Hu, et al. Epitranscriptional orchestration of genetic reprogramming is an emergent property of stress-regulated cardiac microRNAs

Supplemental Information Appendix

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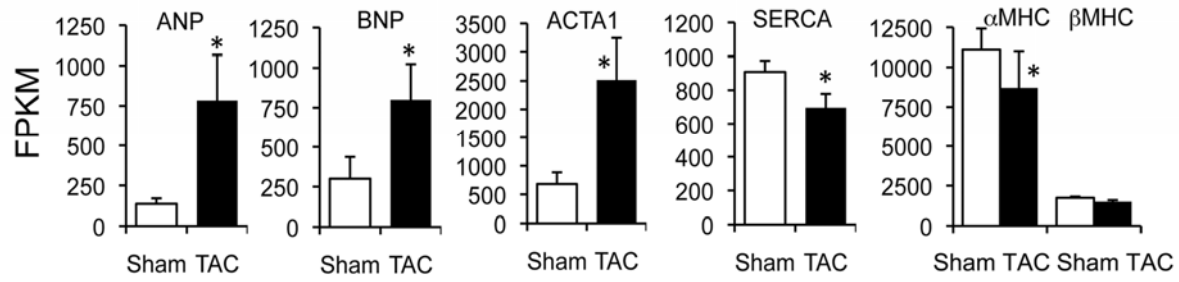
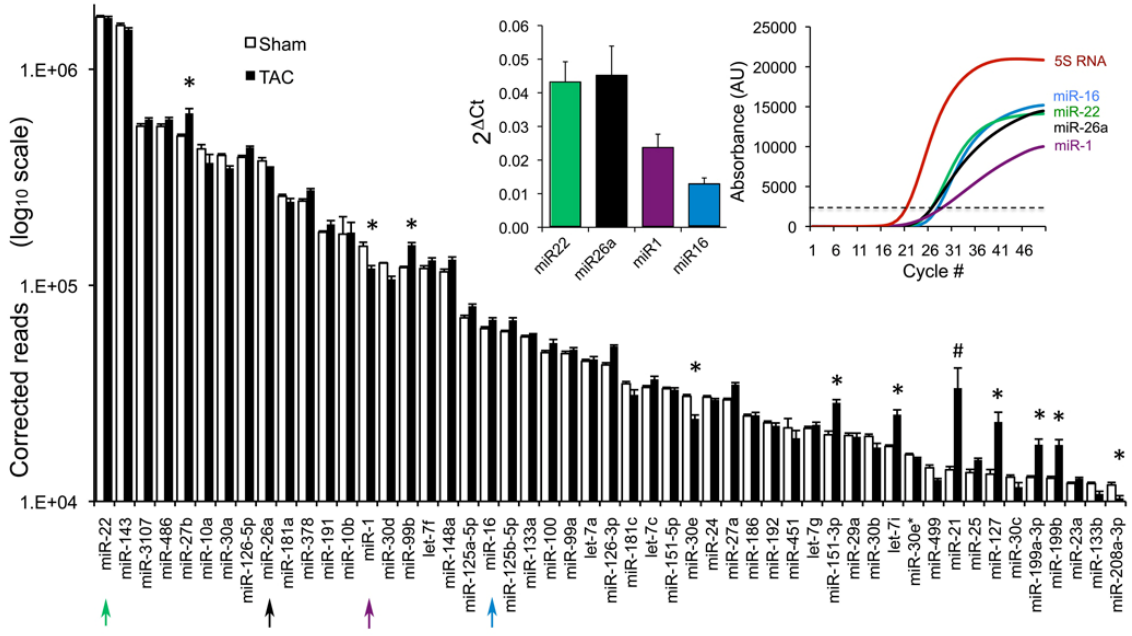
Supplemental Figure S7. *Distinct functions of microRNA-regulated and microRNA-independent cardiac mRNAs*

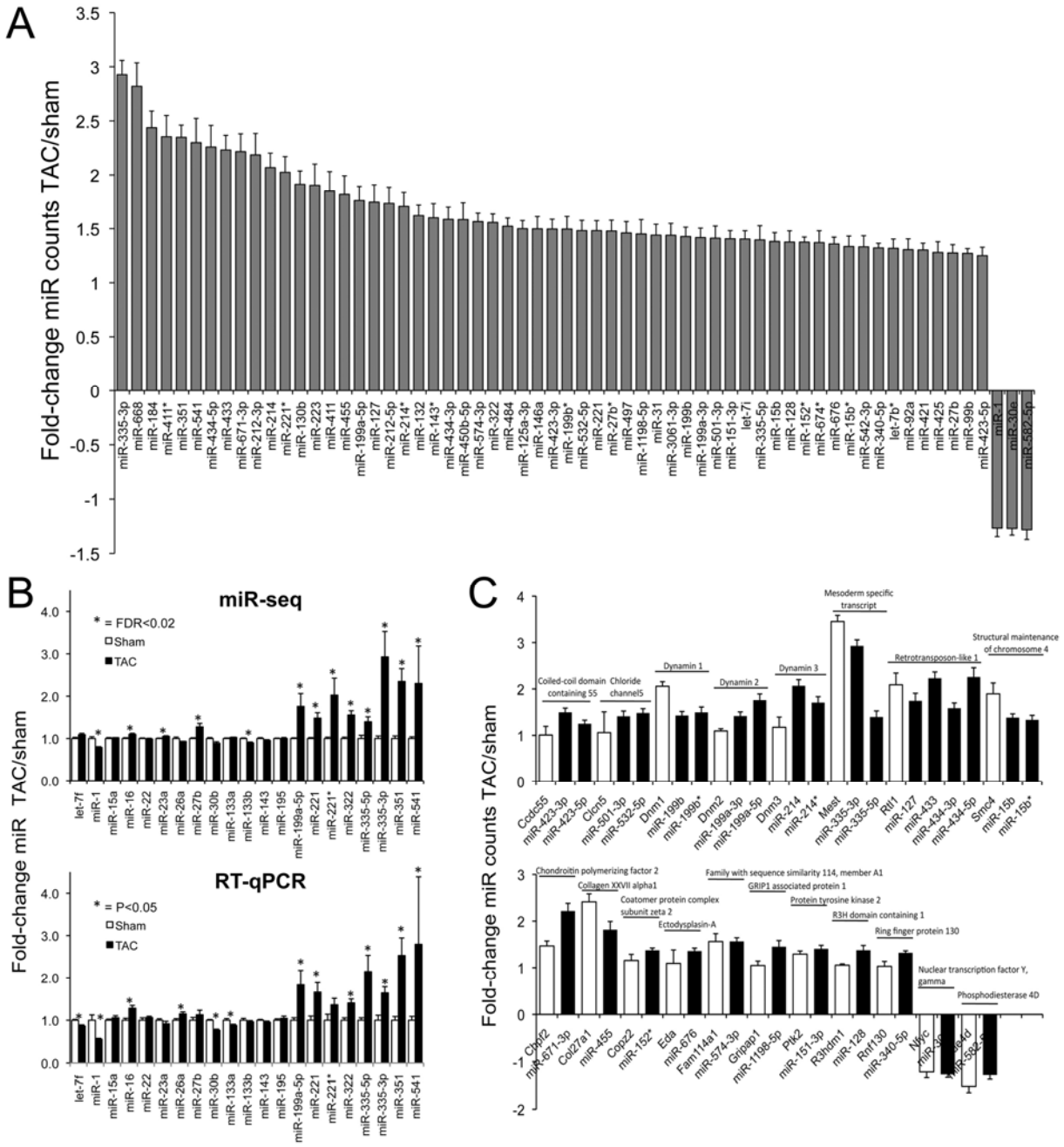
Supplemental Figure S8. *Expression profiles of representative housekeeping, homeostatic, and stress-response cardiac microRNAs.*



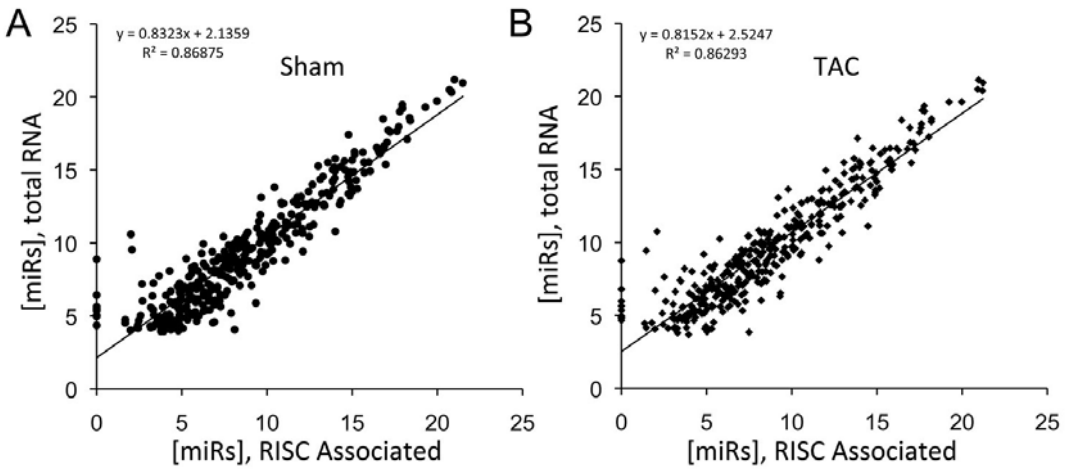
Supplemental Figure S1. *Expression of fetal gene program mRNAs in early cardiac hypertrophy1 week after surgical pressure overloading.* ANP=atrial natriuretic peptide; BNP=brain natriuretic peptide; ACTA1=α skeletal actin; SERCA=sarcoplasmic reticular ATPase; MHC=myosin heavy chain. *=P<0.05 vs sham.



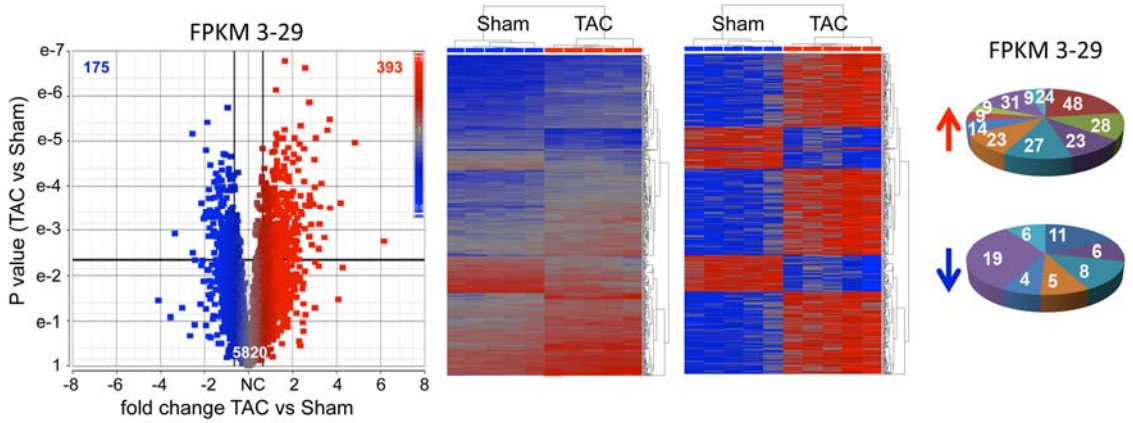
Supplemental Figure S2. *microRNA abundance in normal and early hypertrophying hearts.* Corrected microRNA sequencing reads (log_{10} scale) of 50 most-abundant cardiac microRNAs for normal (white) and 1 week post TAC (black) hearts (n=5 each). *Inset* shows RT-qPCR measurements of four abundant microRNAs indicated by colored arrows. *=P<0.03; #=P<0.08 vs sham.



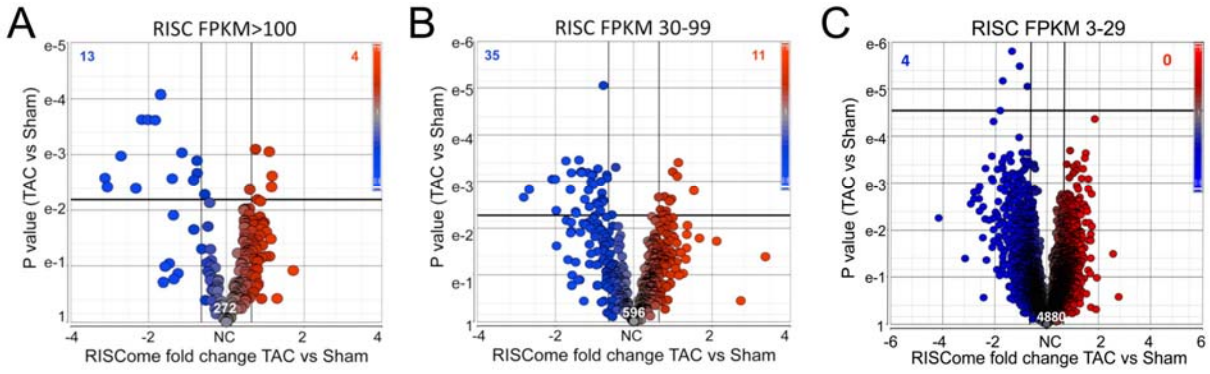
Supplemental Figure S3. *Hypertrophy-regulated cardiac microRNAs.* **A.** Cardiac microRNAs significantly regulated 1 week after acute cardiac pressure overloading are ranked according to degree of regulation (fold-change over RNA-Seq levels in sham-operated hearts), regardless of absolute abundance. **B.** Comparison of fold-change 1 week after pressure overloading for 21 representative microRNAs, assessed by genome-wide RNA-seq (top) or individual RT-qPCR (bottom). Note that P value threshold for statistical significance is genome-wide for RNA-Seq and paired t-test for RT-qPCR. Correlation of these RNA-Seq and RT-qPCR data is in Figure 2d. **C.** Change in relative abundance of microRNAs (black bars) encoded within their parent mRNAs (white bars) in pressure overload hypertrophy.



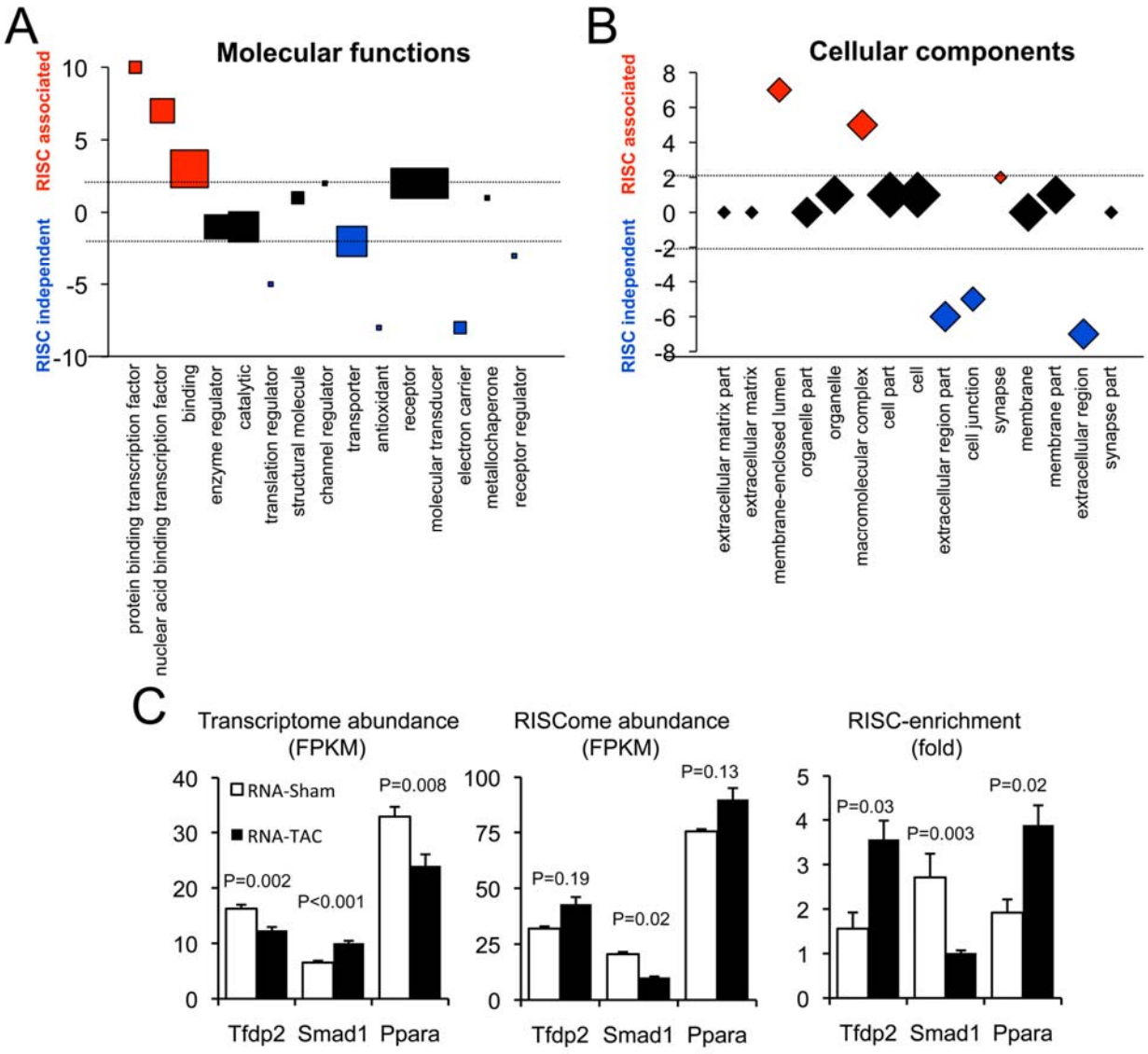
Supplemental Figure S4. *Correlation in microRNA abundance between total cellular and RISC-associated RNA.* **A.** Relative microRNA levels in sequencing libraries prepared from sham-operated mouse heart Argonaute-2 immunoprecipitates (RISC Associated, horizontal axis) and total cardiac RNA (vertical axis). **B**. Same as (A) for pressure overloaded (TAC) hearts.



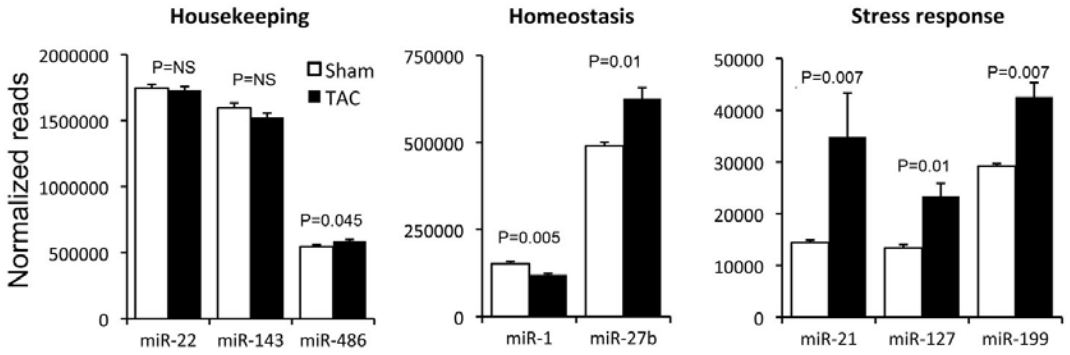
Supplemental Figure S5. *Transcriptional signature of the actively hypertrophying pressure-overloaded mouse heart.* Volcano plot (left) and heat maps (middle) of 5820 lower abundance cardiac mRNAs. Volcano plot shows fold-change TAC/sham vs probability value. Bold horizontal and vertical lines are threshold levels (±25% fold change and p value at false discovery rate [FDR] of 0.02). Colored numerals indicate number of up- (red) and down- (blue) regulated mRNAs. Heat maps show unsupervised hierarchical clustering of raw (left) and normalized (right) RNA-sequence data for the 568 regulated mRNAs; each column is a single mouse heart. Pie charts to the right are functional classification of upregulated (upper) and downregulated (lower) mRNAs, according to the legend in Figure 3.



Supplemental Figure S6. *Relationship of mRNA abundance in Argonaute 2 complexes to their stress-dependent regulation in the heart.* **A-C.** Volcano plots showing fold-change TAC/sham vs probability value. Bold horizontal and vertical lines are threshold levels (±25% fold change and p value at false discovery rate [FDR] of 0.02). Colored numerals indicate number of up- (red) and down- (blue) hypertrophy-regulated highly RISC abundant (A), moderately RISC abundant (B), and low RISC abundance (C) mRNAs.



Supplemental Figure S7. *Distinct functions of microRNA-regulated and microRNA-independent cardiac mRNAs.* **A.** Proportional representation according to annotated molecular function of cardiac mRNAs. Categories with biased representation are depicted in red (microRNA-dependent/RISC-associated) or blue (microRNA/RISC-independent hypertrophy-regulated). **B.** As in (A), but for annotated cellular components. **C.** Comparison of transcript abundance, RISC-abundance, and RISC-enrichment for three cardiac transcription factors regulated at the protein level after TAC for transcription factors described in Figure 6b.



Supplemental Figure S8. *Expression profiles of representative housekeeping, homeostatic, and stress-response cardiac microRNAs.* Absolute expression (normalized sequencing reads) is shown for sham-operated (white) and TAC-operated (black) hearts.

