SUPPLEMENTAL MATERIAL

DISCUSSION

Transcriptome changes were confirmed by RT-PCR. A thorough description of these genes and their role in myocyte disease/function are presented below.

WNT- An increase in WNT9A expression was observed in pediatric and adult DCM patients (Figures 4A and 4D). WNT stimulates β-catenin signaling through frizzled receptors, and frizzled receptors were also significantly increased (FZD1 p=0.0235, FZD4 p=0.0347), which could lead to an increase in β-catenin signaling, and effects in cell regeneration and/or pathologic remodeling(1). WNT9A has also been implicated in the epicardial-to-mesenchymal transition in a neonatal mouse model of cardiac injury, suggesting a role for WNT9A in fibrosis formation in the neonatal heart(2). Interestingly, we have recently shown that the presence of fibrosis is greatly diminished in the pediatric DCM heart(3).

MDK - MDK is highly expressed during embryonic development, and is involved in growth, development and repair. In the heart, MDK has been shown to have a protective effect against tachycardia-induced HF and acute ischemia/reperfusion injury (reviewed in(4)); transgenic over-expression or increased circulating MDK levels have a protective effect in animal models of ischemic HF, through its anti-apoptotic and pro-angiogenic effects(4). However, in a pressure overload model of HF (transverse aortic constriction – TAC), increased MDK levels resulted in worsening of HF and pathologic remodeling(4). MDK stimulates the JAK/STAT pathway, resulting in tumor cell proliferation and cell survival(5). In addition, MDK is expressed in mouse embryonic stem cells promoting cell proliferation and renewal through the PI3K/Akt pathway(6). MDK expression is dramatically increased in pediatric but not in adult DCM patients (Figures 4A and 4D), suggesting a pediatric-specific function for MDK.

CTF1 and the JAK/STAT pathway – JAK2 expression is up-regulated in pediatric and adult DCM patients (Figures 4A and D), suggesting an increase in activity of the JAK/STAT pathway. The JAK/STAT pathway is involved in reprogramming of fibroblasts into proliferative

induced cardiac progenitor cells and in cell survival and pathologic remodeling (reviewed in(7)). JAK2 activation alone is sufficient to induce self-renewal of stem cells, and is a major component of pluripotent stem cell signaling(7). In addition, CTF1, a pro-proliferative stem cell cytokine that can induce hypertrophy and prolong survival, is up-regulated in pediatric DCM patients. CTF1 binds to the Leukemia Inhibitory Factor (LIF) receptor and stimulates signaling via JAK/STAT(8). Although our results did not show a significant increase in CTF1 expression in adult patients, another study showed a small, but significant increase in CTF1 expression in adult DCM and ischemic HF patients(9).

FGF1 and FGF18 - Increases in FGF1 ($p=0.00026$) and FGF18 ($p=0.00039$) in the pediatric DCM heart suggest activation of FGF signaling. FGF1 can induce cardiomyocyte proliferation and differentiation(10). FGF18 can inhibit fibroblast proliferation and decrease apoptosis(11) and is widely expressed in cardiovascular tissue, including the left and right ventricles. Its expression is substantially decreased in healthy adult hearts(12). Notably, FGF18 is known to maintain stem cell populations(13).

DDX17 – DDX17 is an RNA helicase that, in association with DDX5, is involved in orchestrating transcription and splicing to coordinate cellular differentiation(14). Down-regulation of DDX5 and DDX17 results in myoblast differentiation(14). In addition, DDX17 binds to SOX2, resulting in increased tumorigenesis and stem-like features conferred by SOX2 in cancer cells(15). The up-regulation of DDX17 is in agreement with dedifferentiation and cellular proliferation in pediatric DCM hearts.

HMGB2 - HMGB2 is a non-histone chromatin-associated protein that is highly up-regulated in mesenchymal stem cells(16). HMGB2 interacts with Oct4 in mouse or human embryonic stem cells(17) and its expression declines during differentiation of mesenchymal stem cells(16). Furthermore, HMGB2 expression is associated with telomerase activity; in human neuroectodermal cells derived from human embryonic stem cells, down-regulation of HMGB2

resulted in a dramatic increase in telomerase activity(18). Interestingly, the cardiac stem cells identified by Wehman et al in pediatric DCM patients had shorter telomeres and decreased proliferative properties(19). The increase in HMGB2 expression observed in pediatric patients may affect telomere length.

TBX5 – The T-box protein 5 is increased in pediatric DCM hearts. TBX5 functions in early heart development and activates the myocardial gene program(20). During reprogramming of fibroblasts into cardiac progenitor cells, TBX5, in addition to GATA4 and MESP1, is important to maintain multipotency and proliferation(7). Furthermore, TBX5 is involved in cardiomyogenic reprogramming of adult cardiac stem cells and bone marrow mesenchymal stromal cells(21).

CXCL12 – CXCL12/SDF-1 is a chemokine integral to cardiac development and repair processes due to its ability to attract stem cells to injured myocardium(22). Moreover, delivery of mesenchymal stem cells over-expressing CXCL12 to the injured myocardium significantly increases the homing of bone marrow-derived progenitor cells to the myocardium, resulting in regeneration of new cardiomyocytes and blood vessels in a myocardial infarction model(23).

CUX1 – is part of a family of transcriptional factors that can activate or repress transcription, and its expression is increased in pediatric DCM hearts. CUX1 can regulate expression of several genes involved in DNA replication, progression to S phase and cell motility(24, 25). The long p200 isoform functions as a transcription repressor, which can be proteolytically processed to CUXp110 or CUXp75 isoforms. p110 can act as an activator or repressor, and expression of p75 has not been detected in cardiomyoytes. Proteolytic cleavage of p200 into p110 occurs in response to leptin activation of JAK/STAT and is pro-hypertrophic(26).

CCND1 and CCND2 - cyclins are a family of proteins involved in regulating cell cycle progression (reviewed in(27)). During cardiac development cyclins are highly expressed and are associated with the increase in myocyte number. Expression is down-regulated post-

natally as myocytes become differentiated. During cardiac hypertrophy expression of cyclins is increased, which is associated with an increase in cell size. However, this increase is transient lasting hours or days depending on insult and/or species, consistent with no changes in CCND1 expression in adult HF (Figure 4D). Interestingly, CCND1 and CCND2 expression is increased in pediatric DCM. This may be due to re-expression of these genes, or that their expression was maintained post-natally, negatively affecting cardiomyocyte maturation. Moreover, mouse over-expression of CCND2 results in increased cardiomyocyte proliferation post-natally(28). Although speculative, this increase could be associated with increased myocyte division that may result in improper differentiation.

Based on published data and putative transcription factor binding sites shown in Figure 5C, there is a possible interaction between paediatric DCM dysregulated factors. CUX1 is predicted to regulate expression of TBX5, HMGB2, CTF1, CXCL12, JAK2, DDX17 and WNT9A. In addition, previous studies have shown that WNT/β-catenin pathway can regulate expression of FGF18(29) and MDK(30). MDK, in turn can activate the JAK/STAT pathway(5), which has been shown to promote expression of p110CUX1(26). The JAK/STAT pathway can also activate WNT/β-catenin. Furthermore, CTF1 can activate the JAK/STAT pathway(31). Finally, DDX17 and DDX5 promote expression of CCND1 through β-catenin(15, 32). This suggests a possible combinatorial response that results in an age-dependent activation of genes linked to pluripotency, proliferation, and remodelling.

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ID	Group	Sex	Age at tissue collection	EF/FS (%)	LVIDd (cm)	z-score	Genetic Testing	Etiology	Inotrope*	Digoxin	ACEi	Beta Blocker	Diuretic	Anti-Arrhythmic	VAD	RNA Seq	Cell # & Area	RT-PCR
Non-Failing (n = 24)																		
1	NF	F	1.3	49 / 20	NA	NA			Y	N	N	N	N	N	N	x		x
2	NF	M	1.4	NA	NA	NA			N	N	N	N	N	N	N	x		x
3	NF	F	1.5	27 / --	NA	NA			Y	N	N	N	N	N	N	x		
4	NF	F	8.64	NA	NA	NA			Y	N	N	N	N	N	N	x		x
5	NF	M	8.69	NA	NA	NA			NA	N	N	N	N	N	N	x		x
6	NF	F	11.7	NA	NA	NA			Y	N	N	N	N	N	N	x		x
7	NF	M	7.4	NA	NA	NA			Y	N	N	N	N	N	N	x	x	
8	NF	M	13.65	NA	NA	NA			Y	N	N	N	N	N	N		x	x
9	NF	M	14	37 / --	NA	NA			NA	N	N	N	N	N	N		x	x
10	NF	F	16	76 / --	NA	NA			NA	N	N	N	N	N	N		x	x
11	NF	M	17	NA	NA	NA			NA	N	N	N	N	N	N		x	x
12	NF	M	2.87	NA	NA	NA			Y	N	N	N	N	N	N		x	
13	NF	F	8	NA	NA	NA			N	N	N	N	N	N	N		x	x
14	NF	F	14	50 / 24	NA	NA			NA	N	N	N	N	N	N			x
15	NF	M	15	54 / --	NA	NA			NA	N	N	N	N	N	N			x
16	NF	M	15	NA	NA	NA			NA	N	N	N	N	N	N			x
17	NF	F	16	30 / --	NA	NA			NA	N	N	N	N	N	N			x
18	NF	M	17	65 / --	NA	NA			NA	N	N	N	N	N	N			x
19	NF	F	17	60 / --	NA	NA			NA	N	N	N	N	N	N			x
20	NF	F	17	20 / --	NA	NA			NA	N	N	N	N	N	N			x
21	NF	M	17	35 / 28	NA	NA			NA	N	N	N	N	N	N			x
22	NF	M	17	50 / 24	NA	NA			N	N	N	N	N	N	N			x
23	NF	M	7	NA	NA	NA			N	N	N	N	N	N	N			x
24	NF	M	9.51	NA	NA	NA			Y	N	N	N	N	N	N			x
Dilated Cardiomypathy (n = 37)																		
25	DCM	M	0.05	N/A	N/A	N/A	N	LV NC	N	Y	N	N	Y	N	N	x		x
26	DCM	M	12.46	-- / 7	6	5.7#	N	IDC	Y	Y	Y	N	Y	N	N	x		x
27	DCM	F	10.89	-- / 22	6.3	8.7	N	IDC	Y	Y	Y	Y	Y	Y	N	x		x
28	DCM	M	4.62	29 / 16	3.7	1.4	N	IDC	N	Y	Y	N	N	N	N	x		x
29	DCM	M	2.87	14 / 7	4.5	5.3	N	IDC	Y	N	Y	N	Y	Y	N	x		x
30	DCM	F	11.59	-- / 16	5.7	5	N	LV NC	N	N	Y	N	N	Y	N	x		x
31	DCM	F	3.59	28 / 15	5.7	10	N	IDC	Y	N	Y	N	Y	N	N	x	x	x
32	DCM	F	4.08	37 / 12	5.4	6.3	Y*	IDC	Y	N	Y	N	N	N	N		x	x
33	DCM	F	11.45	27 / 16	6.5	5.4	N	IDC	Y	N	N	N	Y	N	Y		x	x
34	DCM	M	13.58	20 / 11	7.3	10	N	IDC	Y	N	Y	N	Y	N	N		x	x
35	DCM	M	0.96	-- / 5	5	9.4#	N	IDC	Y	Y	Y	N	Y	N	N			x
36	DCM	F	0.97	-- / 8	3.9	5.3	Y*	IDC	Y	N	N	N	Y	N	N			x
37	DCM	F	15.77	-- / 26	7.2	8.4	N	IDC	Y	N	Y	Y	Y	N	N			x
38	DCM	F	0.05	-- / 4	3.7	10.7	N	IDC	Y	N	N	N	N	N	N			x
39	DCM	F	0.78	-- / 10	4.3	10.4	N	IDC	Y	Y	Y	N	Y	N	N			x
40	DCM	M	1.3	-- / 5	5.8	13#	N	IDC	Y	N	Y	N	Y	Y	N			x
41	DCM	F	1.39	22 / 17	4.2	10.2	N	IDC	Y	Y	Y	N	Y	N	N			x
42	DCM	M	4.53	15 / 7	5	4.8	N	IDC	Y	Y	Y	N	Y	N	N			x
43	DCM	M	17.67	-- / 11	7.1	8.7	N	IDC	Y	Y	Y	N	Y	N	N			x
44	DCM	F	2.47	41 / 18	4.3	4.3	N	IDC	Y	Y	Y	N	Y	N	N			x
45	DCM	F	0.34	25 / 8	2.6	5.1	N	IDC	Y	N	Y	N	N	N	N			x
46	DCM	F	12.08	25 / 8	6.7	7.9	N	IDC	Y	N	Y	N	Y	N	N			x
47	DCM	M	16.13	17 / 9	8.5	7.7	N	IDC	Y	N	Y	Y	N	Y	N			x
48	DCM	F	3.87	27 / 20	4.5	4.9	N	IDC	Y	Y	Y	Y	Y	N	N			x
49	DCM	M	9.76	21 / 17	5.9	6.7	Y*	IDC	Y	N	Y	N	Y	Y	N			x
50	DCM	F	14.93	-- / 4	6.8	7.8	N	IDC	Y	N	Y	Y	Y	N	Y			x
51	DCM	M	0.58	-- / 8	4.6	10.4	N	IDC	Y	N	N	N	Y	N	Y			x
52	DCM	M	1	17 / 5	5.7	14.2	N	IDC	Y	N	Y	N	Y	N	N			x
53	DCM	F	0.06	-- / 5	2.5	2.5	N	IDC	Y	N	N	N	Y	Y	N			x
54	DCM	F	0.55	-- / 4	4.4	10.4	N	VM	Y	N	Y	N	Y	N	N			x
55	DCM	F	9	NA	NA	NA	NA	NA	Y	N	N	N	N	N	N			x
56	DCM	M	16	NA	NA	NA	NA	NA	Y	N	N	N	N	N	N			x
57	DCM	F	3.8	-- / 12	5	5.6	N	IDC	N	Y	Y	N	Y	N	N			x
58	DCM	M	13.17	-- / 23	7.7	11.1	N	IDC	Y	Y	Y	Y	Y	N	N			x
59	DCM	M	2.3	-- / 10	3.4	3.1	N	IDC	Y	N	Y	N	Y	N	N			x
60	DCM	F	0.92	-- / 8	4.1	9.8	N	IDC	Y	N	Y	N	N	N	N			x
61	DCM	M	13.94	-- / 12	5.8	3.9#	N	IDC	Y	Y	N	N	Y	N	N			x
RNA Seq	**NF**	**43% M**	**5.8**	**38 / 20**					**83%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	x		
	DCM	**57% M**	**6.6**	**24 / 14**	**5.2**	**7.4**			**57%**	**57%**	**86%**	**14%**	**71%**	**42%**	**0%**	x		
Histology	**NF**	**71% M**	**11.3**	**57 / --**					**75%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**		x	
	DCM	**57% M**	**8.2**	**28 / 14**	**6.2**	**7.9**			**100%**	**0%**	**75%**	**0%**	**75%**	**0%**	**25%**		x	
RT-PCR	**NF**	**57% M**	**12.5**	**48 / 24**					**56%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**			x
	DCM	**57% M**	**6.5**	**24 / 11**	**5.3**	**7.4**			**90%**	**38%**	**76%**	**16%**	**76%**	**19%**	**11%**			x
All Pts	**NF**	**60% M**	**11.4**	**62 / 28**					**67%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**			
	DCM	**57% M**	**6.5**	**24 / 11**	**5.3**	**7.6**			**90%**	**38%**	**76%**	**16%**	**76%**	**19%**	**11%**			

