSDARG00000098625	<i>efna5b</i>	ephrin-A5b	-2.400316	-2.028014	-1.189478	-1.903427
ENSDARG00000076041	<i>wwc1</i>	WW and C2 domain containing 1	-2.160647	-1.385353	-1.099536	-2.066671
ENSDARG00000076076	<i>crtc1b</i>	CREB regulated transcription coactivator 1b	-1.983932	-1.49981	-0.85726	-1.861448
ENSDARG00000114444	<i>CABZ01079081.1</i>	XP_021322214.1 LOW QUALITY PROTEIN: cGMP-dependent 3',5'-cyclic phosphodiesterase, partial	-1.886753	-1.178642	-0.644098	-1.261876
ENSDARG00000060551	<i>rps6ka5</i>	ribosomal protein S6 kinase, polypeptide 5	-2.019058	-1.139019	-0.67278	-1.678829
ENSDARG00000027777	<i>tnfaip3</i>	tumor necrosis factor, alpha-induced protein 3	-1.605948	-1.198859	-0.884923	-1.159546
ENSDARG00000012449	<i>si:ch211-169p10.1</i>	si:ch211-169p10.1	-2.197406	-1.522806	-1.064955	-1.584963
ENSDARG00000042123	<i>nudt3b</i>	nudix (nucleoside diphosphate linked moiety X)-type motif 3b	-1.929391	-1.257195	-0.963513	-2.174938
ENSDARG00000079068	<i>adam12</i>	ADAM metallopeptidase domain 12	-1.387023	-1.451874	-0.387023	-1.049328
ENSDARG00000043210	<i>nfic</i>	nuclear factor I/C	-1.973033	-2.064955	-0.986453	-2.805088
ENSDARG00000062579	<i>kremen1</i>	kringle containing transmembrane protein 1	-1.766292	-1.619451	-0.465123	-2.486184
ENSDARG00000015252	<i>st3gal3b</i>	ST3 beta-galactoside alpha-2,3-sialyltransferase 3b	-1.31218	-1.010799	-0.625632	-1.250375
MSTRG.19005	<i>Unc13a</i>	protein unc-13 homolog A-like isoform X2	-4.049849	-4.879924	-2.119111	-3.801921
ENSDARG00000076768	<i>reps2</i>	RALBP1 associated Eps domain containing 2	-1.752232	-2.191344	-0.804321	-1.009141

ENSDARG00000026499	<i>ppm1e</i>	protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1E	-2.22784	-1.320135	-0.670133	-2.411779
ENSDARG00000001881	<i>cacnb3a</i>	calcium channel, voltage-dependent, beta 3a	-2.154328	-1.493815	-0.775817	-1.906891
ENSDARG00000002013	<i>grb10a</i>	growth factor receptor-bound protein 10a	-1.175969	-1.24291	-0.329184	-1.742875
MSTRG.17041	<i>EPHA7</i>	ephrin type-A receptor 7-like	-1.798477	-1.320656	-0.623643	-1.947533
ENSDARG00000004931	<i>slc8a3</i>	solute carrier family 8 member 3	-2.12409	-1.194912	-1.163499	-1.719892
ENSDARG00000001776	<i>stim2b</i>	stromal interaction molecule 2b	-1.750549	-1.375039	-0.218535	-0.86197
ENSDARG00000053389	<i>jade2</i>	jade family PHD finger 2	-1.683591	-1.522768	-0.834082	-1.439967
ENSDARG00000039901	<i>sh3gl2b</i>	SH3 domain containing GRB2 like 2b, endophilin A1	-2.232355	-1.214522	-0.68865	-1.795944
MSTRG.6364	<i>CSMD1</i>	CUB and sushi domain-containing protein 1 isoform X1	-1.696989	-1.536053	-0.599546	-1.369695
ENSDARG00000090398	<i>PDE1C</i>	phosphodiesterase 1C, calmodulin-dependent b	-1.956057	-1.488405	-0.724273	-1.97264
ENSDARG00000040633	<i>PRMT8</i>	protein arginine N-methyltransferase 8-B-like	-1.663764	-1.026117	-0.571129	-1.441806
ENSDARG00000062430	<i>gpd2</i>	glycerol-3-phosphate dehydrogenase 2 (mitochondrial)	-1.256235	-1.065853	-0.337633	-1.24273
ENSDARG00000113609	<i>TMEM164</i>	transmembrane protein 164	-1.741203	-1.929812	-1.289507	-1.424943
ENSDARG00000102334	<i>SH3RF3</i>	si:ch211-124n19.2	-2.61891	-2.104337	-0.868269	-1.776011
ENSDARG00000018393	<i>kank2</i>	KN motif and ankyrin repeat domains 2	-1.762824	-1.162595	-0.986496	-1.240597
ENSDARG00000103609	<i>mib2</i>	mindbomb E3 ubiquitin protein ligase 2	-1.424777	-1.257222	-0.754722	-1.00265
ENSDARG00000103847	<i>CR339059.1</i>	XP_009297443.1 adenylate cyclase type 9-like	-3.099536	-4.141356	-0.152003	-1.334001
ENSDARG00000008403	<i>phospho1</i>	phosphoethanolamine/phosphocholine phosphatase 1	-1.475883	-1.045392	-0.77033	-1.250323
ENSDARG00000061687	<i>atxn1a</i>	ataxin 1a	-1.698225	-1.045028	-0.733592	-1.535167
ENSDARG00000115424	<i>CABZ01083778.1</i>	XP_026100727.1 ryanodine receptor 3-like	-1.796194	-1.675661	-0.36257	-1.090698

ENSDARG00000003462	<i>fech</i>	ferrochelatase	-2.133399	-2.367864	-0.818703	-1.478047
ENSDARG000000061014	<i>kcnj5</i>	potassium inwardly rectifying channel subfamily J member 5	-2.104337	-2.118836	-1.71477	-1.940838
ENSDARG000000071823	<i>adarb2</i>	adenosine deaminase RNA specific B2 (inactive)	-1.857165	-1.559084	-0.508679	-1.611314
ENSDARG000000021909	<i>VSTM2A</i>	zgc:110852	-2.329602	-1.823711	-1.315247	-2.034859
ENSDARG000000033170	<i>sult2st1</i>	sulfotransferase family 2, cytosolic sulfotransferase 1	-2.398038	-2.016254	-1.090629	-3.359662
ENSDARG000000079102	<i>PRRG3</i>	si:dkey-38k9.5	-1.923197	-1.998248	-0.977389	-1.225317
ENSDARG000000042859	<i>slc5a6a</i>	solute carrier family 5 member 6a	-2.462972	-1.777608	-0.820676	-1.683741
ENSDARG000000097869	<i>si:dkey-1m11.6</i>	si:dkey-1m11.6	-1.437974	-1.098886	-0.022937	-1.75375
ENSDARG000000039218	<i>gpr101</i>	G protein-coupled receptor 101	-1.78011	-1.02268	-0.777965	-1.746163
ENSDARG000000042114	<i>bin1a</i>	bridging integrator 1a	-1.9841	-1.30302	-0.987115	-1.990137
ENSDARG000000062884	<i>map3k2</i>	mitogen-activated protein kinase kinase kinase 2	-2.029747	-1.40226	-0.815304	-1.993221
MSTRG.26783	<i>Wnk3</i>	serine/threonine-protein kinase WNK2-like	-1.860597	-1.297494	-0.470865	-1.187959
ENSDARG00000101868	<i>dennd1b</i>	DENN/MADD domain containing 1B	-2.25634	-2.426265	-0.801774	-2.310788
ENSDARG000000061040	<i>pum2</i>	pumilio RNA-binding family member 2	-1.86507	-1.074863	-0.737959	-2.087463
ENSDARG00000106989	<i>ZNF821</i>	zinc finger protein 821	-2.437686	-1.571542	-1.217905	-1.061987
ENSDARG000000002026	<i>qkib</i>	QKI, KH domain containing, RNA binding b	-3.269259	-1.852521	-0.672999	-2.62214
ENSDARG000000093498	<i>MACIR</i>	zgc:194281	-1.803343	-1.244584	-0.84443	-1.715697
ENSDARG00000114363	<i>CABZ01052743.1</i>	E3 ubiquitin-protein ligase RBBP6-like	1.958605	2.085069	1.333678	1.24657
ENSDARG000000089362	<i>grn1</i>	granulin 1	3.367333	4.17428	0.15788	4.060659
ENSDARG000000038703	<i>hkdc1</i>	hexokinase domain containing 1	2.237564	2.037031	0.953079	1.559737

