

Figure S1. Analysis of network topology for various soft-thresholding powers. Numbers in the plots indicate the corresponding soft thresholding powers. A soft threshold power of 7 was selected for further analysis.

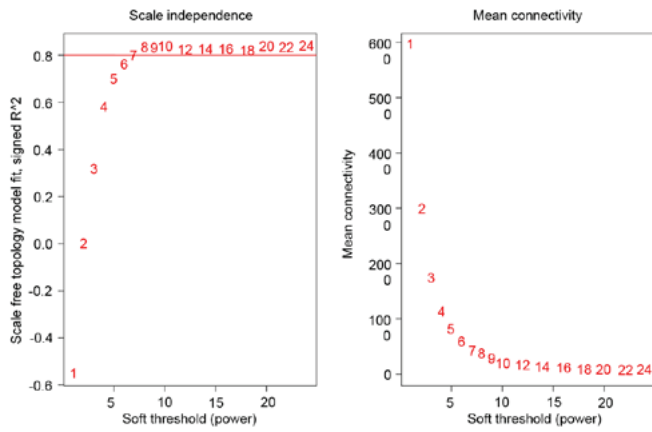


Figure S2. Clustering dendrograms of lncRNAs. Each colored row represents a corresponding module that contains a group of highly connected genes. As a result of weighted correlation network analysis, 27 co-expression modules were constructed, each containing 35-5,360 lncRNAs.

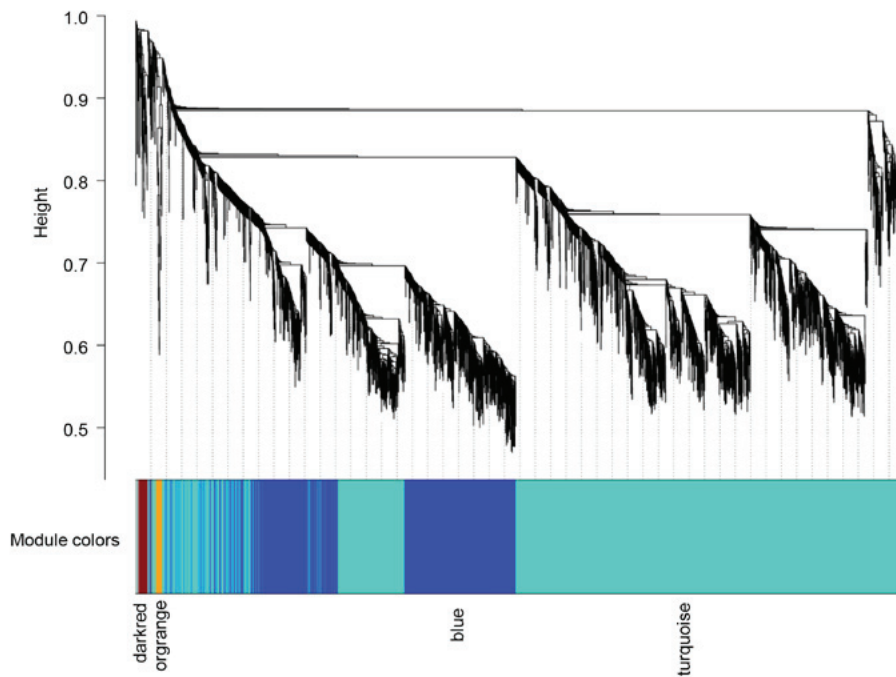


Figure S3. Scatterplots of MM vs. GS for clinical traits in the magenta module. Scatterplots of MM in the magenta module vs. GS for (A) HCM, (B) thickness, (C) obstruction, and (D) LA. GS, gene significance; MM, module membership; HCM, hypertrophic cardiomyopathy; LA, left atrial diameter.