List of Supplementary Tables, Hu, et al:

Supplemental Table S1. *Quantification of cardiac-expressed microRNAs in sham-operated and 1 week TAC mouse hearts.*

Supplemental Table S2. *Hypertrophy-regulated cardiac mRNAs, classified according to biological function.*

Supplemental Table S3. *RISC-enriched/microRNA-targeted cardiac mRNAs.*

Supplemental Table S4. *Biological functions of RISC-associated vs RISC-independent cardiac mRNAs.*

Supplemental Table S5. *GO categorization by biological function.*

Supplemental Table S1. Quantification (normalized sequencing reads/10,000,000) of cardiac-expressed microRNAs in sham-operated and 1 week TAC mouse hearts, ranked by abundance in normal hearts.

microRNAs	Sham (mean)	Sham (S.E.M.)	TAC (mean)	TAC (S.E.M)	Fold change (TAC /Sham)	P value
mmu-miR-22	1745923	26213	1728206	28542	-1.01	6.598E-01
mmu-miR-143	1596491	35896	1525470	31059	-1.05	1.737E-01
mmu-miR-3107	545169	14209	585019	10754	1.07	5.815E-02
mmu-miR-486	543905	13990	586892	11507	1.08	4.616E-02
mmu-miR-27b	490601	9597	625802	31726	1.28	1.074E-02
mmu-miR-10a	427937	19980	368967	34474	-1.16	1.862E-01
mmu-miR-30a	399379	6901	348205	8726	-1.15	2.010E-03
mmu-miR-126-5p	391250	7889	434455	6208	1.11	2.950E-03
mmu-miR-26a	376732	12976	351652	1284	-1.07	1.254E-01
mmu-miR-181a	258473	5144	243549	8749	-1.06	1.883E-01
mmu-miR-378	245451	5624	275592	4737	1.12	3.656E-03
mmu-miR-191	176110	2339	191619	7688	1.09	1.147E-01
mmu-miR-10b	172632	35164	175542	20026	1.02	9.449E-01
mmu-miR-1	151714	6595	119741	3624	-1.27	4.979E-03
mmu-miR-30d	126772	674	106693	3448	-1.19	3.697E-03
mmu-miR-99b	120804	1564	153563	4104	1.27	6.061E-04
mmu-let-7f	119642	3507	130577	3468	1.09	5.743E-02
mmu-miR-148a	115497	3309	131549	3681	1.14	1.201E-02
mmu-miR-125a-5p	70742	1862	80088	1814	1.13	7.034E-03
mmu-miR-16	63007	1278	69286	1485	1.10	1.290E-02
mmu-miR-125b-5p	61070	794	68917	1858	1.13	9.934E-03
mmu-miR-133a	57751	871	59362	351	1.03	1.438E-01
mmu-miR-100	48829	1059	54041	2132	1.11	7.218E-02
mmu-miR-99a	48325	1182	50360	1100	1.04	2.433E-01
mmu-let-7a	44523	873	45429	1354	1.02	5.922E-01
mmu-miR-126-3p	42842	975	52208	717	1.22	8.736E-05
mmu-miR-181c	35049	815	31130	1716	-1.13	8.695E-02
mmu-let-7c	33673	662	36732	1198	1.09	6.525E-02
mmu-miR-151-5p	33224	506	32884	662	-1.01	6.948E-01
mmu-miR-30e	30633	592	24118	995	-1.27	1.015E-03
mmu-miR-24	30369	481	29505	410	-1.03	2.100E-01
mmu-miR-27a	29517	459	34730	712	1.18	5.111E-04
mmu-miR-186	24848	451	25044	767	1.01	8.322E-01
mmu-miR-192	23103	432	22385	678	-1.03	4.023E-01
mmu-miR-451	21895	2295	19610	1675	-1.12	4.467E-01
mmu-let-7g	21773	448	22625	622	1.04	3.018E-01
mmu-miR-151-3p	20333	815	28599	973	1.41	2.124E-04

mmu-miR-29a	20172	539	19907	783	-1.01	7.884E-01
mmu-miR-30b	19986	491	17757	807	-1.13	5.236E-02
mmu-let-7i	17952	280	25211	1319	1.40	4.487E-03
mmu-miR-30e*	16448	212	15800	169	-1.04	4.510E-02
mmu-miR-499	14313	418	12566	189	-1.14	1.017E-02
mmu-miR-21	14004	488	33443	7989	2.39	7.161E-02
mmu-miR-25	13592	468	15551	286	1.14	1.001E-02
mmu-miR-127	13367	676	23319	2540	1.74	1.518E-02
mmu-miR-30c	12949	289	11651	563	-1.11	8.628E-02
mmu-miR-199a-3p	12911	210	18294	1130	1.42	8.023E-03
mmu-miR-199b	12787	262	18250	1058	1.43	5.464E-03
mmu-miR-23a	12114	146	12746	160	1.05	1.941E-02
mmu-miR-133b	12088	170	10836	297	-1.12	9.563E-03
mmu-miR-208a-3p	11906	331	10342	285	-1.15	7.420E-03
mmu-miR-26b	10540	310	9976	156	-1.06	1.563E-01
mmu-miR-145*	10266	222	9939	191	-1.03	2.973E-01
mmu-let-7d	9277	224	9541	323	1.03	5.219E-01
mmu-miR-149	8829	155	9099	63	1.03	1.628E-01
mmu-miR-142-5p	7950	561	8981	343	1.13	1.631E-01
mmu-miR-144	7517	918	6818	320	-1.10	5.043E-01
mmu-miR-101a	7220	151	6907	137	-1.05	1.626E-01
mmu-miR-30a*	6256	113	5916	149	-1.06	1.096E-01
mmu-miR-181b	6109	111	6629	163	1.09	3.333E-02
mmu-let-7b	5935	105	6439	204	1.08	7.046E-02
mmu-miR-24-1*	5879	119	6726	196	-1.14	8.431E-03
mmu-miR-208b	5697	355	6321	378	1.11	2.626E-01
mmu-miR-23b	5572	63	5345	65	-1.04	3.630E-02
mmu-miR-130a	5570	139	5847	115	1.05	1.637E-01
mmu-miR-146a	5099	358	7642	371	1.50	1.144E-03
mmu-miR-145	4850	141	4861	114	1.00	9.521E-01
mmu-let-7d*	4503	133	5505	145	1.22	9.597E-04
mmu-miR-351	4464	274	10484	573	2.35	1.024E-04
mmu-miR-125b-3p	4402	59	4941	222	-1.12	7.118E-02
mmu-miR-29c	4256	155	3937	131	-1.08	1.568E-01
mmu-miR-93	4189	158	5031	132	1.20	3.727E-03
mmu-miR-103	4143	80	4916	117	1.19	9.020E-04
mmu-miR-204	4096	145	4520	101	1.10	4.686E-02
mmu-miR-195	3606	41	3611	85	1.00	9.599E-01
mmu-miR-301a	3124	74	3744	111	1.20	2.390E-03
mmu-miR-150	3097	142	3163	61	1.02	6.858E-01
mmu-miR-199a-5p	3085	54	5429	533	1.76	1.140E-02

mmu-miR-144*	3010	328	3270	162	1.09	5.039E-01
mmu-miR-15a	2862	71	2920	10	1.02	4.618E-01
mmu-miR-98	2709	107	2933	118	1.08	1.968E-01
mmu-miR-181d	2559	66	2717	118	1.06	2.832E-01
mmu-miR-378*	2465	64	2281	86	-1.08	1.278E-01
mmu-miR-322	2449	81	3812	159	1.56	2.751E-04
mmu-miR-148b	2371	119	2199	87	-1.08	2.794E-01
mmu-miR-340-5p	2245	25	2967	81	1.32	4.698E-04
mmu-miR-92a	1998	112	2609	119	1.31	5.702E-03
mmu-miR-30c*	1883	21	1884	40	-1.00	9.889E-01
mmu-let-7e	1721	65	2096	81	1.22	7.637E-03
mmu-miR-411	1693	125	3127	360	1.85	1.334E-02
mmu-miR-107	1529	34	1563	32	1.02	4.891E-01
mmu-miR-486*	1529	27	1714	56	1.12	2.542E-02
mmu-miR-28	1484	44	1673	57	1.13	3.210E-02
mmu-miR-221	1410	35	2090	123	1.48	3.964E-03
mmu-miR-335-3p	1352	81	3959	277	2.93	3.916E-04
mmu-miR-484	1320	73	2010	51	1.52	9.674E-05
mmu-miR-423-3p	1259	64	1885	76	1.50	2.589E-04
mmu-miR-181c*	1200	52	1323	27	1.10	7.885E-02
mmu-miR-423-5p	1162	42	1453	56	1.25	3.826E-03
mmu-miR-497	1140	36	1665	112	1.46	7.247E-03
mmu-miR-29b	1139	64	1068	53	-1.07	4.227E-01
mmu-miR-342-3p	1120	44	1083	31	-1.03	5.137E-01
mmu-miR-541	1097	45	2523	422	2.30	2.729E-02
mmu-miR-19b	1093	68	1291	49	1.18	4.839E-02
mmu-miR-15b	1083	61	1496	43	1.38	7.799E-04
mmu-miR-30d*	1043	17	1013	78	-1.03	7.166E-01
mmu-miR-101b	1019	22	1025	37	1.01	9.090E-01
mmu-miR-128	937	23	1290	92	1.38	1.699E-02
mmu-miR-361	931	12	1050	43	1.13	4.831E-02
mmu-miR-146b	926	61	1486	313	1.60	1.490E-01
mmu-miR-1937a	900	63	1166	92	1.30	4.869E-02
mmu-miR-744	883	23	1069	47	1.21	1.243E-02
mmu-miR-152	882	40	882	36	1.00	9.926E-01
mmu-miR-328	877	22	871	33	-1.01	8.738E-01
mmu-miR-1937b	832	43	1046	86	1.26	6.888E-02
mmu-miR-335-5p	807	61	1127	68	1.40	8.420E-03
mmu-miR-22*	784	21	777	32	-1.01	8.628E-01
mmu-miR-532-5p	779	21	1154	70	1.48	4.205E-03
mmu-miR-338-3p	735	20	621	28	-1.18	1.131E-02

mmu-miR-194	710	30	651	16	-1.09	1.330E-01
mmu-miR-501-3p	710	16	1002	82	1.41	2.209E-02
mmu-miR-208a-5p	691	26	694	24	1.00	9.454E-01
mmu-miR-106b	687	31	716	15	1.04	4.279E-01
mmu-miR-181a*	683	18	777	33	1.14	4.371E-02
mmu-miR-203	651	29	742	45	1.14	1.291E-01
mmu-miR-450a	631	20	651	28	1.03	5.762E-01
mmu-miR-320	629	15	745	35	1.19	2.649E-02
mmu-miR-20a	616	25	648	11	1.05	2.810E-01
mmu-miR-148a*	589	23	693	56	1.18	1.443E-01
mmu-miR-152*	576	7	793	24	1.38	4.315E-04
mmu-miR-425	534	15	684	45	1.28	2.572E-02
mmu-miR-132	531	23	861	44	1.62	5.670E-04
mmu-miR-674*	516	29	707	38	1.37	4.606E-03
mmu-miR-223	501	33	954	126	1.90	2.077E-02
mmu-miR-1843-5p	496	6	502	25	1.01	8.218E-01
mmu-miR-139-5p	480	14	435	11	-1.10	3.686E-02
mmu-miR-582-5p	470	21	367	15	-1.28	5.140E-03
mmu-miR-185	445	23	382	12	-1.16	5.152E-02
mmu-miR-21*	429	15	1425	501	3.32	1.178E-01
mmu-miR-140*	427	10	520	36	1.22	6.237E-02
mmu-miR-199b*	406	21	607	39	1.50	3.552E-03
mmu-miR-214	400	14	827	71	2.07	3.174E-03
mmu-miR-322*	376	14	527	44	1.40	2.277E-02
mmu-miR-1944	368	8	424	11	1.15	3.944E-03
mmu-miR-361*	353	3	422	24	1.19	4.367E-02
mmu-miR-434-3p	343	13	544	37	1.59	3.615E-03
mmu-miR-3057-5p	343	18	366	20	1.07	4.130E-01
mmu-miR-574-3p	340	27	532	6	1.57	1.700E-03
mmu-let-7i*	335	5	320	14	-1.05	3.510E-01
mmu-miR-676	322	10	438	13	1.36	1.194E-04
mmu-miR-381	306	7	463	60	1.52	5.868E-02
mmu-miR-410	306	28	664	105	2.17	2.422E-02
mmu-miR-28*	303	19	382	14	1.26	1.068E-02
mmu-miR-34c	294	12	980	279	3.33	7.004E-02
mmu-miR-17	293	14	362	29	1.24	7.382E-02
mmu-miR-1943	292	12	292	8	-1.00	9.816E-01
mmu-miR-374	290	21	282	18	-1.03	7.683E-01
mmu-miR-421	290	9	377	11	1.30	2.769E-04
mmu-miR-212-5p	289	16	500	47	1.73	8.702E-03
mmu-miR-106b*	288	18	324	5	1.12	1.175E-01

mmu-miR-490-3p	285	21	319	26	1.12	3.384E-01
mmu-miR-1839-5p	280	21	308	12	1.10	2.941E-01
mmu-miR-32	279	11	260	21	-1.07	4.603E-01
mmu-miR-31	279	12	401	22	1.44	2.578E-03
mmu-miR-221*	274	9	555	54	2.02	5.960E-03
mmu-miR-136	273	8	297	12	1.09	1.367E-01
mmu-miR-499*	272	8	234	6	-1.16	5.596E-03
mmu-miR-1249	253	4	229	17	-1.10	2.376E-01
mmu-let-7b*	248	9	326	15	1.32	3.071E-03
mmu-miR-339-5p	242	7	271	18	1.12	1.939E-01
mmu-miR-27b*	241	20	356	10	1.48	2.299E-03
mmu-miR-210	240	13	289	17	1.20	5.064E-02
mmu-miR-142-3p	239	12	317	18	1.33	8.946E-03
mmu-miR-148b*	229	6	280	12	1.22	9.920E-03
mmu-miR-182	228	6	286	18	1.26	2.832E-02
mmu-miR-434-5p	204	16	460	58	2.26	9.646E-03
mmu-miR-324-5p	202	14	233	7	1.15	9.637E-02
mmu-let-7c-2*	202	8	227	17	1.13	2.363E-01
mmu-miR-720	194	19	139	10	-1.39	4.239E-02
mmu-miR-365	190	4	225	9	1.18	1.668E-02
mmu-miR-214*	189	9	322	25	1.71	4.273E-03
mmu-miR-15b*	188	9	251	12	1.34	3.552E-03
mmu-let-7a-1*	181	6	209	12	1.16	7.322E-02
mmu-miR-218	179	8	155	10	-1.15	1.195E-01
mmu-miR-379	178	14	300	42	1.68	4.131E-02
mmu-miR-331-3p	176	5	222	12	1.26	1.601E-02
mmu-miR-1196	175	13	189	10	1.08	4.547E-01
mmu-miR-872*	174	7	204	9	1.17	3.271E-02
mmu-miR-26b*	170	11	179	11	1.05	5.721E-01
mmu-miR-193b	168	7	231	17	1.38	1.694E-02
mmu-miR-3068*	161	8	159	11	-1.01	8.707E-01
mmu-miR-300	158	8	278	35	1.75	2.594E-02
mmu-miR-215	157	16	189	27	1.20	3.547E-01
mmu-miR-184	155	8	377	35	2.44	2.571E-03
mmu-miR-676*	154	11	122	8	-1.27	4.432E-02
mmu-miR-664	146	5	140	4	-1.05	3.672E-01
mmu-miR-652	141	3	161	15	1.14	2.608E-01
mmu-miR-3102	133	6	120	13	-1.11	4.139E-01
mmu-miR-19a	128	6	180	14	1.40	1.677E-02
mmu-miR-1947	127	8	114	9	-1.12	2.963E-01
mmu-miR-191*	126	7	138	8	1.09	2.961E-01

mmu-miR-195*	123	12	165	10	1.35	2.739E-02
mmu-miR-212-3p	122	17	268	26	2.19	2.333E-03
mmu-miR-153	121	7	138	23	1.14	5.009E-01
mmu-miR-98*	120	8	165	16	1.38	4.609E-02
mmu-miR-30b*	119	8	96	8	-1.23	7.012E-02
mmu-miR-3107*	119	8	134	8	1.13	2.008E-01
mmu-miR-345-5p	113	11	113	8	-1.00	9.974E-01
mmu-miR-27a*	111	8	135	18	1.22	2.815E-01
mmu-miR-671-3p	108	4	239	27	2.22	7.567E-03
mmu-miR-190	105	6	91	5	-1.15	1.193E-01
mmu-miR-574-5p	97	8	103	3	1.06	5.240E-01
mmu-miR-744*	92	7	94	8	1.02	8.467E-01
mmu-miR-1839-3p	87	6	79	8	-1.10	4.250E-01
mmu-miR-339-3p	86	6	92	7	1.07	5.217E-01
mmu-miR-16-2*	85	8	75	4	-1.13	2.858E-01
mmu-miR-92b	85	7	124	10	1.46	1.441E-02
mmu-miR-34a	85	9	116	16	1.37	1.307E-01
mmu-miR-674	84	5	79	5	-1.06	4.786E-01
mmu-miR-10a*	80	4	61	9	-1.31	9.999E-02
mmu-miR-101a*	80	6	81	5	1.01	9.415E-01
mmu-miR-29a*	79	7	62	12	-1.28	2.630E-01
mmu-miR-3068	79	6	61	4	-1.31	3.574E-02
mmu-miR-1964-3p	79	4	81	6	1.03	6.926E-01
mmu-miR-409-3p	79	7	178	30	2.26	2.794E-02
mmu-miR-362-3p	78	4	75	5	-1.05	5.980E-01
mmu-miR-455*	78	6	120	10	1.53	1.005E-02
mmu-miR-542-3p	78	6	103	4	1.33	6.820E-03
mmu-miR-350	73	4	68	4	-1.07	3.781E-01
mmu-miR-542-5p	71	7	49	6	-1.44	4.807E-02
mmu-miR-504	70	6	84	10	1.19	2.810E-01
mmu-miR-3074-5p	67	3	85	6	1.27	4.558E-02
mmu-miR-1-1*	65	8	54	4	-1.20	2.954E-01
mmu-miR-136*	63	8	88	13	1.40	1.450E-01
mmu-miR-29c*	63	4	59	4	-1.06	4.900E-01
mmu-miR-3096-3p	62	4	70	8	1.12	4.065E-01
mmu-miR-15a*	62	9	68	8	1.10	6.174E-01
mmu-miR-2145	61	12	31	6	-1.97	6.766E-02
mmu-miR-130b	59	6	112	5	1.91	1.244E-04
mmu-miR-298	59	3	195	37	3.33	2.119E-02
mmu-miR-450b-5p	58	6	93	7	1.58	4.682E-03
mmu-miR-201	58	7	64	7	1.10	5.642E-01

mmu-miR-345-3p	58	7	67	4	1.17	2.639E-01
mmu-miR-7a-1*	57	4	60	7	1.06	7.133E-01
mmu-miR-92a-1*	55	5	84	7	1.53	1.054E-02
mmu-miR-33	55	5	48	6	-1.15	3.961E-01
mmu-miR-210*	53	3	68	5	1.27	6.051E-02
mmu-miR-99a*	53	5	56	5	1.06	7.086E-01
mmu-miR-409-5p	52	7	127	22	2.45	2.570E-02
mmu-miR-431	50	6	125	19	2.47	1.448E-02
mmu-let-7c-1*	50	5	66	3	1.32	2.957E-02
mmu-miR-500	50	8	45	6	-1.12	6.052E-01
mmu-miR-222	50	2	63	9	1.27	2.091E-01
mmu-miR-874	49	3	49	6	-1.00	9.906E-01
mmu-miR-1198-5p	49	5	71	3	1.45	7.319E-03
mmu-let-7f-1*	48	6	62	5	1.27	1.424E-01
mmu-miR-330	48	1	45	3	-1.08	3.894E-01
mmu-miR-700	44	4	51	4	1.14	3.374E-01
mmu-miR-673-5p	44	6	72	9	1.61	4.241E-02
mmu-miR-700*	43	4	32	4	-1.34	8.472E-02
mmu-miR-871-3p	43	9	30	10	-1.42	3.760E-01
mmu-miR-340-3p	41	4	39	4	-1.04	7.892E-01
mmu-miR-200a	41	7	33	6	-1.25	3.859E-01
mmu-miR-17*	40	4	40	5	1.00	9.790E-01
mmu-miR-1983	39	3	64	10	1.65	7.041E-02
mmu-miR-18a	38	6	53	4	1.41	7.060E-02
mmu-miR-125a-3p	37	1	56	2	1.50	9.997E-05
mmu-miR-138	37	4	33	4	-1.11	5.198E-01
mmu-miR-3082-3p	36	4	50	8	1.40	1.730E-01
mmu-miR-490-5p	36	4	40	6	1.11	5.901E-01
mmu-miR-503*	35	5	46	6	1.32	1.978E-01
mmu-miR-326	34	4	64	12	1.88	6.845E-02
mmu-miR-7a	34	3	49	5	1.45	3.237E-02
mmu-miR-429	34	5	46	5	1.36	1.482E-01
mmu-miR-183	34	4	33	4	-1.01	9.344E-01
mmu-let-7e*	33	2	44	8	1.34	2.367E-01
mmu-miR-1981	32	6	36	5	1.10	6.835E-01
mmu-miR-547	32	3	32	4	1.01	9.767E-01
mmu-miR-1960	31	5	32	6	1.06	8.366E-01
mmu-miR-362-5p	30	5	38	4	1.25	2.616E-01
mmu-miR-511-3p	30	3	53	10	1.78	8.492E-02
mmu-miR-26a*	30	5	41	6	1.39	1.552E-01
mmu-miR-3098-5p	29	5	15	4	-1.91	5.475E-02

mmu-miR-133a*	29	4	37	3	1.27	1.264E-01
mmu-miR-3061-3p	28	1	40	3	1.44	1.752E-02
mmu-miR-411*	28	4	66	6	2.35	1.000E-03
mmu-let-7g*	27	3	31	1	1.12	3.453E-01
mmu-miR-532-3p	27	5	36	4	1.32	2.107E-01
mmu-miR-3071	27	3	16	2	-1.65	1.326E-02
mmu-miR-338-5p	27	3	32	5	1.20	4.108E-01
mmu-miR-132*	27	5	46	4	1.71	1.751E-02
mmu-miR-1843-3p	26	3	26	5	-1.01	9.540E-01
mmu-miR-128*	26	4	29	5	1.12	6.661E-01
mmu-miR-488	25	4	29	6	1.16	5.888E-01
mmu-miR-449a	24	2	34	3	1.44	1.844E-02
mmu-miR-190*	23	3	18	1	-1.33	1.201E-01
mmu-miR-200c	23	2	20	3	-1.15	4.227E-01
mmu-miR-130b*	23	5	55	13	2.37	6.774E-02
mmu-miR-16-1*	23	3	20	2	-1.14	4.547E-01
mmu-miR-134	23	2	54	8	2.32	1.809E-02
mmu-miR-187	23	3	38	5	1.67	2.800E-02
mmu-miR-1981*	23	2	31	7	1.35	3.184E-01
mmu-miR-1959	22	4	13	2	-1.67	1.140E-01
mmu-miR-467d	21	2	26	2	1.20	1.871E-01
mmu-miR-708*	21	2	16	4	-1.33	2.815E-01
mmu-miR-341	21	3	63	17	3.02	7.126E-02
mmu-miR-1933-3p	21	2	23	4	1.14	5.341E-01
mmu-miR-154	20	3	23	2	1.14	5.112E-01
mmu-miR-200b	19	4	19	3	1.02	9.338E-01
mmu-miR-3084	19	4	13	1	-1.47	2.475E-01
mmu-miR-874*	19	1	18	2	-1.06	7.069E-01
mmu-miR-369-3p	18	2	23	3	1.22	3.214E-01
mmu-miR-470	18	3	16	5	-1.19	6.186E-01
mmu-miR-540-5p	18	3	18	2	1.03	9.017E-01
mmu-miR-296-5p	18	2	18	0	1.00	9.722E-01
mmu-miR-99b*	18	4	35	6	1.98	5.554E-02
mmu-miR-433	17	1	39	3	2.23	2.755E-04
mmu-miR-185*	17	2	23	3	1.35	1.358E-01
mmu-miR-299	17	2	39	8	2.32	4.405E-02
mmu-miR-193	16	1	21	3	1.27	1.669E-01
mmu-miR-369-5p	16	4	34	3	2.11	7.264E-03
mmu-miR-376b*	16	2	16	2	-1.02	8.986E-01
mmu-miR-467a	15	3	21	4	1.37	3.064E-01
mmu-miR-143*	15	2	24	1	1.60	3.048E-03