ENSDARG00000045904	<i>nr2e3</i>	nuclear receptor subfamily 2, group E, member 3	3.732059	2.824219	0.255097	2.766931
ENSDARG00000023713	<i>aqp1a.1</i>	aquaporin 1a (Colton blood group), tandem duplicate 1	1.261733	1.036994	-0.054736	-0.087541
ENSDARG00000100803	<i>zgc:113443</i>	<i>zgc:113443</i>	1.302788	1.113038	0.372727	0.509059
ENSDARG00000056322	<i>ldb3a</i>	LIM domain binding 3a	1.60284	1.499746	1.03729	0.649458
ENSDARG00000092362	<i>hsp70.2</i>	heat shock cognate 70-kd protein, tandem duplicate 2	1.854988	2.312437	0.385167	2.432667
ENSDARG00000032849	<i>ndrg1a</i>	N-myc downstream regulated 1a	1.893009	1.205661	-0.328852	0.227739
ENSDARG00000045898	<i>si:ch211-152c2.3</i>	<i>si:ch211-152c2.3</i>	2.806762	1.621177	0.139389	0.607618
ENSDARG00000042520	<i>UTP14C</i>	<i>si:dkey-251i10.3</i>	1.628677	1.158388	0.32709	1.092018
ENSDARG00000029688	<i>hsp70.1</i>	heat shock cognate 70-kd protein, tandem duplicate 1	1.959358	2.537434	-0.469485	2.740968
ENSDARG00000015964	<i>zgc:153311</i>	<i>zgc:153311</i>	5.813625	4.403999	3.085391	0.729911
ENSDARG00000101481	<i>rbp5</i>	retinol binding protein 1a, cellular	1.85561	1.098235	0.152282	0.075508
ENSDARG00000070683	<i>dkk3b</i>	dickkopf WNT signaling pathway inhibitor 3b	3.61629	2.082328	0.544044	1.384458
ENSDARG00000029928	<i>ap3m1</i>	adaptor related protein complex 3 subunit mu 1	1.081969	1.094496	-0.197091	0.909552
ENSDARG00000029432	<i>tph1a</i>	tryptophan hydroxylase 1 (tryptophan 5-monooxygenase) a	2.433426	1.747636	0.024982	1.345672
ENSDARG00000096843	<i>zgc:193593</i>	<i>zgc:193593</i>	5.942515	4.762501	0.716207	4.930737
ENSDARG00000079055	<i>si:dkey-85a20.4</i>	<i>si:dkey-85a20.4</i>	1.212202	1.148768	0.382359	1.156761
ENSDARG00000069675	<i>her8.2</i>	hairy-related 8.2	1.008027	1.051397	0.26631	0.149407
MSTRG.20686	<i>pol</i>	Retrovirus-related Pol polyprotein from transposon 412	2.09776	2.066328	0.161025	3.105203

ENSDARG00000045808	<i>rlbp1b</i>	retinaldehyde binding protein 1b	2.232389	1.277853	1.07817	1.685963
ENSDARG00000053744	<i>dcdc2b</i>	doublecortin domain containing 2B	1.485102	1.222176	0.777608	0.076726
ENSDARG00000038770	<i>zgc:103625</i>	zgc:103625	5.603626	5.098032	2.554589	4.584963
ENSDARG00000089372	<i>clk4a</i>	CDC-like kinase 4a	1.427207	1.280847	0.140915	2.323948
ENSDARG00000038386	<i>ascl1a</i>	achaete-scute family bHLH transcription factor 1a	1.080775	1.067877	0.534565	1.042505
ENSDARG00000011235	<i>otx2b</i>	orthodenticle homeobox 2b	2.219937	1.146841	0.124258	0.929611
ENSDARG00000017369	<i>sema3d</i>	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D	1.967724	1.894067	0.427749	0.437209
ENSDARG00000094012	<i>si:dkey-192g7.3</i>	si:dkey-192g7.3	1.226303	1.401265	0.180169	0.739704
ENSDARG00000099767	<i>fhdc2</i>	FH2 domain containing 2	1.638074	1.566815	0.584963	1.217231
ENSDARG00000015404	<i>arl3l2</i>	ADP ribosylation factor like GTPase 3, like 2	2.595984	1.455403	0.525741	0.876881
ENSDARG00000112944	<i>LO018564.1</i>	XP_021336757.1 dedicator of cytokinesis protein 2	1.960472	1.602189	0.563136	1.419903
ENSDARG00000002696	<i>gnb3b</i>	guanine nucleotide binding protein (G protein), beta polypeptide 3b	3.237039	2.316766	-0.449803	2.532495
ENSDARG00000013430	<i>bhmt</i>	betaine-homocysteine methyltransferase	1.218291	1.00463	-0.440271	0.567715
ENSDARG00000077641	<i>thbs3a</i>	thrombospondin 3a	1.346325	1.054862	-0.028234	0.468553
MSTRG.3560	<i>Nim1k</i>	serine/threonine-protein kinase NIM1-like isoform X2	3.045324	1.478834	0.743092	1.131912

Table 4. Expression of Co-DEGs in the midbrain of behavior- defective mutants.

ID	Symbol	Description	Log ₂ (fc) of double KO vs WT male	Log ₂ (fc) of <i>cyp17a1</i> ^{-/-} vs WT male	Log ₂ (fc) of <i>tdrd12</i> ^{-/-} vs WT male	Log ₂ (fc) of WT female vs WT male
MSTRG.26937	<i>cyp19a1b</i>	cytochrome P450 19A1B	-5.940160468	-5.61514969	0.284305576	0.239083387
ENSDARG00000094857	<i>dio2</i>	iodothyronine deiodinase 2	-2.52986779	-2.764006216	0.072151021	-2.432068411
ENSDARG00000112909	<i>ZNF462</i>	zinc finger protein 462	-1.192054656	-1.510445287	-0.294798384	-1.678898901
ENSDARG00000070717	<i>slc25a18</i>	solute carrier family 25 member 18	-1.303709131	-1.039889157	-0.38667058	-1.655409125
ENSDARG00000098631	<i>CABZ01044277.1</i>	dystonin	-1.662641865	-1.866733469	-0.198196047	-0.603993762
ENSDARG00000023287	<i>hsd17b3</i>	hydroxysteroid (17-beta) dehydrogenase 3	-1.028693451	-1.175373126	0.07144586	-1.797401448
ENSDARG00000033251	<i>osbpl3a</i>	oxysterol binding protein-like 3a	-2.837670546	-2.555270816	0.600334514	-3.725195817
MSTRG.26936	<i>cyp19a1</i>	cytochrome P450, family 19, subfamily A, polypeptide 1b isoform X1	-1.360474385	-1.913243881	-0.064130337	-0.264369617
ENSDARG00000078847	<i>si:dkey-238o13.4</i>	si:dkey-238o13.4	-1.632191884	-1.672753181	-0.017714162	-1.734997052
ENSDARG00000075230	<i>tet1</i>	tet methylcytosine dioxygenase 1	-1.644438979	-1.302252045	-0.338139419	-1.806190049
ENSDARG00000056499	<i>ca6</i>	carbonic anhydrase VI	-1.426229325	-1.17262017	-0.037907385	-2.202314271
ENSDARG00000043646	<i>slc6a8</i>	solute carrier family 6 member 8	-1.272940882	-1.187730493	-0.099269592	-1.452463186
ENSDARG00000061368	<i>klf13</i>	Kruppel-like factor 13	-1.392261523	-1.449737474	0.001787726	-1.783625485
ENSDARG00000025206	<i>syt2a</i>	synaptotagmin IIa	-1.652939295	-1.247705605	-0.346729433	-1.569422918
ENSDARG00000014280	<i>dlgap1a</i>	discs, large (Drosophila) homolog-associated protein 1a	-1.41255529	-1.261970079	-0.216725063	-1.151411704

ENSDARG00000035859	<i>angptl4</i>	angiopoietin-like 4	-1.172246313	-1.322349874	0.460696216	-1.842356933
ENSDARG00000074819	<i>si:dkeyp-23e4.3</i>	si:dkeyp-23e4.3	-1.207580227	-1.341845377	0.546815978	-2.117605714
ENSDARG00000004789	<i>lrp1ba</i>	low density lipoprotein receptor-related protein 1Ba	-1.21480925	-1.156445087	-0.25507312	-0.838335332
ENSDARG00000102406	<i>si:ch211-165e15.1</i>	si:ch211-165e15.1	-1.08478042	-1.763865098	0.262238656	-0.184316094
ENSDARG00000104207	<i>pcyt1bb</i>	phosphate cytidylyltransferase 1, choline, beta b	-2.154328146	-3.225881407	0.253419317	0.992137882
ENSDARG00000054848	<i>pdk4</i>	pyruvate dehydrogenase kinase, isozyme 4	-1.534132556	-1.697117661	0.221547505	-2.035919574
ENSDARG00000026499	<i>ppm1e</i>	protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1E	-1.7009501	-1.138728743	-0.306296123	-2.107606225
ENSDARG00000009493	<i>MAP3K13</i>	si:ch211-45c16.2	-1.506790887	-1.326755857	-0.290935382	-1.380119083
ENSDARG00000046013	<i>rasl11a</i>	RAS-like, family 11, member A	-1.627460273	-1.928514286	-0.518467089	-1.77014869
ENSDARG00000075815	<i>slc12a5a</i>	solute carrier family 12 member 5a	-1.52309167	-1.126557492	-0.111031312	-1.200731048
ENSDARG00000060941	<i>ANKFN1</i>	si:ch211-277e21.2	-1.461806426	-1.306479696	-0.015615613	-2.231625701
ENSDARG00000098511	<i>ntrk2b</i>	neurotrophic tyrosine kinase, receptor, type 2b	-1.425107358	-1.195625512	-0.285908872	-1.291566507
ENSDARG00000019742	<i>tlr4ba</i>	toll-like receptor 4b, duplicate a	-1.18592548	-1.935459748	0.009398698	-0.679959015
ENSDARG00000076697	<i>SIPA1</i>	zmp:0000001168	-1.301989248	-1.040723935	-0.282671071	-1.23632233
ENSDARG00000094132	<i>igf1</i>	insulin-like growth factor 1	-1.701599286	-1.558167182	-0.06076234	-1.776393793
ENSDARG00000076702	<i>CABZ01068356.1</i>	PH and SEC7 domain-containing protein 1-like	-1.318447526	-1.466593144	-0.488915813	-1.216133431
ENSDARG00000008912	<i>slc8a2a</i>	solute carrier family 8 member 2a	-1.364129328	-1.101680076	-0.423242422	-0.696184731