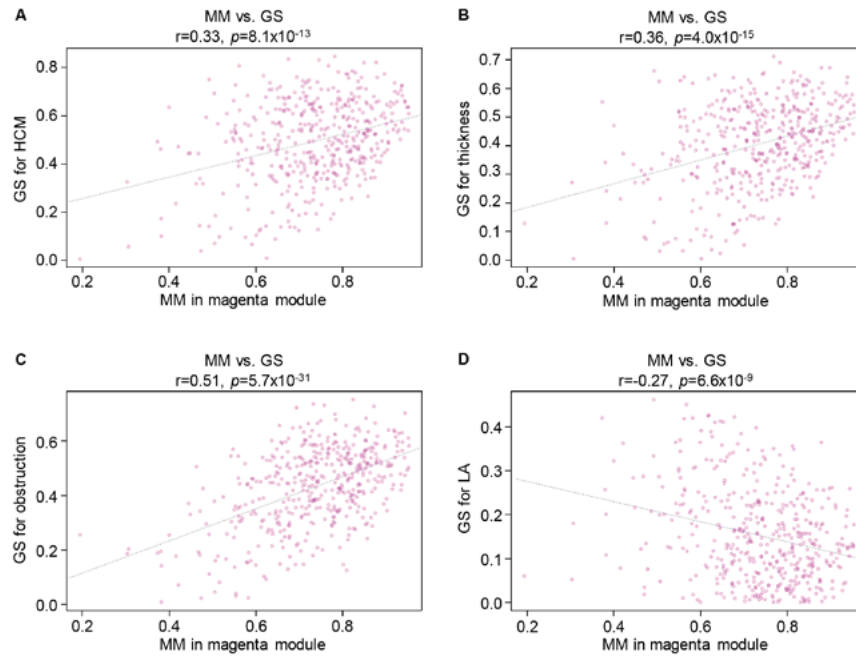


Figure S4. Scatterplots of MM vs. GS for clinical traits in the light-yellow module. Scatterplots of MM in the magenta module vs. GS for (A) HCM, (B) thickness, (C) obstruction and (D) LA. GS, gene significance; MM, module membership; HCM, hypertrophic cardiomyopathy; LA, left atrial diameter.

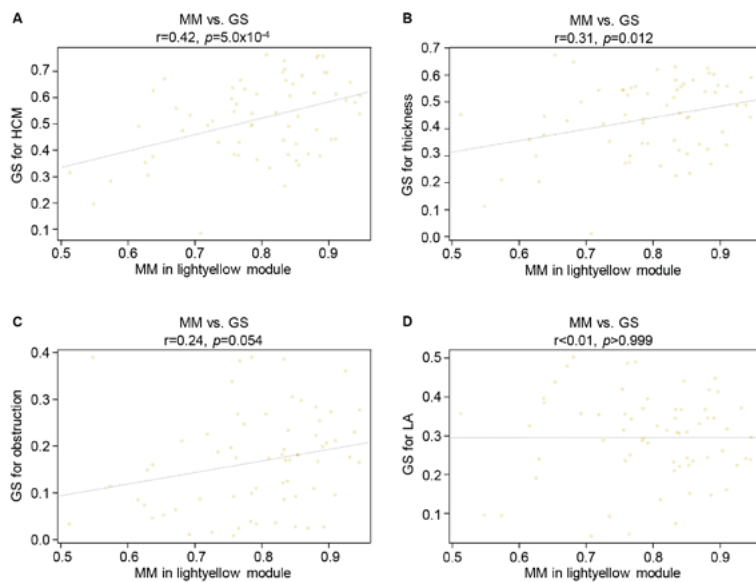


Figure S5. Functional annotation of lncRNAs in the magenta module. (A) GO terms for the host genes of lncRNAs in the magenta module. (B) Cardiac function-associated GO terms for the host genes of lncRNAs in the magenta module. P-values were adjusted using the Benjamini-Hochberg method. GO, Gene Ontology, lncRNA, long noncoding RNA.