Table S1: Pediatric Patient Characteristics. Demographic data is divided by method. Average age of patients for RNA Seq: NF = 5.8 yrs; DCM = 6.6 yrs. Average age of patients for histology: NF = 11.3 yrs; DCM = 8.2 yrs. Average age of patients for RT-PCR: 12.5 yrs; DCM

=6.5 yrs. Average age of all patients studied: NF = 11.4 yrs; DCM = 6.5 yrs. ID = Identification, NF = Non-Failing, DCM = Dilated Cardiomyopathy, M = Male, F = Female, ACEi = Angiotensin-Converting Enzyme Inhibitor, EF = Ejection Fraction, FS = Fractional Shortening, NA = Not Available, *Inotropes include: Phosphodiesterase Inhibitors, Dobutamine, Dopamine, Epinephrine, Norepinephrine, Vasopressin, IDC = idiopathic dilated cardiomyopathy, LV NC = LV non compaction, VM = viral myocarditis, LVIDd = left ventricular internal dimension at end-diastole, calculated via m-mode on echocardiogram, z-score# = Body surface area not available, so the CDC growth curve was used to estimate 50%-ile weight and height based on age and sex to calculate LVIDd z-score; Y* = Indicates genetic testing was performed and there was no identifiable sarcomeric or disease causing mutation.

ID	Group	Sex	Age at tissue collection	EF/FS	Inotrope*	Digoxin	ACEi	Beta Blocker	Diuretic	Anti-Arrhythmic	VAD	Cell # & Area	RT-PCR
Non-Failing (n = 19)													
1	NF	M	22	30 / --	Y	NA	NA	NA	Y	NA	N	x	
2	NF	M	30	50 / --	Y	NA	NA	NA	NA	NA	N	x	
3	NF	M	33	70 / --	Y	N	N	N	N	N	N	x	
4	NF	M	37	65 / --	Y	NA	NA	NA	Y	NA	N	x	
5	NF	F	51	60 / --	Y	NA	NA	NA	NA	NA	N	x	
6	NF	F	59	NA	N	N	N	N	N	N	N	x	
7	NF	F	64	88 / --	Y	N	N	N	N	N	N	x	
8	NF	F	65	NA	Y	N	N	N	N	N	N	x	
9	NF	F	74	NA	N	N	N	N	N	N	N	x	
10	NF	M	29	32 / --	N	N	N	N	N	N	N		x
11	NF	M	44	74 / --	Y	N	N	N	N	N	N		x
12	NF	M	46	70 / --	Y	N	N	N	N	N	N		x
13	NF	M	52	50 / --	Y	N	N	N	N	N	N		x
14	NF	M	52	39 / --	N	N	N	N	N	N	N		x
15	NF	M	59	60 / --	Y	N	N	N	N	N	N		x
16	NF	F	59	35 / --	N	N	N	Y	N	N	N		x
17	NF	M	60	NA	N	N	N	N	N	N	N		x
18	NF	M	65	74 / --	N	N	N	N	N	N	N		x
19	NF	F	69	NA	N	N	N	N	N	N	N		x
Dilated Cardiomypathy (n = 24)													
20	DCM	M	26	15 / --	Y	N	N	N	Y	N	N	x	
21	DCM	M	35	10 / --	N	Y	Y	N	Y	N	N	x	
22	DCM	M	49	17 / --	Y	Y	Y	N	Y	Y	N	x	
23	DCM	F	51	24 / --	N	Y	Y	N	Y	N	N	x	
24	DCM	M	16	NA	Y	Y	Y	NA	Y	NA	N		x
25	DCM	M	17	19 / --	Y	Y	Y	NA	Y	NA	N		x
26	DCM	M	21	-- / 8.5	N	N	Y	Y	Y	N	N		x
27	DCM	M	22	11 / --	Y	Y	Y	Y	Y	NA	N		x
28	DCM	M	28	10 / --	Y	N	N	N	Y	Y	N		x
29	DCM	M	38	NA	Y	NA	NA	NA	NA	NA	N		x
30	DCM	M	41	17 / --	N	Y	N	Y	Y	N	N		x
31	DCM	F	46	20 / --	N	Y	Y	N	Y	N	N		x
32	DCM	M	47	8 / --	N	Y	N	Y	Y	N	N		x
33	DCM	M	48	10 / --	N	N	N	N	N	Y	N		x
34	DCM	M	52	NA	Y	Y	NA	NA	NA	NA	N		x
35	DCM	F	53	20 / --	N	Y	N	N	Y	N	N		x
36	DCM	M	59	NA	Y	NA	NA	NA	NA	NA	N		x
37	DCM	M	60	NA	Y	NA	NA	NA	NA	NA	N		x
38	DCM	F	60	8 / --	N	Y	Y	NA	Y	N	N		x
39	DCM	M	62	9 / --	N	Y	Y	N	Y	N	N		x
40	DCM	M	63	20 / --	N	N	Y	Y	Y	N	N		x
41	DCM	M	65	NA	Y	NA	Y	NA	Y	NA	N		x
42	DCM	M	65	7 / --	N	Y	Y	Y	Y	N	N		x
43	DCM	NA	NA	NA	Y	NA	NA	NA	NA	NA	N		x
Histology	**NF**	**44% M**	**48.3**	**61 / --**	**78%**	**0%**	**0%**	**29%**	**0%**	**0%**	**0%**	x	
	DCM	**75% M**	**40.3**	**17 / --**	**50%**	**75%**	**75%**	**0%**	**100%**	**25%**	**0%**	x	
RT-PCR	**NF**	**80% M**	**53.5**	**54 / --**	**40%**	**0%**	**0%**	**10%**	**0%**	**0%**	**0%**		x
	DCM	**84% M**	**45.4**	**12 / 8.5**	**50%**	**73%**	**67%**	**55%**	**93%**	**18%**	**0%**		x
All Pts	**NF**	**63% M**	**51**	**57 / --**	**58%**	**0%**	**0%**	**7%**	**12%**	**0%**	**0%**		
	DCM	**83% M**	**45**	**14 / --**	**50%**	**74%**	**68%**	**40%**	**95%**	**20%**	**0%**		

Table S2: Adult Patient Characteristics. Demographic data is divided by method. Average age of patients for histology: NF =48.3 yrs; DCM = 40.3 yrs. Average age of patients for RT-PCR: NF = 53.5yrs; DCM = 45.4 yrs. Average age of all patients studied: NF =51 yrs; DCM = 45yrs.

ID = Identification, NF = Non-Failing, DCM = Dilated Cardiomyopathy, M = Male, F = Female, ACEi = Angiotensin-Converting Enzyme Inhibitor, EF = Ejection Fraction, FS = Fractional Shortening, NA = Not Available, *Inotropes include: Phosphodiesterase Inhibitors, Dobutamine, Dopamine, Epinephrine, Norepinephrine, Vasopressin.

Genes	**Fold Difference**	**pvalue_ttest**	**qvalue_ttest**
CRYM	4.749224	4.97E-08	0.000335
C7orf41	2.021547	3.93E-06	0.016991
DHRS11	1.864701	9.54E-06	0.016991
PATZ1	1.427491	1.01E-05	0.016991
MGST3	1.583735	1.58E-05	0.023666
TSPAN9	1.840494	2.83E-05	0.028915
CD59	-1.80022	4.47E-05	0.028915
USP11	1.553913	4.63E-05	0.028915
C5orf4	2.162673	5.11E-05	0.028915
GABRA4	2.665754	5.15E-05	0.028915
SCN2B	3.936666	6.38E-05	0.033954
KIAA1704	1.412964	6.56E-05	0.033954
TERF2IP	1.360332	0.000106	0.041122
PARP10	1.803806	0.000122	0.041122
TNFRSF25	2.045312	0.000123	0.041122
SLC25A27	2.156492	0.000136	0.041122
TMBIM6	-1.69837	0.000148	0.041122

IKBKAP	1.520965	0.00015	0.041122
SGCG	2.079009	0.000152	0.041122
BRP44L	1.637844	0.000155	0.041122
GARNL3	2.569935	0.000157	0.041122
POLL	1.56262	0.000158	0.041122
SERPINA3	-10.6163	0.00016	0.041122
IL13RA1	-1.64988	0.000165	0.041122
GABARAPL2	1.431991	0.000176	0.041122
KIAA0141	1.660347	0.000183	0.041122
DYRK1B	2.244819	0.00021	0.041122
ADPRHL1	1.77198	0.00021	0.041122
PRDX6	-1.94784	0.000211	0.041122
EVL	1.651383	0.000227	0.041122
TMEM53	-1.73554	0.000235	0.041122
TMEM71	2.471439	0.000241	0.041122
CCND2	1.822956	0.000254	0.041122
PLEKHG5	1.791263	0.000254	0.041122
AGFG1	-1.52907	0.000256	0.041122
FGF1	2.821383	0.000262	0.041122
CBY1	1.58102	0.00027	0.041122
EPHX2	2.047747	0.000273	0.041122
MBD2	-1.42378	0.000276	0.041122
MAPKAP1	-1.34724	0.000278	0.041122
FXR1	1.283883	0.000308	0.044161

CDK10	1.459966	0.000346	0.045177
KIF13A	1.775915	0.000356	0.045177
PSIP1	1.360726	0.000361	0.045177
CCDC28A	1.719529	0.000368	0.045177
TRIM45	2.513188	0.000384	0.045177
COPS7B	1.437341	0.000389	0.045177
DUSP28	1.75568	0.000389	0.045177
GBF1	-1.38676	0.00039	0.045177
FGF18	3.404145	0.000391	0.045177
TMEM189	-1.71018	0.000401	0.045177
F3	2.23608	0.000416	0.045177
KCNJ4	2.715045	0.000419	0.045177
IVD	1.818672	0.000419	0.045177
KAT2A	1.841664	0.000455	0.047076
APBB3	1.887443	0.000459	0.047076
ZNF251	1.770439	0.000466	0.047076
GNB3	2.216151	0.000471	0.047076
GSPT1	-1.41909	0.000472	0.047076
LPCAT3	-1.72504	0.000484	0.047504
RGS11	2.642694	0.000487	0.047504
MOAP1	1.425129	0.000514	0.047521
ZNF83	1.772339	0.000519	0.047521
SRP19	-1.44175	0.000545	0.048272
LRRC49	1.881689	0.000565	0.049107

TSPAN32	2.478704	0.000578	0.04987
S100A9	-5.61279	0.000606	0.051663
RALB	-1.31486	0.00062	0.051663
ARAP1	1.425866	0.000623	0.051663
CTSB	-2.36581	0.000637	0.051663
WDR85	1.343471	0.000667	0.051865
CPT1B	2.031206	0.00067	0.051865
MPHOSPH8	1.496398	0.00068	0.05231
TRUB1	1.983722	0.000689	0.052754
SCO1	1.349414	0.000753	0.057295
C4orf29	2.572275	0.000769	0.057498
AMT	2.09619	0.000781	0.057498
HIST1H1C	-2.61416	0.0008	0.058502
SPATA20	1.79064	0.000806	0.058502
SMPD1	-1.45588	0.000812	0.058502
MYO15B	1.672562	0.000822	0.058904
PLA2G6	1.774898	0.000883	0.062287
SNRPN	1.702524	0.000921	0.062691
ZSCAN18	1.773762	0.000931	0.062691
CEP85	1.602105	0.000962	0.064423
WBP1	1.714048	0.00099	0.066015
MYOM2	2.373334	0.001013	0.066631
MYH6	-14.0293	0.001016	0.066631
SDSL	3.094428	0.001025	0.066631

ALDH4A1	1.545211	0.001029	0.066631
C5orf56	1.946275	0.001068	0.066788
CDKN2D	-1.91305	0.001093	0.066788
MCFD2	-1.39771	0.001096	0.066788
SH2B1	1.489971	0.001126	0.066903
HKR1	1.385446	0.001128	0.066903
UNG	1.429551	0.001144	0.067266
TTLL3	2.121872	0.001171	0.068146
ARVCF	1.641259	0.001178	0.068146
DNAJA2	1.148033	0.001179	0.068146
AHSA2	1.765771	0.001204	0.069252
EZR	-1.54836	0.001214	0.069252
TPCN1	1.880823	0.001325	0.072902
HEY1	2.005798	0.001331	0.072902
CAMK2B	1.585423	0.001343	0.072902
ABCB6	-1.64838	0.001376	0.073993
ALDH9A1	1.453681	0.001378	0.073993
UBA7	2.054142	0.001383	0.073993
TMEM80	1.931193	0.001412	0.073993
PALLD	-2.87491	0.001412	0.073993
PRKAA2	1.63896	0.00143	0.074635
HSPB7	-1.70243	0.001455	0.075647
PIK3IP1	2.849155	0.00148	0.076352
RBMX2	1.294998	0.001498	0.076995

