

Table S1 qRT-PCR primer sequences

LncRNA or mRNA	Forward primer (5'-3')	Reverse primer (5'-3')
ENST00000565493	CAGTCCCTTTGTGAATGTCCT	ACCCTTCCTCTTCTCCCTCTT
ENST00000606054	GTCCCTGGCATTCCCGTGCTG	CCGGTGGATTCTTCTCCGTTCC
ENST00000590604	ATGAAGATGGGAAATTAACGC	GACAAAGAGGCTGTGCTGAAA
NONHSAT138949.2	CAGAACGGCAACACCAAGCAA	TCCCACGCATAGTCGTGACCC
ENST00000566942	CTGACATTTCTAATCTCCCTT	CTGTCCTCCACTAATCACAGA
ENST00000369385	AAAGCCCAGAAGAAAGACGGCAAGA	TGGACCCGCTTCAGCACCTTG
NONHSAT217189.1	GCACAGGTAAATGGTGGGAGT	CGCTGGATAGTAGGTAGGGAC
ENST00000540082	CGAGGAGTGAGTTGAGCTTTC	ACTTGGATTTGTCAGGTGGTC
CD226	TAAATGGCTATTGGTTGCGTAT	CAAAGCTGGAAAGTTGGAAAG
PARVB	TCAAGAAACCCAAGGCTCGTC	TGGAAAGGCACAGGGCACAGA
GAPDH	GCACCGTCAAGGCTGAGAAC	TGGTGAAGACGCCAGTGGA
β -actin	AAGGAGCCCCACGAGAAAAAT	ACCGAACTTGCATTGATTCCAG

Table S2 Go enrichment

GO_ID	GO_term	TYPE	target_gene_in_this_GO	all_target_gene_in_all_GO	all_gene_in_this_GO	all_gene_in_all_GO	gene_list	Pvalue	Qvalue
GO:0050839	cell adhesion molecule binding	molecular_function	4	43	198	21445	ENSG00000150637 (CD226), ENSG00000135124 (P2RX4), ENSG00000259207 (ITGB3), ENSG00000150093 (ITGB1),	0.000126273	0.192061381
GO:0019901	protein kinase binding	molecular_function	4	43	545	21445	ENSG00000150637 (CD226), ENSG00000114302 (PRKAR2A), ENSG00000169756 (LIMS1), ENSG00000150093 (ITGB1),	0.010777719	0.745132323
GO:0019900	kinase binding	molecular_function	4	43	610	21445	ENSG00000114302 (PRKAR2A), ENSG00000169756 (LIMS1), ENSG00000150093 (ITGB1), ENSG00000150637 (CD226),	0.016991975	0.923028374
GO:0042802	identical protein binding	molecular_function	7	43	1268	21445	ENSG00000150637 (CD226), ENSG00000101457 (DNITIP1), ENSG00000259207 (ITGB3), ENSG00000066427 (ATXN3), ENSG00000177119 (ANO6), ENSG00000135124 (P2RX4), ENSG00000119917 (IFIT3),	0.009510651	0.688842876
GO:0042803	protein homodimerization activity	molecular_function	4	43	749	21445	ENSG00000150637 (CD226), ENSG00000177119 (ANO6), ENSG00000101457 (DNITIP1), ENSG00000135124 (P2RX4),	0.037752239	1
GO:0046983	protein dimerization activity	molecular_function	6	43	1207	21445	ENSG00000177119 (ANO6), ENSG00000135124 (P2RX4), ENSG00000150093 (ITGB1), ENSG00000150637 (CD226), ENSG00000101457 (DNITIP1), ENSG00000061918 (GUCY1B3),	0.024453622	1
GO:0019899	enzyme binding	molecular_function	7	43	1792	21445	ENSG00000114302 (PRKAR2A), ENSG00000169756 (LIMS1), ENSG00000150093 (ITGB1), ENSG00000147475 (ERLIN2), ENSG00000150637 (CD226), ENSG00000259207 (ITGB3), ENSG00000066427 (ATXN3),	0.061460033	1
GO:0005102	receptor binding	molecular_function	6	43	1628	21445	ENSG00000150093 (ITGB1), ENSG00000117899 (MESDC2), ENSG00000135124 (P2RX4), ENSG00000198721 (ECI2), ENSG00000259207 (ITGB3), ENSG00000150637 (CD226),	0.097893242	1
GO:0046914	transition metal ion binding	molecular_function	5	43	1579	21445	ENSG00000256671 (LIMS3L), ENSG00000278129 (ZNF8), ENSG00000169756 (LIMS1), ENSG00000001630 (CYP51A1), ENSG00000135124 (P2RX4),	0.204021337	1