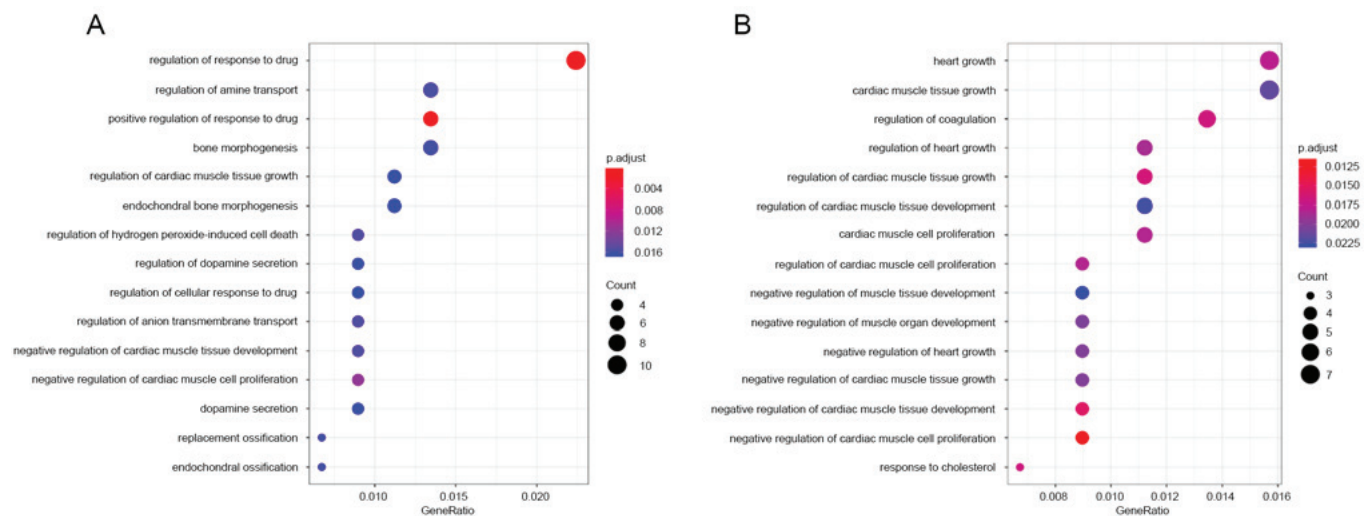


Table SI. Clinical characteristics of patients with HCM and controls.

Characteristic	HCM (n=14)	Control (n=7)	P-value
Subjects, n	14	7	
Age, years	60.92±10.27	54.71±7.49	0.173
Males, n (%)	7 (50.00)	3 (42.85)	0.757
BMI, kg/m <sup>2</sup>	23.68±2.72	22.36±1.39	0.249
Smoking, n (%)	4 (28.57)	0	0.255
Total cholesterol, mmol/l	4.28±0.68	6.03±1.21	<0.001
Triglyceride, mmol/l	1.43±0.96	1.08±0.50	0.381
White blood cell count, x10 <sup>9</sup> /l	7.44±1.20	6.24±0.91	0.031
Blood glucose, mmol/l	4.67±0.67	5.40±0.61	0.028
Hemoglobin, g/l	137.35±16.49	143.57±11.08	0.382
Creatinine, μmol/l	84.00±14.14	72.85±16.74	0.125
Systolic blood pressure, mmHg	123.28±9.31	73.07±12.14	0.126
Diastolic blood pressure, mmHg	116.57±8.46	78.57±9.14	0.306
Maximum LVWT, mm	20.00±4.52	9.28±1.25	<0.001
LVOTO, n (%)	6 (42.85)	0	0.061
LA, mm	38.92±6.25	31.71±2.36	0.009
IVSd, mm	17.00±5.87	9.28±1.25	<0.001
LVEF, %	68.28±8.99	67.71±6.92	0.161
RVDd, mm	19.78±2.66	19.57±1.98	0.853
LVDd, mm	45.21±7.09	45.42±4.27	0.943
ICD, n (%)	4 (28.57)	0	0.255