mmu-miR-337-3p	15	3	19	3	1.24	4.580E-01
mmu-miR-467e	15	3	16	3	1.05	8.489E-01
mmu-miR-376c	15	2	27	7	1.77	1.810E-01
mmu-miR-425*	15	2	14	3	-1.03	9.100E-01
mmu-miR-29b*	14	2	15	3	1.10	7.369E-01
mmu-miR-379*	14	3	34	7	2.47	3.228E-02
mmu-miR-222*	13	3	14	2	1.11	7.065E-01
mmu-miR-3074-3p	12	3	11	3	-1.16	6.623E-01
mmu-miR-196b	12	2	15	2	1.22	3.491E-01
mmu-miR-18a*	12	1	20	3	1.64	9.248E-02
mmu-miR-1191	12	2	10	2	-1.21	4.568E-01
mmu-miR-708	12	2	15	2	1.30	1.763E-01
mmu-miR-3061-5p	11	2	10	2	-1.08	7.935E-01
mmu-miR-3065*	11	2	11	1	-1.01	9.530E-01
mmu-miR-1247	11	3	25	15	2.27	4.129E-01
mmu-miR-31*	11	2	19	3	1.80	6.108E-02
mmu-miR-668	10	2	29	3	2.82	2.361E-03
mmu-miR-666-5p	10	2	19	6	1.83	2.056E-01
mmu-let-7f-2*	10	3	19	4	1.88	8.528E-02
mmu-miR-669a-5p	10	1	9	2	-1.18	4.146E-01
mmu-miR-1-2*	10	3	4	1	-2.64	7.523E-02
mmu-miR-219*	10	4	25	4	2.51	1.883E-02
mmu-miR-9*	10	1	16	2	1.65	3.570E-02
mmu-miR-34b-5p	10	1	36	18	3.81	2.039E-01
mmu-miR-669a-3p	9	1	11	1	1.13	5.714E-01
mmu-miR-669o-3p	9	1	12	2	1.28	2.229E-01
mmu-miR-330*	9	3	11	2	1.18	6.747E-01
mmu-miR-673-3p	9	1	9	1	1.07	7.519E-01
mmu-miR-34b-3p	8	1	20	6	2.43	1.032E-01
mmu-miR-329*	8	3	15	4	1.77	2.026E-01
mmu-miR-299*	8	3	22	6	2.70	8.624E-02
mmu-miR-455	8	1	14	1	1.82	3.689E-03
mmu-miR-690	8	1	3	1	-2.45	1.393E-02
mmu-miR-129-5p	8	1	5	2	-1.48	2.563E-01
mmu-miR-382	8	2	10	3	1.36	4.428E-01
mmu-miR-1949	8	1	6	1	-1.26	3.508E-01
mmu-miR-664*	8	1	8	1	-1.01	9.711E-01
mmu-miR-669p	7	2	9	1	1.24	4.370E-01
mmu-miR-130a*	7	2	8	2	1.06	8.759E-01
mmu-miR-149*	7	0	7	2	-1.04	9.076E-01
mmu-miR-741	7	1	4	1	-1.87	5.688E-02

mmu-miR-1199	6	1	5	1	-1.12	6.964E-01

Supplemental Table S2. Hypertrophy-regulated cardiac mRNAs, classified according to biological function.

	Up-regulated after TAC			Down-regulated after TAC		
Function	**mRNA name**	**Fold change (TAC-Sham)**	**P-value**	**mRNA name**	**Fold change (TAC-Sham)**	**P-value**
Metabolism						
	ARRB2	1.97	6.06E-03	ALDH2	-1.29	8.58E-03
	ASAP2	1.46	4.68E-03	BCKDHA	-1.63	1.27E-04
	GPSM3	1.54	2.79E-02	EGLN1	-1.40	1.84E-04
	PREX1	2.18	5.15E-04	ETFA	-1.51	3.66E-03
	RASGRP3	1.27	2.15E-02	HSD17B10	-1.38	5.64E-05
	SHC1	1.32	6.18E-03	IDH3A	-1.39	2.59E-03
				NDUFS4	-1.37	4.65E-03
				ACADS	-1.38	2.63E-04
				DCI	-1.59	3.06E-04
				IVD	-1.57	9.15E-04
				NNT	-1.45	2.22E-03
				ART3	-2.02	5.62E-05
				CPT1B	-1.33	3.66E-03
				CS	-1.31	6.54E-04
				HADHB	-1.49	1.15E-03
				PFKM	-1.33	5.23E-03
				PINK1	-1.53	5.17E-04
				ACADVL	-1.45	1.61E-03
				ATP1A1	-1.30	2.29E-03
				ATP5O	-1.33	1.24E-03
				CRAT	-1.48	1.50E-04
				ECH1	-1.91	2.37E-05
				ECHS1	-1.35	1.51E-04
				ETFB	-1.44	1.08E-03
				ETFDH	-1.48	2.83E-03
				GOT1	-1.53	2.73E-04
				HADHA	-1.55	1.54E-04
				IDH3G	-1.38	6.15E-04
				LDHB	-1.42	3.00E-04
				NDUFA1	-1.38	1.19E-03
				NDUFA8	-1.30	2.21E-03
				NDUFB10	-1.32	2.00E-04
				ATP2A2	-1.39	3.18E-03
				ATP5A1	-1.33	2.42E-03
				ATP5E	-1.31	4.86E-03
				ATP5J	-1.29	2.76E-02

				COX4I1	-1.32	5.98E-04
				COX7A1	-1.52	3.83E-04
				COX7C	-1.33	1.01E-04
				COX8B	-1.42	2.34E-05
				IDH2	-1.57	4.13E-06
				MDH1	-1.37	9.31E-04
				NDUFA5	-1.31	1.16E-03
				NDUFV3	-1.30	1.19E-03
				COX6A2	-1.32	9.48E-08
				COX7B	-1.32	6.04E-04
				NDUFA3	-1.29	2.76E-04
				ACAD11	-1.44	3.41E-04
				AGL	-1.34	4.13E-03
				AKR1B3	-1.34	1.11E-02
				AKR7A5	-1.30	4.01E-03
				ALDH6A1	-1.47	1.12E-03
				ANKRD9	-1.59	1.64E-04
				CES3	-2.18	7.42E-03
				DECR1	-1.44	2.66E-04
				DHRS11	-1.34	3.98E-03
				DHRS4	-1.36	8.84E-04
				ECHDC2	-1.29	8.23E-03
				ENTPD5	-1.39	2.25E-02
				EPHX2	-1.59	3.26E-04
				FAHD1	-1.43	9.51E-04
				FH1	-1.37	3.53E-04
				GCDH	-1.50	7.89E-03
				GPD1	-1.34	4.45E-02
				GSTK1	-1.83	5.85E-04
				GSTM2	-1.38	4.84E-05
				GSTM7	-1.78	4.40E-03
				HADH	-1.35	8.71E-04
				HSDL2	-1.55	8.68E-04
				LONP2	-1.32	4.07E-03
				ME3	-1.32	2.02E-03
				MLYCD	-1.57	1.98E-02
				MSRB2	-1.37	7.04E-03
				NFS1	-1.39	3.31E-06
				NUDT4	-1.35	1.18E-03
				NUDT7	-1.53	7.56E-05
				OGDHL	-1.64	7.96E-04

				PCCA	-1.34	1.50E-03
				PDE4A	-1.40	2.56E-03
				PECI	-1.39	1.92E-03
				PHYHD1	-1.39	3.67E-04
				PPTC7	-1.41	7.00E-05
				SORD	-1.49	2.03E-04
				ACAD10	-1.55	5.34E-03
				ALDH5A1	-1.52	8.29E-04
				DHRS7C	-1.64	8.56E-03
				MAOB	-1.87	1.76E-04
				NQO2	-1.50	7.37E-03
				P4HTM	-1.50	1.48E-03
				SUOX	-1.49	4.91E-03
				COQ3	-1.49	2.70E-04
				ISCA1	-1.37	1.28E-04
				ADCK1	-1.44	2.11E-05
				PHKG1	-2.43	1.46E-05
Vesicle / cell projection						
	ACTN1	1.79	3.00E-03	ACSL1	-1.41	7.73E-03
	ADAM10	1.42	1.47E-03	CALCOCO1	-1.30	1.11E-02
	ANO6	1.27	9.82E-03	CENPV	-1.52	1.36E-02
	ANXA1	1.93	6.64E-04	CORIN	-1.49	2.18E-03
	ANXA7	1.26	1.75E-02	CTNNAL1	-2.10	1.49E-02
	ARF4	1.38	6.96E-04	EFNB3	-2.02	8.54E-04
	ARHGEF2	1.33	3.13E-03	FHL2	-1.44	3.06E-03
	ARPC1B	1.60	4.71E-04	LPIN1	-1.38	1.83E-02
	ARPC4	1.34	7.29E-03	MAPK14	-1.37	1.51E-04
	BIN3	1.32	1.49E-02	MRPL14	-1.36	5.35E-06
	CALD1	1.39	4.11E-03	MRPS36	-1.31	2.40E-03
	CAP1	1.56	6.32E-04	MYH7B	-1.35	1.24E-02
	CAPG	2.08	1.70E-03	RPL3L	-1.62	1.57E-03
	CDC25B	2.17	2.45E-03	SGCG	-1.31	4.03E-04
	CDC42SE1	1.42	4.03E-03	SLC2A4	-1.35	1.54E-03
	CFL1	1.54	1.71E-03	STAU2	-1.32	1.12E-02
	CHRNB1	1.47	3.43E-04	TTLL1	-1.92	4.18E-06
	DAB2	1.94	4.92E-03	TUBA8	-1.49	7.90E-03
	DBNL	1.24	1.56E-02	WHRN	-1.90	5.32E-04
	DNM1	2.06	9.60E-06			
	DNMT1	1.64	1.11E-02			
	DOCK1	1.37	3.09E-03			
	DPYSL3	2.09	2.31E-03			

	DYNLL1	1.57	7.64E-03			
	EMP1	2.88	1.80E-04			
	ENAH	1.64	5.86E-03			
	FABP5	1.74	6.45E-03			
	FADS1	1.54	2.20E-04			
	FARP1	1.68	8.47E-03			
	FLNA	1.44	1.41E-03			
	FSCN1	2.43	1.21E-03			
	GLTP	1.50	1.69E-02			
	GNB1	1.31	8.17E-05			
	HSP90AA1	1.30	1.70E-03			
	ICAM2	1.52	2.44E-03			
	IPO9	1.54	2.10E-02			
	ITSN2	1.25	2.89E-03			
	KIF3B	1.44	8.57E-03			
	LEPRE1	1.38	4.38E-03			
	LIMK1	1.53	2.08E-02			
	MRC2	2.39	2.18E-04			
	MSN	1.54	2.12E-03			
	MTAP1A	1.82	1.28E-02			
	MYH10	1.72	4.24E-04			
	MYO1C	1.36	1.49E-03			
	MYO1D	1.56	5.90E-04			
	MYO9B	1.48	8.32E-05			
	NCK2	1.40	7.83E-03			
	NIN	1.38	2.63E-03			
	NPC2	1.36	3.60E-02			
	NUP50	1.30	5.97E-03			
	P4HB	1.34	1.18E-02			
	PDIA3	1.45	8.91E-04			
	PDIA4	1.44	7.12E-04			
	PHLDA3	2.11	3.40E-03			
	PPIB	1.32	1.19E-02			
	PPP1R9B	1.49	5.72E-03			
	PRAF2	1.57	3.78E-03			
	PRKD2	1.43	9.09E-03			
	PTPN23	1.32	4.73E-04			
	PXN	1.33	2.69E-03			
	RAB13	1.59	7.85E-03			
	RAB5C	1.27	2.74E-03			
	RASSF1	1.30	9.63E-03			

	SCARB1	1.46	2.01E-03			
	SERP1	1.36	2.95E-03			
	SERPINF1	2.60	2.96E-03			
	SIRPA	1.31	5.44E-02			
	SMAGP	1.37	5.40E-03			
	SNX8	1.37	4.77E-03			
	SPNA2	1.25	3.91E-03			
	SRGAP2	1.31	7.99E-03			
	SURF6	1.34	7.46E-03			
	SYNPO2L	2.92	2.85E-03			
	TLN1	1.24	1.60E-02			
	TMSB10	2.13	6.63E-04			
	TMSB4X	1.62	2.51E-03			
	TNKS1BP1	1.44	2.88E-04			
	TPM2	1.38	1.34E-02			
	TPM3	1.55	4.68E-03			
	TRAM1	1.38	7.26E-04			
	TTYH3	1.66	2.02E-03			
	TUBA1A	1.48	3.17E-03			
	TUBA1B	1.50	2.96E-03			
	TUBB5	1.67	1.73E-04			
	TYK2	1.27	2.68E-03			
	VASP	1.44	9.07E-04			
	WIPF1	1.77	4.12E-04			
	YWHAB	1.34	1.38E-03			
	ZYX	1.43	3.22E-03			
Cardiac contraction / calcium signaling / muscle development						
	VCAN	2.43	3.72E-04	ACADM	-1.61	2.96E-04
	VASH1	2.27	4.58E-06	ATP5H	-1.35	1.52E-03
	TPM4	1.97	1.32E-04	PLN	-1.46	1.41E-04
	THY1	1.71	3.40E-03			
	TGFBR2	1.50	8.22E-05			
	TAGLN2	1.88	3.02E-04			
	SRI	1.39	7.13E-03			
	SPARCL1	1.60	1.96E-03			
	SMAD1	1.57	1.05E-03			
	SHC1	1.32	6.18E-03			
	SERP1	1.36	2.95E-03			
	RTN4	2.11	9.82E-03			
	RCN3	2.06	1.59E-02			
	RCAN1	2.13	2.58E-02			

	PXDN	1.84	1.44E-04			
	PTK2	1.29	7.68E-04			
	PLXND1	1.65	8.94E-04			
	PLSCR3	1.39	4.25E-03			
	PKD1	1.37	3.48E-03			
	PCDHGA11	1.31	4.38E-04			
	PCDH1	1.56	3.02E-04			
	NPPB	2.67	4.20E-03			
	NOTCH4	1.45	1.70E-02			
	NOTCH3	1.29	9.28E-04			
	NID1	1.77	3.09E-05			
	MYL6	1.37	1.57E-04			
	MYH9	1.77	4.37E-05			
	MRC2	2.39	2.18E-04			
	MMP2	1.43	2.99E-03			
	MGP	1.78	2.44E-04			
	MEOX2	1.78	5.51E-03			
	LAMA4	1.57	7.38E-03			
	KLF10	1.72	3.01E-03			
	JUNB	1.37	7.52E-03			
	ITGA6	1.91	4.14E-04			
	ITGA5	1.59	1.87E-03			
	HMOX1	2.09	3.21E-03			
	HBEGF	2.15	3.26E-03			
	GPX1	1.41	9.62E-04			
	GATAD2A	1.27	3.65E-04			
	FSTL1	2.86	1.81E-03			
	FKBP1A	1.29	1.48E-04			
	FGFR1	1.38	5.60E-04			
	FBN1	2.65	2.94E-04			
	FBLN2	2.05	2.70E-03			
	ENAH	1.64	5.86E-03			
	EHD2	1.58	5.61E-04			
	EFHD2	1.69	1.41E-02			
	ECSCR	1.55	6.18E-03			
	CYR61	1.41	1.95E-02			
	CSPG4	1.60	6.54E-05			
	COL5A1	3.02	1.87E-02			
	CDH5	1.50	7.78E-04			
	CD93	1.69	1.18E-03			
	CAV1	1.49	2.99E-05			

	CASQ1	1.56	5.14E-03			
	CAPN2	1.28	2.29E-04			
	BMP1	1.51	2.15E-02			
	APP	1.33	5.23E-04			
	APOE	1.33	9.50E-02			
	ANXA7	1.26	1.75E-02			
	ANXA5	1.32	3.72E-04			
	ANXA4	1.52	8.84E-03			
	ANXA2	1.83	1.20E-03			
	ANKRD1	3.52	8.29E-04			
	AGRN	1.54	1.27E-03			
	ACVRL1	1.45	1.06E-02			
	ACTN4	1.45	7.89E-05			
	ACTG1	1.36	1.39E-04			
	ACTB	1.48	2.84E-04			
	ACTA1	3.70	3.76E-03			
Cytoskeleton						
	AKAP2	1.54	5.78E-03	TUBA4A	-1.28	3.94E-02
	ARPC4	1.34	7.29E-03	TTLL1	-1.92	4.18E-06
	BIN3	1.32	1.49E-02	SLC25A34	-1.83	1.36E-02
	CDK5RAP2	1.39	1.84E-03	SLC25A22	-1.75	1.60E-02
	CEP250	1.86	1.61E-03	RHOT2	-1.40	6.47E-05
	CORO1C	1.46	5.11E-05	PXMP2	-1.76	4.93E-06
	COTL1	2.21	8.95E-03	PICK1	-1.35	1.79E-03
	CSRP1	1.54	1.69E-05	PCNT	-1.50	1.27E-04
	CST6	2.20	4.19E-03	NDUFS1	-1.35	7.99E-03
	DBN1	2.42	3.58E-03	MRPS35	-1.57	5.83E-04
	EPB4.1L1	1.52	1.58E-03	MRPL45	-1.31	1.07E-03
	FLNB	1.87	2.20E-05	MRPL14	-1.36	5.35E-06
	FYN	1.40	2.01E-02	MFN1	-1.48	6.18E-03
	GAS2L1	1.39	1.78E-03	MAPK1IP1	-1.43	3.31E-03
	HOMER3	1.64	1.38E-02	MAPK14	-1.37	1.51E-04
	KITL	1.51	4.76E-03	LDB3	-1.38	3.29E-04
	LASP1	1.91	1.42E-04	HSD17B10	-1.38	5.64E-05
	LIMA1	1.36	3.00E-03	ANK1	-1.30	2.75E-04
	MAP3K11	1.37	5.35E-04	ACAT1	-1.36	8.31E-04
	MARCKS	1.78	2.51E-03	ACACB	-1.51	1.58E-03
	MYBPC2	2.84	1.35E-03			
	MYO1B	1.76	8.58E-03			
	NAV1	1.37	8.03E-03			
	NES	2.23	7.07E-05			

	PFN1	1.34	1.01E-02			
	PPP1R9B	1.49	5.72E-03			
	RNF19A	1.30	1.38E-04			
	SDC3	1.68	1.08E-03			
	TMOD3	1.48	2.96E-04			
	VIM	2.66	5.00E-04			
	XIRP2	2.11	8.55E-03			
Transcription						
	ZNFX1	1.24	4.37E-03	ZFP775	-1.26	1.27E-02
	ZFP664	1.34	3.90E-03	ZFP238	-1.29	2.36E-03
	TLR4	1.76	4.11E-03	ZBTB16	-1.99	6.19E-04
	TCF4	1.40	4.60E-05	YBX2	-1.46	9.48E-03
	TCF3	1.36	7.76E-03	TFDP2	-1.63	1.22E-04
	STAT1	1.28	7.20E-03	TCEA3	-1.36	2.32E-02
	SMARCD2	1.38	7.88E-03	TBX5	-1.96	7.88E-05
	SCX	1.43	1.44E-02	SMAD6	-1.48	9.55E-03
	RPS6KA4	1.40	9.13E-03	RXRG	-1.60	3.59E-04
	RHOG	1.45	5.67E-04	PPARGC1A	-1.79	7.02E-04
	RELB	1.82	1.50E-03	PPARA	-1.55	1.39E-02
	PDLIM1	1.48	6.00E-03	MAPK14	-1.37	1.51E-04
	NOSTRIN	1.78	1.89E-03	KLF15	-1.61	5.74E-03
	NFKB2	1.37	7.92E-04	KHDRBS3	-1.30	1.30E-04
	NFATC2	1.48	6.48E-03	KCNH2	-1.57	3.67E-03
	NDN	1.49	3.90E-03	ESRRG	-1.57	2.93E-04
	MORF4L2	1.33	1.52E-03	DPF3	-1.45	3.01E-03
	MEOX1	2.77	1.16E-03	CREG1	-1.37	3.79E-03
	MAZ	1.28	1.55E-03			
	KLF10	1.72	3.01E-03			
	JUND	1.31	4.08E-03			
	IRF9	1.73	2.98E-02			
	HMOX1	2.09	3.21E-03			
	GATAD2A	1.27	3.65E-04			
	FLI1	1.32	1.01E-02			
	ETS1	1.40	2.09E-02			
	ERG	1.45	5.54E-03			
	ELF4	1.76	1.09E-04			
	CTNNBIP1	1.40	1.41E-03			
	CREB3L2	1.46	7.32E-03			
	CHD3	1.37	6.45E-03			
	CARHSP1	1.76	1.12E-04			
	BHLHE40	1.51	1.66E-04			

	BCL6B	1.89	6.62E-03			
	ATOH8	1.56	9.38E-03			
	ADAR	1.65	1.76E-02			
Cell adhesion						
	VWA1	1.60	2.99E-04	LAMB3	-1.75	5.65E-04
	VCAN	2.43	3.72E-04	LAMB3	-1.75	5.65E-04
	TPM4	1.97	1.32E-04	GJA3	-1.56	6.19E-04
	TNS3	1.33	2.24E-03	GJA3	-1.56	6.19E-04
	THBS3	2.07	2.70E-04	DSG2	-1.53	4.44E-04
	STAB1	1.87	1.54E-02	DSG2	-1.53	4.44E-04
	POSTN	8.46	9.87E-03	DSC2	-1.35	4.75E-04
	PODN	1.38	5.53E-03	DSC2	-1.35	4.75E-04
	PF4	1.47	4.21E-03	COLQ	-1.74	1.05E-03
	NRP2	2.04	1.99E-05	COLQ	-1.74	1.05E-03
	NLGN2	1.98	1.23E-03			
	MYBPC2	2.84	1.35E-03			
	MMRN2	1.49	1.10E-03			
	MFAP4	5.33	1.62E-04			
	MCAM	1.82	8.07E-05			
	LUM	2.03	7.61E-04			
	LTBP4	1.48	1.57E-02			
	LTBP3	1.61	1.08E-02			
	LGALS3BP	2.60	1.84E-06			
	LGALS1	1.57	1.64E-02			
	LAMC1	1.64	4.54E-05			
	ITGA9	1.74	2.46E-03			
	IGFBP7	2.05	3.02E-04			
	ICAM2	1.52	2.44E-03			
	ICAM1	1.37	5.07E-03			
	HSPG2	1.39	1.27E-04			
	FBLN5	1.34	1.14E-02			
	FBLN2	2.05	2.70E-03			
	F13A1	1.57	5.01E-04			
	ENTPD1	1.70	2.45E-03			
	EMILIN1	2.31	3.74E-03			
	DCN	1.29	7.97E-04			
	DCHS1	1.79	3.12E-03			
	CSK	1.39	6.37E-03			
	COL8A1	4.27	2.44E-03			
	COL6A3	2.70	9.69E-03			
	COL6A2	2.58	1.40E-04			