ENSDARG00000073769	<i>magi2b</i>	membrane associated guanylate kinase, WW and PDZ domain containing 2b	-1.477578965	-1.108934372	-0.636701471	-1.683327631
ENSDARG00000104981	<i>SLC45A4</i>	solute carrier family 45 member 4-like	-1.989485778	-1.347786263	-0.2639392	-1.732450113
ENSDARG00000002197	<i>pygl</i>	phosphorylase, glycogen, liver	-1.533114697	-1.320420576	-0.258666935	-1.029715921
ENSDARG00000102610	<i>r3hdm2</i>	R3H domain containing 2	-1.452924187	-1.085996108	-0.357918921	-1.359591611
ENSDARG00000036848	<i>slc43a2a</i>	solute carrier family 43 member 2a	-1.271670009	-1.016653071	0.209880909	-2.44515283
ENSDARG00000041239	<i>wdr20b</i>	WD repeat domain 20b	-1.276517635	-1.796908135	-0.495527417	-0.722361181
ENSDARG00000112918	<i>BX927362.2</i>	uncharacterized LOC101882029	-1.083416008	-1.416839742	-0.513801472	-0.30580843
ENSDARG00000105389	<i>mmel1</i>	membrane metallo-endopeptidase-like 1	-1.78958022	-2.526545814	-0.896495424	-2.163975735
ENSDARG00000060025	<i>nsmfa</i>	NMDA receptor synaptonuclear signaling and neuronal migration factor a	-1.263776342	-1.240221614	-0.189998416	-1.481229714
ENSDARG00000103518	<i>abhd8a</i>	abhydrolase domain containing 8a	-1.588260091	-1.533201073	-0.369645596	-1.044599998
ENSDARG00000069560	<i>kcnh3</i>	potassium voltage-gated channel, subfamily H (eag-related), member 3	-1.31410859	-1.064130337	-0.415037499	-1.890236434
ENSDARG00000029668	<i>crim1</i>	cysteine rich transmembrane BMP regulator 1 (chordin-like)	-1.276840205	-1.017921908	-0.395660866	-0.81181457
ENSDARG00000094491	<i>si:ch211-202m22.1</i>	si:ch211-202m22.1	-2.49057013	-2.812498225	0.141698085	-0.257909374
ENSDARG00000053554	<i>wdr76</i>	WD repeat domain 76	-1.197821187	-1.629859039	0.627203616	-2.476612778
ENSDARG00000087247	<i>kcnab2a</i>	potassium voltage-gated channel, shaker-related subfamily, beta member 2 a	-1.331258083	-1.139121802	-0.572081209	-1.149848209
ENSDARG00000063706	<i>pde8b</i>	phosphodiesterase 8B	-1.236339539	-1.447236322	-0.529698482	-0.99755268

ENSDARG00000091408	<i>mtcl1</i>	microtubule crosslinking factor 1	-1.316992049	-1.206366359	-0.128630765	-0.897171754
ENSDARG00000063332	<i>shank3a</i>	SH3 and multiple ankyrin repeat domains 3a	-1.26101806	-1.182591413	0.006710222	-0.880647693
ENSDARG00000098984	<i>pid1</i>	phosphotyrosine interaction domain containing 1	-1.246926607	-1.036959532	-0.443499855	-1.318372468
ENSDARG00000017780	<i>rorcb</i>	RAR-related orphan receptor C b	-1.01115779	-1.152250109	-0.033735638	1.805130257
ENSDARG00000076997	<i>stxbp4</i>	syntaxin binding protein 4	-1.327804661	-1.030822923	-0.516249751	-0.842377834
ENSDARG00000035732	<i>arntl1b</i>	aryl hydrocarbon receptor nuclear translocator-like 1b	-1.124150973	-1.028113636	0.710141806	1.048529894
ENSDARG00000069431	<i>slc26a4</i>	solute carrier family 26 member 4	-8.26052755	-8.26052755	-1.03170886	-4.523561956
ENSDARG00000019963	<i>sfxn1</i>	sideroflexin 1	-1.386197816	-1.080389387	-0.547134035	-0.959187675
ENSDARG00000098906	<i>herc7</i>	hect domain and RLD 7	-1.887525271	-1.868416448	-0.203454625	-0.27085391
MSTRG.19005	<i>Unc13a</i>	protein unc-13 homolog A-like isoform X2	-1.824512043	-1.75513834	-0.789408242	-1.950689149
ENSDARG00000001881	<i>cacnb3a</i>	calcium channel, voltage-dependent, beta 3a	-1.459926455	-1.117457582	-0.250031741	-1.295455884
ENSDARG00000098252	<i>cpne9</i>	copine family member IX	-1.652995708	-1.694022976	-0.700975737	-1.086123664
ENSDARG00000038703	<i>hkdc1</i>	hexokinase domain containing 1	2.315501826	2.264369617	1.429392792	1.166358386
ENSDARG00000099363	<i>lhb</i>	luteinizing hormone subunit beta	5.788990155	4.680652546	-0.540568381	0.459431619
ENSDARG00000092362	<i>hsp70.2</i>	heat shock cognate 70-kd protein, tandem duplicate 2	1.96749736	2.398877709	-0.488286481	2.680896202
ENSDARG00000079055	<i>si:dkey-85a20.4</i>	si:dkey-85a20.4	1.421208402	1.397778735	0.820065974	0.937211047
ENSDARG00000077728	<i>supv3l1</i>	SUV3-like helicase	1.288512683	1.183890141	0.427732572	1.078002512
ENSDARG00000040479	<i>cga</i>	glycoprotein hormones, alpha polypeptide	7.414012494	6.016301812	-0.874469118	1

ENSDARG00000029688	<i>hsp70.1</i>	heat shock cognate 70-kd protein, tandem duplicate 1	1.804147744	2.309918077	-0.592457037	2.4695891
ENSDARG00000057974	<i>parp12b</i>	poly (ADP-ribose) polymerase family, member 12b	1.160554053	1.070429763	0.112665774	1.699459604
ENSDARG00000010841	<i>fshb</i>	follicle stimulating hormone subunit beta	7.030483225	5.618630213	2.341036918	1.584962501
ENSDARG00000077471	<i>hmces</i>	5-hydroxymethylcytosine binding, ES cell specific	1.435684045	1.425566927	0.858263093	1.10642812
ENSDARG00000038185	<i>gh1</i>	growth hormone 1	10.89431253	9.524868154	0	0
ENSDARG00000100803	<i>zgc:113443</i>	zgc:113443	1.356773487	1.005866325	0.103672517	0.825238322
ENSDARG00000079415	<i>dnajc30b</i>	DnaJ (Hsp40) homolog, subfamily C, member 30b	1.44803307	1.404773009	0.301980686	1.491565964
ENSDARG00000044098	<i>egr2a</i>	early growth response 2a	1.484996343	1.66219836	-0.045398782	1.290556198

Table 5. Expression of Co-DEGs in the hindbrain of behavior- defective mutants.

ID	Symbol	Description	Log ₂ (fc) of double KO vs WT male	Log ₂ (fc) of <i>cyp17a1</i> ^{-/-} vs WT male	Log ₂ (fc) of <i>tdrd12</i> ^{-/-} vs WT male	Log ₂ (fc) of WT female vs WT male
ENSDARG00000112909	<i>ZNF462</i>	zinc finger protein 462	-2.070575	-2.162992	-0.362967	-1.573886
ENSDARG00000079756	<i>peak1</i>	pseudopodium-enriched atypical kinase 1	-1.250444	-1.47469	-0.317355	-1.358675
ENSDARG00000027552	<i>mapk1</i>	mitogen-activated protein kinase 1	-1.539216	-1.397881	0.111799	-1.412878
ENSDARG00000074777	<i>ank1b</i>	ankyrin 1, erythrocytic b	-1.162618	-1.244924	-0.260057	-0.92605
ENSDARG00000001857	<i>aff4</i>	AF4/FMR2 family, member 4	-1.579505	-1.70631	-0.338886	-1.692779
ENSDARG00000094857	<i>dio2</i>	iodothyronine deiodinase 2	-1.138133	-1.412811	0.163576	-1.596213
ENSDARG00000017006	<i>dennd5a</i>	DENN/MADD domain containing 5A	-1.269507	-1.248731	-0.006264	-0.940148
ENSDARG00000016348	<i>dip2bb</i>	disco-interacting protein 2 homolog Bb	-1.056116	-1.409316	-0.032351	-0.525326
ENSDARG00000077864	<i>rasgrp3</i>	RAS guanyl releasing protein 3 (calcium and DAG-regulated)	-1.135878	-1.496039	-0.348951	-1.030595
ENSDARG00000062347	<i>mtus2a</i>	microtubule associated tumor suppressor candidate 2a	-1.055617	-1.15764	-0.17585	-0.692298
ENSDARG00000075928	<i>hivep3a</i>	HIVEP zinc finger 3a	-1.068191	-1.148912	-0.256671	-0.975187
ENSDARG00000017365	<i>slc23a2</i>	solute carrier family 23 member 2	-1.921883	-1.955146	-0.494567	-1.563429
ENSDARG00000014717	<i>dync1h1</i>	dynein, cytoplasmic 1, heavy chain 1	-1.475612	-1.550862	-0.247225	-0.601143
ENSDARG00000060875	<i>pde1a</i>	phosphodiesterase 1A, calmodulin-dependent	-1.16709	-1.446015	-0.279014	-0.440998
ENSDARG00000077749	<i>usp54b</i>	ubiquitin specific peptidase 54b	-1.296354	-1.166901	-0.34877	-1.193923
ENSDARG00000063332	<i>shank3a</i>	SH3 and multiple ankyrin repeat domains 3a	-1.56525	-2.525424	-0.213529	-1.023764
ENSDARG00000054941	<i>ldlrad4b</i>	low density lipoprotein receptor class A domain containing 4b	-1.851653	-1.976251	-0.005248	-1.083167