Categorical variables are presented as n (%). Continuous variables are presented as the mean ± SD. HCM, hypertrophic cardiomyopathy; BMI, body mass index; LVWT, left ventricular wall thickness; LVOTO, left ventricular outflow tract obstruction; LA, left atrial diameter; IVSd, interventricular septal end diastole; LVEF, left ventricular ejection fraction; RVDd, right ventricular diastolic diameter; LVDd, left ventricular diastolic diameter; ICD, implantable cardioverter-defibrillator.

Table SII. Hub lncRNAs in magenta modules.

Probe name	$\log_2$ (FC)	P-value	Adjusted P-value	Target ID	Gene symbol
CUST_8471_PI437845250111	1.84	$1.28 \times 10^{-6}$	0.004	ENST00000591225	RP11-132M7.3
A_22_P00022498	1.16	$2.91 \times 10^{-6}$	0.005	lnc-NAA16-2:1	lnc-NAA16-2
CUST_1405_PI437859739	1.49	$1.32 \times 10^{-5}$	0.013	lnc-PDZRN4-4:4	lnc-PDZRN4-4
A_21_P0012026	1.40	$1.48 \times 10^{-5}$	0.013	ENST00000432608	TEX41
CUST_2854_PI437845250111	1.68	$2.04 \times 10^{-5}$	0.013	ENST00000439440	RP11-452F19.3
CUST_2044_PI437845250111	1.81	$2.08 \times 10^{-5}$	0.013	ENST00000585330	LAMTOR5-AS1
CUST_2820_PI437845420	1.10	$1.44 \times 10^{-5}$	0.013	lnc-TLR2-3:1	lnc-TLR2-3
A_21_P0001153	0.93	$3.27 \times 10^{-5}$	0.014	NR_034089	LOC100131564
CUST_5685_PI437845250111	1.18	$3.23 \times 10^{-5}$	0.014	ENST00000488040	RP11-550I24.2
A_22_P00006790	0.88	$3.21 \times 10^{-5}$	0.014	lnc-FZD4-1:1	lnc-FZD4-1
A_22_P00008862	1.14	$7.11 \times 10^{-5}$	0.018	NR_038878	LINC00550
CUST_3927_PI437845250111	0.95	$7.92 \times 10^{-5}$	0.019	ENST00000433433	LINC01159
CUST_460_PI438111429	1.37	$1.04 \times 10^{-4}$	0.021	ENST00000429664	LINC01122
A_21_P0012197	0.98	$1.38 \times 10^{-4}$	0.024	TCONS_12_00017189	XLOC_12_009182
CUST_20907_PI437845250111	0.81	$1.74 \times 10^{-4}$	0.027	ENST00000425602	LINC00894
CUST_3503_PI438111429	1.09	$2.09 \times 10^{-4}$	0.028	NR_037632	MYCBP
CUST_18427_PI437845250111	0.87	$2.09 \times 10^{-4}$	0.028	ENST00000588047	CTD-2006C1.2
A_22_P00021401	0.87	$2.24 \times 10^{-4}$	0.030	ENST00000553990	NA
CUST_2135_PI438111429	0.77	$3.32 \times 10^{-4}$	0.035	ENST00000508688	HOXB-AS1
CUST_1276_PI437845250111	1.10	$3.53 \times 10^{-4}$	0.036	ENST00000607013	RP11-345P4.10
A_33_P3274754	0.85	$3.77 \times 10^{-4}$	0.037	NR_027455	LINC00893
CUST_1322_PI437845250111	0.95	$3.97 \times 10^{-4}$	0.037	ENST00000587071	TP73-AS1
A_21_P0004523	0.99	$4.16 \times 10^{-4}$	0.037	lnc-C5orf30-2:1	lnc-C5orf30-2
A_21_P0003982	1.17	$5.85 \times 10^{-4}$	0.041	NR_033832	LOC340113