GO:0008270	zinc ion binding	molecular_function	4	43	1316	21445	ENSG00000278129 (ZNF8), ENSG00000256671 (LIMS3L), ENSG00000135124 (P2RX4), ENSG00000169756 (LIMS1),	0.257199114	1
GO:0005215	transporter activity	molecular_function	4	43	1341	21445	ENSG00000177119 (ANO6), ENSG00000250021 (C15orf38-AP3S2), ENSG00000135124 (P2RX4), ENSG00000170144 (HNRNPA3),	0.271865206	1
GO:0046872	metal ion binding	molecular_function	13	43	4408	21445	ENSG00000135482 (ZC3H10), ENSG00000150093 (ITGB1), ENSG00000163590 (PPM1L), ENSG00000061918 (GUCY1B3), ENSG00000278129 (ZNF8), ENSG00000169756 (LIMS1), ENSG00000135124 (P2RX4), ENSG00000001630 (CYP51A1), ENSG00000167625 (ZNF526), ENSG00000256671 (LIMS3L), ENSG00000198482 (ZNF808), ENSG00000172183 (ISG20), ENSG00000241404 (EGFL8),	0.132599619	1
GO:0003723	RNA binding	molecular_function	5	43	1715	21445	ENSG00000172183 (ISG20), ENSG00000119917 (IFIT3), ENSG0000049883 (PTCD2), ENSG00000135482 (ZC3H10), ENSG00000170144 (HNRNPA3),	0.269727149	1
GO:0043169	cation binding	molecular_function	13	43	4496	21445	ENSG00000278129 (ZNF8), ENSG00000061918 (GUCY1B3), ENSG00000135124 (P2RX4), ENSG00000169756 (LIMS1), ENSG00000135482 (ZC3H10), ENSG00000150093 (ITGB1), ENSG00000163590 (PPM1L), ENSG00000198482 (ZNF808), ENSG00000167625 (ZNF526), ENSG00000256671 (LIMS3L), ENSG00000241404 (EGFL8), ENSG00000172183 (ISG20), ENSG00000001630 (CYP51A1),	0.149832621	1
GO:0043167	ion binding	molecular_function	18	43	6572	21445	ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000278129 (ZNF8), ENSG00000169756 (LIMS1), ENSG00000135124 (P2RX4), ENSG00000135482 (ZC3H10), ENSG00000150093 (ITGB1), ENSG00000163590 (PPM1L), ENSG00000198721 (ECI2), ENSG00000107679 (PLEKHA1), ENSG00000074935 (TUBE1), ENSG00000167625 (ZNF526), ENSG00000172183 (ISG20), ENSG00000198482 (ZNF808), ENSG00000172183 (ISG20), ENSG00000241404 (EGFL8), ENSG00000114302 (PRKAR2A), ENSG00000001630 (CYP51A1),	0.15484274	1
GO:0097159	organic cyclic compound binding	molecular_function	17	43	6392	21445	ENSG00000135124 (P2RX4), ENSG00000278129 (ZNF8), ENSG00000066427 (ATXN3), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000135482 (ZC3H10), ENSG00000172183 (ISG20), ENSG00000119917 (IFIT3), ENSG00000147475 (ERLIN2), ENSG00000101457 (DNITIP1), ENSG00000198482 (ZNF808), ENSG00000074935 (TUBE1), ENSG00000167625 (ZNF526), ENSG00000049883 (PTCD2), ENSG00000001630 (CYP51A1), ENSG00000114302 (PRKAR2A), ENSG00000170144 (HNRNPA3),	0.200137941	1
GO:0016787	hydrolase activity	molecular_function	7	43	2701	21445	ENSG00000163590 (PPM1L), ENSG00000155099 (TMEM55A), ENSG00000074935 (TUBE1), ENSG00000066427 (ATXN3), ENSG00000147003 (TMEM27), ENSG00000041353 (RAB27B), ENSG00000172183 (ISG20),	0.361361838	1
GO:0004872	receptor activity	molecular_function	5	43	1978	21445	ENSG00000135124 (P2RX4), ENSG00000150093 (ITGB1), ENSG00000150637 (CD226), ENSG00000259207 (ITGB3), ENSG00000061918 (GUCY1B3),	0.420143897	1
GO:0043168	anion binding	molecular_function	7	43	2837	21445	ENSG00000135124 (P2RX4), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000107679 (PLEKHA1), ENSG00000074935 (TUBE1), ENSG00000114302 (PRKAR2A), ENSG00000198721 (ECI2),	0.429593941	1