TCEB3	-1.30707	0.001517	0.07765
ARHGAP1	1.41007	0.001526	0.077814
NME2	-1.65723	0.001626	0.080624
PPPDE2	-1.58932	0.00163	0.080624
DEGS1	-1.73398	0.001647	0.080624
DIP2A	1.513042	0.001664	0.080624
RBP7	1.724376	0.001671	0.080656
UPF3A	1.294183	0.001693	0.081123
PARM1	1.47332	0.001726	0.082404
CYP2J2	2.321419	0.00174	0.082745
C10orf71	1.993204	0.001751	0.082745
GPATCH4	-2.01721	0.001801	0.082986
STX16	1.517613	0.001818	0.082986
TANK	-1.45403	0.001913	0.084785
TJAP1	1.312404	0.00192	0.084785
CGNL1	2.3127	0.00195	0.085802
SNX4	-1.34444	0.001979	0.086808
TNNI3	2.138972	0.002007	0.087727
RAP1A	-1.25724	0.002053	0.08897
STRAP	-1.283	0.002066	0.08897
ING4	1.578133	0.002107	0.08897
NIPA2	-1.54838	0.002134	0.08897
C5orf62	-1.44584	0.00216	0.089152
SMCR7	1.439469	0.002166	0.089152

EIF4EBP1	-2.31004	0.002172	0.089152
DERL1	-1.55382	0.00219	0.089377
CD53	-2.58771	0.002225	0.090061
ZNF775	1.68864	0.002232	0.090061
TRIP12	-1.23592	0.002234	0.090061
SEC61A1	-1.71184	0.002244	0.09021
FAM200B	1.278677	0.002257	0.090446
WDR48	1.403316	0.002264	0.090477
SCRN2	1.866997	0.002332	0.092621
PXDNL	1.748948	0.002341	0.092715
CCND1	2.2606	0.002348	0.092715
IRAK1	-2.3931	0.002373	0.092769
DVL2	1.372189	0.002377	0.092769
C5orf53	1.606341	0.002393	0.093149
JMJD7-PLA2G4B	2.105183	0.002423	0.09375
SLC27A1	1.721838	0.002455	0.094358
AAAS	1.418137	0.002459	0.094358
RAMP1	-2.51219	0.002471	0.094519
AACS	-1.47843	0.00252	0.094644
TMED4	1.404547	0.002524	0.094644
LYVE1	-4.11258	0.002525	0.094644
NID1	-1.91158	0.002535	0.094644
C16orf58	1.441508	0.00255	0.094644
EIF4A2	1.415498	0.002563	0.094644

TNNT3	2.133428	0.002567	0.094644
TEX2	-1.3101	0.002576	0.094644
MVP	-1.70725	0.002577	0.094644
COL21A1	2.56578	0.002592	0.094644
SRGN	-1.87411	0.002594	0.094644
CASD1	1.352706	0.002597	0.094644
C1orf123	1.336391	0.002601	0.094644
FGGY	1.912783	0.002615	0.094666
MYL2	1.807778	0.002639	0.095255
ERBB2	-1.54718	0.002661	0.095548
PACSIN3	1.3915	0.002693	0.095921
PARVB	-1.75216	0.002767	0.096198
IWS1	-1.20031	0.002778	0.096198
SYNE1	1.372619	0.002814	0.096198
C19orf51	5.565052	0.002832	0.096198
SIRT5	1.617265	0.002835	0.096198
DUT	1.393314	0.002846	0.096198
DHX32	1.222402	0.002857	0.096198
GPRASP2	1.576811	0.002857	0.096198
EIF5A	-1.57202	0.002857	0.096198
KCMF1	-1.30492	0.002892	0.096811
ABHD11	1.781716	0.002919	0.096811
CTNNA1	-1.38399	0.002928	0.096887
HSPA14	-1.50179	0.002962	0.097747

PLIN2	-2.6633	0.00301	0.098473
ADAMTSL5	1.83649	0.003019	0.098473
KLF2	1.777041	0.003033	0.098473
MYH7B	1.802147	0.003034	0.098473
C7orf58	1.703889	0.003035	0.098473
TGM2	-2.52547	0.003072	0.0992
VPS8	1.71041	0.003122	0.100086
SCARB2	-1.58195	0.003129	0.100086
LMOD2	1.965744	0.003168	0.101099
EFTUD2	-1.38738	0.003259	0.103512
PPOX	1.652085	0.003275	0.103535
TBC1D1	-1.57626	0.00331	0.104398
TLN2	1.399484	0.003366	0.105024
HAGH	1.375217	0.003369	0.105024
RAB28	1.56433	0.003377	0.105024
SGSM2	1.50843	0.003405	0.10541
VWC2	1.554715	0.003451	0.106581
PPP2R5A	-1.30412	0.003499	0.106756
C20orf24	-1.52285	0.00352	0.106756
LIN7B	1.818434	0.003525	0.106756
G6PD	-1.96051	0.003528	0.106756
C1orf212	-1.75645	0.003644	0.109522
PRKCD	-2.14322	0.003725	0.111481
QSOX1	-2.45335	0.003775	0.112454

GATA6	1.565644	0.003802	0.113023
COL7A1	2.237964	0.003811	0.113043
ASB18	3.554396	0.003892	0.114227
ST13	1.209285	0.003898	0.114227
EML2	1.398095	0.003902	0.114227
SCN4B	1.959685	0.003954	0.114657
IDI2-AS1	2.960528	0.004006	0.114657
TEAD2	-1.63719	0.004007	0.114657
SERPINI1	1.916747	0.00401	0.114657
PCNX	-1.46271	0.004067	0.115524
LDHA	-3.21847	0.004105	0.115524
B3GALTL	1.681016	0.004146	0.115524
IFT27	1.49543	0.004157	0.115524
ACTG1	-1.54536	0.004169	0.115524
WDR90	1.464514	0.004178	0.115526
C1orf63	1.601341	0.004194	0.115545
SAMHD1	-2.16751	0.004201	0.115545
P4HTM	1.400517	0.004213	0.115545
ADAM33	2.266181	0.004238	0.115757
HTRA1	2.124277	0.004263	0.116199
SLC25A11	1.443786	0.004348	0.117607
SEMA6C	1.366468	0.00443	0.117607
HMOX2	-2.55994	0.004445	0.117607
COQ5	1.289121	0.004451	0.117607

POLR3F	1.448094	0.004458	0.117607
MIB2	2.005538	0.0045	0.117607
SRPX	-1.55657	0.004521	0.117607
ATG16L2	1.659612	0.004532	0.117607
TMED10	-1.39105	0.004539	0.117607
JAK2	2.248753	0.004562	0.117607
EIF4EBP3	3.659676	0.004569	0.117607
WRNIP1	1.352863	0.004632	0.117607
OBSCN	1.575215	0.00464	0.117607
TMEM128	1.341962	0.004654	0.117607
QDPR	1.469264	0.004666	0.117607
DCUN1D5	-1.30916	0.00468	0.117607
CUX1	1.510668	0.004688	0.117607
RHOBTB1	2.061174	0.004702	0.117607
FN3K	1.472022	0.004707	0.117607
CTSF	1.753421	0.00473	0.117956
INADL	1.951588	0.004755	0.118351
PDLIM1	1.343367	0.004771	0.118546
ITIH5	2.181408	0.004853	0.119671
DST	1.548574	0.004881	0.119671
ECM2	2.487261	0.004888	0.119671
LARP4B	1.46058	0.005056	0.123561
S100A10	-2.18077	0.005108	0.124603
PPDPF	2.501478	0.005143	0.125176

SFRP1	4.902754	0.00515	0.125176
ZBTB25	1.498261	0.005176	0.125395
PLEKHA5	1.428949	0.00524	0.125395
BBS2	1.652512	0.005288	0.125395
KCNH2	-1.55101	0.005289	0.125395
ACAD8	1.311515	0.005299	0.125395
ATPIF1	1.944781	0.005328	0.125395
SORBS2	1.985087	0.005354	0.125395
C16orf53	1.465945	0.005431	0.126759
C22orf39	1.354022	0.005441	0.126759
LAS1L	1.262219	0.005472	0.126761
HAT1	-1.18981	0.00549	0.126761
SRSF5	1.450196	0.005507	0.126761
CLK3	1.248153	0.005542	0.126812
GNS	-1.48189	0.005546	0.126812
ATHL1	1.615725	0.005547	0.126812
TTC28-AS1	1.301402	0.005588	0.127322
SERTAD3	-1.40399	0.005694	0.127591
CBX7	1.734756	0.005702	0.127591
TCEB1	-1.38939	0.005713	0.127591
RIMKLB	1.482687	0.005727	0.12768
RNF207	1.792022	0.005777	0.127954
PTS	-1.30895	0.00581	0.127954
CRADD	1.43059	0.005815	0.127954

SHC1	-1.46928	0.005815	0.127954
ANKH	1.481273	0.005885	0.129277
ZNF337	1.395818	0.00592	0.129475
LRRC32	-2.3219	0.005923	0.129475
PCMTD2	1.502078	0.006028	0.13075
SRRM2	1.298635	0.00604	0.13075
RABGAP1L	2.338101	0.006041	0.13075
KIF22	1.557909	0.00607	0.13075
PTDSS1	-1.84059	0.006079	0.13075
CHPT1	-1.41827	0.006085	0.13075
ATG14	1.375846	0.006106	0.13075
SPTBN1	1.266998	0.006108	0.13075
TM7SF2	3.139563	0.00612	0.13075
RNF146	1.417727	0.006121	0.13075
DSP	-1.57474	0.006128	0.13075
DPY19L2	1.866273	0.006136	0.13075
WTIP	1.921225	0.006163	0.13079
CFL1	-1.79747	0.006181	0.13079
CSAD	1.605175	0.006185	0.13079
DPH3	-1.66187	0.006187	0.13079
ZNF480	-1.4921	0.006203	0.130916
UGGT1	-1.51913	0.006241	0.130958
MYOM1	1.865786	0.006243	0.130958
NECAB3	1.524445	0.006352	0.132668

TUBA1C	-3.82994	0.00641	0.132668
STAG3L4	1.371602	0.006428	0.132668
TCN2	-1.55161	0.006447	0.132668
ITPK1	-1.95596	0.006466	0.132668
MUTYH	1.458082	0.006473	0.132668
WDR27	1.617559	0.006525	0.133323
PAAF1	1.475202	0.006568	0.134003
ABCB7	1.26011	0.006578	0.134017
INF2	1.535754	0.006659	0.135055
GAS8	1.434768	0.006843	0.136915
CLIC4	-1.97887	0.006844	0.136915
FERMT2	-1.50105	0.006882	0.136915
APBB1	-1.4222	0.006894	0.136915
ISCU	1.621552	0.006909	0.136915
MAD2L2	-1.53095	0.006916	0.136915
MYL12A	2.477782	0.00692	0.136915
AUH	1.482514	0.006931	0.136915
DUSP13	-2.06964	0.006934	0.136915
RNF10	-1.33706	0.006965	0.137052
RFC2	-1.29448	0.006972	0.137052
S1PR3	-3.32624	0.006982	0.137052
ANKMY2	1.535112	0.007052	0.138237
TMTC1	-1.90477	0.007099	0.138665
MAN2C1	1.389258	0.007105	0.138665

HDAC10	1.689416	0.00713	0.138756
RWDD1	-1.38034	0.007175	0.138896
C21orf34	1.714284	0.007205	0.138896
CD163	-4.12641	0.00721	0.138896
GEMIN8	1.382513	0.007243	0.138932
LENG8	1.854274	0.007332	0.140439
EIF3I	-1.58375	0.007401	0.141384
EIF4G1	-1.732	0.007465	0.141384
KPNB1	-1.32868	0.007508	0.141944
GTF3A	-1.60131	0.007524	0.141944
RNF145	-1.17891	0.007578	0.141944
PSEN1	-1.21805	0.007589	0.141944
FAM180A	2.704337	0.007638	0.142652
KAZALD1	2.979763	0.007663	0.142825
ACYP2	1.419314	0.007669	0.142825
ANAPC16	1.363049	0.007688	0.142825
CAT	1.660445	0.00769	0.142825
LCN12	2.716143	0.007706	0.142925
CHRD	1.543302	0.007744	0.143431
RANBP6	-1.87146	0.007835	0.144536
PLCD3	-1.64472	0.007856	0.14461
FYCO1	1.462347	0.007866	0.14461
ACAP3	1.365382	0.007872	0.14461
IFITM2	-1.73684	0.007924	0.145366

PSMD14	-1.36557	0.007967	0.14597
TMC6	1.614555	0.008051	0.147036
FAM204A	1.32889	0.008139	0.147036
MYCBP	-1.64162	0.008151	0.147036
COL6A3	-2.0965	0.008169	0.147036
PPIL1	-1.79372	0.008184	0.147036
PRUNE	1.401092	0.008185	0.147036
ANO1	1.626598	0.008225	0.147036
PLIN3	-1.88893	0.008242	0.147036
TFCP2	1.254838	0.008255	0.147036
ATP2A2	-2.04551	0.008319	0.14725
KCTD12	-1.28281	0.008343	0.14725
TKT	-1.98337	0.008386	0.14725
C9orf24	2.437887	0.008423	0.14725
OAZ2	1.498111	0.008424	0.14725
IRF2BP2	1.47698	0.008433	0.14725
CCNG1	-1.73027	0.008445	0.14725
PPFIA4	1.724916	0.008456	0.14725
VSIG4	-3.53418	0.008464	0.14725
PPP1R14B	-2.27691	0.008499	0.147678
FCER1G	-2.68753	0.008566	0.148236
APOA1	8.711584	0.008606	0.148236
YIPF5	-1.45476	0.008608	0.148236
LUC7L3	1.575986	0.008629	0.148236