	COL4A2	1.64	5.67E-04			
	COL4A2	1.64	5.67E-04			
	COL4A1	1.81	1.41E-04			
	COL3A1	4.43	2.99E-02			
	COL1A2	4.39	3.54E-02			
	COL18A1	2.82	3.61E-04			
	COL16A1	3.06	1.29E-03			
	COL15A1	2.61	1.33E-04			
	COL14A1	2.67	2.06E-03			
	CDH5	1.50	7.78E-04			
	CD9	1.39	2.28E-03			
	CD34	1.68	7.72E-04			
	CCDC80	1.81	3.01E-02			
	BGN	2.99	2.29E-03			
	AOC3	1.42	4.34E-03			
	AHNAK	1.31	5.54E-03			
	ADAMTSL5	1.25	2.14E-03			
	ADAM15	1.40	6.55E-03			
Programmed cell death						
	YWHAH	1.45	3.31E-04	ZBTB16	-1.99	6.19E-04
	TNFRSF1A	1.38	3.06E-02	STAT5B	-1.27	1.44E-02
	TICAM1	1.38	7.16E-04	SH3KBP1	-1.47	2.84E-03
	TGFB1	1.57	1.03E-04	PIK3R1	-1.51	1.08E-03
	SLK	1.28	3.14E-03	NTN1	-1.38	1.43E-03
	SHISA5	1.37	1.34E-02	ENDOG	-1.36	2.95E-04
	PPM1F	1.71	1.04E-05	CUL1	-1.40	7.72E-03
	PIGT	1.36	1.69E-03	APBB1	-1.67	4.12E-04
	PHLDA3	2.11	3.40E-03			
	PEA15A	1.50	2.25E-03			
	NRAS	1.29	3.45E-04			
	LYZ2	1.82	2.64E-02			
	LITAF	1.78	3.26E-03			
	KLF10	1.72	3.01E-03			
	KITL	1.51	4.76E-03			
	GPX1	1.41	9.62E-04			
	GCLM	1.36	6.59E-04			
	GATAD2A	1.27	3.65E-04			
	FGFR1	1.38	5.60E-04			
	FCGR3	2.13	5.45E-03			
	FCER1G	2.04	2.42E-02			
	BAX	1.29	9.58E-04			

	BAK1	1.89	4.32E-03			
Lysosome / proteolysis						
	UBE2L6	2.00	1.45E-02			
	UBA7	1.55	4.83E-03			
	SOCS2	1.79	1.51E-02			
	SCPEP1	1.64	1.72E-04			
	S100A6	1.52	4.09E-03			
	S100A11	1.96	7.49E-03			
	S100A10	1.54	1.71E-02			
	RNF19A	1.30	1.38E-04			
	PRCP	2.28	4.78E-04			
	NPC2	1.36	3.60E-02			
	LITAF	1.78	3.26E-03			
	LGMN	1.48	1.33E-02			
	LAPTM5	2.08	5.32E-03			
	FUCA1	1.28	1.23E-02			
	CTSZ	1.74	6.22E-04			
	CHFR	1.32	1.49E-03			
	CD63	1.30	2.38E-02			
	CAPN2	1.28	2.29E-04			
	C1QC	1.73	8.62E-03			
	C1QB	1.72	8.62E-03			
	C1QA	1.70	8.40E-03			
	ARL8A	1.37	4.97E-03			
	ACE	2.39	6.04E-05			
Cell cycle						
	RASSF2	1.88	7.08E-03			
	MAD2L2	1.51	3.21E-03			
	HJURP	2.22	1.42E-02			
	H2AFX	1.60	7.44E-03			
	GAS2L1	1.39	1.78E-03			
	CKS1B	2.61	1.89E-03			
	CHFR	1.32	1.49E-03			
	CEP250	1.86	1.61E-03			
	CCND3	1.28	1.97E-02			
	CCND2	1.45	1.71E-03			
	CCND1	1.96	8.15E-04			
	ARHGAP8	1.66	6.13E-03			
	ANP32B	1.35	4.04E-03			
Homeostasis						
	ZFP664	1.34	3.90E-03	ZFYVE21	-1.64	1.04E-04

	ZFP36L2	1.69	4.05E-03	VDAC3	-1.31	5.09E-03
	ZFP366	1.46	2.48E-03	TESC	-1.38	7.73E-04
	ZC3HAV1	1.46	2.87E-03	TECR	-1.29	3.25E-03
	TRIM47	1.83	4.61E-03	SLC38A3	-1.50	2.49E-03
	TRIM16	1.95	7.89E-04	SLC31A2	-1.33	7.12E-05
	SULF1	1.87	6.12E-04	SLC27A1	-1.79	1.30E-02
	RNF145	1.41	1.70E-04	SLC25A42	-1.70	1.78E-04
	RNF115	1.54	1.01E-06	SLC25A4	-1.37	2.10E-03
	RCN1	1.63	3.64E-03	SLC25A20	-1.42	9.30E-03
	RABIF	1.45	1.52E-02	SLC25A12	-1.42	1.77E-02
	PTGIS	1.80	9.46E-04	SLC22A5	-1.57	1.89E-03
	PLOD3	1.49	1.83E-03	SCN4A	-1.54	2.28E-03
	PLOD1	1.41	2.07E-03	SAR1B	-1.27	1.76E-02
	PARP12	1.32	9.54E-03	RTN4IP1	-1.31	6.42E-04
	PAPLN	1.67	8.54E-04	RHOT2	-1.40	6.47E-05
	NUDT5	1.56	1.18E-02	RANGRF	-1.34	2.28E-05
	NUDT18	1.74	5.33E-05	PPM1K	-1.61	1.19E-03
	NT5C	1.63	4.98E-03	PPA2	-1.30	2.65E-03
	NID2	2.43	7.37E-06	PDP2	-1.85	9.40E-04
	MOBKL2A	2.07	1.02E-03	P4HTM	-1.50	1.48E-03
	MAN2B1	1.39	1.40E-02	NUDT7	-1.53	7.56E-05
	LOXL1	1.89	7.50E-03	NUDT4	-1.35	1.18E-03
	LIMK1	1.53	2.08E-02	NQO2	-1.50	7.37E-03
	LEPREL2	1.92	8.91E-03	MRPL45	-1.31	1.07E-03
	LASP1	1.91	1.42E-04	KCNK3	-1.38	9.56E-05
	KLF10	1.72	3.01E-03	KCNJ12	-1.81	7.78E-04
	GUSB	1.35	1.03E-02	KCNJ11	-1.43	1.93E-04
	GBA	1.54	1.09E-02	ITGB1BP2	-1.36	6.07E-04
	FTL2	1.35	1.41E-02	GAL3ST3	-1.88	1.14E-02
	FKBP10	1.67	9.81E-04	FDX1	-1.37	1.99E-03
	EDEM2	1.41	1.77E-03	FBLIM1	-1.28	5.03E-02
	CYBA	1.42	6.94E-03	FARS2	-1.28	2.05E-03
	CSRP1	1.54	1.69E-05	FABP3	-1.32	4.07E-04
	CLIC1	1.76	3.18E-04	ESRRA	-1.32	3.82E-04
	CHFR	1.32	1.49E-03	ENO3	-1.48	3.17E-03
	CD248	1.88	7.26E-04	DUSP18	-1.95	4.60E-04
	CASQ1	1.56	5.14E-03	DPF3	-1.45	3.01E-03
	ATP8B2	1.70	1.01E-03	CAR14	-1.41	6.30E-03
	ATP13A3	1.39	2.34E-03	CACNA1C	-1.33	5.14E-04
	ADAM19	2.00	3.86E-05	APOBEC2	-1.32	1.18E-04
	ACSL5	1.49	9.49E-03	AP4S1	-1.54	9.22E-04

				ANO10	-2.10	3.81E-04
				ALAD	-1.31	8.28E-03
				ACAT1	-1.36	8.31E-04
Differentiation / proliferation						
	TGFB1I1	1.41	3.50E-03	TGFBR3	-1.48	1.02E-02
	STX2	1.79	2.90E-03	TAB1	-1.48	7.02E-05
	SHROOM3	1.51	4.95E-03	FXN	-1.32	3.62E-03
	IGF1	2.85	1.79E-02	ESRRB	-1.35	6.11E-04
	HCLS1	1.82	7.48E-04	EFNB3	-2.02	8.54E-04
	EPB4.1L2	1.48	2.72E-04	AGTPBP1	-1.42	1.73E-03
	DDR2	1.35	3.29E-03			
	CYFIP1	1.31	1.65E-04			
	CDC42EP2	1.36	4.42E-03			
Cell motion						
	ITGAM	1.79	1.30E-03			
	ITGA1	1.65	8.36E-03			

Supplemental Table S3. RISC-enriched cardiac mRNAs

Genes	Sham RISCScore (mean)	Sham RISCScore (S.E.M)	TAC RISCScore (mean)	TAC RISCScore (S.E.M)	Fold Change (TAC-Sham)	P- Value
Tcf20	21.5	2.1	16.2	1.0	-1.3	0.05918
Lars2	11.0	0.9	7.9	1.1	-1.4	0.05037
Lpp	11.0	0.9	5.3	0.3	-2.1	0.00108
Thbs1	10.8	3.9	2.2	0.5	-5.0	0.07920
Calcrl	10.0	1.2	5.2	0.8	-1.9	0.00713
Yipf6	9.9	1.3	6.2	1.3	-1.6	0.07788
Sntb2	9.9	1.5	2.5	0.2	-3.9	0.00447
Gtf2a1	9.7	0.9	6.0	0.5	-1.6	0.00930
Hist1h4c	9.7	1.3	4.6	0.5	-2.1	0.00907
Lnpep	9.6	0.4	6.7	0.3	-1.4	0.00025
Tbl1xr1	9.6	0.5	7.1	0.6	-1.4	0.01235
Rc3h1	9.2	0.8	7.1	0.3	-1.3	0.03968
Ccdc50	8.7	1.6	4.5	0.5	-1.9	0.04133
Dpysl2	8.3	0.7	3.9	0.4	-2.1	0.00101
Bmpr2	8.1	0.5	5.4	0.3	-1.5	0.00113
Mib1	7.8	0.5	3.6	0.2	-2.2	0.00018
Hook3	7.8	0.7	4.2	0.2	-1.9	0.00283
E2f3	7.8	1.8	4.7	1.4	-1.6	0.21807
Cbl	7.5	0.4	4.1	0.2	-1.8	0.00007
Zbtb44	7.4	0.8	5.8	0.3	-1.3	0.10144
Fbn1	7.4	1.0	1.2	0.2	-6.0	0.00138
Tnpo1	7.3	0.4	3.9	0.3	-1.9	0.00013
Alg10b	7.2	0.7	5.8	0.3	-1.3	0.09919
Cbx5	7.2	1.0	4.7	0.2	-1.5	0.06179
Col5a2	7.2	1.4	0.6	0.1	-11.9	0.00554
Mtap1b	7.1	0.9	1.7	0.2	-4.2	0.00185
Rest	7.0	0.6	4.7	0.2	-1.5	0.00825
Mgat5	6.9	0.8	3.6	0.3	-1.9	0.00565
Zswim6	6.9	0.8	3.1	0.3	-2.2	0.00400
Col8a1	6.8	1.2	0.6	0.1	-11.8	0.00387
Lrrc58	6.7	0.5	3.5	0.2	-1.9	0.00088
Enc1	6.7	2.7	3.3	0.5	-2.0	0.26874
Hist1h4f	6.7	1.3	1.4	0.2	-4.9	0.00775
Btbd7	6.7	0.6	4.0	0.2	-1.6	0.00818
Gna13	6.6	0.9	3.2	0.3	-2.0	0.01486
Atp13a3	6.6	0.8	2.6	0.2	-2.5	0.00386
Mtmr6	6.5	0.7	3.1	0.2	-2.1	0.00452

Fam198b	6.5	0.9	1.5	0.2	-4.3	0.00210
Thbs4	6.4	1.8	0.9	0.2	-7.4	0.02644
Tacc1	6.3	0.6	3.3	0.2	-1.9	0.00293
Fndc1	6.2	1.6	0.6	0.1	-10.4	0.01866
Eif2c2	6.2	0.6	3.8	0.1	-1.7	0.00829
Atxn1l	6.2	1.0	2.7	0.2	-2.3	0.01727
Nufip2	6.2	0.3	3.4	0.3	-1.8	0.00009
Reep3	6.2	0.4	2.4	0.2	-2.6	0.00002
Stc1	6.2	2.0	2.2	0.5	-2.8	0.10077
Tgfb2	6.1	1.4	0.9	0.2	-6.5	0.01347
Sesn3	6.1	0.6	3.5	0.3	-1.7	0.00601
Ptprb	6.1	1.1	2.4	0.2	-2.5	0.01814
Fndc3b	6.1	0.5	3.0	0.2	-2.0	0.00129
Slc23a2	6.0	0.6	2.6	0.4	-2.3	0.00091
Dpysl3	6.0	1.1	1.2	0.2	-4.9	0.00636
Serpina3n	6.0	3.3	1.0	0.2	-6.3	0.18392
Col3a1	5.9	1.3	0.7	0.1	-9.0	0.00973
Ddi2	5.8	0.6	3.9	0.2	-1.5	0.01824
Atxn1	5.8	0.8	3.3	0.2	-1.8	0.02285
Prcp	5.6	1.1	1.0	0.2	-5.7	0.00837
Itga1	5.6	0.6	2.0	0.2	-2.8	0.00125
Nucks1	5.6	0.4	3.6	0.1	-1.6	0.00288
Dcun1d3	5.6	0.7	2.6	0.2	-2.1	0.00527
Sulf1	5.5	0.7	1.6	0.1	-3.5	0.00152
Rell1	5.5	1.0	1.2	0.2	-4.7	0.00636
Abhd2	5.5	0.7	2.4	0.2	-2.2	0.00672
Slc38a1	5.4	0.7	3.9	0.4	-1.4	0.09866
Arid5b	5.4	0.6	3.0	0.3	-1.8	0.00614
Elf4	5.4	0.7	1.5	0.2	-3.6	0.00146
Man2a1	5.4	0.6	1.8	0.1	-2.9	0.00259
Loxl2	5.3	1.0	0.6	0.1	-8.6	0.00464
Lrp6	5.3	0.5	3.8	0.2	-1.4	0.02919
Rnf111	5.3	0.5	3.2	0.2	-1.6	0.00442
Rassf2	5.3	0.6	1.2	0.2	-4.5	0.00108
Chsy1	5.2	0.7	2.9	0.3	-1.8	0.01579
Pten	5.2	0.5	3.3	0.1	-1.6	0.01257
Ammecr1l	5.2	0.6	2.9	0.2	-1.8	0.00986
Cpeb2	5.2	0.8	4.1	0.5	-1.3	0.29479
Cggbp1	5.2	0.8	3.1	0.3	-1.7	0.04116
Rbm15	5.2	0.5	3.0	0.3	-1.7	0.00703
Cpsf6	5.1	0.3	3.1	0.2	-1.6	0.00093

Sbno1	5.1	0.5	3.5	0.3	-1.5	0.03237
Zfp568	5.1	0.6	2.6	0.2	-1.9	0.00562
Pik3r3	5.1	0.9	2.2	0.2	-2.3	0.02164
Otud4	5.1	0.3	3.8	0.2	-1.4	0.00713
Scd2	5.1	1.1	1.6	0.2	-3.1	0.02646
Ccnd2	5.1	0.6	2.3	0.2	-2.3	0.00384
Ankfy1	5.1	0.6	2.3	0.1	-2.2	0.00626
Arhgap18	5.1	0.5	2.0	0.3	-2.5	0.00098
Etnk1	5.1	0.4	3.5	0.1	-1.4	0.01182
Parp14	5.1	0.6	1.8	0.3	-2.8	0.00103
Adam10	5.1	0.8	2.2	0.1	-2.3	0.01156
Stk35	5.1	0.6	2.9	0.2	-1.7	0.01412
Gpc6	5.0	1.0	1.1	0.1	-4.6	0.00966
Sfrp1	5.0	1.2	1.3	0.1	-4.0	0.02371
Pds5a	5.0	0.4	3.4	0.3	-1.5	0.00691
Abl2	5.0	0.6	3.0	0.1	-1.7	0.02520
Afap1	4.9	0.5	2.7	0.1	-1.8	0.00691
Aplnr	4.9	1.7	1.1	0.3	-4.6	0.07145
Osmr	4.9	1.3	2.1	0.2	-2.4	0.08360
Ptch1	4.9	0.6	3.4	0.4	-1.4	0.05860
Creb3l2	4.9	0.6	1.9	0.2	-2.5	0.00385
Col1a1	4.9	1.0	0.4	0.1	-10.8	0.00773
Cd93	4.8	0.6	1.6	0.1	-3.1	0.00242
Il6st	4.8	0.4	2.9	0.2	-1.7	0.00476
Elovl5	4.8	0.5	2.6	0.2	-1.9	0.00267
Tm9sf3	4.8	0.5	2.4	0.1	-2.0	0.00501
Rbm14	4.8	0.6	2.7	0.2	-1.8	0.01894
Aak1	4.8	0.5	3.1	0.3	-1.6	0.01441
Lats1	4.8	0.4	2.5	0.1	-1.9	0.00075
Birc6	4.8	0.5	3.2	0.1	-1.5	0.02033
Hmbox1	4.8	0.4	3.1	0.2	-1.5	0.00562
Gsk3b	4.7	0.5	3.1	0.1	-1.5	0.01659
Jag1	4.7	0.7	2.5	0.4	-1.9	0.02416
Fgl2	4.7	0.9	1.5	0.2	-3.2	0.01535
Gpr17	4.7	0.6	3.4	0.1	-1.4	0.10146
Appbp2	4.7	0.6	3.3	0.2	-1.4	0.09142
Itpripl2	4.7	0.9	2.1	0.3	-2.2	0.02905
Cpd	4.7	0.4	2.1	0.3	-2.2	0.00090
Gatad2b	4.7	0.4	3.5	0.3	-1.3	0.05503
Klf7	4.7	0.4	2.5	0.2	-1.9	0.00328
Ell2	4.7	0.9	2.9	0.2	-1.6	0.09862

Tead1	4.6	0.3	3.2	0.1	-1.4	0.00409
Mdfic	4.6	0.5	2.0	0.3	-2.3	0.00250
Egr3	4.6	1.5	0.7	0.1	-7.0	0.04970
Mapk1ip1l	4.6	0.5	2.5	0.1	-1.8	0.00711
Eif2ak3	4.6	0.7	2.0	0.2	-2.3	0.01394
Qser1	4.6	0.3	3.5	0.2	-1.3	0.01569
Ppm1e	4.6	0.7	2.2	0.4	-2.1	0.01947
Dcaf12	4.6	0.5	2.8	0.2	-1.6	0.00984
Pdzd8	4.6	0.4	3.1	0.1	-1.5	0.00690
Map3k1	4.6	0.5	3.0	0.4	-1.5	0.03730
N4bp2l2	4.6	0.9	1.4	0.2	-3.2	0.01342
Man1a2	4.6	0.4	2.6	0.2	-1.8	0.00282
Cmtm4	4.6	0.4	3.3	0.2	-1.4	0.01510
Sp1	4.6	0.3	3.0	0.2	-1.5	0.00262
Ptgfrn	4.6	0.7	1.2	0.1	-4.0	0.00453
Hivep1	4.6	0.5	2.6	0.2	-1.8	0.01132
Nras	4.6	0.5	2.2	0.2	-2.1	0.00321
Mapk6	4.6	0.5	2.9	0.1	-1.6	0.01929
Tnks	4.6	0.4	2.4	0.1	-1.9	0.00227
Zfp516	4.6	0.5	2.0	0.2	-2.2	0.00341
Spry4	4.5	0.7	2.0	0.1	-2.2	0.01717
Impad1	4.5	0.2	3.0	0.2	-1.5	0.00031
Ets1	4.5	0.5	1.7	0.2	-2.7	0.00201
Adam19	4.5	0.4	1.4	0.2	-3.2	0.00012
Eif2c1	4.5	0.5	2.5	0.3	-1.8	0.00833
Dcaf7	4.5	0.4	2.8	0.1	-1.6	0.01023
Lgals3bp	4.5	0.8	0.6	0.1	-8.1	0.00495
Pppde1	4.5	0.6	3.0	0.3	-1.5	0.05189
Slc6a6	4.5	0.6	2.3	0.3	-2.0	0.01081
Rnd3	4.5	0.4	3.0	0.2	-1.5	0.01103
Abca1	4.5	0.6	2.2	0.3	-2.0	0.01334
Rcor1	4.5	0.6	2.7	0.1	-1.7	0.02802
Trim23	4.5	1.4	3.0	1.4	-1.5	0.47160
Strn	4.5	0.3	2.9	0.2	-1.5	0.00113
Zfp217	4.4	0.6	2.4	0.3	-1.8	0.01718
Zfhx3	4.4	0.6	1.8	0.1	-2.4	0.00619
Rnf115	4.4	0.4	1.9	0.2	-2.3	0.00064
Hist1h4m	4.4	0.5	1.4	0.2	-3.3	0.00103
Slc25a37	4.4	0.7	1.6	0.3	-2.7	0.00574
Eln	4.4	1.1	1.0	0.1	-4.3	0.02652
Cdk17	4.4	0.4	2.0	0.3	-2.3	0.00084