ENSDARG00000063307	<i>sgsm2</i>	small G protein signaling modulator 2	-1.423524	-1.541723	-0.017558	-1.153885
ENSDARG00000003544	<i>adarb1b</i>	adenosine deaminase RNA specific B1b	-1.51076	-1.825879	-0.371168	-0.670929
ENSDARG00000061042	<i>gabbr2</i>	gamma-aminobutyric acid (GABA) B receptor, 2	-1.30998	-1.545758	-0.276444	-0.877159
ENSDARG00000103739	<i>bahcc1a</i>	BAH domain and coiled-coil containing 1a	-1.483053	-1.732134	-0.272304	-0.858063
ENSDARG00000062801	<i>erfl3</i>	Ets2 repressor factor like 3	-1.09447	-1.199897	-0.001512	-1.280216
ENSDARG00000061635	<i>myo5aa</i>	myosin VAa	-1.354568	-1.335071	-0.30545	-1.076298
ENSDARG00000102082	<i>nr3c2</i>	nuclear receptor subfamily 3, group C, member 2	-1.33534	-1.325906	-0.14789	-0.691997
ENSDARG00000008372	<i>spred2b</i>	sprouty related EVH1 domain containing 2b	-1.454292	-1.868847	0.015233	-1.3416
ENSDARG00000043646	<i>slc6a8</i>	solute carrier family 6 member 8	-1.502257	-1.729314	-0.236896	-1.0299
ENSDARG00000025108	<i>magixa</i>	MAGI family member, X-linked a	-1.086816	-1.584224	-0.229431	-0.795028
ENSDARG00000063706	<i>pde8b</i>	phosphodiesterase 8B	-1.735574	-1.740798	-0.613161	-1.031662
ENSDARG00000102406	<i>si:ch211-165e15.1</i>	si:ch211-165e15.1	-1.690854	-2.367016	-0.20304	-0.354665
ENSDARG00000104810	<i>akt3a</i>	v-akt murine thymoma viral oncogene homolog 3a	-1.214319	-1.332695	-0.346526	-0.878929
ENSDARG00000063417	<i>erf</i>	Ets2 repressor factor	-2.34645	-2.185407	-0.623984	-2.342334
ENSDARG00000105972	<i>CABZ01050944.1</i>	protein shisa-9-like	-3.053901	-2.400633	-0.178836	-1.863717
ENSDARG00000046150	<i>b4galnt4a</i>	beta-1,4-N-acetyl-galactosaminyl transferase 4a	-1.214451	-1.203155	-0.297432	-0.853982
MSTRG.15433	<i>RELN</i>	reelin precursor	-1.310399	-1.529229	-0.141867	-0.167638
ENSDARG00000058248	<i>si:dkeyp-77h1.4</i>	si:dkeyp-77h1.4	-1.482796	-1.597635	-0.367201	-0.910667
ENSDARG00000009493	<i>MAP3K13</i>	si:ch211-45c16.2	-2.284258	-2.608046	0.013675	-1.169925
ENSDARG00000025206	<i>syt2a</i>	synaptotagmin IIa	-1.709664	-1.569913	-0.445705	-1.343212

ENSDARG00000076213	<i>DOCK4</i>	si:dkey-81e3.1	-1.435095	-1.341986	-0.145064	-0.79849
ENSDARG00000079805	<i>tagln3a</i>	transgelin 3a	-1.230808	-1.460164	-0.153023	-0.50543
MSTRG.14233	<i>UNC13C</i>	protein unc-13 homolog C-like isoform X2	-1.288927	-1.318542	-0.33358	-1.305591
ENSDARG00000063544	<i>pip4k2ab</i>	phosphatidylinositol-5-phosphate 4-kinase, type II, alpha b	-1.308509	-1.116493	-0.044256	-0.125732
ENSDARG00000075815	<i>slc12a5a</i>	solute carrier family 12 member 5a	-1.598605	-1.902654	-0.429061	-1.065983
ENSDARG00000027279	<i>numb</i>	NUMB endocytic adaptor protein	-1.266538	-1.521685	-0.372146	-0.822144
ENSDARG00000094577	<i>cdc42se2</i>	CDC42 small effector 2	-1.276806	-1.217033	0.016598	-1.42228
ENSDARG00000005670	<i>ttbk2a</i>	tau tubulin kinase 2a	-1.453946	-1.401837	-0.325072	-0.99269
ENSDARG00000098631	<i>CABZ01044277.1</i>	XP_021336603.1 dystonin	-1.473432	-1.961857	0.164622	-0.180752
ENSDARG00000058473	<i>st6galnac3</i>	ST6 (alpha-N-acetyl-neuraminy-2,3-beta-galactosyl-1,3)-N-acetylgalactosaminide alpha-2,6-sialyltransferase 3	-1.322373	-1.411782	-0.341393	-0.462936
ENSDARG00000052642	<i>shisa9b</i>	shisa family member 9b	-2.978542	-2.967226	-1.106139	-1.431951
ENSDARG00000013389	<i>gabra4</i>	gamma-aminobutyric acid (GABA) A receptor, subunit alpha 4	-1.110683	-1.099871	-0.355313	-0.457883
ENSDARG00000002411	<i>pde4cb</i>	phosphodiesterase 4C, cAMP-specific b	-1.321928	-1.401436	-0.465148	-0.781481
ENSDARG00000088898	<i>caln1</i>	calneuron 1	-1.399407	-1.787903	-0.464973	-1.053946
ENSDARG00000078645	<i>si:ch73-62l21.1</i>	si:ch73-62l21.1	-1.393825	-1.038819	-0.005516	-0.749483
ENSDARG00000013020	<i>dtbb</i>	dystrobrevin, beta b	-1.341719	-1.185355	-0.280262	-0.835771
ENSDARG00000078425	<i>oat</i>	ornithine aminotransferase	-1.011387	-1.057393	-0.18305	-1.042658
ENSDARG00000078011	<i>NAV1</i>	neuron navigator 1a	-1.137504	-1.276407	-0.21832	-0.616378
ENSDARG00000020718	<i>slc25a22a</i>	solute carrier family 25 member 22a	-1.438035	-1.283851	-0.497894	-1.343903
ENSDARG00000020057	<i>bmpr2b</i>	bone morphogenetic protein receptor, type II b (serine/threonine kinase)	-1.318553	-1.344058	-0.24064	-0.632708

ENSDARG00000059523	<i>rims4</i>	regulating synaptic membrane exocytosis 4	-1.495158	-1.466708	-0.338157	-0.634447
ENSDARG00000076014	<i>ERC1</i>	si:key-222113.1	-1.185529	-1.359873	-0.069108	-1.119532
ENSDARG00000068582	<i>rnf44</i>	ring finger protein 44	-1.096138	-1.157885	-0.353141	-1.061562
ENSDARG00000011042	<i>pgbd5</i>	piggyBac transposable element derived 5	-1.172591	-1.376628	-0.419278	-0.451413
ENSDARG00000097017	<i>mical3a</i>	microtubule associated monooxygenase, calponin and LIM domain containing 3a	-1.045676	-1.195783	-0.229544	-0.415637
ENSDARG00000091408	<i>mtcl1</i>	microtubule crosslinking factor 1	-1.329758	-1.555016	-0.097411	-0.764559
ENSDARG00000075230	<i>tet1</i>	tet methylcytosine dioxygenase 1	-2.176189	-2.438397	-0.380495	-2.428515
ENSDARG00000055672	<i>map3k10</i>	mitogen-activated protein kinase kinase kinase 10	-1.049687	-1.356144	0.037089	-0.872436
ENSDARG00000093091	<i>iqsec3b</i>	IQ motif and Sec7 domain ArfGEF 3b	-1.092987	-1.476997	-0.173605	-0.705157
ENSDARG00000076697	<i>SIPA1</i>	zmp:0000001168	-2.138337	-1.191257	-0.359202	-1.226564
ENSDARG00000105099	<i>golga7bb</i>	golgin A7 family, member Bb	-1.319398	-1.14847	-0.260143	-0.683581
ENSDARG00000090170	<i>rab11fip4a</i>	RAB11 family interacting protein 4 (class II) a	-1.079754	-1.036671	-0.09148	-0.924871
ENSDARG00000112431	<i>LO018598.1</i>	NP_001233205.1 reelin precursor	-1.226401	-1.517692	-0.042022	-0.090775
ENSDARG00000060309	<i>srgap3</i>	SLIT-ROBO Rho GTPase activating protein 3	-1.04171	-1.062376	-0.123494	-1.017548
ENSDARG00000086856	<i>stk35</i>	serine/threonine kinase 35	-1.333694	-1.382387	-0.31105	-2.62858
ENSDARG00000069101	<i>napbb</i>	N-ethylmaleimide-sensitive factor attachment protein, beta b	-1.188646	-1.060557	-0.234634	-1.012997
ENSDARG00000003449	<i>pde10a</i>	phosphodiesterase 10A	-1.343079	-1.830312	0.293319	-0.596037
ENSDARG00000079912	<i>rapgef1</i>	Rap guanine nucleotide exchange factor (GEF)-like 1	-1.233991	-1.06007	-0.122311	-1.026845
ENSDARG00000068286	<i>slc7a4</i>	solute carrier family 7 member 4	-1.345775	-1.869223	-0.454513	-1.354912