GO:0017076	purine nucleotide binding	molecular_function	5	43	2036	21445	ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000074935 (TUBE1), ENSG00000135124 (P2RX4), ENSG00000114302 (PRKAR2A),	0.456699693	1
GO:0003824	catalytic activity	molecular_function	15	43	6133	21445	ENSG00000066427 (ATXN3), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000164181 (ELOVL7), ENSG00000198721 (ECI2), ENSG00000163590 (PPM1L), ENSG00000074935 (TUBE1), ENSG00000155099 (TMEM55A), ENSG00000147003 (TMEM27), ENSG00000172183 (ISG20), ENSG00000123427 (METTL21B), ENSG00000133997 (MED6), ENSG00000137364 (TPMT), ENSG00000259207 (ITGB3), ENSG00000001630 (CYP51A1),	0.356539494	1
GO:0036094	small molecule binding	molecular_function	7	43	2866	21445	ENSG00000135124 (P2RX4), ENSG00000147475 (ERLIN2), ENSG00000074935 (TUBE1), ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000114302 (PRKAR2A), ENSG00000170144 (HNRNPA3),	0.4447432	1
GO:0000166	nucleotide binding	molecular_function	6	43	2555	21445	ENSG00000135124 (P2RX4), ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000074935 (TUBE1), ENSG00000114302 (PRKAR2A), ENSG00000170144 (HNRNPA3),	0.512921749	1
GO:0003676	nucleic acid binding	molecular_function	10	43	4265	21445	ENSG00000119917 (IFIT3), ENSG00000172183 (ISG20), ENSG00000167625 (ZNF526), ENSG00000198482 (ZNF808), ENSG00000101457 (DNITIP1), ENSG00000049883 (PTCD2), ENSG00000170144 (HNRNPA3), ENSG00000066427 (ATXN3), ENSG00000278129 (ZNF8), ENSG00000135482 (ZC3H10),	0.48555041	1
GO:0005515	protein binding	molecular_function	29	43	14009	21445	ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000066427 (ATXN3), ENSG00000169756 (LIMS1), ENSG00000177119 (ANO6), ENSG00000161911 (TREML1), ENSG00000117899 (MESDC2), ENSG00000150093 (ITGB1), ENSG00000198721 (ECI2), ENSG00000147003 (TMEM27), ENSG00000101457 (DNITIP1), ENSG00000130311 (DDA1), ENSG00000170144 (HNRNPA3), ENSG00000259207 (ITGB3), ENSG00000114302 (PRKAR2A), ENSG00000278129 (ZNF8), ENSG00000135124 (P2RX4), ENSG00000135482 (ZC3H10), ENSG00000163590 (PPM1L), ENSG00000164181 (ELOVL7), ENSG00000256671 (LIMS3L), ENSG00000107679 (PLEKHA1), ENSG00000188677 (PARVB), ENSG00000133997 (MED6), ENSG00000147475 (ERLIN2), ENSG00000119917 (IFIT3), ENSG00000241404 (EGFL8), ENSG00000150637 (CD226), ENSG00000187699 (C2orf88),	0.768267171	1
GO:0005488	binding	molecular_function	35	43	17182	21445	ENSG00000169756 (LIMS1), ENSG00000066427 (ATXN3), ENSG00000198721 (ECI2), ENSG00000150093 (ITGB1), ENSG00000117899 (MESDC2), ENSG00000172183 (ISG20), ENSG00000198482 (ZNF808), ENSG00000074935 (TUBE1), ENSG00000001630 (CYP51A1), ENSG00000259207 (ITGB3), ENSG00000170144 (HNRNPA3), ENSG00000135124 (P2RX4), ENSG00000135482 (ZC3H10), ENSG00000241404 (EGFL8), ENSG00000119917 (IFIT3), ENSG00000147475 (ERLIN2), ENSG00000133997 (MED6), ENSG00000107679 (PLEKHA1), ENSG00000150637 (CD226), ENSG00000177119 (ANO6), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000161911 (TREML1), ENSG00000101457 (DNITIP1), ENSG00000167625 (ZNF526), ENSG00000147003 (TMEM27), ENSG00000049883 (PTCD2), ENSG00000114302 (PRKAR2A), ENSG00000130311 (DDA1), ENSG00000278129 (ZNF8), ENSG00000164181 (ELOVL7), ENSG00000163590 (PPM1L), ENSG00000188677 (PARVB), ENSG00000256671 (LIMS3L), ENSG00000187699 (C2orf88),	0.837150357	1