Hiatl1	4.4	0.6	2.3	0.2	-1.9	0.02018
Rgmb	4.4	0.4	2.5	0.3	-1.7	0.00536
Adamts1	4.4	0.9	2.1	0.3	-2.1	0.04759
Adamts2	4.4	0.8	0.7	0.1	-5.9	0.00751
Tbx20	4.4	0.3	3.0	0.1	-1.4	0.00914
Sh3d19	4.4	0.4	1.7	0.1	-2.5	0.00125
CH36-125B10.3	4.3	1.1	1.6	0.2	-2.7	0.05857
Dcp1a	4.3	0.5	2.5	0.1	-1.7	0.01220
Nr1d2	4.3	0.8	3.1	0.3	-1.4	0.18348
Lrrc8b	4.3	0.3	1.8	0.1	-2.4	0.00067
Mbnl1	4.3	0.2	3.2	0.1	-1.4	0.00180
Uck2	4.3	1.0	1.1	0.2	-3.8	0.02805
Atrnl1	4.3	0.3	2.6	0.2	-1.6	0.00284
Serpine1	4.3	1.4	1.5	0.2	-2.9	0.10651
Cdr2l	4.3	0.6	1.1	0.1	-4.1	0.00221
Arl6ip1	4.3	0.6	1.7	0.1	-2.6	0.00607
Prkaa1	4.3	0.3	3.0	0.2	-1.4	0.00471
Arid2	4.3	0.2	3.1	0.2	-1.4	0.00368
Col5a1	4.3	0.8	0.5	0.1	-8.6	0.00415
Igf1r	4.2	0.6	2.2	0.2	-2.0	0.02046
Vps4b	4.2	0.6	2.4	0.2	-1.8	0.03029
Eea1	4.2	0.4	2.3	0.2	-1.8	0.00174
Adam9	4.2	0.6	1.8	0.2	-2.3	0.01195
Ddr2	4.2	0.6	1.8	0.1	-2.4	0.00728
Wwp1	4.2	0.5	3.0	0.1	-1.4	0.06899
Nipbl	4.2	0.2	3.0	0.2	-1.4	0.00221
Mtpn	4.2	0.5	1.7	0.1	-2.4	0.00314
Tnfrsf1b	4.2	0.5	1.4	0.3	-2.9	0.00240
Alox5ap	4.2	1.5	1.1	0.5	-3.8	0.10180
Tmtc1	4.2	0.5	2.6	0.1	-1.6	0.01608
Nsd1	4.2	0.5	2.9	0.2	-1.4	0.05462
Socs3	4.2	1.3	0.6	0.2	-6.5	0.04661
Nid1	4.2	0.5	1.4	0.1	-2.9	0.00126
Socs5	4.2	0.5	2.9	0.2	-1.5	0.03986
Tnks2	4.2	0.4	3.1	0.2	-1.3	0.04037
Efna5	4.1	0.3	2.5	0.3	-1.7	0.00195
Spcs3	4.1	0.5	1.6	0.1	-2.6	0.00411
Chd1	4.1	0.4	2.2	0.2	-1.9	0.00267
Nab1	4.1	0.7	2.0	0.2	-2.1	0.02699
Hip1	4.1	0.5	1.9	0.1	-2.2	0.00734
Anpep	4.1	1.0	2.2	0.7	-1.9	0.14923

Fosl2	4.1	0.9	1.7	0.1	-2.4	0.04677
Rad54l2	4.1	0.4	2.5	0.2	-1.7	0.01179
Pja2	4.1	0.3	3.2	0.2	-1.3	0.02617
Prrg3	4.1	0.4	1.4	0.2	-2.9	0.00088
Gcnt1	4.1	0.5	3.1	0.4	-1.3	0.13119
Dnajc3	4.1	0.3	2.7	0.2	-1.5	0.00368
Akap10	4.1	0.3	1.9	0.2	-2.2	0.00006
Arhgef12	4.1	0.4	2.6	0.2	-1.6	0.01209
Pak2	4.1	0.4	2.3	0.1	-1.8	0.00850
Ankrd1	4.1	0.6	0.5	0.1	-8.0	0.00132
Pafah1b2	4.1	0.4	2.3	0.1	-1.8	0.00362
Jarid2	4.1	0.5	2.4	0.2	-1.7	0.01928
Bzw1	4.1	0.3	2.0	0.1	-2.0	0.00120
Ptpn14	4.1	0.4	2.5	0.2	-1.6	0.00917
Atp6v1a	4.1	0.6	2.4	0.2	-1.7	0.03829
Slk	4.1	0.3	2.2	0.1	-1.8	0.00116
Bmpr1a	4.1	0.3	3.0	0.1	-1.4	0.01420
Snx27	4.0	0.3	3.0	0.2	-1.3	0.01675
Scd1	4.0	0.7	3.1	0.4	-1.3	0.24647
Arsb	4.0	0.6	1.0	0.1	-4.1	0.00263
Atf7	4.0	0.4	3.0	0.1	-1.3	0.04422
Klhl9	4.0	0.2	2.9	0.2	-1.4	0.00083
Rbm27	4.0	0.3	2.4	0.1	-1.6	0.00077
Adamts5	4.0	0.6	2.6	0.4	-1.6	0.08663
Pdcd10	4.0	0.8	3.2	0.6	-1.3	0.42078
Apc	4.0	0.3	2.8	0.2	-1.4	0.01096
Nupl1	4.0	0.5	2.6	0.2	-1.5	0.03103
Fibin	4.0	0.4	0.9	0.1	-4.5	0.00067
Lifr	4.0	0.2	5.5	0.6	1.4	0.06530
Adcy7	4.0	0.7	0.6	0.1	-6.7	0.00321
Fnip1	4.0	0.2	2.8	0.2	-1.4	0.00039
Cyr61	4.0	0.6	1.5	0.1	-2.6	0.00825
Egr1	4.0	0.8	2.0	0.4	-2.0	0.06997
Slc39a9	4.0	0.5	2.5	0.2	-1.6	0.02929
Arhgap32	3.9	0.5	2.0	0.2	-2.0	0.00642
Cebpg	3.9	0.6	1.4	0.1	-2.9	0.01013
Fos	3.9	1.3	2.0	0.9	-2.0	0.25254
Gja1	3.9	0.3	2.9	0.2	-1.4	0.03691
Zbtb46	3.9	0.6	2.2	0.3	-1.8	0.02456
Bach1	3.9	0.5	2.7	0.2	-1.5	0.05179
Zcchc2	3.9	0.5	2.0	0.2	-2.0	0.00648

Ppargc1b	3.9	0.3	3.0	0.2	-1.3	0.02583
Pdgfra	3.9	0.3	2.2	0.2	-1.7	0.00224
Samd8	3.9	0.5	2.4	0.1	-1.6	0.02747
Ptplad1	3.9	0.4	2.9	0.1	-1.4	0.04200
Dicer1	3.9	0.4	2.5	0.2	-1.6	0.01660
Shroom4	3.9	0.6	2.2	0.2	-1.8	0.02411
Cfh	3.9	0.5	3.0	0.3	-1.3	0.16904
Ccnt1	3.9	0.3	2.4	0.1	-1.6	0.00528
F2r	3.9	0.4	1.2	0.1	-3.1	0.00121
Klf3	3.9	0.4	2.1	0.1	-1.8	0.00937
Zc3hav1	3.9	0.4	1.3	0.1	-2.9	0.00201
Lrrc8c	3.9	0.7	1.6	0.2	-2.4	0.01930
Zbtb39	3.9	0.4	2.8	0.2	-1.4	0.04455
Nbas	3.9	0.3	2.8	0.2	-1.4	0.02988
Plk2	3.8	0.7	1.2	0.2	-3.1	0.01603
Plxna4	3.8	0.5	2.3	0.5	-1.7	0.05945
Nup153	3.8	0.4	2.3	0.1	-1.7	0.01561
Farp1	3.8	0.6	1.2	0.1	-3.3	0.00539
C3	3.8	0.9	1.4	0.2	-2.7	0.04942
Matn2	3.8	0.8	0.7	0.1	-5.3	0.00988
Utrn	3.8	0.5	2.4	0.2	-1.6	0.03232
Kirrel	3.8	0.6	1.2	0.1	-3.1	0.00849
Dip2b	3.8	0.5	2.2	0.1	-1.7	0.02073
Snx18	3.8	0.4	2.2	0.1	-1.8	0.00445
Btg2	3.8	0.8	2.2	0.4	-1.7	0.12983
Wdr82	3.8	0.4	2.1	0.1	-1.8	0.00404
Iqgap1	3.8	0.4	1.2	0.1	-3.2	0.00157
Mast4	3.8	0.3	2.3	0.2	-1.7	0.00405
Cyfip1	3.8	0.4	1.8	0.1	-2.1	0.00420
Emp1	3.8	0.5	0.6	0.1	-6.9	0.00084
Gnaq	3.8	0.3	2.1	0.2	-1.8	0.00254
B4galt1	3.8	0.4	2.2	0.1	-1.7	0.01403
Mll3	3.8	0.4	3.0	0.2	-1.3	0.10791
Fam160b1	3.8	0.4	2.3	0.2	-1.7	0.00895
Cttnbp2nl	3.8	0.6	1.3	0.1	-3.0	0.01008
Eaf1	3.8	0.5	1.9	0.2	-2.0	0.01436
Notch2	3.8	0.3	2.4	0.1	-1.6	0.00511
Ube3a	3.7	0.2	2.5	0.2	-1.5	0.00026
Tjp1	3.7	0.5	2.6	0.2	-1.4	0.06556
Sacm1l	3.7	0.3	3.0	0.2	-1.3	0.05534
Tmcc1	3.7	0.5	2.5	0.1	-1.5	0.05042

Itga9	3.7	0.8	1.1	0.1	-3.4	0.02148
Dyrk2	3.7	0.4	2.4	0.2	-1.6	0.01709
Hivep2	3.7	0.4	2.4	0.2	-1.5	0.01719
Mapre1	3.7	0.4	2.1	0.2	-1.8	0.00557
Tgoln2	3.7	0.3	2.6	0.1	-1.4	0.01459
Nynrin	3.7	0.3	1.4	0.1	-2.7	0.00016
Ccdc80	3.7	0.5	1.1	0.1	-3.4	0.00297
Stk4	3.7	0.5	2.3	0.2	-1.6	0.03882
Atf7ip	3.7	0.5	2.7	0.2	-1.4	0.11056
Rbbp5	3.7	0.4	2.7	0.1	-1.3	0.06882
Cav2	3.7	0.3	2.1	0.1	-1.8	0.00210
Akap12	3.7	0.6	1.4	0.1	-2.6	0.01039
Sec23a	3.7	0.2	2.9	0.1	-1.3	0.01494
Cbll1	3.6	0.4	2.9	0.2	-1.3	0.12248
F13a1	3.6	0.4	1.6	0.1	-2.2	0.00405
Lamc1	3.6	0.4	1.3	0.1	-2.9	0.00117
Fnip2	3.6	0.3	2.6	0.3	-1.4	0.03307
Nmt2	3.6	0.5	1.7	0.1	-2.1	0.01208
Zfp84	3.6	0.2	2.5	0.1	-1.5	0.00039
Trip12	3.6	0.3	2.7	0.1	-1.3	0.03064
Pros1	3.6	0.4	1.4	0.1	-2.6	0.00268
Ikzf5	3.6	0.4	2.8	0.2	-1.3	0.13264
Slc38a2	3.6	0.5	1.8	0.1	-2.1	0.00839
Slc33a1	3.6	0.4	2.1	0.1	-1.7	0.00774
Rap1gds1	3.6	1.0	1.8	0.2	-2.0	0.12333
Pggt1b	3.6	0.5	2.0	0.2	-1.8	0.01792
Cpm	3.6	0.6	1.7	0.2	-2.1	0.01780
Fam13a	3.6	0.2	2.0	0.2	-1.9	0.00049
Sdc2	3.6	0.5	1.7	0.2	-2.2	0.01381
Pcgf3	3.6	0.5	2.4	0.2	-1.5	0.04490
Tbc1d2b	3.6	0.6	1.5	0.4	-2.4	0.01494
Irs2	3.6	1.2	1.3	0.4	-2.7	0.10983
Tmf1	3.6	0.4	2.4	0.2	-1.5	0.02588
Atp2c1	3.6	0.8	2.3	0.2	-1.5	0.18672
Actr2	3.6	0.4	1.8	0.2	-2.0	0.00701
Ap2b1	3.6	0.4	1.7	0.1	-2.1	0.00238
Atf6	3.6	0.3	2.8	0.1	-1.3	0.04995
Cand1	3.6	0.3	2.4	0.3	-1.5	0.01655
Zbtb43	3.6	0.5	2.8	0.3	-1.3	0.27347
Smad7	3.6	0.5	2.2	0.2	-1.6	0.04088
Frmd6	3.6	0.3	2.0	0.1	-1.8	0.00240

Myo1d	3.6	0.4	1.3	0.1	-2.9	0.00241
Hif1a	3.6	0.6	1.7	0.2	-2.2	0.01910
Cdv3	3.6	0.4	1.4	0.2	-2.6	0.00133
Esyt2	3.6	0.4	1.9	0.1	-1.9	0.00749
Cirh1a	3.6	1.3	2.0	0.6	-1.8	0.31269
Bat2l2	3.6	0.4	2.2	0.1	-1.6	0.02104
Mecp2	3.6	0.3	2.6	0.2	-1.4	0.02341
Lclat1	3.6	0.2	2.3	0.1	-1.5	0.00126
Cd276	3.6	0.5	1.1	0.2	-3.4	0.00351
Rbm4	3.6	0.6	2.7	0.3	-1.3	0.23435
Zfp367	3.5	0.3	1.8	0.1	-2.0	0.00195
Rnf150	3.5	0.6	2.7	0.2	-1.3	0.19956
Wasl	3.5	0.4	2.0	0.1	-1.8	0.01108
Wdfy3	3.5	0.4	2.1	0.1	-1.7	0.01390
Rnf141	3.5	0.4	2.4	0.2	-1.5	0.04220
Cdgap	3.5	0.4	1.8	0.1	-2.0	0.00665
Nup50	3.5	0.3	1.8	0.1	-1.9	0.00132
Ifnar1	3.5	0.4	1.6	0.1	-2.2	0.00690
Stim2	3.5	0.5	1.0	0.2	-3.4	0.00192
Zfp148	3.5	0.2	2.7	0.3	-1.3	0.06165
Secisbp2l	3.5	0.3	2.3	0.2	-1.5	0.00949
Znrf2	3.5	0.5	1.9	0.1	-1.9	0.02443
Larp4b	3.5	0.3	2.7	0.2	-1.3	0.04052
Cmtm6	3.5	0.4	1.8	0.1	-1.9	0.01065
Rassf8	3.5	0.4	2.0	0.2	-1.7	0.01440
Smcr8	3.5	0.3	2.1	0.1	-1.6	0.00692
Nedd9	3.5	0.3	2.2	0.2	-1.6	0.00515
Sertad2	3.5	0.5	2.1	0.2	-1.6	0.03379
Fam178a	3.5	0.3	2.1	0.2	-1.6	0.00202
Lamp2	3.5	0.4	2.2	0.0	-1.6	0.01294
Ppp1r15b	3.5	0.5	1.8	0.1	-1.9	0.01471
Twsg1	3.5	0.4	2.5	0.1	-1.4	0.04296
Ppp1r3b	3.5	0.4	2.5	0.3	-1.4	0.10046
Rpl27a	3.5	0.4	2.5	0.2	-1.4	0.05274
Rab31	3.5	0.6	1.0	0.1	-3.5	0.00798
Ctsc	3.5	0.8	1.1	0.2	-3.1	0.02373
Srsf2ip	3.5	0.2	2.5	0.1	-1.4	0.00783
Trib2	3.5	0.3	1.8	0.2	-1.9	0.00236
Obfc2a	3.5	0.3	1.6	0.2	-2.2	0.00071
Elmo1	3.5	0.4	1.3	0.1	-2.6	0.00267
Fam63b	3.5	0.3	2.3	0.2	-1.5	0.00736

Antxr1	3.5	0.6	1.2	0.2	-2.9	0.01052
Lamb1	3.5	0.4	1.2	0.1	-2.9	0.00142
Cd200	3.5	0.8	1.9	0.3	-1.8	0.10961
Otud1	3.5	0.9	0.6	0.0	-5.5	0.02743
Tppp	3.5	0.5	4.4	0.6	1.3	0.24649
Myst3	3.5	0.4	2.4	0.1	-1.5	0.02773
She	3.5	0.4	1.6	0.1	-2.1	0.00480
Sft2d2	3.4	0.4	2.5	0.2	-1.4	0.08509
Ptgs1	3.4	1.0	1.5	0.2	-2.3	0.11921
Synpo2l	3.4	0.5	0.7	0.1	-5.0	0.00174
Fzd6	3.4	0.4	2.4	0.2	-1.5	0.04616
Insr	3.4	0.2	2.6	0.2	-1.3	0.01386
Ttyh2	3.4	0.7	0.7	0.1	-5.1	0.01274
Rdx	3.4	0.2	2.5	0.1	-1.4	0.00937
Fut8	3.4	0.5	2.1	0.2	-1.7	0.03618
Mef2c	3.4	0.4	1.9	0.1	-1.8	0.00813
Flnb	3.4	0.3	1.0	0.1	-3.6	0.00013
Tmem165	3.4	0.7	1.9	0.2	-1.8	0.06784
Sh3rf1	3.4	0.4	1.3	0.2	-2.7	0.00204
Slc25a30	3.4	0.3	1.9	0.2	-1.8	0.00418
Snx13	3.4	0.4	2.4	0.1	-1.4	0.03611
Sel1l	3.4	0.3	2.0	0.1	-1.7	0.00667
Rap2a	3.4	0.5	1.5	0.1	-2.3	0.00905
Marcks	3.4	0.3	0.9	0.2	-3.8	0.00008
Zfp532	3.4	0.4	1.8	0.2	-1.9	0.01225
Wipf2	3.4	0.3	2.1	0.2	-1.6	0.00939
Fam120a	3.4	0.4	2.0	0.1	-1.7	0.01296
Arl8a	3.4	0.5	1.6	0.2	-2.1	0.01796
Trim44	3.4	0.5	2.0	0.0	-1.7	0.03684
Kpna4	3.4	0.3	1.9	0.1	-1.8	0.00132
Nfe2l2	3.4	0.2	2.1	0.1	-1.6	0.00262
Ppm1f	3.4	0.4	1.1	0.1	-3.0	0.00132
Dock1	3.4	0.4	1.5	0.1	-2.3	0.00585
Cmklr1	3.3	0.5	1.4	0.1	-2.5	0.01244
Erap1	3.3	0.4	2.2	0.2	-1.5	0.02778
Hist2h2ac	3.3	0.8	1.4	0.2	-2.5	0.05494
Gcap14	3.3	0.3	2.3	0.1	-1.5	0.01733
Actn1	3.3	0.5	1.0	0.1	-3.2	0.00363
Mobkl2a	3.3	0.7	0.7	0.1	-4.8	0.01228
Hic1	3.3	0.7	1.2	0.3	-2.8	0.02116
Ptp4a1	3.3	0.5	2.3	0.3	-1.4	0.13839

Col18a1	3.3	0.6	0.4	0.1	-9.3	0.00573
Rab18	3.3	0.2	2.4	0.1	-1.4	0.00829
Igfbp5	3.3	0.6	1.9	0.2	-1.7	0.04969
Trib1	3.3	0.4	1.1	0.1	-3.0	0.00182
Prrc1	3.3	0.5	2.1	0.2	-1.6	0.03949
Arl5a	3.3	0.3	2.1	0.2	-1.6	0.00301
S1pr2	3.3	0.4	1.0	0.1	-3.5	0.00245
Pias2	3.3	0.3	2.4	0.1	-1.4	0.02339
Col6a2	3.3	0.6	0.6	0.1	-5.6	0.00551
Tek	3.3	0.4	1.9	0.2	-1.7	0.01613
Spin1	3.3	0.4	1.9	0.1	-1.8	0.01896
Rcan3	3.3	0.7	1.5	0.2	-2.2	0.03801
Nus1	3.3	0.3	1.8	0.1	-1.8	0.00630
Edc3	3.3	0.4	2.0	0.2	-1.6	0.02068
Sephs1	3.3	0.4	2.1	0.3	-1.5	0.02824
Rnf144b	3.3	0.3	2.2	0.2	-1.5	0.01780
Setd2	3.3	0.3	2.1	0.1	-1.6	0.00503
Nid2	3.3	0.4	0.5	0.0	-6.1	0.00092
Fam49b	3.3	0.4	2.3	0.2	-1.4	0.04892
Cramp1l	3.3	0.4	2.0	0.1	-1.6	0.02562
Ppp1r12a	3.3	0.2	2.2	0.1	-1.5	0.00285
Zfp828	3.3	0.4	1.7	0.1	-2.0	0.01242
Fam114a1	3.3	0.7	1.2	0.2	-2.8	0.02314
Tmod3	3.3	0.3	1.3	0.1	-2.5	0.00158
Fbxo28	3.3	0.4	2.3	0.2	-1.4	0.07606
Lama2	3.3	0.3	1.7	0.1	-1.9	0.00562
Gtf3c4	3.3	0.4	1.9	0.2	-1.8	0.01732
Pldn	3.3	0.5	2.0	0.2	-1.6	0.05615
Fcho2	3.2	0.2	2.5	0.2	-1.3	0.03936
Nat12	3.2	0.4	2.0	0.3	-1.7	0.02584
Ttpal	3.2	0.4	1.9	0.3	-1.7	0.02088
Wapal	3.2	0.3	2.1	0.1	-1.5	0.00877
Casq1	3.2	0.4	1.2	0.1	-2.7	0.00292
Peli1	3.2	0.4	2.3	0.1	-1.4	0.05012
Lbh	3.2	0.4	2.1	0.1	-1.6	0.02631
Cmya5	3.2	0.4	4.4	0.4	1.4	0.05160
Ubtd2	3.2	0.6	2.0	0.2	-1.6	0.12315
Peli2	3.2	0.5	1.9	0.3	-1.7	0.04009
Prkx	3.2	0.2	1.8	0.1	-1.8	0.00039
Rock2	3.2	0.2	2.4	0.1	-1.3	0.01553
Mn1	3.2	0.4	1.2	0.1	-2.7	0.00467