CUST_13359_PI437845420	0.95	$7.06 \times 10^{-4}$	0.045	lnc-MSX1-5:1	lnc-MSX1-5
A_33_P3410232	0.63	$7.20 \times 10^{-4}$	0.045	NR_024541	LY6G6E
A_21_P0007594	1.26	$6.88 \times 10^{-4}$	0.045	lnc-SYT1-2:1	lnc-SYT1-2
CUST_4619_PI437859739	1.09	$9.53 \times 10^{-4}$	0.051	lnc-CLN6-3:2	lnc-CLN6-3
CUST_6810_PI437845250111	0.86	$1.05 \times 10^{-3}$	0.053	ENST00000610019	RP11-219C20.3
CUST_4030_PI437944915	0.95	$1.08 \times 10^{-3}$	0.053	lnc-ZNF672-2:3	lnc-ZNF672-2
A_21_P0012522	0.71	$1.13 \times 10^{-3}$	0.054	NR_037891	LOC100507391
A_21_P0007917	0.61	$1.24 \times 10^{-3}$	0.057	lnc-GPR183-2:3	lnc-GPR183-2
CUST_16451_PI437845250111	0.73	$1.30 \times 10^{-3}$	0.057	ENST00000566506	RP11-252A24.5
CUST_5408_PI437845250111	0.77	$1.47 \times 10^{-3}$	0.061	ENST00000609673	RP11-484K9.4
A_21_P0002906	0.58	$1.48 \times 10^{-3}$	0.061	NR_046852	TMEM212-AS1
A_33_P3663277	0.61	$1.50 \times 10^{-3}$	0.061	NR_038918	LOC339666
CUST_1328_PI437947525111	0.55	$1.51 \times 10^{-3}$	0.061	TCONS_00019217	linc-EIF3F-1
CUST_16739_PI437845250111	0.72	$1.65 \times 10^{-3}$	0.063	ENST00000570712	AC012146.7
A_21_P0011489	0.55	$1.94 \times 10^{-3}$	0.069	TCONS_12_00010286	XLOC_12_005553
A_22_P00004878	0.62	$2.02 \times 10^{-3}$	0.070	ENST00000567540	NA
A_21_P0007733	0.74	$2.12 \times 10^{-3}$	0.072	lnc-C12orf50-2:1	lnc-C12orf50-2
A_21_P0013163	0.82	$2.16 \times 10^{-3}$	0.072	NR_024045	RAET1K
A_33_P3324186	0.63	$2.24 \times 10^{-3}$	0.073	NR_046243	LOC642366
A_22_P00012241	0.90	$2.59 \times 10^{-3}$	0.078	lnc-PPIL2-1:1	lnc-PPIL2-1
CUST_7611_PI437859739	0.50	$2.61 \times 10^{-3}$	0.079	lnc-ASPDH-1:1	lnc-ASPDH-1
CUST_8803_PI437859739	0.70	$2.79 \times 10^{-3}$	0.082	lnc-MGAT4A-1:3	lnc-MGAT4A-1
CUST_2232_PI437947525	0.46	$2.81 \times 10^{-3}$	0.082	TCONS_12_00008486	linc-APBA2-3
A_23_P408930	0.45	$3.20 \times 10^{-3}$	0.088	NR_027688	OR7E5P
A_21_P0001645	0.62	$3.28 \times 10^{-3}$	0.090	lnc-TOMM20-2:7	lnc-TOMM20-2
CUST_16738_PI437845250111	0.61	$3.28 \times 10^{-3}$	0.090	ENST00000413077	AC012146.7
CUST_14253_PI437845250111	0.75	$3.54 \times 10^{-3}$	0.093	ENST00000570285	RP11-29G8.3
CUST_8771_PI437845250111	0.77	$3.62 \times 10^{-3}$	0.094	ENST00000603042	RP3-466P17.2
CUST_12515_PI437845250111	0.41	$4.15 \times 10^{-3}$	0.101	ENST00000533218	RP11-618K13.2
A_22_P00023600	0.90	$4.17 \times 10^{-3}$	0.101	ENST00000563289	NA
CUST_6013_PI437859739	0.58	$4.67 \times 10^{-3}$	0.108	lnc-USP36-2:1	lnc-USP36-2
A_22_P00019529	0.36	$5.29 \times 10^{-3}$	0.112	NR_125874	LOC102724096

Table SII. Continued.