GO:0035639	purine ribonucleoside triphosphate binding	molecular_function	4	43	1985	21445	ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000074935 (TUBE1), ENSG00000135124 (P2RX4),	0.735372916	1
GO:0001883	purine nucleoside binding	molecular_function	4	43	1998	21445	ENSG00000135124 (P2RX4), ENSG00000061918 (GUCY1B3), ENSG00000041353 (RAB27B), ENSG00000074935 (TUBE1),	1	1
GO:0032549	ribonucleoside binding	molecular_function	4	43	1998	21445	ENSG00000074935 (TUBE1), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3), ENSG00000135124 (P2RX4),	1	1
GO:0001882	nucleoside binding	molecular_function	4	43	2005	21445	ENSG00000135124 (P2RX4), ENSG00000074935 (TUBE1), ENSG00000041353 (RAB27B), ENSG00000061918 (GUCY1B3),	1	1
GO:0003677	DNA binding	molecular_function	5	43	2569	21445	ENSG00000066427 (ATXN3), ENSG00000167625 (ZNF526), ENSG00000198482 (ZNF808), ENSG00000278129 (ZNF8), ENSG00000101457 (DNITIP1),	1	1
GO:0016740	transferase activity	molecular_function	4	43	2361	21445	ENSG00000164181 (ELOVL7), ENSG00000137364 (TPMT), ENSG00000133997 (MED6), ENSG00000123427 (METTL21B)	1	1

Table S3 KEGG enrichment

pathway_ID	PATHWAY_DES	target_gene_in_this_pathway	target_gene_in_all_pathway	all_gene_in_this_pathway	all_gene_in_all_pathway	all_gene_list	Pvalue	Qvalue
hsa05412	Arrhythmogenic right ventricular cardiomyopathy (ARVC)	2	15	74	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.001720314	0.041287533
hsa04611	Platelet activation	3	15	122	6914	ENSG00000150093 (ITGB1), ENSG00000061918 (GUCY1B3), ENSG00000259207 (ITGB3),	0.000568765	0.027300739
hsa04512	ECM-receptor interaction	2	15	82	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.002303211	0.036851376
hsa05410	Hypertrophic cardiomyopathy (HCM)	2	15	83	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.002383691	0.028604288
hsa05414	Dilated cardiomyopathy	2	15	89	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.002903562	0.027874194
hsa04510	Focal adhesion	3	15	202	6914	ENSG00000150093 (ITGB1), ENSG00000188677 (PARVB), ENSG00000259207 (ITGB3),	0.003575027	0.028600218
hsa04514	Cell adhesion molecules (CAMs)	2	15	142	6914	ENSG00000150093 (ITGB1), ENSG00000150637 (CD226),	0.010606171	0.07272803
hsa04145	Phagosome	2	15	153	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.012980299	0.077881792
hsa05205	Proteoglycans in cancer	2	15	203	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.027474421	0.146530247
hsa04015	Rap1 signaling pathway	2	15	211	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.030373543	0.145793004
hsa04810	Regulation of actin cytoskeleton	2	15	214	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.031502562	0.137465724