Ncoa4	3.2	0.3	2.4	0.1	-1.3	0.04204
Mmp14	3.2	0.7	0.6	0.1	-5.0	0.01759
Pik3r1	3.2	0.3	4.3	0.4	1.3	0.04198
Ankrd17	3.2	0.3	2.4	0.1	-1.3	0.03684
Clec1a	3.2	0.4	1.5	0.1	-2.1	0.00843
Snx4	3.2	0.3	2.0	0.1	-1.6	0.01315
Frzb	3.2	0.8	0.8	0.2	-3.9	0.02862
Nin	3.2	0.4	1.3	0.1	-2.4	0.00416
Atxn7l3b	3.2	0.6	1.5	0.1	-2.1	0.04376
Lfng	3.2	0.4	0.8	0.2	-4.0	0.00090
Slc16a2	3.2	0.3	1.6	0.1	-2.0	0.00356
Parva	3.2	0.4	1.6	0.1	-2.0	0.00590
Cxcl12	3.2	0.4	2.1	0.2	-1.5	0.03759
Trpc3	3.2	0.6	2.1	0.3	-1.5	0.14168
Vim	3.2	0.6	0.5	0.0	-6.5	0.00510
Nup98	3.2	0.2	2.3	0.1	-1.4	0.00817
Dnaja1	3.2	0.6	1.6	0.2	-1.9	0.04806
Smad1	3.2	0.4	1.0	0.1	-3.1	0.00343
Cbfb	3.2	0.3	1.6	0.1	-2.0	0.00452
Plxna2	3.1	0.4	2.0	0.1	-1.6	0.05092
Gem	3.1	0.4	1.7	0.2	-1.9	0.01660
Bhlhe41	3.1	0.4	1.0	0.1	-3.2	0.00275
Cbfa2t2-ps1	3.1	0.4	2.1	0.2	-1.5	0.03133
Tomm70a	3.1	0.2	2.4	0.1	-1.3	0.02325
Stard9	3.1	0.9	1.0	0.1	-3.2	0.05530
Actr3	3.1	0.4	1.8	0.1	-1.7	0.01381
Trim56	3.1	0.3	1.7	0.1	-1.8	0.00493
Ube2h	3.1	0.4	2.0	0.2	-1.5	0.02459
Meox1	3.1	0.4	0.4	0.1	-7.2	0.00154
Lum	3.1	0.7	0.8	0.1	-4.0	0.01610
Snai1	3.1	0.6	0.8	0.1	-4.1	0.01290
Dnajb4	3.1	0.4	1.7	0.1	-1.8	0.01156
Sorl1	3.1	0.4	2.4	0.2	-1.3	0.17316
Dgkd	3.1	0.3	1.8	0.1	-1.7	0.00448
Prelp	3.1	0.4	1.6	0.1	-2.0	0.00628
Lancl2	3.1	0.2	2.4	0.2	-1.3	0.06659
Usp24	3.1	0.3	2.3	0.2	-1.4	0.04337
Crkl	3.1	0.4	1.9	0.1	-1.6	0.02280
Nedd4	3.1	0.3	2.1	0.1	-1.5	0.01209
Stxbp3a	3.1	0.6	2.3	0.3	-1.3	0.31012
Cep120	3.1	0.3	2.0	0.1	-1.6	0.01218

Dusp5	3.1	0.7	2.4	0.2	-1.3	0.37906
Thrb	3.1	0.2	4.3	0.2	1.4	0.00386
Dnmt3a	3.1	0.4	2.3	0.1	-1.3	0.11793
Serinc5	3.1	0.3	1.6	0.1	-1.9	0.00216
Kcnj2	3.1	0.4	5.0	0.6	1.6	0.02894
Magi1	3.1	0.3	1.7	0.1	-1.8	0.00593
Tbl1x	3.1	0.3	2.2	0.1	-1.4	0.02546
Per3	3.1	1.0	1.1	0.2	-2.8	0.11716
Ptprm	3.1	0.3	2.1	0.1	-1.5	0.03219
Sptlc2	3.1	0.5	1.2	0.1	-2.6	0.00827
Leprel1	3.1	1.0	1.2	0.1	-2.6	0.12710
Zfp521	3.1	0.5	2.2	0.2	-1.4	0.16180
Nuak1	3.1	0.6	0.8	0.1	-3.9	0.00899
Pdia4	3.1	0.3	1.2	0.1	-2.5	0.00208
Nek7	3.1	0.3	2.4	0.1	-1.3	0.09947
Pkd2	3.1	0.3	1.3	0.1	-2.4	0.00248
Nhlrc2	3.0	0.2	2.4	0.2	-1.3	0.05001
Fli1	3.0	0.3	1.3	0.1	-2.4	0.00114
Igdcc4	3.0	0.5	2.1	0.2	-1.4	0.11443
Rnf145	3.0	0.5	1.2	0.2	-2.5	0.01042
Gucy1a3	3.0	0.3	1.9	0.2	-1.6	0.01681
Zfc3h1	3.0	0.5	1.4	0.1	-2.1	0.01566
Plod2	3.0	0.3	1.7	0.2	-1.8	0.00493
Hcfc2	3.0	0.3	2.4	0.1	-1.3	0.13262
Zfp36l2	3.0	0.4	0.8	0.1	-3.8	0.00334
Slc36a1	3.0	0.4	1.7	0.1	-1.8	0.01801
Ptpn12	3.0	0.5	1.2	0.1	-2.4	0.01282
Hbegf	3.0	0.6	0.6	0.0	-5.4	0.00714
Tnrc6a	3.0	0.4	2.4	0.2	-1.3	0.14893
Rnf19a	3.0	0.3	1.5	0.1	-2.1	0.00133
Katnal1	3.0	1.4	2.1	0.5	-1.4	0.58789
Rgl1	3.0	0.4	1.4	0.2	-2.1	0.00771
Map4k3	3.0	0.2	2.3	0.2	-1.3	0.04029
Syncrip	3.0	0.3	2.0	0.1	-1.5	0.01796
Ndst1	3.0	0.4	2.1	0.1	-1.4	0.06019
Asap2	3.0	0.4	0.7	0.2	-4.0	0.00123
Plxdc2	3.0	0.2	1.6	0.1	-1.9	0.00046
Grk5	3.0	0.5	1.8	0.2	-1.7	0.05444
Per2	3.0	0.6	0.8	0.1	-3.5	0.01712
Fzd1	3.0	0.5	1.1	0.1	-2.8	0.01025
Pgam1	3.0	0.5	2.1	0.2	-1.4	0.12856

Shoc2	3.0	0.3	1.8	0.1	-1.7	0.00909
Intu	3.0	0.7	1.7	0.1	-1.8	0.11408
Impa1	3.0	0.4	2.0	0.1	-1.5	0.06199
Pgam1-ps1	3.0	0.4	2.2	0.3	-1.3	0.17261
Efnb2	3.0	0.6	1.4	0.2	-2.2	0.03828
Ppm1k	3.0	0.2	4.2	0.4	1.4	0.03971
Atp2b1	3.0	0.3	2.2	0.1	-1.4	0.02012
Twf1	3.0	0.3	1.6	0.1	-1.9	0.00248
Megf9	3.0	0.6	1.4	0.2	-2.1	0.05737
Dnajb1	3.0	0.5	1.8	0.2	-1.6	0.06877
Setd7	3.0	0.3	1.6	0.1	-1.9	0.00852
Zbtb11	3.0	0.4	1.7	0.1	-1.7	0.02596
Ano6	3.0	0.4	1.2	0.1	-2.4	0.00473
Sik1	2.9	0.4	2.1	0.3	-1.4	0.11317
Lats2	2.9	0.3	1.9	0.1	-1.6	0.02437
Alkbh5	2.9	0.3	2.0	0.1	-1.5	0.02162
Smc1a	2.9	0.4	1.7	0.1	-1.7	0.03352
Ecm2	2.9	0.4	1.4	0.2	-2.1	0.01530
Gab2	2.9	0.3	1.4	0.1	-2.1	0.00526
Sparcl1	2.9	0.5	1.1	0.1	-2.8	0.01087
Dusp6	2.9	0.5	1.1	0.1	-2.6	0.00993
Qrich1	2.9	0.4	1.9	0.1	-1.5	0.03498
Uso1	2.9	0.3	1.8	0.0	-1.6	0.00753
Hist2h3c1	2.9	0.4	1.1	0.1	-2.6	0.00859
Zcchc3	2.9	0.4	2.2	0.2	-1.3	0.14936
Hnrnpk	2.9	0.2	2.3	0.1	-1.3	0.02326
Tmem64	2.9	0.3	1.8	0.1	-1.6	0.00489
Fbxo40	2.9	0.2	1.8	0.1	-1.6	0.00446
Fzd4	2.9	0.2	1.8	0.1	-1.6	0.00470
Usp13	2.9	0.2	2.3	0.1	-1.3	0.02551
Gpr124	2.9	0.5	0.7	0.0	-4.2	0.00493
Magi3	2.9	0.5	2.1	0.1	-1.4	0.22233
Faf2	2.9	0.4	1.9	0.1	-1.5	0.03291
Heatr5a	2.9	0.4	1.4	0.1	-2.1	0.00674
Matr3	2.9	0.2	2.3	0.1	-1.3	0.05520
Vash1	2.9	0.5	0.4	0.0	-6.8	0.00484
Phf3	2.9	0.2	2.2	0.1	-1.3	0.01875
Sntb1	2.9	0.6	1.0	0.2	-2.8	0.01872
Aftph	2.9	0.2	2.1	0.2	-1.4	0.02031
Pcdh12	2.9	0.5	0.9	0.1	-3.1	0.01116
Edem3	2.9	0.3	1.8	0.1	-1.6	0.00584

Smcr7l	2.9	0.3	2.2	0.1	-1.3	0.10437
Tgfb3	2.9	0.5	1.0	0.1	-2.9	0.00922
Aebp1	2.9	0.6	0.5	0.1	-5.4	0.00937
Zc3h11a	2.9	0.2	1.7	0.1	-1.7	0.00149
Dnmt1	2.9	0.4	1.0	0.1	-3.0	0.00245
Hspa4l	2.9	0.2	2.0	0.1	-1.4	0.00761
Stk10	2.9	0.5	1.0	0.1	-2.9	0.01468
Grlf1	2.9	0.3	2.0	0.1	-1.4	0.03271
Wac	2.9	0.3	2.2	0.1	-1.3	0.06913
Ppfia1	2.9	0.4	1.4	0.1	-2.0	0.01494
Tdrd3	2.9	0.3	2.0	0.1	-1.4	0.03290
Ube2j1	2.9	0.2	2.0	0.3	-1.4	0.05358
Heatr5b	2.9	0.2	2.3	0.2	-1.3	0.06822
Zhx2	2.9	0.3	1.7	0.1	-1.7	0.00675
Rnf4	2.9	0.3	1.3	0.1	-2.2	0.00289
Nlk	2.9	0.3	2.0	0.1	-1.4	0.02530
Lipa	2.9	0.2	1.6	0.1	-1.7	0.00285
Tbc1d15	2.9	0.3	2.2	0.2	-1.3	0.10855
Pkn2	2.9	0.6	2.1	0.1	-1.4	0.29667
Foxk1	2.9	0.3	1.5	0.1	-1.9	0.00736
Coro1c	2.9	0.3	1.1	0.1	-2.6	0.00242
Rarb	2.9	0.4	1.8	0.3	-1.6	0.07735
Atrn	2.9	0.3	2.0	0.1	-1.4	0.03321
Slc25a1	2.9	0.3	1.2	0.2	-2.3	0.00066
Cdr2	2.9	0.6	0.8	0.1	-3.6	0.01826
Gabarapl1	2.9	0.2	2.1	0.2	-1.4	0.03386
Dstyk	2.9	0.3	2.2	0.2	-1.3	0.08138
Rbm4b	2.8	0.5	2.2	0.2	-1.3	0.23291
Kif5b	2.8	0.3	1.7	0.1	-1.7	0.01292
Dync1h1	2.8	0.3	1.6	0.1	-1.8	0.00686
Bbc3	2.8	0.5	0.9	0.2	-3.0	0.01063
Chd7	2.8	0.4	2.1	0.2	-1.4	0.11439
Srcap	2.8	0.3	1.9	0.1	-1.5	0.02977
Snx14	2.8	0.2	2.1	0.1	-1.4	0.00857
Nav1	2.8	0.3	1.2	0.1	-2.4	0.00430
Usp4	2.8	0.2	1.6	0.1	-1.7	0.00318
Layn	2.8	0.4	0.9	0.2	-3.3	0.00543
Rbm16	2.8	0.2	2.0	0.1	-1.4	0.00469
Kpna3	2.8	0.2	1.6	0.1	-1.8	0.00014
Rap1b	2.8	0.6	1.2	0.1	-2.3	0.04497
St3gal2	2.8	0.5	0.9	0.1	-3.1	0.00750

Mcc	2.8	0.3	2.3	0.2	-1.3	0.15112
Tmem131	2.8	0.3	2.1	0.1	-1.4	0.03068
Fam117b	2.8	0.4	2.3	0.4	-1.3	0.33169
Synm	2.8	0.3	1.5	0.3	-1.8	0.02093
Casp8	2.8	0.4	1.1	0.1	-2.6	0.00565
Pdcl	2.8	0.2	1.9	0.2	-1.5	0.00811
Spast	2.8	0.4	1.7	0.1	-1.6	0.02876
Thsd1	2.8	0.4	1.3	0.1	-2.2	0.00708
Flt1	2.8	0.3	2.1	0.2	-1.4	0.06506
Dsc2	2.8	0.2	4.0	0.2	1.4	0.00387
Mtmr12	2.8	0.4	1.0	0.0	-2.7	0.00539
Elavl1	2.8	0.3	2.0	0.1	-1.4	0.03688
Wdr1	2.8	0.3	1.8	0.1	-1.5	0.02363
Epha2	2.8	0.7	1.3	0.2	-2.2	0.09549
Ehd2	2.8	0.3	1.0	0.1	-2.8	0.00312
Sparc	2.8	0.4	0.5	0.1	-5.3	0.00323
Aldh1a1	2.8	0.3	1.0	0.1	-2.9	0.00189
Skap2	2.8	0.4	1.1	0.2	-2.6	0.00932
Setx	2.8	0.3	2.1	0.2	-1.3	0.10489
Crim1	2.8	0.6	1.5	0.3	-1.8	0.11178
Rbm15b	2.8	0.4	1.2	0.1	-2.3	0.01097
Ddx6	2.8	0.2	2.1	0.1	-1.3	0.04168
Myo1e	2.8	0.4	0.9	0.1	-3.2	0.00238
Asah1	2.8	0.4	1.2	0.2	-2.3	0.00839
Tmed7	2.8	0.2	1.7	0.1	-1.6	0.00061
Pcdh1	2.8	0.3	0.9	0.1	-3.0	0.00227
Uggt1	2.8	0.2	1.6	0.1	-1.7	0.00209
Picalm	2.8	0.4	1.8	0.1	-1.6	0.05742
Pgam1-ps2	2.8	0.4	1.9	0.2	-1.4	0.09020
Trio	2.8	0.3	1.5	0.1	-1.9	0.00605
Vgll4	2.8	0.3	1.3	0.1	-2.1	0.00400
Nrp1	2.8	0.2	1.5	0.1	-1.9	0.00068
Gfer	2.8	0.3	2.1	0.2	-1.3	0.11517
Atp8b2	2.8	0.4	0.6	0.1	-4.7	0.00340
Arf3	2.8	0.3	1.2	0.1	-2.3	0.00103
Stx12	2.8	0.4	1.5	0.1	-1.8	0.02146
Ints7	2.8	0.4	1.4	0.0	-1.9	0.01885
Pfn2	2.8	0.3	1.8	0.1	-1.5	0.01287
Usp22	2.8	0.2	1.5	0.1	-1.8	0.00161
Sec24d	2.8	0.3	1.8	0.1	-1.6	0.02726
Clic5	2.8	0.4	1.5	0.1	-1.9	0.01340

Fbxo42	2.7	0.4	1.6	0.1	-1.7	0.04237
Adnp2	2.7	0.4	1.6	0.1	-1.7	0.02459
Abcb4	2.7	0.6	1.2	0.1	-2.3	0.04929
Kif3b	2.7	0.3	1.3	0.1	-2.2	0.00451
Gpr137b-ps	2.7	0.6	1.1	0.1	-2.5	0.03495
Agap1	2.7	0.4	2.1	0.1	-1.3	0.19377
Dchs1	2.7	0.5	0.6	0.1	-4.4	0.00645
Fam193a	2.7	0.3	1.8	0.2	-1.5	0.02101
Ndst2	2.7	0.4	1.7	0.2	-1.6	0.04640
Hmox1	2.7	0.8	0.5	0.1	-6.0	0.03813
Ppp2r1b	2.7	0.2	1.6	0.1	-1.7	0.00370
Bhlhe40	2.7	0.3	1.1	0.1	-2.4	0.00165
Cdh5	2.7	0.3	1.1	0.1	-2.5	0.00117
Herc2	2.7	0.3	1.8	0.1	-1.5	0.02437
Vezf1	2.7	0.2	2.1	0.1	-1.3	0.04879
Nostrin	2.7	0.4	0.7	0.1	-4.0	0.00480
Ptprk	2.7	0.2	2.1	0.1	-1.3	0.05197
Mlxip	2.7	0.3	2.1	0.0	-1.3	0.06202
Irgq	2.7	0.4	1.6	0.1	-1.7	0.02720
Ddx21	2.7	0.2	1.5	0.1	-1.9	0.00242
Ssr3	2.7	0.3	1.6	0.1	-1.7	0.02024
Ap3b1	2.7	0.3	1.4	0.1	-1.9	0.00928
Fam18b	2.7	0.3	2.1	0.4	-1.3	0.21623
Tmem38b	2.7	0.4	2.0	0.2	-1.4	0.11176
Nfatc1	2.7	0.3	1.4	0.1	-2.0	0.00899
Wdr6	2.7	0.3	2.0	0.3	-1.4	0.11952
Nars2	2.7	0.4	2.1	0.4	-1.3	0.35387
Efr3b	2.7	0.4	1.4	0.2	-2.0	0.03156
Zfp36l1	2.7	0.3	1.4	0.2	-1.9	0.01163
Klf6	2.7	0.4	1.2	0.1	-2.2	0.00762
Sash1	2.7	0.3	1.6	0.1	-1.7	0.01122
Phactr4	2.7	0.2	1.8	0.1	-1.5	0.00290
Gnpda1	2.7	0.5	1.5	0.2	-1.7	0.06351
Nln	2.7	0.3	1.4	0.1	-1.8	0.01160
Cstf2t	2.7	0.2	1.8	0.2	-1.5	0.00592
Armcx3	2.7	0.4	1.4	0.2	-1.8	0.03608
Tmem30a	2.7	0.3	1.4	0.1	-1.9	0.00321
Atxn7	2.7	0.2	1.6	0.1	-1.6	0.00685
Dync1li2	2.7	0.3	1.5	0.1	-1.8	0.00532
Socs7	2.7	0.5	1.7	0.2	-1.6	0.10252
Fbxl17	2.6	0.2	1.9	0.2	-1.4	0.03280

Usp42	2.6	0.2	1.8	0.1	-1.5	0.01298
Ece1	2.6	0.7	1.3	0.1	-2.0	0.14233
Inpp1	2.6	0.4	1.4	0.1	-2.0	0.03138
Yipf5	2.6	0.3	1.5	0.2	-1.8	0.01934
Sh3bp4	2.6	0.3	0.8	0.1	-3.4	0.00103
Acvr1b	2.6	0.3	1.9	0.2	-1.4	0.10741
Ppm1l	2.6	0.3	3.8	0.3	1.4	0.02517
Prrx1	2.6	0.3	1.3	0.1	-2.1	0.00472
Fam3c	2.6	0.4	1.2	0.1	-2.3	0.00785
Cdk13	2.6	0.2	1.5	0.1	-1.7	0.00052
Zfand5	2.6	0.4	1.9	0.3	-1.4	0.13899
Golt1b	2.6	0.3	1.6	0.2	-1.7	0.01975
Ldlrap1	2.6	0.4	1.2	0.1	-2.1	0.01243
Aldh18a1	2.6	0.6	0.7	0.1	-3.7	0.02352
Ylpm1	2.6	0.2	1.9	0.1	-1.4	0.01699
Tnfrsf21	2.6	0.3	1.2	0.1	-2.3	0.00323
Mybpc2	2.6	0.4	0.4	0.0	-6.3	0.00209
Sec14l1	2.6	0.3	1.1	0.1	-2.5	0.00587
Exoc2	2.6	0.2	2.0	0.2	-1.3	0.03595
Nvl	2.6	0.2	2.1	0.2	-1.3	0.09792
Rarg	2.6	0.6	3.3	1.6	1.3	0.71821
Klhl2	2.6	0.3	1.9	0.1	-1.4	0.07349
Sgpp1	2.6	0.2	2.1	0.1	-1.3	0.07700
Smek1	2.6	0.3	1.7	0.2	-1.6	0.02839
Lima1	2.6	0.3	1.0	0.1	-2.6	0.00459
Csf1	2.6	0.4	1.0	0.1	-2.5	0.00741
Pdxk	2.6	0.4	1.4	0.1	-1.9	0.01860
Gsr	2.6	0.4	1.7	0.1	-1.6	0.06911
Ei24	2.6	0.2	2.0	0.2	-1.3	0.04603
Mut	2.6	0.2	3.5	0.3	1.4	0.04094
Ankrd13c	2.6	0.2	1.7	0.1	-1.5	0.00992
Wwc2	2.6	0.3	1.6	0.1	-1.7	0.00945
Syt11	2.6	0.3	1.6	0.1	-1.6	0.01103
Cpsf2	2.6	0.2	1.9	0.2	-1.3	0.01848
Pcf11	2.6	0.3	1.9	0.1	-1.4	0.05575
Adra1a	2.6	0.2	4.4	0.9	1.7	0.11255
P4ha1	2.6	0.4	1.0	0.1	-2.6	0.01104
Copb1	2.6	0.3	1.5	0.1	-1.7	0.01079
Spon1	2.6	0.4	1.3	0.1	-2.0	0.01291
Chordc1	2.6	0.2	1.8	0.1	-1.4	0.01513
Bclaf1	2.6	0.2	1.9	0.2	-1.4	0.02968

Tubb5	2.6	0.3	0.9	0.1	-3.0	0.00117
Nova2	2.6	0.3	0.8	0.1	-3.3	0.00208
Senp2	2.6	0.3	1.7	0.2	-1.5	0.05791
Ppp4r2	2.6	0.3	2.0	0.1	-1.3	0.09842
Slc35f5	2.6	0.2	1.7	0.0	-1.5	0.00593
Man2b1	2.6	0.4	0.9	0.1	-2.9	0.00543
Atp6ap2	2.6	0.5	1.6	0.2	-1.6	0.10621
C1qtnf6	2.6	0.4	0.5	0.1	-4.7	0.00537
Angptl2	2.6	0.6	0.8	0.1	-3.1	0.02792
C80913	2.6	0.3	1.3	0.1	-2.0	0.00543
Myadm	2.6	0.2	1.3	0.1	-1.9	0.00354
Clip4	2.6	0.2	1.6	0.1	-1.6	0.00829
Glg1	2.6	0.3	1.6	0.1	-1.6	0.01161
Ddx19b	2.6	0.4	1.6	0.1	-1.6	0.05021
Cyb5b	2.6	0.3	1.9	0.1	-1.3	0.09854
Pofut1	2.6	0.3	1.4	0.1	-1.8	0.00512
Rasgrp3	2.6	0.3	1.0	0.1	-2.4	0.00201
Rcc2	2.5	0.3	1.0	0.1	-2.7	0.00104
Fam59a	2.5	0.3	1.8	0.1	-1.4	0.05039
Timp2	2.5	0.3	1.2	0.1	-2.1	0.01131
Pcnx	2.5	0.3	1.7	0.1	-1.5	0.02340
Ttyh3	2.5	0.4	0.6	0.1	-4.1	0.00482
Cyth3	2.5	0.4	1.1	0.1	-2.3	0.01248
Ubqln1	2.5	0.3	1.9	0.1	-1.4	0.05534
Cdk7	2.5	0.2	1.9	0.1	-1.4	0.02666
Cdca4	2.5	0.4	0.9	0.1	-2.8	0.00764
Gpkow	2.5	0.4	1.8	0.1	-1.4	0.08818
Ankrd52	2.5	0.4	1.9	0.1	-1.4	0.12432
Blzf1	2.5	0.2	1.9	0.1	-1.3	0.01641
Clec14a	2.5	0.4	0.7	0.1	-3.6	0.00650
Yy1	2.5	0.2	1.6	0.1	-1.5	0.00183
Mrc2	2.5	0.4	0.5	0.1	-5.3	0.00274
Usp28	2.5	0.2	1.7	0.1	-1.5	0.01029
Dhx9	2.5	0.2	1.5	0.1	-1.7	0.00376
Nes	2.5	0.4	0.5	0.0	-4.8	0.00336
Ets2	2.5	0.3	1.2	0.1	-2.1	0.00509
Cnot4	2.5	0.2	2.0	0.1	-1.3	0.07714
Pdha2	2.5	0.3	2.0	0.2	-1.3	0.17081
Gjc1	2.5	0.3	0.9	0.1	-3.0	0.00332
Col4a1	2.5	0.3	0.8	0.1	-3.3	0.00229
Irf2bp2	2.5	0.3	1.8	0.2	-1.4	0.07911