DCAF11	-1.36103	0.008762	0.148236
GGT5	-2.06881	0.008774	0.148236
JMJD4	1.679968	0.008816	0.148236
TES	-1.9086	0.008822	0.148236
MTRR	-1.54393	0.008822	0.148236
DPM1	1.316918	0.008828	0.148236
ODF3B	1.863627	0.008835	0.148236
RDH13	1.445255	0.008851	0.148236
C21orf59	1.325981	0.008873	0.148236
HSF4	2.128426	0.008876	0.148236
RFTN1	-1.3367	0.008886	0.148236
CTNNBIP1	-1.64588	0.00891	0.148236
KIAA1191	1.383286	0.008928	0.148236
NPEPL1	1.409906	0.008965	0.148309
COL16A1	2.647851	0.00902	0.148506
TSC1	1.301021	0.009032	0.148506
FAM50B	1.531719	0.009032	0.148506
PPP3CC	-1.53685	0.009105	0.14879
YIPF1	-1.371	0.009108	0.14879
HMGCL	1.441331	0.009116	0.14879
ABCA10	2.60267	0.009267	0.151084
LDB1	1.413604	0.009302	0.15119
RAB1A	-1.17861	0.009319	0.15119
UTP11L	-1.29611	0.009385	0.151907

WDR59	1.303372	0.009386	0.151907
CDV3	-1.4312	0.009472	0.152753
AMD1	-1.86489	0.009517	0.15311
SRPR	-1.22471	0.009594	0.153992
SLC25A44	-1.63874	0.00963	0.154019
POLE3	-1.28127	0.00963	0.154019
BOC	1.798825	0.00971	0.15511
NONO	-1.17814	0.009758	0.155131
ZMYM6NB	1.432182	0.009788	0.15543
SAR1A	-1.31342	0.009856	0.156084
RG9MTD1	-1.253	0.009866	0.156084
AP4M1	1.27093	0.009877	0.156084
TMEM43	-1.74567	0.009887	0.156084
AGPAT6	-1.36588	0.00992	0.156221
SLC2A1	-3.7352	0.009927	0.156221
IMPAD1	-1.41748	0.009931	0.156221
FYN	1.379298	0.009997	0.156239
SNAPC5	1.320095	0.010039	0.156239
DCAKD	1.37739	0.010054	0.156239
C14orf159	1.514594	0.010059	0.156239
ALOX5AP	-3.08853	0.010118	0.156789
ZNF76	1.474506	0.010157	0.157215
CDH2	1.369965	0.010186	0.157222
C6orf106	-1.55024	0.010193	0.157222

GLT25D1	-1.5262	0.010249	0.157734
C1QBP	1.161156	0.010249	0.157734
CD63	-1.74639	0.01029	0.157995
SPCS3	-1.47151	0.010357	0.158845
EIF2D	1.389196	0.010392	0.159026
LDOC1L	-1.43012	0.010453	0.159422
NAAA	1.46694	0.010454	0.159422
FARSB	-1.35437	0.010508	0.159666
DPY19L2P1	1.846738	0.010522	0.159666
UBE2H	1.457874	0.010546	0.159666
ABCD4	1.269539	0.010605	0.159666
HYI	2.183948	0.010611	0.159666
SYF2	1.299096	0.010617	0.159666
SMYD2	1.582515	0.010643	0.159666
ZFYVE21	1.292449	0.010648	0.159666
TGFBR2	-1.39059	0.01067	0.159666
NDUFAF2	-1.32641	0.010696	0.159666
ZNF577	1.588645	0.010707	0.159666
TRIAP1	-1.23051	0.010738	0.159956
UCKL1	1.342746	0.010768	0.160039
JAK1	-1.79401	0.010799	0.160328
PPA1	-1.49994	0.010842	0.160793
EIF3J	-1.55208	0.010873	0.160966
BCL2L13	-1.43549	0.010897	0.160966

TMSB10	-1.43527	0.010904	0.160966
TFPI	-1.77338	0.010968	0.160966
SMTN	1.472438	0.010994	0.160966
HDGF	-1.3739	0.011008	0.160966
NCKAP1	-1.34501	0.011064	0.160966
ACVRL1	-1.91389	0.011085	0.160966
NELF	-1.66293	0.011093	0.160966
TRIM41	1.391379	0.011161	0.161011
HIGD1B	1.441472	0.011171	0.161011
HM13	-1.43843	0.01118	0.161011
PITPNA	-1.3631	0.011247	0.161813
PA2G4	-1.28604	0.011303	0.162437
TCEA2	1.516806	0.011407	0.163571
PRKRIP1	1.243438	0.011418	0.163571
KIAA0100	-1.34321	0.01145	0.163847
NUP88	-1.18031	0.011483	0.163879
SVIL	1.546521	0.011501	0.163879
PLP2	-2.77009	0.011506	0.163879
AFF1	-1.63614	0.011526	0.163879
ENO1	-2.15452	0.011558	0.163879
SRPRB	-1.57249	0.011568	0.163879
LRRC59	-2.11872	0.011576	0.163879
ZNF207	-1.26093	0.011619	0.163879
LETM1	-1.61978	0.011622	0.163879

LAPTM5	-2.9856	0.011764	0.165698
PRMT7	1.400572	0.011791	0.165739
C12orf51	1.266411	0.011835	0.165744
TNFRSF14	1.500153	0.011853	0.165744
MAP2K1	-1.81495	0.011891	0.165744
GLOD4	1.407936	0.011912	0.165744
CNDP2	-1.31141	0.011934	0.165744
TUBA3E	-10.2254	0.01195	0.165744
ECHDC2	1.58812	0.011973	0.165744
MTERFD3	1.338293	0.011973	0.165744
HEATR5A	-1.3545	0.011974	0.165744
EDEM2	-1.65637	0.011988	0.165744
LRRC20	1.410953	0.012032	0.165837
CASP9	1.263922	0.012103	0.166469
CCS	1.620463	0.012147	0.166553
DCTN6	1.303686	0.012192	0.166553
PSMD11	-1.31591	0.012302	0.166553
ACCS	1.854287	0.01231	0.166553
NDUFA10	1.414394	0.012329	0.166553
COTL1	-2.20028	0.012396	0.166553
BIRC2	-1.07368	0.012421	0.166553
SETMAR	1.36032	0.012446	0.166553
DMD	1.357583	0.01246	0.166553
UBE2J1	-1.52195	0.012493	0.166553

WNK1	-1.45981	0.012517	0.166553
SNRPG	-1.37288	0.012546	0.166781
SDHD	1.263349	0.012567	0.166896
TPRKB	-1.31513	0.012626	0.167457
NCDN	1.218308	0.012669	0.167457
ETF1	-1.52583	0.012672	0.167457
MPZL1	-1.34984	0.01275	0.167998
KBTBD10	-1.83684	0.012875	0.168863
PMM2	-1.89262	0.012914	0.168863
CRBN	1.404579	0.012938	0.168863
CHMP5	1.184152	0.01295	0.168863
NUDT4	-2.16359	0.01298	0.168863
KPNA2	-2.20948	0.012981	0.168863
PNISR	1.529391	0.013008	0.168863
EXOC6B	1.479723	0.013027	0.168863
IRX6	3.669494	0.013091	0.168863
WBSCR16	1.230923	0.013093	0.168863
ELK1	-1.62946	0.013119	0.168863
SFRP4	6.189337	0.013149	0.168863
NT5DC2	-1.73828	0.013168	0.168863
C6orf57	1.381447	0.013215	0.168863
BMS1	-1.35115	0.013219	0.168863
LAMP2	-1.3229	0.013224	0.168863
COX7A2L	1.282322	0.013258	0.168863

LCN10	-2.72416	0.013266	0.168863
BTN3A2	1.633274	0.013306	0.168863
BEX4	1.397892	0.013313	0.168863
MCRS1	-1.24136	0.013326	0.168863
MFN2	1.31123	0.01334	0.168863
CHKB	1.581767	0.013345	0.168863
ZYX	-1.80202	0.013361	0.168863
TNFRSF1A	-2.41009	0.013394	0.168863
MBP	2.016226	0.013405	0.168863
YWHAZ	-1.32416	0.013482	0.16888
C22orf40	1.799496	0.013514	0.169126
USP21	1.22024	0.013612	0.170038
DIABLO	-1.17545	0.01372	0.170751
FBXO40	1.70739	0.013844	0.172042
CIAPIN1	-1.36506	0.013925	0.172042
FAHD2A	1.27951	0.013954	0.172042
LRCH4	-1.27754	0.013962	0.172042
S100A16	-1.6417	0.013969	0.172042
UBE2L3	-1.19928	0.013992	0.172042
DNAJC19	1.296863	0.014023	0.172042
ENTPD4	-1.63044	0.014041	0.172042
COQ4	1.31853	0.01417	0.173471
DDX46	-1.29033	0.014183	0.173471
NAA15	-1.6287	0.014218	0.173739

PHACTR1	-1.66194	0.014268	0.174185
TNRC6A	1.347738	0.014362	0.174784
CNNM3	1.561564	0.014424	0.174784
LTBP1	1.456862	0.014464	0.174784
PNPLA7	2.113922	0.014472	0.174784
RBM24	1.581847	0.014511	0.174784
SMARCA2	1.310903	0.014541	0.174784
HFE2	5.626627	0.014563	0.174784
ZNF692	1.561135	0.01468	0.175536
C1orf35	1.892681	0.014687	0.175536
ANKRD46	1.43327	0.014691	0.175536
ARHGDIG	2.648617	0.014704	0.175536
PPM1G	-1.30972	0.014747	0.175891
PRMT2	1.503651	0.014806	0.176281
SATB1	1.646503	0.014845	0.176281
SREBF1	-2.76637	0.014917	0.17682
C16orf80	1.320052	0.014979	0.177402
SH3GLB2	1.565446	0.01501	0.177613
NAGA	-1.55796	0.015052	0.17795
FAM98C	1.696235	0.015099	0.178055
MFSD1	-1.63448	0.0151	0.178055
C1orf97	1.616868	0.015189	0.178315
CAPN1	-1.27276	0.015243	0.178315
SUCLG2	1.350987	0.01525	0.178315

POGZ	1.571719	0.015308	0.178315
LARP1B	-1.45709	0.015321	0.178315
AQP3	-3.78684	0.015343	0.178419
SNRNP70	1.412851	0.01537	0.178467
NRBP2	1.545037	0.015374	0.178467
HIRIP3	1.316042	0.015394	0.178547
TUBA3D	-12.4404	0.015413	0.178614
FBXO44	1.750345	0.015509	0.179075
GRIP2	1.621768	0.015574	0.179075
S100A11	-2.14058	0.015587	0.179075
ACAD9	1.217361	0.015588	0.179075
TBX5	1.561281	0.015612	0.179075
PRKAR1A	1.446077	0.015653	0.179087
SMOC2	2.165419	0.015695	0.17926
CCDC47	-1.34868	0.015797	0.17964
MRPL3	-1.43455	0.015822	0.17964
RHOA	-1.28477	0.015824	0.17964
CTF1	1.776313	0.015857	0.17964
PDE1C	1.470373	0.015898	0.17964
ADHFE1	1.497876	0.01591	0.17964
THRA	1.352441	0.015928	0.17964
MLYCD	1.679203	0.016015	0.180343
WDPCP	1.632665	0.016017	0.180343
PREPL	1.50048	0.016173	0.180507

C15orf24	-1.34208	0.016179	0.180507
PHYH	1.323911	0.016278	0.180507
EXD3	1.531829	0.016288	0.180507
CCDC159	1.51078	0.016294	0.180507
AASS	-2.35138	0.016358	0.180507
PARD3	-1.50085	0.016375	0.180507
ACYP1	1.449421	0.01645	0.180507
DDX19A	-1.17518	0.01645	0.180507
MARK3	-1.86314	0.016461	0.180507
C3orf45	1.752497	0.016515	0.180698
PDCD10	-1.26659	0.016572	0.180698
PRICKLE1	1.617971	0.016586	0.180698
EFHD1	1.380715	0.01662	0.180776
BCKDHA	1.472323	0.016731	0.181692
PTN	2.810532	0.01688	0.183161
S100A8	-4.24132	0.016911	0.18335
USP20	1.35051	0.017054	0.184155
KCNIP2	-6.06647	0.017122	0.184155
INMT	1.811763	0.01729	0.185663
LRP5	2.091204	0.017313	0.185705
TNNT1	2.209264	0.017385	0.185705
SAP30	-1.34132	0.017407	0.185705
FKBP5	-4.11516	0.017467	0.185705
ME3	1.417752	0.017467	0.185705

DDX39A	-1.64088	0.017495	0.185705
SNAP47	2.403837	0.0175	0.185705
HUS1	-1.39699	0.017565	0.18596
PYCR2	1.204519	0.017583	0.18596
TRMT2A	1.443169	0.017593	0.18596
NME1	-2.36901	0.0177	0.186766
MTCH2	-1.30834	0.017711	0.186766
LTV1	-1.33551	0.017742	0.186942
HMGN2	2.206519	0.017825	0.187675
TMEM19	-1.6518	0.017853	0.187821
ZNF704	1.790577	0.017918	0.188354
GRB14	-2.08398	0.017939	0.188428
UBE4B	1.242476	0.018035	0.188871
TCP1	-1.33798	0.018042	0.188871
DTX3	1.411177	0.01818	0.188871
LCN6	-3.24908	0.018184	0.188871
TRAP1	1.235542	0.018246	0.188871
UBAP2	-1.29781	0.018247	0.188871
TARS2	1.363249	0.018253	0.188871
NR2C1	1.418896	0.018255	0.188871
SHQ1	-1.49791	0.018294	0.188871
TATDN2	-1.24087	0.018297	0.188871
AFMID	1.401217	0.018322	0.188871
CLSTN1	1.339191	0.018334	0.188871

TMX2	-1.3042	0.018408	0.188871
C17orf91	-2.17485	0.018427	0.188871
ZCCHC17	1.296887	0.018429	0.188871
CIRBP	1.396398	0.018434	0.188871
UBE2K	-1.2612	0.018458	0.188871
CDK2AP2	-1.88821	0.018511	0.189272
TUBGCP6	1.34316	0.018614	0.190152
HNRNPH2	-1.16603	0.018642	0.190152
AVEN	-1.70086	0.018654	0.190152
CES2	-1.65611	0.018699	0.190183
CHRAC1	-1.41585	0.018779	0.190214
PTP4A2	-2.1592	0.018785	0.190214
IFITM3	-1.73442	0.018796	0.190214
PTEN	-1.32135	0.018801	0.190214
TMEM159	1.726147	0.018835	0.190386
CYB5R1	1.390877	0.018846	0.190386
VPS13D	-2.49149	0.018907	0.190716
ARF3	-1.49631	0.018964	0.19114
TNK2	1.548777	0.019025	0.191468
GHITM	1.135925	0.019042	0.1915
C9orf37	1.378702	0.019067	0.191607
FHL3	-1.55905	0.019109	0.191891
LYPLAL1	1.480582	0.019206	0.19259
P4HB	-1.36524	0.019208	0.19259