ENSDARG00000076560	<i>apbb1</i>	amyloid beta (A4) precursor protein-binding, family B, member 1 (Fe65)	-1.108685	-1.046116	-0.226584	-1.126411
ENSDARG00000098857	<i>lifra</i>	LIF receptor subunit alpha a	-1.320875	-1.246479	-0.128888	-0.990547
ENSDARG00000032039	<i>mxdl</i>	MAX dimerization protein 1	-1.357776	-1.346818	0.251424	-1.098412
ENSDARG00000098320	<i>grm1b</i>	glutamate receptor, metabotropic 1b	-1.337099	-1.325591	-0.21884	-1.014709
ENSDARG00000104296	<i>zgc:165508</i>	zgc:165508	-1.30942	-1.115289	-0.72236	-0.966654
ENSDARG00000058015	<i>ano3</i>	anoctamin 3	-1.090386	-1.137796	-0.081861	-0.239283
ENSDARG00000067607	<i>srebfl</i>	sterol regulatory element binding transcription factor 1	-1.223864	-1.098118	-0.442754	-1.389287
ENSDARG00000101419	<i>drp2</i>	dystrophin related protein 2	-1.404802	-1.677512	-0.218895	-0.425346
ENSDARG00000114067	<i>tspan17</i>	tetraspanin 17	-1.166163	-1.186024	-0.168984	-1.008816
ENSDARG00000075456	<i>pik3ca</i>	phosphatidylinositol-4,5-bisphosphate 3-kinase, catalytic subunit alpha	-1.114973	-1.13312	-0.15234	-0.680799
ENSDARG00000018743	<i>scamp5a</i>	secretory carrier membrane protein 5a	-1.312879	-1.128384	-0.310538	-0.981028
ENSDARG00000022614	<i>ddx43</i>	DEAD (Asp-Glu-Ala-Asp) box polypeptide 43	-5.34493	-5.830357	-1.652439	0.365385
ENSDARG00000012833	<i>foxn3</i>	forkhead box N3	-1.281056	-1.199361	-0.166022	-0.777811
ENSDARG00000092119	<i>si:ch211-235f12.2</i>	si:ch211-235f12.2	-11.58402	-11.58402	-3.323495	-11.58402
ENSDARG00000042518	<i>hipk2</i>	homeodomain interacting protein kinase 2	-1.479513	-1.444975	-0.171635	-1.074841
ENSDARG00000017254	<i>kcnk1b</i>	potassium channel, subfamily K, member 1b	-1.533894	-1.205839	-0.731946	-1.498327
ENSDARG00000090496	<i>thsd7ab</i>	thrombospondin, type I, domain containing 7Ab	-1.43504	-1.535914	-0.101913	-0.752291
ENSDARG00000023933	<i>skila</i>	SKI-like proto-oncogene a	-1.291058	-1.699414	-0.422447	-1.003288
ENSDARG00000078908	<i>fbxo41</i>	F-box protein 41	-1.098506	-1.17897	-0.0385	-0.793357
ENSDARG00000016536	<i>npas2</i>	neuronal PAS domain protein 2	-2.830305	-3.400621	0.836915	-0.204224

ENSDARG00000059888	<i>ago3a</i>	argonaute RISC catalytic component 3a	-2.570607	-2.542318	0.216196	-2.00965
ENSDARG00000071375	<i>celf5a</i>	cugbp, Elav-like family member 5a	-1.150172	-1.18725	-0.070583	-0.576739
ENSDARG00000037415	<i>dlgap1b</i>	discs, large (Drosophila) homolog-associated protein 1b	-1.415037	-1.782409	-0.392842	-0.787226
ENSDARG00000017108	<i>kcna1b</i>	potassium voltage-gated channel, shaker-related subfamily, member 1b	-1.198015	-1.389813	-0.832809	-0.580763
ENSDARG00000073822	<i>IQSEC1</i>	IQ motif and Sec7 domain ArfGEF 1a	-1.420332	-1.501368	-0.301129	-0.977528
ENSDARG00000099547	<i>nbeal1</i>	neurobeachin-like 1	-1.011353	-1.027729	-0.215677	-0.780149
ENSDARG00000061718	<i>znf704</i>	zinc finger protein 704	-1.939458	-2.321928	-0.202493	-0.949374
ENSDARG00000105178	<i>erc2</i>	ELKS/RAB6-interacting/CAST family member 2	-1.344446	-1.36732	-0.35013	-1.202528
ENSDARG00000079348	<i>GRIN2B</i>	glutamate receptor ionotropic, NMDA 2B-like	-1.155463	-1.192066	-0.302788	-0.671327
ENSDARG00000003069	<i>btbd7</i>	BTB (POZ) domain containing 7	-1.166474	-1.33931	-0.455334	-0.661238
ENSDARG00000053122	<i>clvs2</i>	clavesin 2	-1.213458	-1.088059	0.186805	-1.037582
ENSDARG00000077686	<i>aak1b</i>	AP2 associated kinase 1b	-1.555519	-1.483049	-0.585334	-1.073218
ENSDARG00000045301	<i>st8sia3</i>	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 3	-1.844911	-2.32812	-0.735422	-1.301225
ENSDARG00000078839	<i>LRRTM4</i>	si:dkey-28o19.1	-1.683194	-1.824809	-0.565013	0.281182
ENSDARG00000076520	<i>mafB</i>	v-maf avian musculoaponeurotic fibrosarcoma oncogene homolog b (paralog b)	-1.281696	-1.01503	-0.436124	-1.014167
ENSDARG00000076622	<i>atp13a3</i>	ATPase 13A3	-1.560545	-1.408542	0.847903	-0.073152
ENSDARG00000005834	<i>gata2b</i>	GATA zinc finger domain containing 2B	-1.262565	-1.148823	-0.075708	-1.074718
ENSDARG00000053389	<i>jade2</i>	jade family PHD finger 2	-1.457548	-1.47142	-0.632226	-0.842979

ENSDARG00000053326	<i>gna11b</i>	guanine nucleotide binding protein (G protein), alpha 11b (Gq class)	-1.424054	-1.272504	-0.288196	-0.746171
ENSDARG00000090656	<i>tomm20a</i>	translocase of outer mitochondrial membrane 20	-1.171543	-1.06619	-0.061682	-0.806546
ENSDARG00000074258	<i>gramd1bb</i>	GRAM domain containing 1Bb	-1.100532	-1.013476	-0.513271	-0.773551
ENSDARG00000076041	<i>wwc1</i>	WW and C2 domain containing 1	-1.491659	-1.869296	-0.427528	-1.192645
ENSDARG00000061363	<i>GFOD1</i>	si:ch211-276f18.2	-1.010454	-1.561714	-0.489251	-0.823723
ENSDARG00000004789	<i>lrp1ba</i>	low density lipoprotein receptor-related protein 1Ba	-1.097611	-1.241621	-0.101222	-1.282035
ENSDARG00000098906	<i>herc7</i>	hect domain and RLD 7	-2.586146	-2.867778	-0.702661	-0.323704
MSTRG.19521	<i>C14orf132</i>	chromosome 14 open reading frame 132, partial	-1.22281	-1.484676	-0.178238	-1.14051
ENSDARG00000005394	<i>dnmt3aa</i>	DNA (cytosine-5-)-methyltransferase 3 alpha a	-1.329582	-1.215286	0.014431	-1.194173
ENSDARG00000077582	<i>ank3b</i>	ankyrin 3b	-1.30348	-1.378374	-0.235517	-0.424697
ENSDARG00000099841	<i>prkcb</i>	protein kinase C, alpha, b	-1.36087	-1.200552	-0.353938	-0.56668
ENSDARG00000037069	<i>zdhc14</i>	zinc finger DHHC-type containing 14	-1.271016	-1.467955	0.208108	-1.351244
ENSDARG00000100908	<i>lcor</i>	ligand dependent nuclear receptor corepressor	-1.896582	-2.297681	-0.643504	-1.316296
MSTRG.21108	<i>SHC3</i>	SHC-transforming protein 3	-1.483395	-1.143855	-0.12287	-1.070449
ENSDARG00000091130	<i>kcnq2b</i>	potassium voltage-gated channel, KQT-like subfamily, member 2b	-1.027676	-1.146261	-0.24267	-0.793211
ENSDARG00000069484	<i>dab2ipa</i>	DAB2 interacting protein a	-1.34504	-1.390555	-0.06986	-1.360053
ENSDARG00000063079	<i>ago3b</i>	argonaute RISC catalytic component 3b	-1.855052	-1.813231	-0.965235	-1.011777
ENSDARG00000062550	<i>rc3h1a</i>	ring finger and CCCH-type domains 1a	-1.108892	-1.047877	-0.323802	-0.633392
ENSDARG00000068830	<i>zgc:172139</i>	zgc:172139	-1.831912	-1.399182	-0.424635	-1.234619