Coq10b	2.5	0.5	1.4	0.1	-1.8	0.05541
Actb	2.5	0.3	1.0	0.1	-2.6	0.00357
Siah2	2.5	0.6	1.8	0.2	-1.4	0.33835
Wipi1	2.5	0.3	1.4	0.1	-1.8	0.00566
Mtf1	2.5	0.2	1.6	0.1	-1.6	0.00499
Ywhag	2.5	0.2	1.7	0.1	-1.5	0.01518
Dnajc10	2.5	0.4	1.3	0.1	-2.0	0.02397
Kidins220	2.5	0.2	1.6	0.1	-1.5	0.01481
Fbln5	2.5	0.3	0.9	0.1	-2.7	0.00264
Smtnl2	2.5	0.7	1.4	0.2	-1.8	0.19138
Pols	2.5	0.2	1.0	0.1	-2.4	0.00122
Brwd2	2.5	0.3	1.5	0.1	-1.6	0.01278
Cdc42se2	2.5	0.2	1.4	0.1	-1.8	0.00448
Eif4ebp2	2.5	0.3	1.9	0.1	-1.3	0.10590
Hist1h4i	2.5	0.4	1.4	0.2	-1.8	0.04079
H3f3b	2.5	0.2	1.4	0.1	-1.8	0.00083
Sik2	2.5	0.3	1.9	0.1	-1.3	0.12053
Cdc42	2.5	0.3	1.3	0.1	-1.9	0.00769
Mbtps1	2.5	0.3	1.4	0.1	-1.8	0.02251
Rcan1	2.5	0.6	0.6	0.1	-4.3	0.02459
Lbr	2.5	0.2	1.6	0.1	-1.5	0.00916
Gpr116	2.5	0.4	1.9	0.1	-1.3	0.19264
Nrarp	2.5	0.3	0.8	0.1	-3.2	0.00261
Steap4	2.5	0.3	1.3	0.1	-1.9	0.01548
Xirp1	2.5	0.4	1.1	0.1	-2.2	0.01206
Casp7	2.5	0.3	1.3	0.1	-1.9	0.00478
Bcl6b	2.5	0.3	0.5	0.0	-5.3	0.00076
Rhoq	2.5	0.2	1.5	0.1	-1.7	0.00162
Rad21	2.5	0.2	1.7	0.1	-1.5	0.01420
Zfp68	2.5	0.5	2.0	0.4	-1.3	0.44584
Rrp12	2.5	0.4	0.7	0.1	-3.7	0.00506
Poldip3	2.5	0.3	1.3	0.1	-1.9	0.00714
Rab3gap2	2.5	0.2	1.3	0.1	-1.9	0.00309
Patl1	2.5	0.3	1.8	0.1	-1.4	0.07103
Serpine2	2.5	0.8	0.5	0.1	-5.1	0.05150
Rasl11b	2.5	0.6	1.1	0.3	-2.3	0.06176
Rbm7	2.5	0.3	1.4	0.1	-1.8	0.01221
Scyl2	2.5	0.2	1.6	0.1	-1.5	0.00998
Peg3	2.5	0.2	1.9	0.2	-1.3	0.09043
Smad2	2.5	0.4	1.7	0.4	-1.5	0.20123
Ythdf2	2.5	0.2	1.2	0.1	-2.0	0.00026

Ubr5	2.5	0.3	1.7	0.1	-1.5	0.03282
Erlin2	2.5	0.2	1.4	0.1	-1.8	0.00176
Gprc5b	2.5	0.5	0.8	0.1	-3.3	0.01274
Gpr125	2.5	0.3	1.5	0.1	-1.6	0.01886
Pik3c2b	2.5	0.3	1.5	0.2	-1.6	0.03297
Tle4	2.5	0.2	1.9	0.1	-1.3	0.02149
Kat2b	2.5	0.2	1.9	0.1	-1.3	0.05951
Tln2	2.5	0.4	1.9	0.1	-1.3	0.20210
Csf1r	2.4	0.3	0.6	0.1	-4.0	0.00209
Mdc1	2.4	0.2	1.4	0.1	-1.7	0.00583
X99384	2.4	0.4	0.6	0.1	-4.1	0.00406
Oxsr1	2.4	0.3	1.8	0.1	-1.4	0.10457
Mcl1	2.4	0.2	1.7	0.1	-1.4	0.02004
Kdelr3	2.4	0.4	0.7	0.1	-3.7	0.00738
Zbtb16	2.4	0.3	4.8	0.8	2.0	0.03510
Josd1	2.4	0.3	1.8	0.1	-1.4	0.10625
Gclc	2.4	0.3	1.5	0.2	-1.6	0.05119
Srbd1	2.4	0.4	1.3	0.3	-1.8	0.04340
Smad4	2.4	0.3	1.7	0.1	-1.5	0.02718
Ulk2	2.4	0.2	1.7	0.1	-1.4	0.02665
Naa40	2.4	0.3	1.9	0.2	-1.3	0.14993
Rqcd1	2.4	0.3	1.7	0.2	-1.5	0.07512
Btg1	2.4	0.5	1.2	0.1	-2.1	0.04641
Mnt	2.4	0.3	1.4	0.1	-1.7	0.00793
Clic4	2.4	0.3	1.5	0.1	-1.6	0.02191
St5	2.4	0.3	1.6	0.1	-1.5	0.01802
Tspan12	2.4	0.2	1.6	0.1	-1.5	0.02363
Fam98b	2.4	0.3	1.7	0.1	-1.4	0.04013
Nr4a3	2.4	0.5	0.9	0.2	-2.6	0.04108
Rras2	2.4	0.3	1.0	0.1	-2.4	0.00789
Itpkb	2.4	0.3	1.1	0.1	-2.1	0.00297
Kpnb1	2.4	0.3	1.3	0.1	-1.9	0.01653
Kdr	2.4	0.2	1.8	0.2	-1.3	0.07271
Ppp2r5c	2.4	0.3	1.8	0.1	-1.4	0.06148
Polr1b	2.4	0.2	1.6	0.3	-1.5	0.04147
Itga5	2.4	0.4	0.9	0.1	-2.8	0.00716
Ext1	2.4	0.4	1.3	0.1	-1.8	0.02651
Ccdc8	2.4	0.6	0.7	0.1	-3.5	0.02967
Cnot2	2.4	0.2	1.9	0.1	-1.3	0.05564
Slc16a1	2.4	0.2	1.9	0.1	-1.3	0.05973
Bcl6	2.4	0.2	1.5	0.1	-1.6	0.00919

Srfbp1	2.4	0.1	1.5	0.1	-1.6	0.00045
Galnt1	2.4	0.3	1.6	0.1	-1.5	0.02533
Surf6	2.4	0.2	1.3	0.1	-1.9	0.00090
Prr8	2.4	0.2	1.8	0.1	-1.3	0.03475
Srpk1	2.4	0.3	1.8	0.1	-1.4	0.08928
Podxl	2.4	0.3	1.2	0.1	-1.9	0.01062
Kdm6b	2.4	0.3	1.5	0.1	-1.6	0.02252
Rhobtb1	2.4	0.2	1.7	0.2	-1.4	0.02808
Tcea1-ps1	2.4	0.3	0.9	0.1	-2.5	0.00714
Hsp90aa1	2.4	0.1	1.3	0.1	-1.9	0.00012
Ptdss1	2.4	0.4	1.3	0.1	-1.8	0.03159
Acbd3	2.4	0.3	1.4	0.1	-1.7	0.01667
Tnfaip1	2.4	0.3	1.2	0.1	-2.0	0.00453
Uhrf1bp1l	2.4	0.3	1.7	0.1	-1.4	0.06070
Gbp2	2.4	0.5	0.8	0.2	-2.9	0.02344
Csnk1a1	2.4	0.2	1.6	0.1	-1.5	0.00815
Parp12	2.4	0.3	1.1	0.1	-2.2	0.00571
Zfp526	2.4	0.3	1.7	0.2	-1.4	0.12526
Alkbh4	2.4	0.5	1.6	0.2	-1.5	0.17890
Cd34	2.4	0.3	0.7	0.1	-3.2	0.00179
Lmbr1l	2.4	0.1	1.6	0.2	-1.4	0.00594
C2cd2	2.4	0.3	1.2	0.1	-1.9	0.00758
Prkar2a	2.4	0.2	1.7	0.1	-1.4	0.02644
Ptpra	2.4	0.2	1.3	0.1	-1.8	0.00291
Smc3	2.4	0.3	1.7	0.2	-1.4	0.10686
Vps35	2.4	0.2	1.5	0.2	-1.6	0.00808
Gnb1	2.4	0.2	1.3	0.1	-1.9	0.00432
Atp6v1b2	2.4	0.2	1.8	0.2	-1.3	0.04775
Fubp1	2.4	0.2	1.4	0.2	-1.7	0.00336
Vamp3	2.4	0.2	1.3	0.1	-1.8	0.00105
Plxna1	2.4	0.3	1.1	0.1	-2.1	0.01212
Acta1	2.4	0.4	0.3	0.0	-8.6	0.00409
Golga3	2.4	0.2	1.7	0.1	-1.4	0.03263
Senp6	2.4	0.2	1.8	0.1	-1.3	0.04738
Stat1	2.4	0.3	1.2	0.1	-2.0	0.00723
Ctdsp2	2.4	0.2	1.4	0.1	-1.7	0.00995
Smg1	2.3	0.1	1.8	0.1	-1.3	0.01650
Akna	2.3	0.3	1.1	0.1	-2.2	0.00769
Arl10	2.3	0.4	1.1	0.1	-2.1	0.03615
Ppara	2.3	0.3	3.9	0.4	1.7	0.01740
Abra	2.3	0.4	0.9	0.1	-2.6	0.00859

Stt3b	2.3	0.3	1.5	0.0	-1.6	0.02106
Ywhab	2.3	0.2	1.2	0.1	-2.0	0.00285
Iws1	2.3	0.2	1.5	0.1	-1.6	0.00153
Kdm2a	2.3	0.3	1.4	0.1	-1.6	0.02227
Klraq1	2.3	0.4	1.0	0.1	-2.3	0.02044
Sox4	2.3	0.6	1.0	0.1	-2.3	0.07836
Bcr	2.3	0.3	1.1	0.1	-2.2	0.01238
Tgfbi	2.3	0.3	0.8	0.1	-2.9	0.00297
Zzef1	2.3	0.3	1.4	0.1	-1.6	0.01469
Irf8	2.3	0.5	0.7	0.1	-3.2	0.01629
Pde8a	2.3	0.2	1.0	0.1	-2.3	0.00022
Srgap2	2.3	0.2	1.0	0.1	-2.2	0.00221
Ptpn21	2.3	0.2	1.4	0.1	-1.7	0.01102
Naa15	2.3	0.2	1.6	0.2	-1.5	0.01454
Ppp2cb	2.3	0.3	1.4	0.0	-1.7	0.03257
Rgs4	2.3	0.4	1.5	0.2	-1.5	0.10050
Sox7	2.3	0.5	0.7	0.1	-3.2	0.03056
Prep	2.3	0.2	1.5	0.1	-1.5	0.01580
Pskh1	2.3	0.2	1.5	0.1	-1.5	0.01727
Ugdh	2.3	0.4	1.3	0.1	-1.7	0.06048
Nppa	2.3	0.5	0.3	0.1	-8.2	0.00979
Stx17	2.3	0.3	1.8	0.2	-1.3	0.22727
Sppl3	2.3	0.3	1.5	0.1	-1.6	0.04165
Mfhas1	2.3	0.2	1.4	0.1	-1.6	0.01262
Pknox1	2.3	0.2	1.5	0.2	-1.5	0.01848
Kbtbd10	2.3	0.3	1.7	0.1	-1.4	0.08547
Ubap2l	2.3	0.2	1.6	0.3	-1.5	0.08026
Ppil4	2.3	0.3	1.6	0.1	-1.4	0.04547
Eif3j	2.3	0.3	1.8	0.1	-1.3	0.15665
Yap1	2.3	0.2	1.7	0.1	-1.4	0.06406
Prkab2	2.3	0.4	1.2	0.2	-1.9	0.02828
B4galt6	2.3	0.1	1.8	0.1	-1.3	0.01392
Zfp592	2.3	0.2	1.6	0.1	-1.4	0.00777
Car3	2.3	0.7	3.7	2.1	1.6	0.54033
Rundc2a	2.3	0.5	1.7	0.4	-1.4	0.38730
Lman1	2.3	0.3	1.6	0.1	-1.4	0.04695
Pgm5	2.3	0.3	1.6	0.1	-1.5	0.03534
Eprs	2.3	0.2	1.7	0.1	-1.3	0.06641
Cnn3	2.3	0.2	0.6	0.0	-3.6	0.00098
Hira	2.3	0.4	1.5	0.1	-1.5	0.07627
Cux1	2.3	0.2	1.7	0.1	-1.3	0.01671

Elk3	2.3	0.2	1.1	0.1	-2.0	0.00121
Scamp5	2.3	0.4	1.0	0.1	-2.3	0.01457
Kctd5	2.3	0.4	1.3	0.1	-1.7	0.04632
Chmp4c	2.3	0.3	1.8	0.1	-1.3	0.14702
Tcerg1	2.3	0.2	1.6	0.1	-1.5	0.03321
Tex2	2.3	0.3	1.7	0.1	-1.3	0.18450
Carhsp1	2.3	0.4	0.6	0.1	-3.6	0.00832
Baz2a	2.3	0.2	1.5	0.1	-1.6	0.00867
Khnyn	2.3	0.2	1.3	0.1	-1.7	0.01155
N4bp1	2.3	0.3	1.6	0.1	-1.4	0.08872
Stx7	2.3	0.3	1.5	0.1	-1.5	0.05173
Aco1	2.3	0.4	1.4	0.3	-1.6	0.10015
Slc35c1	2.3	0.2	1.1	0.1	-2.1	0.00432
Mll2	2.3	0.3	1.7	0.2	-1.3	0.10082
Syk	2.3	0.4	1.2	0.1	-1.9	0.04598
Ednrb	2.3	0.3	1.3	0.1	-1.7	0.03293
Gatad2a	2.3	0.3	1.1	0.1	-2.1	0.00663
Crtc1	2.3	0.4	1.2	0.1	-1.8	0.04838
Papss1	2.3	0.4	1.0	0.1	-2.3	0.01389
Plxdc1	2.3	0.3	1.0	0.1	-2.2	0.00634
Arrdc4	2.2	0.2	1.3	0.1	-1.7	0.00652
Psmc6	2.2	0.3	1.7	0.2	-1.3	0.13363
Spred2	2.2	0.2	1.4	0.1	-1.6	0.01220
Crispld2	2.2	0.3	0.7	0.1	-3.1	0.00645
Asb12	2.2	0.3	1.8	0.1	-1.3	0.16912
Eif4b	2.2	0.3	1.3	0.1	-1.7	0.01329
Gbp9	2.2	0.5	0.6	0.1	-3.7	0.02002
Vat1	2.2	0.4	0.5	0.2	-4.9	0.00643
Sec23ip	2.2	0.1	1.6	0.1	-1.4	0.00110
Rab21	2.2	0.2	1.7	0.1	-1.3	0.02860
Hmg20a	2.2	0.3	1.7	0.1	-1.3	0.13592
Sfrs1	2.2	0.2	1.5	0.1	-1.5	0.01963
Mmp2	2.2	0.3	0.9	0.1	-2.5	0.00453
Phf20l1	2.2	0.2	0.9	0.3	-2.4	0.00680
Bpnt1	2.2	0.3	1.5	0.1	-1.5	0.07391
Il4ra	2.2	0.5	0.5	0.1	-4.2	0.02727
Dhx15	2.2	0.1	1.4	0.1	-1.5	0.00002
Pygl	2.2	0.4	1.5	0.1	-1.5	0.12816
App	2.2	0.3	1.0	0.1	-2.2	0.00463
Tmem173	2.2	0.7	0.8	0.1	-2.9	0.10377
Hspa4	2.2	0.2	1.5	0.1	-1.5	0.01331

Nup93	2.2	0.3	1.3	0.1	-1.8	0.01905
Crk	2.2	0.2	1.0	0.0	-2.3	0.00341
Pon2	2.2	0.5	1.2	0.1	-1.9	0.10014
Myom1	2.2	0.2	1.8	0.1	-1.3	0.05475
Myot	2.2	0.6	1.3	0.1	-1.7	0.17929
Pdcd6ip	2.2	0.2	1.2	0.1	-1.8	0.00318
Sec62	2.2	0.2	1.5	0.1	-1.5	0.00766
Arhgef3	2.2	0.2	1.3	0.0	-1.7	0.01296
Phlpp1	2.2	0.3	1.6	0.1	-1.4	0.08525
H2-T24	2.2	0.4	1.3	0.2	-1.7	0.07470
Krt222	2.2	0.4	1.7	0.2	-1.3	0.32175
Aplp2	2.2	0.2	1.5	0.1	-1.4	0.02653
C1qtnf1	2.2	0.5	1.1	0.1	-2.1	0.06087
Cerk	2.2	0.2	1.6	0.1	-1.3	0.02851
Ep300	2.2	0.3	1.4	0.1	-1.5	0.03413
Litaf	2.2	0.5	0.7	0.1	-3.3	0.03477
Ipo7	2.2	0.2	1.3	0.1	-1.7	0.00943
Ranbp9	2.2	0.2	1.7	0.2	-1.3	0.12084
Tbl2	2.2	0.2	1.2	0.1	-1.8	0.00638
Zcchc14	2.2	0.3	1.3	0.1	-1.7	0.01527
Mcart1	2.2	0.2	1.7	0.1	-1.3	0.05599
Siah1a	2.2	0.2	1.6	0.1	-1.3	0.02405
Prpf18	2.2	0.1	1.7	0.2	-1.3	0.02204
Tspan14	2.2	0.2	0.9	0.1	-2.4	0.00127
Polr2a	2.2	0.2	1.4	0.1	-1.6	0.01254
Ppp1r3c	2.2	0.4	1.7	0.1	-1.3	0.22253
Ipo5	2.2	0.2	1.4	0.1	-1.6	0.00764
Xpot	2.2	0.2	1.6	0.1	-1.4	0.01512
Etf1	2.2	0.3	1.6	0.1	-1.3	0.10264
Sbf2	2.2	0.3	1.4	0.1	-1.5	0.05976
Plat	2.2	0.3	0.8	0.1	-2.7	0.00452
Smurf1	2.2	0.3	1.3	0.1	-1.7	0.05342
Odc1	2.2	0.3	1.1	0.1	-2.1	0.01612
Nudt18	2.2	0.2	0.6	0.0	-3.5	0.00050
Rad17	2.2	0.3	1.6	0.1	-1.4	0.09574
Hs3st1	2.2	0.3	1.3	0.3	-1.7	0.06168
Atp6v1h	2.2	0.2	1.1	0.1	-2.0	0.00439
Rbm22	2.2	0.4	1.6	0.2	-1.3	0.21593
Zfyve26	2.2	0.3	1.5	0.1	-1.5	0.04175
Rab10	2.2	0.2	1.5	0.1	-1.5	0.02185
Ryk	2.2	0.4	1.3	0.1	-1.7	0.05729

Id2	2.2	0.4	1.2	0.1	-1.8	0.04679
Ythdf1	2.2	0.2	1.5	0.1	-1.4	0.04599
Slc25a17	2.2	0.4	1.3	0.1	-1.6	0.06942
Otud3	2.2	0.4	1.2	0.1	-1.8	0.06587
Bod1l	2.2	0.2	1.6	0.1	-1.3	0.07103
Atmin	2.2	0.3	1.6	0.1	-1.4	0.09376
C5ar1	2.2	0.3	0.7	0.1	-2.9	0.00555
Rnf13	2.2	0.1	1.6	0.1	-1.3	0.01515
Vps26b	2.2	0.3	1.4	0.0	-1.5	0.04715
Fads2	2.2	0.3	0.6	0.1	-3.4	0.00247
Dr1	2.2	0.3	1.1	0.1	-1.9	0.01292
Iars	2.2	0.2	1.7	0.1	-1.3	0.03054
Atf1	2.2	0.2	1.5	0.1	-1.4	0.02549
Mphosph10	2.2	0.1	0.9	0.1	-2.4	0.00008
Nup54	2.2	0.4	1.6	0.2	-1.3	0.31077
Mtmr9	2.2	0.3	1.3	0.1	-1.7	0.02336
Tep1	2.1	0.3	1.0	0.1	-2.1	0.01029
Sf3b3	2.1	0.2	1.3	0.0	-1.7	0.00398
Tapt1	2.1	0.2	1.5	0.1	-1.5	0.01373
Dpp8	2.1	0.2	1.6	0.1	-1.3	0.06565
Lyve1	2.1	0.4	1.6	0.2	-1.4	0.19271
Sdpr	2.1	0.3	1.4	0.1	-1.5	0.03484
Arhgef5	2.1	0.2	1.0	0.1	-2.1	0.00202
Pnrc2	2.1	0.2	1.4	0.1	-1.5	0.03384
Osbpl11	2.1	0.2	1.7	0.1	-1.3	0.10548
Srp54a	2.1	0.2	1.7	0.1	-1.3	0.05953
Efhd2	2.1	0.4	0.6	0.1	-3.7	0.01657
Tmx1	2.1	0.1	1.4	0.1	-1.5	0.00269
Pmp22	2.1	0.3	0.8	0.1	-2.9	0.00518
Pvr	2.1	0.4	1.1	0.1	-1.9	0.04476
Tmem55a	2.1	0.4	1.5	0.1	-1.4	0.16654
Nol9	2.1	0.2	1.1	0.1	-1.9	0.00633
Fbxl18	2.1	0.3	1.2	0.1	-1.8	0.02774
mt-Nd1	2.1	0.1	2.7	0.1	1.3	0.00879
Arf6	2.1	0.2	0.9	0.1	-2.4	0.00206
Glb1	2.1	0.3	1.0	0.1	-2.2	0.01124
Vhl	2.1	0.3	1.4	0.3	-1.5	0.12481
Utp6	2.1	0.3	1.4	0.1	-1.5	0.07882
Pramef8	2.1	0.4	1.6	0.2	-1.4	0.28820
Fscn1	2.1	0.3	0.3	0.0	-7.0	0.00111
Abce1	2.1	0.2	1.4	0.1	-1.5	0.00898