Probe name	log <sub>2</sub> (FC)	P-value	Adjusted P-value	Target ID	Gene symbol
CUST_17640_PI437845250111	0.53	5.34x10 <sup>-3</sup>	0.112	ENST00000588701	RP11-936I5.1
A_22_P00021795	0.60	5.55x10 <sup>-3</sup>	0.115	NR_046600	MTOR-AS1
CUST_16109_PI437845250111	0.71	6.14x10 <sup>-3</sup>	0.120	ENST00000609586	AC009158.1
CUST_12586_PI437845250111	0.47	7.58x10 <sup>-3</sup>	0.130	ENST00000535076	SNHG1
A_32_P56249	0.52	8.13x10 <sup>-3</sup>	0.134	NR_038996	USP30-AS1
CUST_10245_PI437845420	0.46	8.38x10 <sup>-3</sup>	0.136	lnc-ARHGAP4-1:1	lnc-ARHGAP4-1
A_21_P0005793	0.67	9.14x10 <sup>-3</sup>	0.143	lnc-ANGPT2-2:4	lnc-ANGPT2-2
A_24_P92451	0.60	9.26x10 <sup>-3</sup>	0.143	NR_108107	FAM230B
A_22_P00012686	0.51	9.50x10 <sup>-3</sup>	0.145	ENST00000584807	ESP33
CUST_10341_PI437845250111	0.57	9.99x10 <sup>-3</sup>	0.148	ENST00000519233	RP11-68L18.1
A_22_P00005903	0.57	1.04x10 <sup>-2</sup>	0.150	ENST00000434589	NA
CUST_7164_PI437859739	0.42	1.48x10 <sup>-2</sup>	0.176	lnc-ZNF98-6:1	lnc-ZNF98-6
CUST_2094_PI437859739	0.54	1.53x10 <sup>-2</sup>	0.178	lnc-GLT8D2-1:1	lnc-GLT8D2-1
CUST_22545_PI437845250	0.44	1.62x10 <sup>-2</sup>	0.182	TCONS_12_00022946	linc-GTF2H2-1
CUST_13143_PI437845420	0.44	1.93x10 <sup>-2</sup>	0.196	lnc-KLK4-2:1	lnc-KLK4-2
A_21_P0006231	0.47	2.86x10 <sup>-2</sup>	0.236	lnc-METTLL11A-5:1	lnc-METTLL11A-5
CUST_8244_PI437845250111	0.45	3.08x10 <sup>-2</sup>	0.243	ENST00000477984	LINC00336

A total of 73 hub lncRNAs were identified in the magenta module. Twenty-seven hub lncRNAs were significantly dysregulated. FC, fold-change; NA, not available; lncRNA, long noncoding RNA.



Table SIII. Hub lncRNAs in the light-yellow module.