ENSDARG00000040633	<i>PRMT8</i>	protein arginine N-methyltransferase 8-B-like	-1.448308	-1.1651	0.187302	-1.358386
ENSDARG00000090814	<i>si:dkey-18a10.3</i>	si:dkey-18a10.3	-1.692726	-1.325216	0.097896	-7.005095
ENSDARG00000001881	<i>cacnb3a</i>	calcium channel, voltage-dependent, beta 3a	-1.119299	-1.79595	-0.19031	-0.619728
ENSDARG00000100815	<i>srsf3a</i>	serine and arginine rich splicing factor 3a	-1.156194	-1.299762	-0.289734	-2.042971
ENSDARG00000018399	<i>rps6kb1a</i>	ribosomal protein S6 kinase b, polypeptide 1a	-1.100521	-1.158337	0.100952	-1.39318
ENSDARG00000021996	<i>ppp2r2aa</i>	protein phosphatase 2, regulatory subunit B, alpha a	-1.048103	-1.207051	-0.498693	-0.714611
ENSDARG00000019990	<i>cabp1a</i>	calcium binding protein 1a	-1.083325	-1.258324	-0.468064	-0.758158
ENSDARG00000017220	<i>otud7b</i>	OTU deubiquitinase 7B	-1.632738	-1.575594	-0.337282	-0.659705
ENSDARG00000005126	<i>large1</i>	LARGE xylosyl- and glucuronyltransferase 1	-1.285737	-1.656425	-0.144672	-0.620251
ENSDARG00000057633	<i>cxcr4a</i>	chemokine (C-X-C motif) receptor 4a	-1.090581	-2.058103	-0.117357	-2.192645
ENSDARG00000031336	<i>hsd20b2</i>	hydroxysteroid (20-beta) dehydrogenase 2	-1.018408	-1.268073	0.183327	-2.025372
ENSDARG00000054848	<i>pdk4</i>	pyruvate dehydrogenase kinase, isozyme 4	-1.079886	-1.485825	0.70289	-2.401814
MSTRG.37189	<i>GPR22</i>	probable G-protein coupled receptor 22	-1.246858	-1.101984	-0.779443	-1.530356
ENSDARG00000071055	<i>ZNF512B</i>	si:dkey-256k13.2	-1.245422	-1.257362	0.037946	-0.442604
ENSDARG00000074120	<i>usp2b</i>	ubiquitin specific peptidase 2b	-1.084648	-1.154762	-0.199495	-2.19875
ENSDARG00000027423	<i>igf1ra</i>	insulin-like growth factor 1a receptor	-1.029595	-1.052196	-0.118226	-0.550589
ENSDARG00000070076	<i>actr2b</i>	actin related protein 2b	-1.056916	-1.079322	0.021606	-1.267554
ENSDARG00000101949	<i>numbl</i>	NUMB like endocytic adaptor protein	-1.194816	-1.261517	-0.427749	-0.722798
ENSDARG00000102610	<i>r3hdm2</i>	R3H domain containing 2	-1.215619	-1.418436	-0.128929	-1.077877
ENSDARG00000061699	<i>sipa1l3</i>	signal-induced proliferation-associated 1 like 3	-1.08573	-1.096813	0.149747	-0.836254

ENSDARG00000074376	<i>mdga1</i>	MAM domain containing glycosylphosphatidylinositol anchor 1	-1.439984	-1.497015	-0.428843	-1.624663
ENSDARG00000018716	<i>dgkh</i>	diacylglycerol kinase, eta	-1.340624	-1.07569	-0.38037	-0.787371
ENSDARG00000062305	<i>rims3</i>	regulating synaptic membrane exocytosis 3	-1.569532	-1.140609	-0.250957	-1.351132
ENSDARG00000098511	<i>ntrk2b</i>	neurotrophic tyrosine kinase, receptor, type 2b	-1.412149	-1.540831	-0.219745	-1.221429
ENSDARG00000104727	<i>ino80da</i>	INO80 complex subunit Da	-1.900101	-2.142958	-0.40239	-0.951816
ENSDARG00000040700	<i>nab1b</i>	NGFI-A binding protein 1b (EGR1 binding protein 1)	-1.832997	-1.171425	-0.879523	-1.804787
ENSDARG00000043835	<i>rab3ab</i>	RAB3A, member RAS oncogene family, b	-1.338188	-1.031519	-0.260398	-0.750173
ENSDARG00000005232	<i>ccdc85ca</i>	coiled-coil domain containing 85C, a	-1.323634	-1.234666	-0.075258	-1.787876
ENSDARG00000043226	<i>nfixa</i>	nuclear factor I/Xa	-1.756637	-1.57898	-0.391693	-0.853202
ENSDARG00000098801	<i>sbno2a</i>	strawberry notch homolog 2a	-1.671377	-1.796908	-0.18786	-0.942449
ENSDARG00000110973	<i>tln2b</i>	talin 2b	-1.043991	-1.042091	-0.24235	-0.682689
ENSDARG00000062462	<i>shisa7a</i>	shisa family member 7a	-1.034727	-1.022002	0.214797	-1.648738
ENSDARG00000018967	<i>gabbr1a</i>	gamma-aminobutyric acid (GABA) B receptor, 1a	-1.574041	-1.762031	-0.172119	-1.167187
ENSDARG00000060901	<i>trim62.1</i>	tripartite motif containing 62, tandem duplicate 1	-1.087384	-1.098101	-0.234059	-0.92713
ENSDARG00000035732	<i>arntl1b</i>	aryl hydrocarbon receptor nuclear translocator-like 1b	-1.047532	-1.240931	0.63919	1.034857
ENSDARG00000068787	<i>slc6a17</i>	solute carrier family 6 member 17	-1.45957	-1.491028	-0.886555	-1.289137
ENSDARG00000061687	<i>atxn1a</i>	ataxin 1a	-1.253757	-1.262783	0.062763	-0.8238
ENSDARG00000076757	<i>ephb1</i>	EPH receptor B1	-1.876039	-2.002355	-0.115085	-0.38016
ENSDARG00000060539	<i>shank1</i>	SH3 and multiple ankyrin repeat domains 1	-1.766112	-1.494109	-0.112475	-1.177882

ENSDARG00000089079	<i>si:ch211-214b16.3</i>	si:ch211-214b16.3	-1.773229	-2.577309	-0.594587	-0.861102
ENSDARG00000079581	<i>nyap2a</i>	neuronal tyrosine-phosphorylated phosphoinositide-3-kinase adaptor 2a	-1.525256	-1.505891	0.192081	-0.286249
ENSDARG00000061992	<i>dot1l</i>	DOT1-like histone H3K79 methyltransferase	-1.272048	-1.190033	-0.186241	-0.136007
ENSDARG00000068421	<i>ttc9b</i>	tetratricopeptide repeat domain 9B	-1.406038	-1.269198	-0.42625	-1.112115
ENSDARG00000088307	<i>mrtfba</i>	myocardin related transcription factor Ba	-1.439506	-1.375156	-0.212782	-0.714741
ENSDARG00000099487	<i>si:ch73-233f7.7</i>	si:ch73-233f7.7	-1.025502	-1.122046	-0.702431	-0.917226
ENSDARG00000031588	<i>si:dkey-239b22.1</i>	si:dkey-239b22.1	-1.028014	-1.490986	-0.746243	-0.656046
ENSDARG00000060865	<i>scai</i>	suppressor of cancer cell invasion	-1.253928	-1.140291	-0.36863	-0.798608
ENSDARG00000087260	<i>mtss1lb</i>	MTSS I-BAR domain containing 2b	-1.931287	-1.718513	-0.162795	-1.084534
ENSDARG00000102067	<i>grm5b</i>	glutamate receptor, metabotropic 5b	-1.974005	-2.3484	-0.103288	-0.579726
ENSDARG00000017785	<i>zgc:158689</i>	zgc:158689	-1.224197	-1.685803	0.903866	0.358129
ENSDARG00000032072	<i>cdk16</i>	cyclin-dependent kinase 16	-1.022403	-1.060145	-0.28747	-0.211504
ENSDARG00000103333	<i>baiap2b</i>	BAR/IMD domain containing adaptor protein 2b	-2.324265	-1.97854	-0.496574	-2.922717
ENSDARG00000011855	<i>aak1a</i>	AP2 associated kinase 1a	-1.505569	-1.230077	-0.502309	-1.413888
ENSDARG00000098566	<i>si:ch73-233f7.4</i>	si:ch73-233f7.4	-1.529891	-1.398294	-0.523825	-1.119928
ENSDARG00000089536	<i>erbb4b</i>	erb-b2 receptor tyrosine kinase 4b	-1.233888	-1.354182	-0.438121	-1.27684
ENSDARG00000074742	<i>elmod3</i>	ELMO/CED-12 domain containing 3	-1.740702	-1.360572	-0.629368	-1.281908
ENSDARG00000075539	<i>snphb</i>	syntaphilin b	-1.192104	-1.448234	-0.369076	-0.858543
ENSDARG00000060597	<i>zgc:158659</i>	zgc:158659	-1.142801	-1.392553	-0.508651	-1.053867
ENSDARG00000026988	<i>tbc1d22b</i>	TBC1 domain family, member 22B	-1.459136	-2.045727	-1.133954	-0.576106
ENSDARG00000092644	<i>ago1</i>	argonaute RISC component 1	-1.508341	-1.703357	-0.392864	-0.68919
ENSDARG00000028469	<i>rps6ka2</i>	ribosomal protein S6 kinase, polypeptide 2	-1.242722	-1.138311	-0.393664	-0.906218