hsa04151	PI3K-Akt signaling pathway	2	15	340	6914	ENSG00000150093 (ITGB1), ENSG00000259207 (ITGB3),	0.099191119	0.396764476
hsa05130	Pathogenic Escherichia coli infection	1	15	55	6914	ENSG00000150093 (ITGB1),	1	1
hsa04910	Insulin signaling pathway	1	15	139	6914	ENSG00000114302 (PRKAR2A),	1	1
hsa05145	Toxoplasmosis	1	15	118	6914	ENSG00000150093 (ITGB1),	1	1
hsa04380	Osteoclast differentiation	1	15	132	6914	ENSG00000259207 (ITGB3),	1	1
hsa04146	Peroxisome	1	15	83	6914	ENSG00000198721 (ECI2),	1	1
hsa05200	Pathways in cancer	1	15	397	6914	ENSG00000150093 (ITGB1),	1	1
hsa05100	Bacterial invasion of epithelial cells	1	15	78	6914	ENSG00000150093 (ITGB1),	1	1
hsa04730	Long-term depression	1	15	60	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04713	Circadian entrainment	1	15	95	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa05222	Small cell lung cancer	1	15	86	6914	ENSG00000150093 (ITGB1),	1	1
hsa04670	Leukocyte transendothelial migration	1	15	118	6914	ENSG00000150093 (ITGB1),	1	1
hsa00062	Fatty acid elongation	1	15	25	6914	ENSG00000164181 (ELOVL7),	1	1
hsa03040	Spliceosome	1	15	134	6914	ENSG00000170144 (HNRNPA3),	1	1
hsa04020	Calcium signaling pathway	1	15	179	6914	ENSG00000135124 (P2RX4),	1	1
hsa01100	Metabolic pathways	1	15	1238	6914	ENSG00000001630 (CYP51A1),	1	1
hsa04022	cGMP-PKG signaling pathway	1	15	167	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04919	Thyroid hormone signaling pathway	1	15	118	6914	ENSG00000259207 (ITGB3),	1	1
hsa04972	Pancreatic secretion	1	15	96	6914	ENSG00000041353 (RAB27B),	1	1
hsa00100	Steroid biosynthesis	1	15	20	6914	ENSG00000001630 (CYP51A1),	1	1
hsa05133	Pertussis	1	15	75	6914	ENSG00000150093 (ITGB1),	1	1
hsa00230	Purine metabolism	1	15	175	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa00071	Fatty acid degradation	1	15	44	6914	ENSG00000198721 (ECI2),	1	1
hsa04970	Salivary secretion	1	15	89	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04540	Gap junction	1	15	88	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa05206	MicroRNAs in cancer	1	15	256	6914	ENSG00000259207 (ITGB3),	1	1
hsa04924	Renin secretion	1	15	64	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04640	Hematopoietic cell lineage	1	15	87	6914	ENSG00000259207 (ITGB3),	1	1
hsa04360	Axon guidance	1	15	173	6914	ENSG00000150093 (ITGB1),	1	1
hsa00983	Drug metabolism - other enzymes	1	15	46	6914	ENSG00000137364 (TPMT),	1	1
hsa05140	Leishmaniasis	1	15	72	6914	ENSG00000150093 (ITGB1),	1	1
hsa05131	Shigellosis	1	15	65	6914	ENSG00000150093 (ITGB1),	1	1
hsa04141	Protein processing in endoplasmic reticulum	1	15	169	6914	ENSG00000066427 (ATXN3),	1	1
hsa04270	Vascular smooth muscle contraction	1	15	120	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04080	Neuroactive ligand-receptor interaction	1	15	277	6914	ENSG00000135124 (P2RX4),	1	1
hsa04921	Oxytocin signaling pathway	1	15	158	6914	ENSG00000061918 (GUCY1B3),	1	1
hsa04070	Phosphatidylinositol signaling system	1	15	98	6914	ENSG00000155099 (TMEM55A),	1	1