Probe name	log <sub>2</sub> (FC)	P-value	Adjusted P-value	Target ID	Gene symbol
A_22_P00006790	0.88	3.21x10 <sup>-5</sup>	0.014	lnc-FZD4-1:1	lnc-FZD4-1
CUST_19393_PI437845250111	1.04	4.05x10 <sup>-5</sup>	0.015	ENST00000415411	FAM182A
A_22_P00014379	0.94	4.01x10 <sup>-5</sup>	0.015	lnc-SEZ6-1:1	lnc-SEZ6-1
CUST_9766_PI437845420	1.30	5.51x10 <sup>-5</sup>	0.016	lnc-ZC3H12B-14:1	lnc-ZC3H12B-14
CUST_7120_PI437845250111	1.02	5.42x10 <sup>-5</sup>	0.016	ENST00000505518	CTD-2218G20.2
A_21_P0007236	0.80	7.12 x10 <sup>-5</sup>	0.018	lnc-P2RY6-1:1	lnc-P2RY6-1
CUST_4226_PI437845250111	0.79	8.56x10 <sup>-5</sup>	0.020	ENST00000608652	TEX41
A_21_P0000675	1.21	1.58x10 <sup>-4</sup>	0.025	NR_037168	LOC100287846
A_22_P00006715	1.15	2.37x10 <sup>-4</sup>	0.030	ENST00000465347	NA
CUST_9360_PI437859739	0.92	2.97x10 <sup>-4</sup>	0.033	lnc-UBR3-1:3	lnc-UBR3-1
A_22_P00012462	0.93	3.07x10 <sup>-4</sup>	0.034	lnc-PRR15-1:1	lnc-PRR15-1
CUST_96_PI438111429	0.81	3.86x10 <sup>-4</sup>	0.037	ENST00000333854	RP11-181G12.2
A_21_P0004719	0.99	6.91x10 <sup>-4</sup>	0.045	ENST00000443445	NA
A_21_P0007689	0.58	1.07x10 <sup>-3</sup>	0.053	lnc-HIST4H4-3:1	lnc-HIST4H4-3
CUST_4030_PI437944915	0.95	1.08x10 <sup>-3</sup>	0.053	lnc-ZNF672-2:3	lnc-ZNF672-2
A_33_P3353991	0.66	1.10x10 <sup>-3</sup>	0.054	lnc-OR10AB1P-1:1	lnc-OR10AB1P-1
CUST_16451_PI437845250111	0.73	1.30x10 <sup>-3</sup>	0.057	ENST00000566506	RP11-252A24.5
A_21_P0002906	0.58	1.48x10 <sup>-3</sup>	0.061	NR_046852	TMEM212-AS1
CUST_1328_PI437947525111	0.55	1.51x10 <sup>-3</sup>	0.061	TCONS_00019217	linc-EIF3F-1
CUST_2588_PI437845250111	0.64	1.72x10 <sup>-3</sup>	0.064	ENST00000457217	RP11-222A5.1
CUST_9091_PI437859739	0.68	1.94x10 <sup>-3</sup>	0.069	lnc-C2orf27A-4:1	lnc-C2orf27A-4
A_33_P3324186	0.63	2.24x10 <sup>-3</sup>	0.073	NR_046243	LOC642366
CUST_5385_PI437845420	0.74	2.29x10 <sup>-3</sup>	0.074	lnc-PGM3-3:1	lnc-PGM3-3
A_22_P00004478	0.66	2.37x10 <sup>-3</sup>	0.075	NR_038930	LOC100507250
A_21_P0005609	0.71	2.76x10 <sup>-3</sup>	0.081	NR_024586	KMT2E-AS1
CUST_13248_PI437845250111	0.73	2.82x10 <sup>-3</sup>	0.082	ENST00000456299	RP11-444D3.1
CUST_5377_PI437845420	0.64	2.99x10 <sup>-3</sup>	0.086	lnc-FAM46A-4:2	lnc-FAM46A-4
A_21_P0008052	0.57	3.52x10 <sup>-3</sup>	0.093	lnc-NHLRC3-1:1	lnc-NHLRC3-1
CUST_8771_PI437845250111	0.77	3.62x10 <sup>-3</sup>	0.094	ENST00000603042	RP3-466P17.2
A_21_P0010995	0.69	4.59x10 <sup>-3</sup>	0.106	TCONS_12_00004725	XLOC_12_002441
A_22_P00023423	0.52	5.19x10 <sup>-3</sup>	0.112	lnc-AP000892.4.1-1:1	lnc-AP000892.4.1-1
CUST_12586_PI437845250111	0.47	7.58x10 <sup>-3</sup>	0.130	ENST00000535076	SNHG1
CUST_10245_PI437845420	0.46	8.38x10 <sup>-3</sup>	0.136	lnc-ARHGAP4-1:1	lnc-ARHGAP4-1
CUST_162_PI437859739	0.33	8.67x10 <sup>-3</sup>	0.138	lnc-CD248-1:1	lnc-CD248-1
CUST_4950_PI437845250111	0.39	8.66x10 <sup>-3</sup>	0.138	ENST00000430219	GRIP2
A_21_P0010070	0.75	1.01x10 <sup>-2</sup>	0.148	lnc-TCFL5-3:2	lnc-TCFL5-3
CUST_7164_PI437859739	0.42	1.48x10 <sup>-2</sup>	0.176	lnc-ZNF98-6:1	lnc-ZNF98-6
CUST_22545_PI437845250	0.44	1.62x10 <sup>-2</sup>	0.182	TCONS_12_00022946	linc-GTF2H2-1
CUST_3448_PI437944915	0.40	1.73x10 <sup>-2</sup>	0.188	lnc-ATP6V1G3-8:1	lnc-ATP6V1G3-8
CUST_13143_PI437845420	0.44	1.93x10 <sup>-2</sup>	0.196	lnc-KLK4-2:1	lnc-KLK4-2
A_21_P0006231	0.47	2.86x10 <sup>-2</sup>	0.236	lnc-METTL11A-5:1	lnc-METTL11A-5
CUST_8244_PI437845250111	0.45	3.08x10 <sup>-2</sup>	0.243	ENST00000477984	LINC00336