ATXN7L3	-1.37707	0.019243	0.192661
NFYB	-1.28787	0.019355	0.193633
FBXL22	1.547037	0.019438	0.19409
C3orf78	1.340032	0.019453	0.19409
TXNRD1	-1.93972	0.019501	0.19409
LEMD2	1.159387	0.01959	0.194685
SNRPB	-1.59804	0.019672	0.195211
PLEKHO1	-1.89588	0.019693	0.195272
ABCD3	-1.45216	0.019772	0.195515
HNRNPAB	-1.45491	0.019775	0.195515
PPFIBP2	1.368539	0.019798	0.195602
RPN2	-1.67222	0.019883	0.195833
TRPM4	1.388478	0.019924	0.195833
ACVR1	-1.33282	0.019935	0.195833
PANK2	-1.28021	0.019953	0.195833
WDR6	1.216052	0.019967	0.195833
TIMM17A	-1.31152	0.020143	0.197411
RAD1	-1.38554	0.020333	0.198881
PVRL2	-1.58213	0.020352	0.198881
ACSL3	-1.39911	0.020421	0.199267
ME1	-1.33771	0.020458	0.19948
HDLBP	-1.19063	0.020496	0.1995
NPTXR	1.368201	0.020538	0.1995
WDR77	-1.31715	0.020553	0.1995

IL11RA	1.471697	0.020563	0.1995
STXBP6	-1.72872	0.02064	0.199935
LTBP4	2.624171	0.02068	0.199935
TMEM175	1.459542	0.020682	0.199935
EIF4E	-1.43073	0.020776	0.200171
USP10	-1.18107	0.020777	0.200171
PSME3	-1.42626	0.020804	0.200171
C16orf45	1.499756	0.020826	0.200171
PCGF5	-1.47225	0.020883	0.200513
PCCB	1.421542	0.020923	0.200513
MDFIC	1.617262	0.020972	0.200513
PDCD11	-1.59379	0.020998	0.200513
KIF9	1.439111	0.02101	0.200513
CDC37L1	-1.51777	0.021047	0.200705
ADAMTS15	-2.3057	0.021077	0.200705
LEPREL2	1.675833	0.021123	0.200705
PANK3	-2.13669	0.02113	0.200705
CD14	-3.04263	0.02115	0.200705
MTUS2	-1.60684	0.021205	0.200945
TSTD1	1.952276	0.021407	0.201052
EZH1	1.380191	0.021435	0.201052
PLCG1	1.433884	0.02148	0.201052
SLC2A4RG	1.488584	0.021523	0.201052
MORF4L2	-1.33162	0.021559	0.201052

RRP36	-1.27848	0.021673	0.20197
C20orf194	1.325013	0.021747	0.202516
RAD21	1.288223	0.021802	0.202895
TIMP1	-3.81958	0.02183	0.203015
ITGB1BP2	-1.38883	0.021853	0.20309
H2AFZ	-1.8443	0.021948	0.203686
CAMLG	1.329002	0.022062	0.203686
IMPDH1	-1.53237	0.022093	0.203686
ACAD10	1.397392	0.022144	0.203686
CPE	1.323495	0.02215	0.203686
ITGA7	-1.51582	0.022161	0.203686
F11R	-1.55422	0.022185	0.203686
ANAPC7	-1.19029	0.02219	0.203686
GALNT11	1.327043	0.022218	0.203804
TBC1D17	1.417288	0.022293	0.204103
SLC39A1	-1.69958	0.022323	0.204103
LEPREL1	3.74613	0.022326	0.204103
CCT5	-1.50682	0.022504	0.205167
CHTOP	1.146872	0.022507	0.205167
SNURF	1.348767	0.022519	0.205167
STIP1	-1.5414	0.022629	0.206031
DUSP26	1.723074	0.022699	0.206067
B4GALT5	-1.59719	0.022699	0.206067
HMBS	-1.58229	0.022712	0.206067

TSPAN17	-1.4522	0.02274	0.206067
EIF2S2	-1.35002	0.022784	0.206166
CSDC2	-2.49119	0.022835	0.206166
SDHA	1.338659	0.02286	0.206166
CCNL2	1.269696	0.022878	0.206166
DLD	1.267788	0.022923	0.206166
POP5	1.397325	0.022941	0.206166
FAM120B	1.267606	0.022952	0.206166
RPL7L1	-1.26344	0.023014	0.206166
ZNHIT3	1.293963	0.02303	0.206166
ST3GAL1	-1.61278	0.02304	0.206166
SSU72	-1.27748	0.023146	0.206166
SH3YL1	1.455503	0.023152	0.206166
C7orf50	1.795278	0.023189	0.206166
CHMP4B	-1.36787	0.023218	0.206166
FTSJ1	-1.52732	0.023226	0.206166
ARHGEF6	1.393564	0.023234	0.206166
PPP4R1	-1.26323	0.023265	0.206166
RPL3L	1.275649	0.023278	0.206166
PARP3	1.37371	0.023317	0.206166
UBE2F	-1.2666	0.023317	0.206166
TUBB6	-2.09929	0.023334	0.206166
DHPS	1.255903	0.023349	0.206166
CMTM5	-20.1809	0.023358	0.206166

STAT3	-3.03214	0.023381	0.206166
C1orf105	-9.77318	0.023394	0.206166
GDI2	-1.25605	0.023471	0.206575
FZD1	1.714766	0.023531	0.206611
CD164	-1.54995	0.023567	0.206611
METTL22	-1.64127	0.023609	0.206692
GMPPB	-1.42699	0.023622	0.206692
FLII	-1.40303	0.023663	0.206721
SYMPK	1.326037	0.023666	0.206721
ANXA5	-1.59613	0.023672	0.206721
C19orf47	-1.57355	0.023709	0.206913
C17orf108	1.671299	0.023972	0.209076
ANP32E	1.323974	0.024093	0.209209
RPN1	-1.46489	0.024122	0.209209
APRT	-1.47884	0.024143	0.209209
XPO7	1.21989	0.024201	0.209209
RAB8A	-1.27996	0.024231	0.209209
MAPRE1	-1.24047	0.024257	0.209209
FCN3	-3.77884	0.024258	0.209209
TXNIP	1.65602	0.024277	0.209209
FAM63A	1.452722	0.024322	0.209209
CTPS	-1.82728	0.024332	0.209209
RANGAP1	-1.79381	0.024333	0.209209
FN3KRP	1.323927	0.024361	0.209209

CNBP	1.228078	0.024392	0.209209
ATOH8	1.818078	0.024412	0.209246
FURIN	-1.91212	0.024486	0.209751
YKT6	-1.42136	0.024517	0.209884
PSMD7	-1.22717	0.024652	0.210904
IFRD2	-1.32427	0.024685	0.211052
NPDC1	1.700937	0.024828	0.211954
FLYWCH1	1.608765	0.024926	0.211954
KPNA1	-1.61162	0.025007	0.211954
ANXA2	-1.84962	0.025008	0.211954
MAST4	-1.22773	0.025024	0.211954
ECE1	-1.35458	0.025052	0.211954
CPSF1	1.5152	0.025058	0.211954
TUBB2C	-1.91327	0.025107	0.212234
C2orf56	-1.30976	0.025164	0.212447
FAM165B	1.360569	0.025241	0.212964
ISG20L2	-1.37205	0.025353	0.213411
SEC13	-1.24218	0.025373	0.213411
SOBP	1.295083	0.025451	0.213929
TXLNB	1.586456	0.025466	0.213929
MKL1	-1.37699	0.025485	0.213955
AP1B1	-1.45821	0.025607	0.214574
FAM174A	1.27817	0.025651	0.214808
KIAA1462	1.586046	0.02573	0.214966

PNMT	-1.72569	0.025732	0.214966
ORMDL2	-2.05082	0.025742	0.214966
HINT1	-1.29894	0.02579	0.214966
CD68	-2.55131	0.0258	0.214966
EIF3L	1.300989	0.025813	0.214966
C6orf125	1.309677	0.025891	0.215485
ATP6V1B2	-1.15918	0.025914	0.215537
YBEY	1.467991	0.025991	0.215911
PDIA6	-1.39676	0.026085	0.216561
FAM193B	1.371308	0.026129	0.216655
LRRC14B	1.729572	0.026205	0.217157
XAF1	1.718755	0.026261	0.217354
PARVA	-1.66393	0.026334	0.217669
CADPS	1.870189	0.026364	0.217669
GGCT	-1.50111	0.026516	0.218252
PRPF40B	1.371728	0.026554	0.218302
MICALL1	-1.68262	0.026645	0.218914
TIE1	1.266856	0.026718	0.219377
FUNDC2	-1.32404	0.026747	0.219396
PDCD6IP	-1.51263	0.026801	0.219396
KLHL22	1.338391	0.026867	0.219667
PTTG1IP	-1.40219	0.026943	0.21983
PHLDB2	1.66777	0.026988	0.21983
ALDH1A1	1.951972	0.02703	0.21983

ANTXR1	1.513291	0.027034	0.21983
SEPT7P2	1.571809	0.02707	0.219992
IFI30	-3.21261	0.027092	0.220036
LTBP2	2.974202	0.027254	0.220862
MYH11	2.32651	0.027276	0.220862
ATP1B1	-1.26978	0.02741	0.221487
COLQ	2.651231	0.02743	0.221487
SKP1	1.167759	0.027462	0.221487
DIRAS1	-1.99212	0.027483	0.221487
NSMCE1	1.395568	0.027484	0.221487
MED12	1.341534	0.027526	0.221664
EXOC7	1.224788	0.027663	0.221664
ASAH1	1.278752	0.027718	0.221664
ACE	2.105011	0.027722	0.221664
C1R	-1.8785	0.027737	0.221664
SLCO4A1	-3.57496	0.027852	0.222392
HMGXB3	-1.26583	0.027861	0.222392
RBPMS2	-1.4313	0.027912	0.222671
VASP	-1.8076	0.028037	0.223536
LRRC39	1.566413	0.028162	0.223942
HK1	-1.45545	0.028188	0.223942
CAPZA1	-1.41345	0.028234	0.223995
YWHAH	-1.50463	0.028378	0.223995
FLT1	-1.78717	0.028402	0.223995

ALG3	-1.78411	0.028462	0.223995
KLC4	1.229575	0.028495	0.223995
ADAM9	-1.56593	0.028509	0.223995
LSG1	-1.61744	0.028554	0.223995
NFS1	1.293047	0.028608	0.223995
SLC2A11	1.393368	0.028621	0.223995
ACTB	-1.65103	0.028627	0.223995
PLAA	-1.34539	0.028683	0.224209
WNT9A	11.19941	0.028688	0.224209
SLC31A2	-1.54412	0.028749	0.224213
LACTB	-1.30857	0.028802	0.224213
TAF9	-1.20913	0.028805	0.224213
HCLS1	-2.098	0.029009	0.225447
PRKRA	-1.12513	0.029031	0.225447
VMP1	-1.53949	0.029174	0.22582
DIDO1	1.188056	0.029196	0.22582
C15orf59	-2.80266	0.029216	0.225842
ZNF211	1.337878	0.029254	0.225857
PLA2G4C	1.533831	0.029301	0.225857
MAU2	1.328888	0.029321	0.225875
DDX24	1.209201	0.029345	0.225933
TXNDC11	-1.17785	0.02944	0.226246
USP7	-1.24883	0.029447	0.226246
PYROXD2	1.555384	0.0295	0.226246

SH3GLB1	-1.53318	0.029503	0.226246
GARS	-1.45949	0.02955	0.226325
RRP15	-1.39188	0.029614	0.226325
RNF6	-1.51924	0.029619	0.226325
CCT6A	-1.3676	0.029631	0.226325
PKM2	-1.32845	0.0298	0.226619
C14orf180	1.599682	0.029804	0.226619
POLR2C	1.159056	0.029992	0.227235
PCBP2	1.157148	0.030068	0.227235
NAGLU	-1.53698	0.030096	0.227235
NSMAF	-1.17264	0.030188	0.227235
SLC50A1	-1.84016	0.030215	0.227235
PTPRE	-1.70247	0.030368	0.227235
ELMO1	-1.56918	0.030413	0.227235
UBE2N	-1.19847	0.030441	0.227235
IP6K2	1.485735	0.030478	0.227235
NCAM1	-1.53772	0.030498	0.227235
EIF3M	-1.36045	0.030509	0.227235
NME4	1.441814	0.030541	0.227244
CA14	-2.56478	0.030544	0.227244
GP1BB	2.667212	0.030665	0.228014
SNHG9	1.647159	0.030701	0.228154
MRPL45	1.242887	0.030823	0.228768
ABCE1	-1.61985	0.030884	0.228768

ABCA8	1.736042	0.030886	0.228768
FAM89B	-1.37012	0.030902	0.228768
BAG2	-1.40849	0.030929	0.22884
SMTNL2	-4.08587	0.030977	0.228943
AP1S2	-1.38351	0.031014	0.229093
PCBD1	1.253929	0.031095	0.229563
PSMD2	-1.20611	0.031259	0.230613
ADAL	1.442522	0.031325	0.230613
ZBTB1	1.26691	0.031378	0.230613
MAP1LC3B	-1.52781	0.031385	0.230613
RALGPS1	1.28656	0.031408	0.230613
MRPL15	-1.13269	0.03148	0.231013
CLINT1	-1.27034	0.031532	0.231015
SEC23IP	-1.42533	0.031627	0.231446
RPL21	-1.6047	0.031642	0.231446
TIMP2	1.400658	0.031704	0.231771
LMCD1	-2.80315	0.031731	0.231847
BCL9L	-1.91672	0.03183	0.232442
PDCD5	-1.33284	0.03188	0.23268
HYOU1	-1.93437	0.03194	0.232864
RAB3GAP1	1.138013	0.032071	0.232937
PSMB3	-1.23824	0.032095	0.232937
DHX15	-1.39308	0.032103	0.232937
GLUL	-1.6484	0.032112	0.232937