ENSDARG00000061368	<i>klf13</i>	Kruppel-like factor 13	-2.284939	-2.311394	-0.112204	-2.416398
ENSDARG00000054036	<i>rnf34b</i>	ring finger protein 34b	-1.399985	-1.884371	-0.176106	-0.982346
ENSDARG00000098816	<i>kcnc3b</i>	potassium voltage-gated channel, Shaw-related subfamily, member 3b	-1.135201	-1.24017	-0.540149	-1.245625
ENSDARG00000055565	<i>cacnb2b</i>	calcium channel, voltage-dependent, beta 2b	-1.245756	-1.106173	-0.293877	-1.069231
ENSDARG00000102424	<i>ARHGAP44</i>	si:ch211-114m9.1	-1.09148	-1.192645	-0.61118	-0.715225
ENSDARG00000005586	<i>zbtb20</i>	zinc finger and BTB domain containing 20	-2.776494	-2.887525	-0.361456	-1.055648
ENSDARG00000104283	<i>cdc42bpaa</i>	CDC42 binding protein kinase alpha (DMPK-like) a	-1.868562	-1.744383	-0.437405	-0.868562
ENSDARG00000074905	<i>camk1da</i>	calcium/calmodulin-dependent protein kinase 1Da	-1.154051	-1.187218	-0.345135	-0.797566
ENSDARG00000102198	<i>si:ch73-233f7.3</i>	si:ch73-233f7.3	-1.499571	-1.385566	-0.707053	-0.821978
ENSDARG00000041239	<i>wdr20b</i>	WD repeat domain 20b	-1.204358	-1.889201	0.05142	-0.057673
ENSDARG00000026499	<i>ppm1e</i>	protein phosphatase, Mg ²⁺ /Mn ²⁺ dependent, 1E	-1.478134	-1.170534	-0.223611	-1.223611
ENSDARG00000104981	<i>SLC45A4</i>	solute carrier family 45 member 4-like	-2.310183	-2.290818	-0.374978	-1.390353
ENSDARG00000036560	<i>gpr185b</i>	G protein-coupled receptor 185 b	-1.079767	-1.018936	-0.592921	-0.822128
ENSDARG00000039901	<i>sh3gl2b</i>	SH3 domain containing GRB2 like 2b, endophilin A1	-1.350195	-1.431523	-0.534049	-1.429484
ENSDARG00000038121	<i>si:ch211-13k12.2</i>	si:ch211-13k12.2	-1.519778	-1.745071	-0.850424	-1.59561
ENSDARG00000061231	<i>tinagl1</i>	tubulointerstitial nephritis antigen-like 1	-1.468031	-1.576708	-0.353309	-2.464763
ENSDARG00000060641	<i>prkaa2</i>	protein kinase, AMP-activated, alpha 2 catalytic subunit	-1.686501	-1.931613	-0.496676	-0.716874
ENSDARG00000103519	<i>adamts1</i>	ADAM metalloproteinase with thrombospondin type 1 motif, 1	-1.044139	-1.12479	-0.096918	-0.811777
ENSDARG00000100958	<i>HECW1</i>	si:ch211-188f17.1	-1.104469	-1.192645	-0.491273	-1.026767

ENSDARG00000069608	<i>palm2akap2</i>	palm2 and akap2 fusion	-1.725335	-1.823367	-0.720079	-2.016012
ENSDARG00000090815	<i>kcnj10a</i>	potassium inwardly rectifying channel subfamily J member 10a	-1.816119	-1.775667	-0.501045	-1.900594
ENSDARG00000090421	<i>SH2B2</i>	SH2B adaptor protein 2	-1.094408	-1.228397	-0.062769	-0.462243
ENSDARG00000070522	<i>cacna1ia</i>	calcium voltage-gated channel subunit alpha1 1a	-1.110807	-1.277704	-0.166421	-0.104758
ENSDARG00000076068	<i>crtc1a</i>	CREB regulated transcription coactivator 1a	-1.237134	-1.288322	-0.488898	-0.713163
ENSDARG00000043553	<i>ches1</i>	checkpoint suppressor 1	-1.280956	-1.380492	-0.01392	-1.079322
ENSDARG00000062248	<i>ptpn21</i>	protein tyrosine phosphatase non-receptor type 21	-1.886132	-2.169925	-0.371559	-1.154328
ENSDARG00000075271	<i>rapgef5a</i>	Rap guanine nucleotide exchange factor (GEF) 5a	-1.09287	-1.304643	-0.029073	-0.126512
ENSDARG00000061471	<i>sema5ba</i>	sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5Ba	-1.158531	-1.062831	-0.25079	-1.29923
ENSDARG00000052368	<i>cltb</i>	clathrin, light chain B	-1.492914	-1.612378	-0.462192	-0.949959
ENSDARG00000053771	<i>apbb3</i>	amyloid beta (A4) precursor protein-binding, family B, member 3	-1.246747	-1.639531	-0.193545	-1.104494
ENSDARG00000104005	<i>slc4a3</i>	solute carrier family 4 member 3	-1.059906	-1.142368	0.002022	-0.638554
ENSDARG00000018393	<i>kank2</i>	KN motif and ankyrin repeat domains 2	-1.117437	-1.028475	-0.524003	-0.527385
ENSDARG00000099265	<i>slc7a5</i>	solute carrier family 7 member 5	-1.731912	-1.238341	-0.261213	-1.876833
ENSDARG00000087247	<i>kcnab2a</i>	potassium voltage-gated channel, shaker-related subfamily, beta member 2 a	-1.381487	-1.252614	-0.19603	-0.645095
ENSDARG00000054253	<i>sobpa</i>	sine oculis binding protein homolog (Drosophila) a	-1.267366	-1.536362	-0.682403	-1.072863

ENSDARG00000002197	<i>pygl</i>	phosphorylase, glycogen, liver	-1.227568	-1.125413	0.133153	-0.842325
ENSDARG00000101933	<i>CELF6</i>	si:dkey-205h23.2	-1.153351	-1.213931	-0.730917	-0.223808
ENSDARG00000036626	<i>sema6ba</i>	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6Ba	-1.570165	-1.775484	-0.709142	-1.396973
ENSDARG00000042259	<i>tgfbr1b</i>	transforming growth factor, beta receptor 1 b	-1.402098	-1.674864	-0.785164	-1.496016
ENSDARG00000008727	<i>ranbp3a</i>	RAN binding protein 3a	-1.364093	-1.628225	-0.709525	-0.688767
ENSDARG00000041926	<i>dlg4a</i>	discs, large homolog 4a (Drosophila)	-1.017237	-1.186295	-0.134594	-0.280965
ENSDARG00000099199	<i>itchb</i>	itchy E3 ubiquitin protein ligase b	-1.075884	-1.11667	-0.158642	-1.085973
MSTRG.26783	<i>Wnk3</i>	serine/threonine-protein kinase WNK2-like	-1.111411	-1.353486	-0.411874	-0.327708
ENSDARG00000059850	<i>slc35f3b</i>	solute carrier family 35 member F3b	-1.329758	-1.80151	-0.846436	-0.846436
ENSDARG00000078135	<i>mrc2</i>	mannose receptor, C type 2	-1.056413	-1.255394	-0.021437	-0.069751
ENSDARG00000075505	<i>si:ch211-132g1.7</i>	si:ch211-132g1.7	-1.641231	-1.181799	-0.596837	-1.414162
ENSDARG00000060085	<i>kcnq3</i>	potassium voltage-gated channel, KQT-like subfamily, member 3	-1.147161	-1.228749	-0.450923	-1.069942
ENSDARG00000098215	<i>BICD2</i>	zgc:171572	-1.250407	-1.26939	0.046794	-0.365688
ENSDARG00000090727	<i>celf5b</i>	cugbp, Elav-like family member 5b	-2.246161	-2.221214	-0.579668	-1.160673
ENSDARG00000074644	<i>spock1</i>	SPARC (osteonectin), cwcw and kazal like domains proteoglycan 1	-2.715631	-2.396353	0.141893	-2.483816
ENSDARG00000079933	<i>SLC46A3</i>	si:dkey-5g14.1	-1.296075	-1.551332	0.301827	-0.310068
ENSDARG00000101547	<i>CR354395.2</i>	XP_030634258.1 receptor-type tyrosine-protein phosphatase gamma-like	-1.597563	-1.636037	-0.293974	-0.541709
ENSDARG00000086345	<i>cux2b</i>	cut-like homeobox 2b	-2.137155	-2.240532	-0.310201	-0.663838
ENSDARG00000035273	<i>tmtc2b</i>	transmembrane O-mannosyltransferase targeting cadherins 2b	-1.316474	-1.062034	-0.257217	-0.429684
ENSDARG00000078485	<i>snpha</i>	syntaphilin a	-2.604402	-1.906546	-0.69975	-1.472246

ENSDARG00000078567	<i>lonrf1l</i>	LON peptidase N-terminal domain and ring finger 1, like	-1.043427	-1.43266	0.023009	-2.147135
ENSDARG00000069500	<i>hs6st3b</i>	heparan sulfate 6-O-sulfotransferase 3b	-1.368029	-1.357881	-0.287171	-0.589573
MSTRG.4700	<i>ADAP1</i>	PREDICTED: arf-GAP with dual PH domain-containing protein 1-like	-1.266551	-1.23078	-0.534423	-0.233727
ENSDARG00000077762	<i>si:rp71-79p20.2</i>	si:rp71-79p20.2	-1.204106	-1.082206	-0.600299	-0.775741
ENSDARG00000025468	<i>bnip3la</i>	BCL2 interacting protein 3 like a	-1.437299	-1.330877	-0.518949	-0.300214
ENSDARG00000104483	<i>gipc1</i>	GIPC PDZ domain containing family, member 1	-1.270161	-1.061347	-0.280546	-0.830211
ENSDARG00000071904	<i>pcdh2ab1</i>	protocadherin 2 alpha b 1	-1.847125	-1.550508	-1.12276	-0.589328
ENSDARG00000073769	<i>magi2b</i>	membrane associated guanylate kinase, WW and PDZ domain containing 2b	-2.173829	-1.465292	-0.789914	-1.245979
ENSDARG00000086931	<i>CABZ01029822.1</i>	uncharacterized LOC100004582	-1.569908	-1.459432	-0.326981	-1.023735
ENSDARG00000009733	<i>kif21b</i>	kinesin family member 21B	-1.85561	-1.21818	-0.263034	-0.821663
ENSDARG00000099133	<i>UNC5C</i>	si:ch73-72b7.1	-1.214809	-1.339137	-0.349998	-0.955088
ENSDARG00000102142	<i>ece2b</i>	endothelin converting enzyme 2b	-1.257616	-1.20854	-0.14022	-1.14714
ENSDARG00000057107	<i>si:ch73-383g2.1</i>	si:ch73-383g2.1	-1.696908	-1.430351	-0.44065	-0.445087
ENSDARG00000042859	<i>slc5a6a</i>	solute carrier family 5 member 6a	-1.667017	-1.433653	-0.793549	-0.938888
ENSDARG00000089800	<i>pr7</i>	proline rich 7 (synaptic)	-1.510308	-1.252607	-1.157829	-1.570089
ENSDARG00000069560	<i>kcnh3</i>	potassium voltage-gated channel, subfamily H (eag-related), member 3	-1.099536	-1.078551	-0.603578	-0.925506
ENSDARG00000037815	<i>b4galt5</i>	UDP-Gal:betaGlcNAc beta 1,4-galactosyltransferase, polypeptide 5	-1.838249	-2.163825	-0.609625	-0.936224
ENSDARG00000025920	<i>tiam1b</i>	TIAM Rac1 associated GEF 1b	-1.389042	-1.436592	-0.902363	-1.426055
ENSDARG00000052978	<i>mbnl1</i>	muscleblind-like splicing regulator 1	-1.185692	-1.023893	-0.095062	-1.093574
ENSDARG00000003462	<i>feh</i>	ferrochelatase	-1.900209	-2.236493	0.081824	-1.547193