A total of 42 hub lncRNAs were identified in the light-yellow module. Thirteen hub lncRNAs were significantly dysregulated. FC, fold-change; NA, not available; lncRNA, long noncoding RNA.

Table SIV. Functional annotation of three differentially expressed hub lncRNAs.

LncRNA	Gene symbol	GO term	P-value
lnc-P2RY6-1:1	lnc-P2RY6-1	GO:0002292 T cell differentiation involved in immune response	3.82x10 <sup>-4</sup>
		GO:0032352 positive regulation of hormone metabolic process	8.34x10 <sup>-4</sup>
		GO:0043950 positive regulation of cAMP-mediated signaling	3.21x10 <sup>-3</sup>
		GO:0010660 regulation of muscle cell apoptotic process	4.99x10 <sup>-3</sup>
		GO:0003208 cardiac ventricle morphogenesis	6.29x10 <sup>-3</sup>
ENST00000488040	RP11-550I24.2	GO:0060419 heart growth	4.15x10 <sup>-4</sup>
		GO:0055017 cardiac muscle tissue growth	2.95x10 <sup>-4</sup>
		GO:0010613 positive regulation of cardiac muscle hypertrophy	4.48x10 <sup>-3</sup>
		GO:0003301 physiological cardiac muscle hypertrophy	3.44x10 <sup>-3</sup>
		GO:0050432 catecholamine secretion	1.51x10 <sup>-2</sup>
ENST00000588047	CTD-2006C1.2	GO:1901984 negative regulation of protein acetylation	5.60x10 <sup>-5</sup>
		GO:0001783 B cell apoptotic process	2.09x10 <sup>-3</sup>
		GO:0050432 catecholamine secretion	1.72x10 <sup>-3</sup>
		GO:0016242 negative regulation of macroautophagy	3.08x10 <sup>-3</sup>
		GO:2000406 positive regulation of T cell migration	3.08x10 <sup>-3</sup>

For each differentially expressed hub lncRNA, five significant GO terms are presented (P<0.05). GO, Gene Ontology; cAMP, cyclic adenosine monophosphate; lncRNA, long noncoding RNA.