VPRBP	-1.33299	0.032139	0.232937
AP3M2	1.601162	0.03214	0.232937
KCTD10	-1.43168	0.032208	0.233306
C10orf58	-1.51983	0.032302	0.233731
MTCH1	-1.44312	0.032328	0.233766
PLXDC1	1.597034	0.032372	0.233766
CLIP1	-1.50433	0.032376	0.233766
BNIP3L	-1.19584	0.032484	0.233999
TBRG1	-1.32175	0.032488	0.233999
AKIRIN1	-1.39192	0.032495	0.233999
DYNC2LI1	1.436198	0.032578	0.234219
TMEM42	1.521974	0.032607	0.234306
BCAS3	1.423733	0.032679	0.234571
TMEM47	1.295019	0.032777	0.235148
PPP1R1A	-1.84533	0.032838	0.235458
UBAC2	1.296886	0.032902	0.235542
SLC25A30	1.648336	0.032953	0.235785
ACE2	2.17204	0.033119	0.236567
C6orf89	-1.32414	0.033141	0.236567
PLEKHA6	1.504181	0.033178	0.236567
SGCA	1.373607	0.033178	0.236567
CLPTM1L	-1.30386	0.033232	0.236567
RPS6KA4	-1.42926	0.033239	0.236567
BDH2	1.394632	0.033332	0.236567

EMP3	-1.87531	0.033335	0.236567
CDCA7L	1.503478	0.033347	0.236567
PSME4	-1.27308	0.033355	0.236567
STK3	-1.56355	0.03336	0.236567
XPO4	1.650154	0.033402	0.236567
LGI4	1.754198	0.033443	0.236567
PSMC2	-1.19834	0.033453	0.236567
GMPR	-1.43227	0.033458	0.236567
CXCL12	1.603557	0.033484	0.236567
DOCK6	1.332299	0.033588	0.237035
GLRX2	-1.57025	0.033603	0.237035
IGHMBP2	-1.21722	0.033828	0.238495
PELO	-1.32353	0.033904	0.238904
A4GALT	-1.58911	0.033993	0.239408
INTS12	-1.24297	0.034071	0.239546
RBM20	1.438566	0.034145	0.239546
GPT	-1.60619	0.034151	0.239546
AMZ2	1.319708	0.03419	0.239546
SOCS2	1.813884	0.034239	0.239759
MTMR9LP	1.662174	0.034288	0.239984
C1orf144	-1.38575	0.034415	0.240619
TMED2	-1.28842	0.034513	0.241182
ERO1L	-2.25789	0.034624	0.241717
DPP3	-2.07129	0.034644	0.241717

FZD4	1.382935	0.03473	0.241857
SRPK3	1.480042	0.034738	0.241857
PCNT	-1.82822	0.034754	0.241857
GALK1	-1.58251	0.034842	0.242348
ZMPSTE24	-1.45886	0.03489	0.24251
KIAA0195	1.255337	0.034902	0.24251
C19orf66	1.268988	0.034973	0.242783
UQCRC2	1.241832	0.03501	0.242783
MTA2	-1.29947	0.0351	0.242783
SUN1	1.305712	0.035121	0.242783
CXorf26	-1.46788	0.035124	0.242783
MEMO1	-1.48766	0.035139	0.242783
NDFIP2	-1.49893	0.035175	0.242784
MAPK12	1.514719	0.035267	0.24316
ITGB2	-2.49543	0.035284	0.24316
CCNB1IP1	1.310954	0.035468	0.243576
TUBA8	1.508068	0.035524	0.243576
EDIL3	2.233263	0.035577	0.243576
MLEC	-1.33013	0.035632	0.243576
TBC1D7	1.426917	0.035801	0.243576
AGFG2	-1.42984	0.035803	0.243576
NUDT3	1.28274	0.035897	0.243576
EIF5B	-1.47742	0.035912	0.243576
F8	-1.30721	0.035917	0.243576

FOXJ3	1.158683	0.035919	0.243576
HES4	1.45909	0.035968	0.243576
FBXO25	1.222277	0.03599	0.243576
NASP	-1.32837	0.036009	0.243576
PRPF31	1.148294	0.036018	0.243576
PEA15	-1.53606	0.036028	0.243576
PLAGL1	1.530738	0.03605	0.243576
MAFK	1.97565	0.036144	0.243658
TRIM47	-1.96006	0.036221	0.243658
OGG1	1.35273	0.036243	0.243658
JAGN1	-1.39492	0.036389	0.244521
GALT	1.330402	0.036481	0.245016
RHBDF1	1.351263	0.036534	0.245246
C1QC	-1.98089	0.036571	0.245252
COX17	-1.28862	0.036614	0.245415
NOP10	-1.27561	0.036676	0.245711
C11orf48	-1.28679	0.036825	0.245839
POLR1A	-1.64246	0.036913	0.245839
OSMR	-2.97619	0.036969	0.245839
PRDX1	-1.31697	0.036996	0.245839
ZBTB4	1.340819	0.037016	0.245839
CRELD1	1.273742	0.037045	0.245839
FGFRL1	-1.50345	0.037062	0.245839
XBP1	-1.75289	0.037089	0.245839

TEAD4	-4.59085	0.037124	0.245839
P2RX5	-2.43081	0.037152	0.245839
EIF2S1	-1.41776	0.037222	0.246186
CAP1	-1.60636	0.03743	0.246823
NOP16	-1.93443	0.037436	0.246823
C4orf42	1.312798	0.037461	0.246823
SMC1A	-1.51363	0.037518	0.246823
GPN1	-1.12051	0.037545	0.246823
TMED5	-1.52817	0.037557	0.246823
POLR2D	-1.37712	0.037603	0.247004
EI24	-1.32851	0.03777	0.247859
TMEM214	-1.27084	0.03787	0.248278
CTSO	1.409117	0.037957	0.248347
SUPT7L	1.116082	0.038056	0.248347
SMAD7	1.672844	0.038098	0.248347
MYADM	-1.70565	0.038199	0.248347
MGST1	-3.98235	0.038205	0.248347
SNRNP27	-1.12017	0.038219	0.248347
SNORA77	-3.47354	0.038238	0.248347
WDR1	-1.68549	0.03825	0.248347
TNNC1	1.312742	0.038576	0.249688
SRL	-1.34529	0.038594	0.249688
NOL6	-1.51222	0.038647	0.249688
MLX	-1.34131	0.038746	0.249688

LTBP3	1.729146	0.038816	0.249688
ARPC4	-1.3873	0.038835	0.249688
CALU	-1.83217	0.038842	0.249688
C12orf39	1.531052	0.038859	0.249688
UGP2	-1.37406	0.038883	0.249688
C4orf52	1.404571	0.038903	0.249699
RAMP2	1.660982	0.039003	0.250219
TAF13	-1.28376	0.039052	0.250414
RPGR	-1.63432	0.039093	0.250442
IFT20	1.405256	0.039284	0.251544
XRN2	-1.28839	0.039348	0.251832
NPIP	1.254752	0.039402	0.25206
IFNAR1	-1.38567	0.039455	0.252249
RAE1	-1.21707	0.039504	0.252249
QTRT1	1.426322	0.039506	0.252249
ARAP3	1.266354	0.039565	0.252504
ARF4	-1.27974	0.039584	0.252504
C1QB	-2.14822	0.039782	0.253647
FABP3	1.316121	0.039804	0.253671
SEC23A	-1.53422	0.039825	0.25368
HLTF	1.588859	0.039895	0.253889
OSTM1	-1.52908	0.040002	0.254246
ABTB1	1.565182	0.040032	0.254246
ATP6V1F	-1.24278	0.040081	0.254246

HHATL	1.529851	0.04012	0.254246
RASL11B	1.86117	0.040257	0.254246
SARS	-1.2785	0.040314	0.254246
FAM69B	1.527958	0.040322	0.254246
TTL	-1.26636	0.040329	0.254246
TPM4	-1.71999	0.040334	0.254246
OBSL1	1.548328	0.040376	0.254246
HRH2	-1.44736	0.040404	0.254246
GLT8D2	1.547394	0.040551	0.254997
KRT8	-2.26063	0.040562	0.254997
SYNCRIP	-1.35158	0.040986	0.256677
QRICH1	-1.24812	0.041018	0.256677
ELOVL5	-1.82524	0.041061	0.256677
BTN3A1	2.178881	0.041086	0.256677
TMEM39A	-1.53772	0.041096	0.256677
SLC7A6OS	1.221983	0.041176	0.257062
PHF23	-1.3259	0.04121	0.257152
NDUFA7	1.26817	0.04129	0.257301
MAVS	-1.66707	0.041347	0.257301
MRPL21	1.30703	0.041358	0.257301
PRAF2	-1.34119	0.041396	0.257301
C19orf12	-1.2902	0.041407	0.257301
ACTR3	-1.53306	0.041454	0.257301
YPEL3	1.666806	0.041463	0.257301

RGL1	1.294611	0.041675	0.258297
RNASEH1	-1.32745	0.041733	0.258297
SLC1A5	-2.93987	0.041776	0.258297
SPTAN1	1.266232	0.041808	0.258297
MARS	-1.30375	0.041809	0.258297
DALRD3	1.596898	0.041835	0.258297
IMMP1L	1.292872	0.041946	0.258866
NAP1L1	1.121029	0.042053	0.259222
AEBP1	2.163932	0.042062	0.259222
SLC35A4	-1.27844	0.042169	0.259766
RAB24	1.647295	0.042237	0.259946
VCL	-1.78123	0.042452	0.260667
GAB3	1.481943	0.042461	0.260667
NRSN2	-1.44217	0.042539	0.260667
MAP2K5	1.295313	0.042596	0.260667
ARPC1A	1.299493	0.042608	0.260667
PDPN	-1.63712	0.042685	0.260667
ARHGEF9	1.199577	0.042701	0.260667
HTRA3	1.996047	0.042703	0.260667
ZDHHC16	-1.4777	0.042807	0.260716
NET1	1.483291	0.042914	0.261128
HMGB2	1.642809	0.042997	0.261278
EPN3	-1.64621	0.043048	0.261338
C20orf26	2.287789	0.043065	0.261338

SIX5	1.480015	0.043084	0.261338
CAND2	1.35531	0.043264	0.261759
ABHD14B	1.629768	0.043313	0.261759
PDE2A	-1.47008	0.043342	0.261759
ARHGAP31	-1.81129	0.043348	0.261759
C11orf71	1.397561	0.043396	0.261931
PLOD1	-1.53409	0.04351	0.262503
GATAD1	1.294861	0.043551	0.262634
FASTKD2	-1.22189	0.043665	0.262968
SNRPD1	-1.3994	0.04369	0.263001
TSEN34	1.338182	0.043907	0.263998
BCL6	-2.72546	0.043985	0.263998
CHCHD8	-1.2692	0.04401	0.263998
C5orf43	-1.21402	0.044031	0.263998
KIAA0930	-1.40714	0.044032	0.263998
MZT2A	-1.41051	0.044179	0.26473
TMEM165	-1.79916	0.044232	0.26473
MRPS26	1.336363	0.04429	0.26473
COMMD7	-1.52506	0.044346	0.26473
ACO2	1.230114	0.044354	0.26473
IL6ST	-1.99529	0.044394	0.26473
ANXA7	1.143008	0.044403	0.26473
PSMD12	-1.47282	0.044477	0.26473
ITGA5	-2.38048	0.044543	0.26473

GSTA4	1.373495	0.044598	0.26473
FKBP1A	-1.47498	0.044621	0.26473
SDCCAG3	-1.31091	0.044633	0.26473
POLR1D	-1.16356	0.044709	0.26473
PRELID1	-1.4626	0.044714	0.26473
CORO1C	-1.4409	0.044726	0.26473
USP14	-1.39994	0.04474	0.26473
POLR1B	-1.67638	0.044746	0.26473
RPL22L1	-2.40206	0.044792	0.26473
C20orf4	-1.19706	0.044814	0.26473
GOLT1B	-1.54754	0.044824	0.26473
RABGGTA	-1.31867	0.044843	0.26473
TOMM20	1.240296	0.044908	0.264951
TACC2	1.26371	0.044978	0.264951
PPP1CC	-1.20555	0.045045	0.265228
SLC29A2	-1.63926	0.045139	0.265665
COL4A1	-1.77404	0.045421	0.266508
GRPEL1	-1.29074	0.045459	0.266508
EGFL7	1.32213	0.045471	0.266508
FAM20C	-1.61474	0.045475	0.266508
ZBTB7B	-1.86698	0.045551	0.266508
GOSR2	-1.2939	0.045574	0.266508
KAT5	1.161143	0.045578	0.266508
C10orf125	-1.85316	0.045587	0.266508

FAM110B	1.236796	0.045602	0.266508
EXTL3	-1.51304	0.045684	0.266508
PPP1R9B	-1.36878	0.04571	0.266508
DHCR24	-3.38048	0.045726	0.266508
TMEM138	-1.16188	0.045742	0.266508
NQO1	-1.85033	0.045794	0.266508
TPRG1L	1.286849	0.045806	0.266508
IARS	-1.44356	0.045817	0.266508
GFM2	1.213037	0.046051	0.267451
MYH9	-1.5317	0.046058	0.267451
PDGFRB	-1.52955	0.046091	0.267528
SH3BGRL3	-2.05821	0.046274	0.268357
ALOX5	-2.44208	0.046286	0.268357
GLRX3	-1.51823	0.046314	0.268357
RRAGB	1.29442	0.046385	0.268538
SEPN1	-1.55581	0.046495	0.268568
PPFIBP1	-1.56495	0.046542	0.268568
COPZ2	1.503689	0.046576	0.268568
AKAP9	1.284783	0.046578	0.268568
SRP72	-1.31024	0.046589	0.268568
AGRN	1.442762	0.046702	0.269101
SNN	-1.52188	0.046778	0.269424
KCTD9	-1.25469	0.046805	0.269465
IPO5	-1.23413	0.046914	0.269975