ENSDARG00000093498	<i>MACIR</i>	zgc:194281	-1.528255	-1.332139	-0.839028	-0.839028
ENSDARG00000031618	<i>unm_sa1261</i>	un-named sa1261	-1.423694	-1.500163	0.056883	-2.740609
ENSDARG00000101322	<i>tfr1a</i>	transferrin receptor 1a	-1.06517	-1.024718	-0.30447	-1.024718
ENSDARG00000019588	<i>chico</i>	chico	-1.237715	-1.193772	-0.271574	-1.133724
ENSDARG00000100097	<i>mafgb</i>	v-maf avian musculoaponeurotic fibrosarcoma oncogene homolog Gb	-1.270961	-1.156402	-0.759372	-0.496338
MSTRG.4521	<i>TMEM63B</i>	CSC1-like protein 2 isoform X3	-1.322697	-1.201019	0.255839	-0.540289
ENSDARG00000098654	<i>FQ976914.1</i>	raftlin-like	-3.834836	-2.125884	-0.82103	-1.793808
ENSDARG00000077207	<i>lzts2b</i>	leucine zipper, putative tumor suppressor 2b	-2.537134	-1.738768	0.01612	-2.812768
ENSDARG00000015057	<i>ube2d4</i>	ubiquitin-conjugating enzyme E2D 4 (putative)	-1.453718	-1.119299	-0.135215	-1.027321
ENSDARG00000034605	<i>zgc:153169</i>	zgc:153169	-1.228659	-1.031027	-0.74152	-0.013707
ENSDARG00000094491	<i>si:ch211-202m22.1</i>	si:ch211-202m22.1	-3.899473	-3.076351	0.365871	-0.410088
ENSDARG00000102380	<i>cnnm4a</i>	cyclin and CBS domain divalent metal cation transport mediator 4a	-1.480432	-1.239871	-0.769292	-1.259703
ENSDARG00000109726	<i>PLCB1</i>	si:ch1073-140o9.2	-1.666757	-1.260764	-0.177042	-0.24273
ENSDARG00000060944	<i>rnf217</i>	ring finger protein 217	-1.549339	-1.514573	-0.590986	-0.60921
ENSDARG00000061723	<i>tmem64</i>	transmembrane protein 64	-1.192645	-1.085117	-0.390206	-1.085117
ENSDARG00000025797	<i>abhd2a</i>	abhydrolase domain containing 2a	-1.485427	-1.117523	-0.163499	-1.418313
ENSDARG00000070536	<i>creb5b</i>	cAMP responsive element binding protein 5b	-1.260867	-1.038474	-0.251151	-1.620654
ENSDARG00000078775	<i>RASA2</i>	RAS p21 protein activator 2	-1.369908	-1.186878	0.141176	-1.019001
ENSDARG00000109769	<i>LO017835.1</i>	tumor protein p53 inducible nuclear protein 2	-1.61471	-1.536368	-0.624403	-1.244645
ENSDARG00000037691	<i>pcdh2ab2</i>	protocadherin 2 alpha b2	-1.608018	-2.079567	0.056922	-0.563136
ENSDARG00000060246	<i>slc16a6b</i>	solute carrier family 16 member 6b	-1.053328	-1.216184	0.503009	-2.655397

ENSDARG00000077728	<i>supv3l1</i>	SUV3-like helicase	1.478646	1.286071	0.629565	1.449791
ENSDARG00000111102	<i>camk2n2</i>	calcium/calmodulin-dependent protein kinase II inhibitor 2	1.249927	1.226137	0.385318	0.790448
ENSDARG00000010770	<i>sox19a</i>	SRY-box transcription factor 19a	1.33631	1.517381	0.16665	1.022574
ENSDARG00000100803	<i>zgc:113443</i>	<i>zgc:113443</i>	1.709291	1.446256	0.24894	0.679574
ENSDARG00000030463	<i>tppp3</i>	tubulin polymerization-promoting protein family member 3	1.57301	1.736251	0.627191	0.230532
ENSDARG00000095580	<i>si:ch211-67e16.11</i>	<i>si:ch211-67e16.11</i>	1.015689	1.130184	0.061759	0.170244
ENSDARG00000060264	<i>si:dkey-37g12.1</i>	<i>si:dkey-37g12.1</i>	1.119111	1.00197	0.600644	0.301284
ENSDARG00000054906	<i>ier5l</i>	immediate early response 5-like	1.037846	1.078155	0.223426	1.247394
ENSDARG00000073944	<i>si:ch73-386h18.1</i>	<i>si:ch73-386h18.1</i>	1.30648	1.086961	0.517984	-0.052151
ENSDARG00000036344	<i>calb2b</i>	calbindin 2b	1.571885	1.227516	0.328319	0.355436
ENSDARG00000079055	<i>si:dkey-85a20.4</i>	<i>si:dkey-85a20.4</i>	1.532341	1.385515	0.596584	0.681662
ENSDARG00000031136	<i>moxd1</i>	monooxygenase, DBH-like 1	1.497212	1.403777	0.286994	0.554736
ENSDARG00000094557	<i>nupr1b</i>	nuclear protein 1b	1.306851	1.551851	0.566996	0.779541
ENSDARG00000077504	<i>si:ch211-103n10.5</i>	<i>si:ch211-103n10.5</i>	1.232057	1.072093	0.001394	-0.38149
ENSDARG00000057974	<i>parp12b</i>	poly (ADP-ribose) polymerase family, member 12b	1.108524	1.110883	-0.027159	1.490301
ENSDARG00000022531	<i>ntn1b</i>	netrin 1b	1.335603	1.133483	0.090347	-0.177305
ENSDARG00000045904	<i>nr2e3</i>	nuclear receptor subfamily 2, group E, member 3	1.550197	1.437405	0.251539	1.337303
ENSDARG00000069998	<i>si:ch211-145b13.6</i>	<i>si:ch211-145b13.6</i>	1.344335	1.578676	0.776562	1.049328
ENSDARG00000006868	<i>trh</i>	thyrotropin-releasing hormone	1.196491	1.042495	0.394614	-0.057611

ENSDARG00000024325	<i>cert1a</i>	ceramide transporter 1a	1.187151	1.434403	0.862009	0.767827
ENSDARG00000071562	<i>mtus1a</i>	microtubule associated tumor suppressor 1a	1.374691	1.32935	0.759931	0.949522
ENSDARG00000051914	<i>slc14a2</i>	solute carrier family 14 member 2	1.824428	2.01495	0.824428	0.841302
ENSDARG00000098293	<i>si:dkey-27i16.2</i>	si:dkey-27i16.2	1.038668	1.117172	0.434501	0.749161
ENSDARG00000100560	<i>zfp2b</i>	zinc finger protein, FOG family member 2b	1.400461	1.113924	0.641029	0.092794
ENSDARG00000063670	<i>gtf2a1l</i>	general transcription factor IIA, 1-like	1.397839	1.069497	0.832298	1.437117
ENSDARG00000101952	<i>pigv</i>	phosphatidylinositol glycan anchor biosynthesis, class V	1.117695	1.278976	0.278976	1.34861
ENSDARG00000077382	<i>hcn5</i>	hyperpolarization activated cyclic nucleotide-gated potassium channel 5	2.166192	1.687477	1.412939	-0.086415
ENSDARG00000010630	<i>hoxb6a</i>	homeobox B6a	1.108607	1.293207	0.472641	-0.265691
ENSDARG00000095930	<i>myha</i>	myosin, heavy chain a	5.43105	3.478047	3.099536	-1.807355
ENSDARG00000031658	<i>si:ch211-207d6.2</i>	si:ch211-207d6.2	1.419903	2.080565	0.504792	0.130397
ENSDARG00000034896	<i>ldb2b</i>	LIM domain binding 2b	1.695546	1.186963	0.053439	0.218499
ENSDARG00000000212	<i>krt97</i>	keratin 97	2.25164	3.871485	1.454839	0.331982
ENSDARG00000093233	<i>si:ch211-215d8.2</i>	si:ch211-215d8.2	1.927396	1.865591	1.056413	1.073337
ENSDARG00000004643	<i>cdhr1a</i>	cadherin-related family member 1a	1.463656	1.31259	0.472068	0.753163