PRR13	-1.2568	0.047013	0.270189
DECR2	1.341077	0.047019	0.270189
MED30	1.399336	0.047031	0.270189
ANAPC2	1.269599	0.0471	0.270389
PI16	5.60539	0.047137	0.270389
WDR62	1.511446	0.047166	0.270389
LHPP	1.549285	0.047248	0.270588
MIOS	-1.25482	0.047298	0.270588
ITGA3	-2.09276	0.047357	0.270588
PABPN1	1.216491	0.047422	0.270588
RAB5C	-1.37544	0.047489	0.270588
YARS	-2.19791	0.04754	0.270588
CREB3	-1.36739	0.047559	0.270588
PICALM	-1.33892	0.047684	0.270588
USP40	1.347267	0.047754	0.270588
GTF2H5	1.346666	0.047816	0.270588
DMKN	2.301388	0.047821	0.270588
SSH3	1.588105	0.047843	0.270588
SLC5A6	-1.64807	0.047978	0.270588
MDK	2.298867	0.048117	0.270588
LRRC47	1.150438	0.048133	0.270588
LAPTM4A	-1.23872	0.048211	0.270588
MPP3	-1.97862	0.048229	0.270588
UNC45A	1.279525	0.04823	0.270588

DNTTIP1	1.328692	0.048257	0.270588
C10orf54	-1.87427	0.048302	0.270588
SOX13	1.273136	0.048393	0.270588
WSB1	1.434059	0.048393	0.270588
EIF3B	-1.30845	0.048424	0.270588
ASNS	-2.63926	0.04847	0.270588
NSDHL	-1.78488	0.048521	0.270588
APPL1	1.250375	0.048582	0.270588
ATP1A1	-1.88686	0.048652	0.270588
EIF4A1	-2.00008	0.048659	0.270588
FBXO21	1.398023	0.048827	0.270588
RAP1GAP2	-1.25894	0.04883	0.270588
CCT7	-1.19335	0.048916	0.270588
CACYBP	-1.49182	0.048939	0.270588
GALNT2	-1.49562	0.048959	0.270588
FAM173A	1.617505	0.049092	0.270588
ST3GAL3	1.231324	0.049095	0.270588
HTATIP2	-1.52926	0.049126	0.270588
ANKRD54	-1.29711	0.049146	0.270588
ST7L	1.219228	0.049172	0.270588
ABCA2	1.30643	0.049203	0.270588
SLC1A4	-1.65069	0.049227	0.270588
LMNA	-1.84708	0.049231	0.270588
H1F0	-2.07808	0.049389	0.271042

NXN	-1.31917	0.049465	0.271042
NGFRAP1	1.338204	0.049545	0.271042
GLYR1	-1.25322	0.049554	0.271042
SHOC2	-1.24354	0.049562	0.271042
DNAJB2	1.274112	0.049621	0.271042
PRKAG2	-1.2285	0.049627	0.271042
GPR172A	-1.51213	0.049688	0.271042
NACC2	-1.6375	0.049692	0.271042
CCT2	-1.80528	0.049707	0.271042
ATP5L	1.162726	0.049721	0.271042
DCTN5	-1.22734	0.049776	0.271042
ING3	-1.32295	0.049859	0.271276
ABHD5	-1.88559	0.050047	0.272189
MMP19	-3.53983	0.05012	0.272471
NDUFA8	1.233779	0.050254	0.272979
LTBR	-1.27634	0.050254	0.272979
PAK2	-1.45952	0.050286	0.273017
DDX17	1.421855	0.050321	0.273017
C3orf43	1.600454	0.050344	0.273032

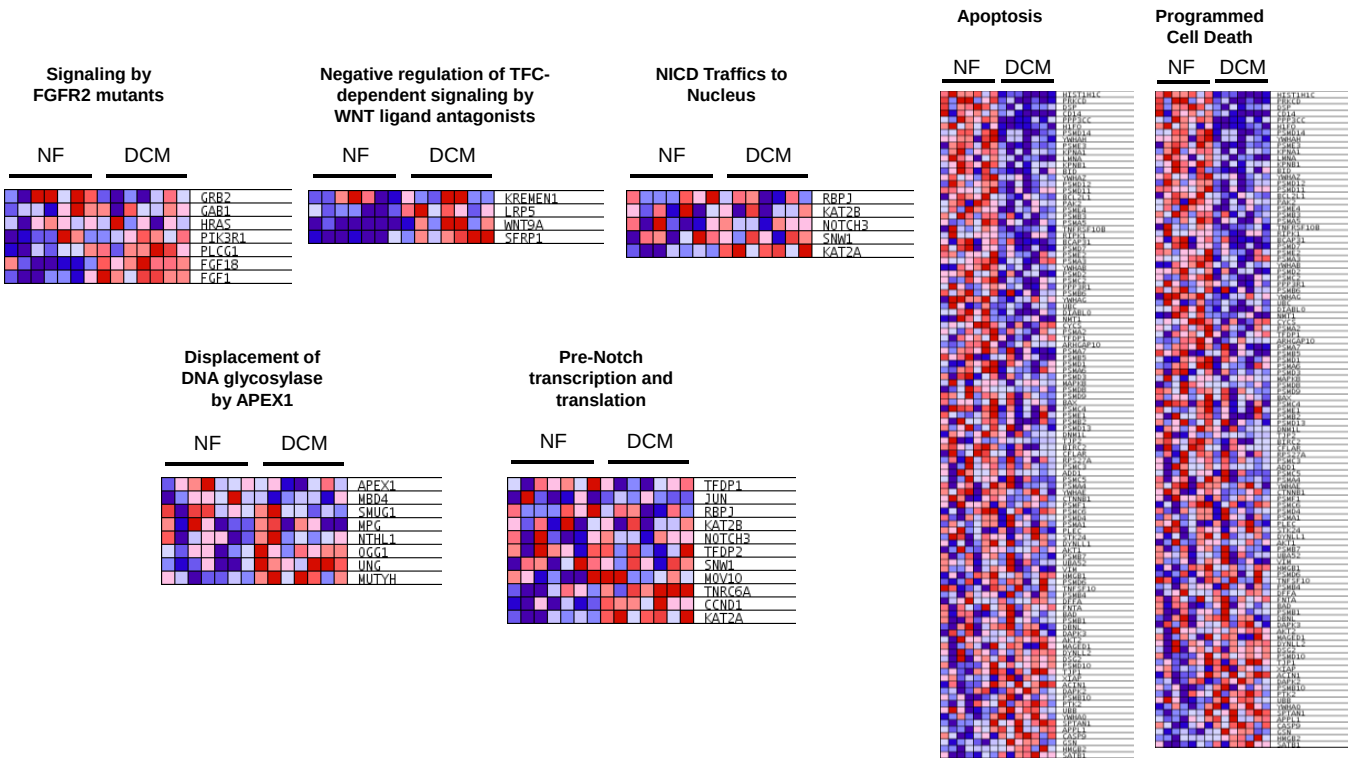
Table S3: List of genes dysregulated in pediatric DCM. P-value≤0.05

	ANF	FGF18	JAK2	TBX5	CTF1	WNT9	CXCL12	HMGB2	MDK	DDX17	CUX1	CCND1
Age at Transplant	0.81	0.0014	0.89	0.6	0.05	0.047	0.008	0.44	0.07	0.13	0.09	0.46

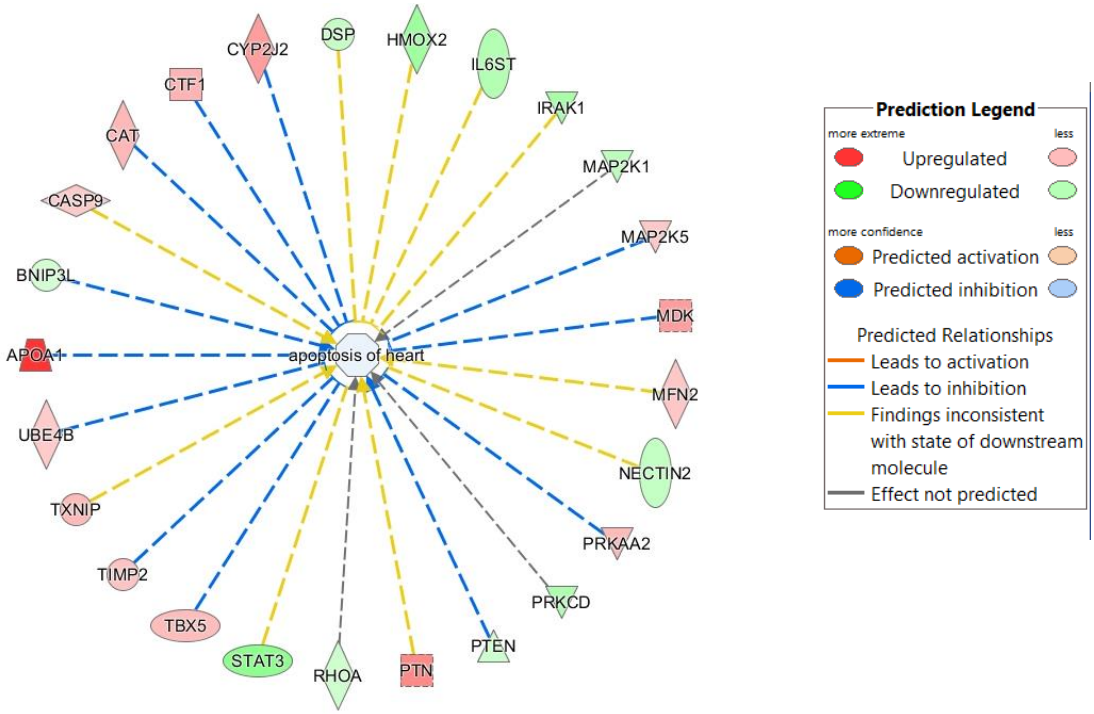
Table S4: Regression analysis of gene expression based on patient age at the time of transplant and at the time of disease presentation. Pvalues are shown.

MOTIF NAME	PVALUE	QVALUE
Klf5	<0.0001	0
Klf4	<0.0001	0
E2A	<0.0001	0
Stat3	<0.0001	0
Oct4	<0.0001	0
Nanog	<0.0001	0
Stat4	<0.0001	0
Esrrb	<0.0001	0
Oct4	<0.0001	0
Tbx5	<0.0001	0.0001
Smad3	<0.0001	0.0001
Sox2	0.0001	0.0009

Table S5: enriched motifs in the promoters of significantly changed genes in IDCM patients. Duplicate transcription factors represent differing motifs derived from different studies.

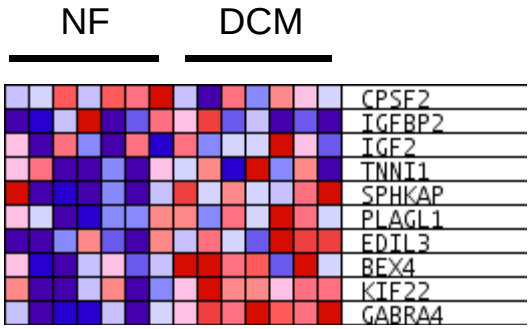


Supplemental Figure 1: Heatmaps of the genes from each pathway found enriched in the GSEA analysis. Red is associated with higher relative expression, while blue is associated with lower relative expression.

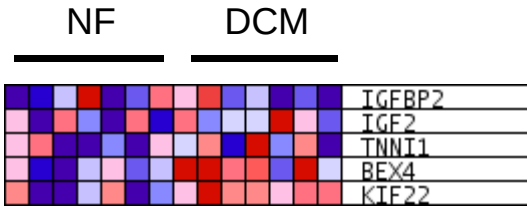


Supplemental Figure 2: Confirmatory GSEA analysis using Ingenuity Pathway Analysis (IPA). IPA of dysregulated genes in pediatric DCM showing predicted down-regulation of apoptosis. Colors are indicative of activation or repression and are described in the Figure. P values and z-scores for predicted response are stated in the text.

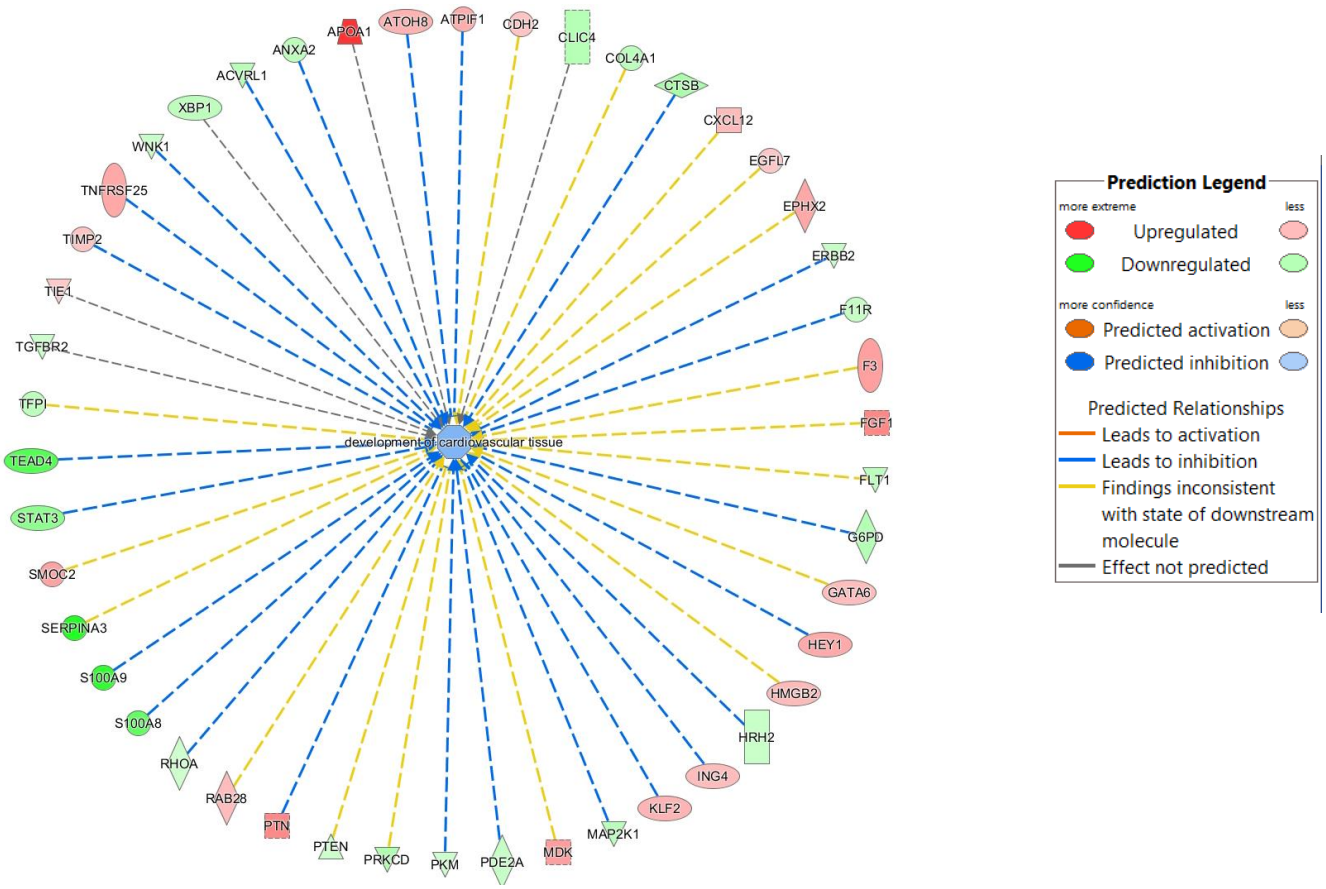
Embryonic day 12.5 compared to adult



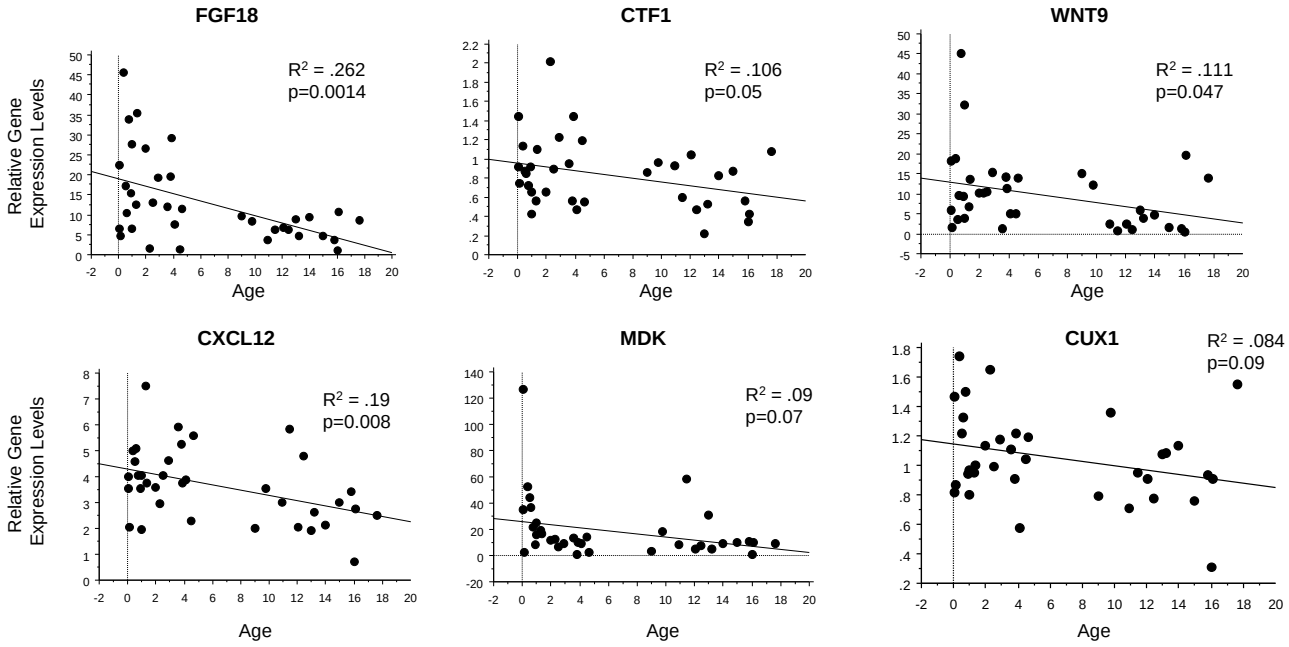
Embryonic day 14.5 compared to adult



Supplemental Figure 3: Heatmaps of the genes specifically up- or down-regulated in mouse embryonic days 12.5 and 14.5 when compared to adults, and found to be enriched in pediatric patients using GSEA. Red is associated with higher relative expression, while blue is associated with lower relative expression.

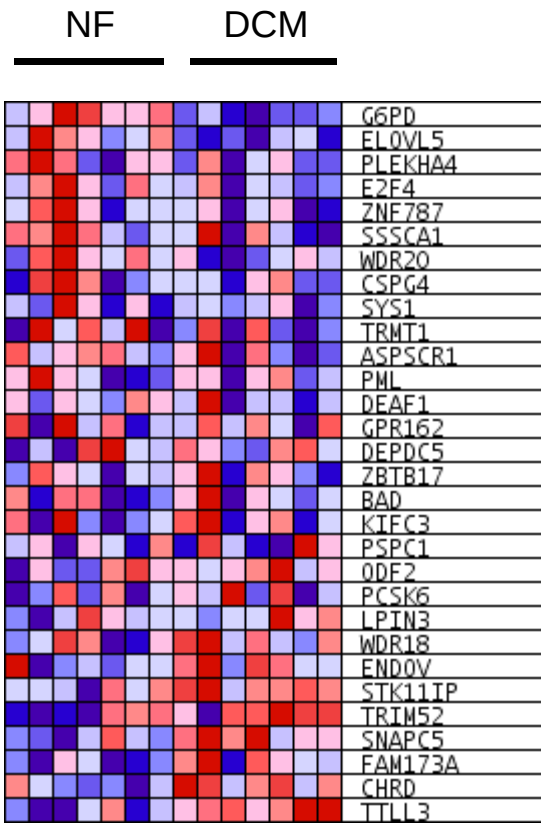


Supplemental Figure 4: IPA of dysregulated genes in pediatric DCM patients suggests down-regulation of cardiovascular tissue development. Colors are indicative of activation or repression and are described in the Figure. P values and z-scores for predicted response are stated in the text.

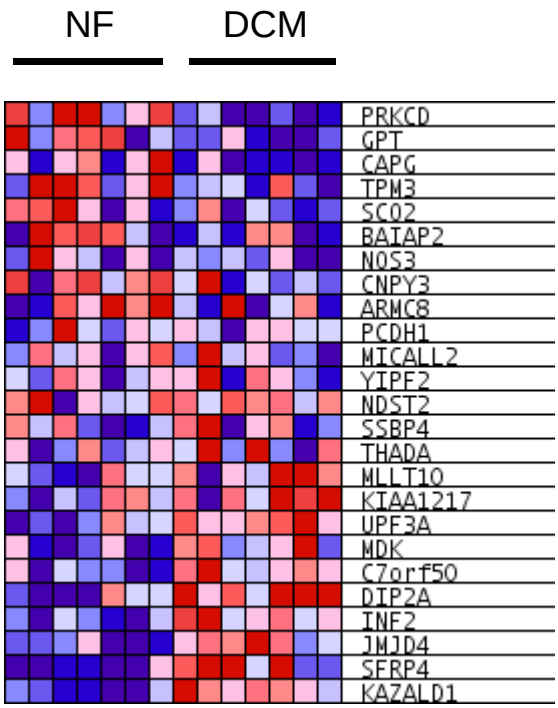


Supplemetal Figure 5: Regression analysis of age and gene expression as determined by RT-PCR. Only significant results ($p<0.1$) are shown in the Figure.

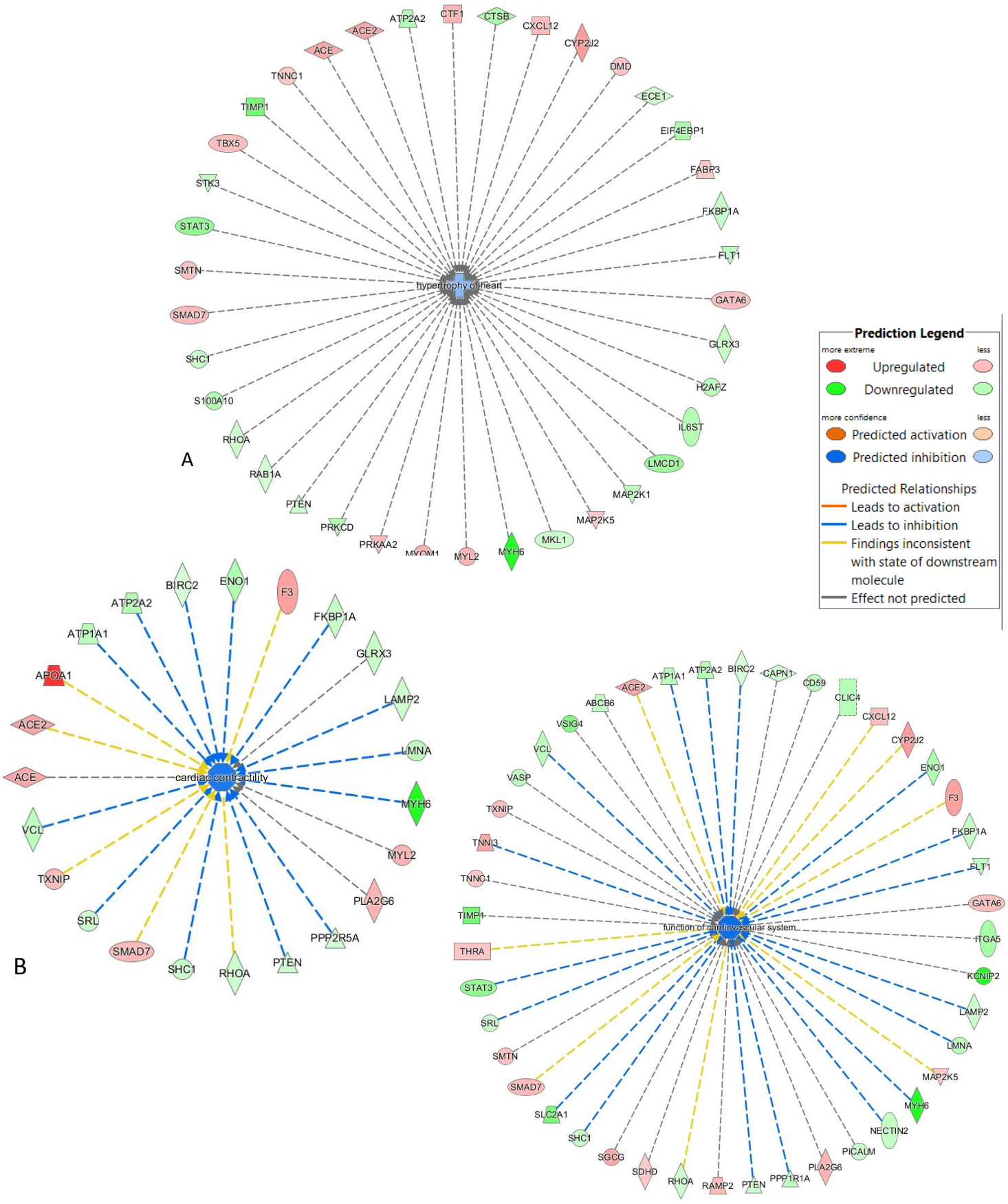
Up-regulated in Adult DCM compared to NF



Down-regulated in Adult DCM compared to NF



Supplemental Figure 6: Heatmaps of the genes up- or down-regulated in adult DCM patients that were also dysregulated in pediatric patients. As shown in the heatmap, expression of pediatric DCM genes is both up- and down-regulated in up- or down-regulated-specific adult datasets. No significant enrichment was found using GSEA analysis. Red is associated with higher relative expression in pediatric DCM patients, while blue is associated with lower relative expression in pediatric DCM patients.


A
hypertrophy of heart
ATP2A2
CTF1
CTSB
CXCL12
CYP2J2
DMD
ECE1
EIF4EBP1
FABP3
FKBP1A
FLT1
GATA6
GLRX3
H2AFZ
IL6ST
LMCD1
MAP2K1
MAP2K5
MKL1
MYH6
MYL2
PRKAA2
PRKCD
PTEN
RAB1A
RHOA
S100A10
SHC1
SMAD7
SMTN
STAT3
STK3
TBX5
TIMP1
TNNC1
ACE
ACE2
Prediction Legend
more extreme
less
Upregulated
Downregulated
more confidence
less
Predicted activation
Predicted inhibition
Predicted Relationships
Leads to activation
Leads to inhibition
Findings inconsistent with state of downstream molecule
Effect not predicted
B
cardiac contractility
APOA1
ATP1A1
ATP2A2
BIRC2
ENO1
F3
FKBP1A
GLRX3
LAMP2
LMNA
MYH6
MYL2
PLA2G6
PPP2R5A
PTEN
RHOA
SHC1
SMAD7
SRL
TXNIP
VCL
ACE
ACE2
function of cardiovascular system
ABCB6
ATP1A1
ATP2A2
BIRC2
CAPN1
CD59
CLIC4
CXCL12
CYP2J2
ENO1
F3
FKBP1A
FLT1
GATA6
ITGA5
KCNIP2
LAMP2
LMNA
MAP2K5
MYH6
NECTIN2
PICALM
PLA2G6
PPP1R1A
PTEN
RAMP2
RHOA
SDHD
SGCG
SHC1
SLC2A1
SMAD7
SMTN
SRL
STAT3
THRA
TIMP1
TNNC1
TNNI3
TXNIP
VASP
VCL
VSIG4
ACE2

Supplemental Figure 7: IPA of dysregulated genes in pediatric DCM patients suggests a decrease in hypertrophy (A), contractility (B) and cardiac function (C). Colors are indicative of activation or repression and are described in the Figure. P values and z-scores for predicted response are stated in the text.