Nr2f2	2.1	0.4	1.3	0.2	-1.7	0.11150
Mtdh	2.1	0.2	1.4	0.1	-1.5	0.00555
Freq	2.1	0.4	1.0	0.1	-2.1	0.04472
Pim1	2.1	0.2	1.4	0.1	-1.5	0.03005
Mlec	2.1	0.2	1.3	0.1	-1.6	0.01831
Map4k4	2.1	0.3	1.1	0.1	-1.9	0.01528
Adap2	2.1	0.2	1.4	0.1	-1.5	0.02236
Zfp282	2.1	0.2	1.1	0.1	-1.9	0.00233
Plxnd1	2.1	0.3	0.6	0.1	-3.4	0.00436
Hnrnpul2	2.1	0.2	1.4	0.1	-1.5	0.02673
H6pd	2.1	0.3	1.6	0.1	-1.3	0.18197
Gspt1	2.1	0.1	1.3	0.1	-1.6	0.00149
Srsf15	2.1	0.2	1.2	0.1	-1.8	0.00349
Ppargc1a	2.1	0.1	4.6	0.8	2.2	0.03196
Arhgef18	2.1	0.3	1.5	0.1	-1.4	0.08683
Rnf11	2.1	0.3	1.5	0.1	-1.4	0.09152
Pkia	2.1	0.2	1.6	0.0	-1.3	0.04821
Dcn	2.1	0.2	1.3	0.1	-1.6	0.00845
Aggf1	2.1	0.2	1.4	0.1	-1.5	0.02683
Gpc4	2.1	0.1	1.5	0.3	-1.4	0.13025
Nktr	2.1	0.2	1.4	0.1	-1.5	0.00958
Kdm5c	2.1	0.3	1.4	0.1	-1.6	0.05831
Tceb3	2.1	0.2	1.5	0.1	-1.4	0.03749
Il13ra1	2.1	0.2	1.0	0.1	-2.0	0.00354
Adpgk	2.1	0.3	1.0	0.1	-2.1	0.01256
Tmem39a	2.1	0.3	0.9	0.1	-2.4	0.00831
Tram1	2.1	0.1	1.0	0.1	-2.0	0.00010
Tbk1	2.1	0.3	1.4	0.2	-1.5	0.08237
Klf13	2.1	0.3	1.1	0.1	-1.9	0.03374
Prpf4	2.1	0.2	1.6	0.2	-1.3	0.07062
Ivns1abp	2.1	0.2	1.4	0.1	-1.5	0.00626
Cd248	2.1	0.4	0.5	0.1	-3.9	0.00943
Anxa1	2.1	0.5	0.6	0.1	-3.7	0.02596
Wwtr1	2.1	0.2	1.1	0.1	-1.8	0.00245
Ganab	2.1	0.1	1.4	0.1	-1.5	0.00269
Per1	2.1	0.3	1.4	0.4	-1.5	0.19649
Cisd2	2.1	0.1	1.7	0.1	-1.3	0.02873
Arih1	2.1	0.2	1.3	0.1	-1.6	0.00551
Rab5c	2.1	0.2	0.6	0.2	-3.3	0.00118
Cmas	2.1	0.3	1.5	0.2	-1.4	0.09535
Sec24c	2.1	0.2	1.4	0.1	-1.5	0.02255

Ier3	2.1	0.3	0.7	0.1	-2.9	0.00379
Islr	2.1	0.4	0.6	0.1	-3.3	0.01343
Ip6k1	2.1	0.2	1.6	0.1	-1.3	0.09569
Pdp2	2.1	0.2	4.4	1.0	2.1	0.06302
Kcnd2	2.1	0.2	2.9	0.3	1.4	0.06014
Plscr1	2.1	0.4	0.9	0.1	-2.3	0.01958
Prepl	2.1	0.1	1.6	0.1	-1.3	0.04155
Polr3b	2.1	0.3	1.3	0.1	-1.5	0.08648
Anp32e	2.1	0.1	1.3	0.1	-1.6	0.00189
Nptn	2.1	0.2	1.1	0.1	-1.9	0.00557
Arfgap3	2.1	0.3	0.9	0.1	-2.2	0.01100
Irgm1	2.1	0.5	0.8	0.1	-2.6	0.05734
Fuca2	2.1	0.3	0.9	0.1	-2.2	0.00683
Fasn	2.1	0.4	1.4	0.3	-1.5	0.14190
Creb3l1	2.1	0.4	0.7	0.1	-3.1	0.01964
Hnrnph2	2.1	0.2	1.2	0.1	-1.7	0.01334
Zwint	2.1	0.4	1.4	0.1	-1.4	0.18517
Arcn1	2.1	0.2	1.5	0.1	-1.4	0.04010
Id1	2.1	0.2	1.2	0.1	-1.8	0.00230
Igf2r	2.1	0.3	1.3	0.1	-1.6	0.06958
Dusp11	2.1	0.3	1.4	0.1	-1.4	0.05992
Gtf2b	2.1	0.2	1.4	0.2	-1.5	0.03952
Metap1	2.1	0.2	1.4	0.1	-1.5	0.04052
Lpin1	2.1	0.2	2.7	0.2	1.3	0.08019
Wls	2.1	0.2	1.1	0.1	-1.8	0.00934
Fbxo38	2.1	0.2	1.4	0.1	-1.4	0.03779
Ube3c	2.1	0.2	1.6	0.1	-1.3	0.05714
St3gal1	2.0	0.3	1.4	0.1	-1.5	0.09115
Canx	2.0	0.2	1.6	0.1	-1.3	0.09766
Tusc3	2.0	0.2	1.3	0.1	-1.6	0.00942
Polr3k	2.0	0.8	1.1	0.4	-1.8	0.32709
Pdgfrb	2.0	0.2	1.0	0.1	-2.1	0.00066
Nck1	2.0	0.2	1.4	0.1	-1.5	0.04051
Slc35a4	2.0	0.3	1.4	0.1	-1.5	0.05856
Pcyox1	2.0	0.3	1.1	0.1	-1.9	0.03616
Sri	2.0	0.2	0.9	0.1	-2.3	0.00166
Pank1	2.0	0.1	2.7	0.3	1.3	0.10214
G3bp2	2.0	0.3	1.4	0.1	-1.5	0.06954
Sec22b	2.0	0.3	1.3	0.1	-1.5	0.09586
Ptbp1	2.0	0.2	0.9	0.1	-2.2	0.00315
Ergic1	2.0	0.3	1.1	0.1	-1.8	0.01767

Dusp18	2.0	0.3	3.6	0.4	1.8	0.02070
Adrbk1	2.0	0.2	1.3	0.1	-1.5	0.02247
Zfp366	2.0	0.2	0.8	0.1	-2.5	0.00235
Ift52	2.0	0.2	1.1	0.2	-1.8	0.01404
Fbxl14	2.0	0.2	1.1	0.1	-1.8	0.01042
Emp2	2.0	0.3	1.4	0.1	-1.5	0.06969
Tspyl1	2.0	0.2	1.6	0.1	-1.3	0.04673
Nlrp10	2.0	0.2	1.5	0.1	-1.3	0.03437
Prps1	2.0	0.2	1.3	0.2	-1.6	0.02448
Etv3	2.0	0.2	1.4	0.0	-1.5	0.01173
Pomt2	2.0	0.2	1.2	0.1	-1.6	0.01118
Dusp22	2.0	0.3	1.5	0.2	-1.4	0.15958
Ccdc141	2.0	0.3	2.6	0.2	1.3	0.17114
Khsrp	2.0	0.2	1.2	0.1	-1.7	0.00537
Lmnb2	2.0	0.4	0.7	0.0	-2.9	0.01653
Lgals9	2.0	0.3	0.4	0.1	-5.0	0.00173
Lmod2	2.0	0.2	1.3	0.1	-1.6	0.00840
Ckap4	2.0	0.4	0.6	0.1	-3.4	0.02382
Snx2	2.0	0.2	1.4	0.1	-1.5	0.02053
Swap70	2.0	0.2	1.0	0.1	-1.9	0.00501
Cyb561d1	2.0	0.3	1.4	0.2	-1.4	0.09439
S1pr3	2.0	0.2	1.0	0.1	-2.0	0.00356
Psen1	2.0	0.2	1.3	0.0	-1.6	0.00466
Xrcc2	2.0	0.3	1.4	0.3	-1.5	0.15852
BX547995.1	2.0	0.7	1.2	0.3	-1.7	0.28928
Igsf3	2.0	0.2	1.6	0.1	-1.3	0.11642
Hk2	2.0	0.2	1.5	0.1	-1.3	0.09738
Gltp	2.0	0.3	0.7	0.1	-2.8	0.00612
Serinc3	2.0	0.1	1.4	0.1	-1.5	0.00457
Heatr6	2.0	0.3	1.4	0.2	-1.4	0.16624
Ctps	2.0	0.3	1.0	0.1	-2.1	0.01214
Glud1	2.0	0.2	1.4	0.1	-1.4	0.05982
Sema7a	2.0	0.2	0.9	0.1	-2.3	0.00194
Pdzd2	2.0	0.3	2.5	0.2	1.3	0.13879
Slc2a1	2.0	0.4	0.8	0.1	-2.6	0.02772
Prdm4	2.0	0.2	1.3	0.1	-1.6	0.01904
Ino80	2.0	0.2	1.3	0.1	-1.5	0.00598
Trf	2.0	0.3	0.8	0.1	-2.6	0.00825
Ccny	2.0	0.1	1.3	0.1	-1.5	0.00406
Cnksr3	2.0	0.1	1.4	0.2	-1.5	0.02907
Pbx2	2.0	0.2	1.3	0.1	-1.6	0.00638

Gosr1	2.0	0.2	1.5	0.2	-1.3	0.14068
Pfas	2.0	0.2	1.3	0.1	-1.5	0.02081
Dctn4	2.0	0.2	1.5	0.1	-1.3	0.06061
Samd4b	2.0	0.3	1.1	0.0	-1.9	0.01407
Cd164	2.0	0.1	1.6	0.1	-1.3	0.02806
Zfp746	2.0	0.2	1.1	0.1	-1.7	0.01588
Tfdp2	2.0	0.4	3.6	0.4	1.8	0.02712
Zxdc	2.0	0.2	1.5	0.2	-1.3	0.05170
Nckap5l	2.0	0.4	0.6	0.1	-3.5	0.00987
Rhbdf2	2.0	0.3	0.7	0.1	-2.8	0.00849
Sdccag1	2.0	0.2	1.5	0.1	-1.3	0.05623
Zfyve20	2.0	0.3	1.4	0.2	-1.4	0.15608
Ranbp10	2.0	0.2	1.2	0.1	-1.7	0.01226
Slc44a2	2.0	0.2	1.3	0.1	-1.5	0.01171
Cstf3	2.0	0.2	1.1	0.2	-1.7	0.01222
Taf2	2.0	0.2	1.3	0.1	-1.6	0.03110
Ubqln2	2.0	0.2	1.3	0.1	-1.5	0.03807
Zfp180	2.0	0.2	1.6	0.1	-1.3	0.08665
Sh3pxd2a	2.0	0.5	1.1	0.1	-1.7	0.15129
Upf2	2.0	0.3	1.3	0.2	-1.5	0.09601
Rars	2.0	0.2	1.1	0.1	-1.8	0.00418
Nrbf2	2.0	0.5	1.1	0.2	-1.8	0.12504
Sdc4	2.0	0.5	1.1	0.1	-1.8	0.12451
Gbf1	2.0	0.2	1.4	0.0	-1.4	0.02788
Galm	2.0	0.2	2.8	0.3	1.4	0.07602
Nars	2.0	0.3	1.1	0.1	-1.7	0.02419
Erbb2	2.0	0.3	1.0	0.1	-1.9	0.01268
Taf5l	2.0	0.3	1.2	0.1	-1.6	0.08637
Pmepa1	2.0	0.3	0.9	0.1	-2.1	0.02162
Gusb	2.0	0.3	0.5	0.1	-4.1	0.00540
Fads1	2.0	0.3	0.7	0.1	-2.7	0.00352
Exoc8	2.0	0.2	1.1	0.1	-1.8	0.01293
Lgmn	2.0	0.3	0.7	0.1	-2.8	0.01251
Glyr1	2.0	0.2	1.2	0.1	-1.6	0.01119
Dnajc18	2.0	0.2	1.3	0.1	-1.5	0.01848
Ptrf	2.0	0.3	0.9	0.1	-2.2	0.00926
Syde1	2.0	0.1	1.3	0.1	-1.5	0.00497
Spsb4	2.0	0.4	0.6	0.2	-3.4	0.01641
Tmem128	2.0	0.2	1.4	0.1	-1.4	0.03446
Dstn	2.0	0.2	1.1	0.1	-1.9	0.00247
Slc46a3	2.0	0.6	1.4	0.3	-1.4	0.41209

Nploc4	2.0	0.2	1.2	0.1	-1.6	0.02162
Map3k3	2.0	0.2	1.1	0.1	-1.8	0.00911

Supplemental Table S4. Biological functions of RISC-associated vs RISC-independent cardiac mRNAs

Protein class	Actual	n	R	N	Expected	Ratio	p-value	z-score	% in data set	% in protein function	% protein function in database
RISC-associated mRNAs											
Enzymes	161	1306	2623	20322	168.6	0.9551	2.752E-01	-0.6457	12.33%	6.14%	12.91%
Kinases	79	1306	624	20322	40.1	1.97	5.327E-09	6.45	6.05%	12.66%	3.07%
Ligands	27	1306	467	20322	30.01	0.8996	3.232E-01	-0.575	2.07%	5.78%	2.30%
Phosphatases	35	1306	221	20322	14.2	2.464	6.726E-07	5.736	2.68%	15.84%	1.09%
Proteases	44	1306	545	20322	35.02	1.256	7.021E-02	1.589	3.37%	8.07%	2.68%
Receptors	86	1306	1426	20322	91.64	0.9384	2.855E-01	-0.6319	6.58%	6.03%	7.02%
Transcription factors	93	1306	890	20322	57.2	1.626	2.211E-06	5.005	7.12%	10.45%	4.38%
Other	794	1306	13577	20322	872.5	0.91	1.406E-06	-4.77	60.80%	5.85%	66.81%
RISC-independent mRNAs											
Enzymes	405	2090	2623	20322	269.8	1.501	6.300E-19	9.315	19.38%	15.44%	12.91%
Kinases	86	2090	624	20322	64.17	1.34	2.968E-03	2.921	4.11%	13.78%	3.07%
Ligands	48	2090	467	20322	48.03	0.9994	5.367E-01	-0.004353	2.30%	10.28%	2.30%
Phosphatases	34	2090	221	20322	22.73	1.496	1.112E-02	2.51	1.63%	15.38%	1.09%
Transcription factors	103	2090	890	20322	91.53	1.125	1.091E-01	1.294	4.93%	11.57%	4.38%
Proteases	51	2090	545	20322	56.05	0.9099	2.611E-01	-0.7219	2.44%	9.36%	2.68%
Receptors	113	2090	1426	20322	146.7	0.7705	1.002E-03	-3.043	5.41%	7.92%	7.02%
Other	1252	2090	13577	20322	1396	0.8966	1.687E-12	-7.077	59.90%	9.22%	66.81%

RISC-associated and RISC-independent mRNAs were analyzed using an 'Enrichment by protein function' analysis in MetaCore (http://www.genego.com).

Table columns have the following meaning:	
Protein class	a broadly defined protein function

Actual	number of genes in the gene list for a given protein class
n	number of genes in the gene list
R	number of genes for a given protein class in the complete MetaCore database
N	total number of genes in the complete MetaCore datgabase
Expected	mean value for hypergeometric distribution (n*R/N)
Ratio	connectivity ratio (Actual/Expected)
z-score	z-score ((Actual-Expected)/sqrt(variance))
p-value	probability to have the given value of Actual or higher (or lower for negative z-score)
In data set	% of genes with a selected function in the gene list
In protein function	% of genes with a selected function in the gene list among genes with this function in the complete MetaCore database
Protein function in database	% of genes with a selected function in the complete MetaCore database

Supplemental Table S5. GO categorization by biological function	
Gene Ontology ID	**Description**
cardiac contraction/calcium signaling	
0005509	calcium ion binding
0055074	calcium ion homeostasis
0043292	contractile fiber
0048634	regulation of muscle organ development
0001944	vasculature development
0001725	stress fiber
0001568	blood vessel development
0048738	cardiac muscle tissue development
cell cycle	
0051726	regulation of cell cycle
0007049	cell cycle
cell motion	
0016477	cell migration
0007018	microtubule-based movement
0006928	cellular component movement
cell adhesion	
0007155	cell adhesion
0031012	extracellular matrix
0022610	biological adhesion
0030155	regulation of cell adhesion
cytoskeleton	
0005856	cytoskeleton
0007010	cytoskeleton organization
0005583	fibrillar collagen
differentiation/proliferation	
0050678	regulation of epithelial cell proliferation
0048634	regulation of muscle organ development
0060429	epithelium development
0001501	skeletal system development
0008284	positive regulation of cell proliferation
0007517	muscle organ development
0008283	cell proliferation
0045444	fat cell differentiation
homeostasis	
0055074	calcium ion homeostasis
0043167	ion binding
0046872	metal ion binding
lysosome/proteolysis	

0006508	proteolysis
0005764	lysosome
metabolism	
0006732	coenzyme metabolic process
0006631	fatty acid metabolic process
0006006	glucose metabolic process
0006796	phosphate-containing compound metabolic process
0009891	positive regulation of biosynthetic process
0006091	generation of precursor metabolites and energy
0051174	regulation of phosphorus metabolic process
0055114	oxidation-reduction process
0006754	ATP biosynthetic process
0044271	cellular nitrogen compound biosynthetic process
programmed cell death	
0043067	regulation of programmed cell death
0012501	programmed cell death
0008219	cell death
0042981	regulation of apoptotic process
0043066	negative regulation of apoptotic process
transcription	
0006355	regulation of transcription, DNA-dependent
vesicle/cell projection	
0042995	cell projection
0043228	non-membrane-bounded organelle
0046907	intracellular transport
0043232	intracellular non-membrane-bounded organelle
0030030	cell projection organization
0031982	vesicle
0006897	endocytosis
0046907	intracellular transport
0016192	vesicle-mediated transport

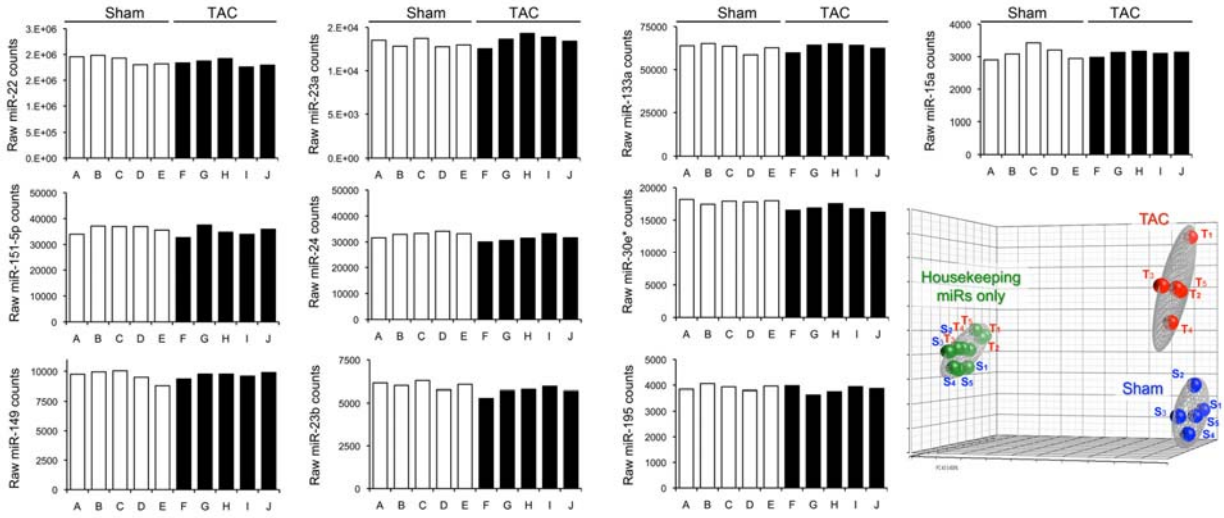
Supplemental Table S5. *Gene Ontology category groups used for characterization of cardiac function.* Gene Ontology IDs and descriptions, grouped by categories used in Figure 4, Supplemental Figure 4 and Supplemental Figure 5.

Supplemental Materials and Methods

Mouse heart modeling. Mouse hearts were hemodynamically stressed by surgical coarctation of the transverse aorta, inducing reactive left ventricular hypertrophy that develops over a five-week period (1, 2). The current studies were designed to measure changes in cardiac gene expression that drive this universal hypertrophic response. Accordingly, we studied hearts at a time (1 week after surgical modeling) when ongoing hypertrophy is active and the mice have recovered from the stress of surgery (3, 4).

microRNA sequencing. Deep sequencing is currently the most accurate technique for quantifying (large or small) RNAs. We and many others have directly compared deep RNA sequencing to microarrays (5-23). In almost all instances RNA-sequencing was found to be superior to microarrays. In the other few instances the two techniques were judged to be equivalent.

Comparing microRNA levels in different experimental conditions or disease states requires normalization of microRNA abundance to an unregulated internal factor (24). 5S rRNA is commonly used for this purpose (25), but is not included in microRNA sequencing libraries. Also 5S rRNA levels can potentially vary with demands for increased protein production (26). Thus, we identified a set of ten cardiac microRNAs whose abundance was consistent between individual hearts and not changed by pressure overload (**Methods Figures 1a and 1b**), and normalized each of the microRNA sequence studies to these internal references.



Methods Figure 1. *Expression characteristics of non-regulated reference cardiac microRNAs.* **A.** Comparative expression levels (sequence reads/10,000,000 reads) for ten reference cardiac microRNAs in sham-operated (white bars, hearts A-E) and pressure-overloaded (TAC; black bars, hearts F-J) mouse hearts. **B.** Principal components analysis of microRNA expression profiles in TAC (red) and sham (blue) hearts, compared to expression of reference microRNAs only (green).

We categorized cardiac microRNAs as highly expressed (n=144 with >400 reads per sample) or moderately expressed (n=266 with 5-399 reads per sample) and defined significant regulation for each group as an increase or decrease by >25% in pressure overloaded hearts, false discovery rate (FDR) of 0.02.

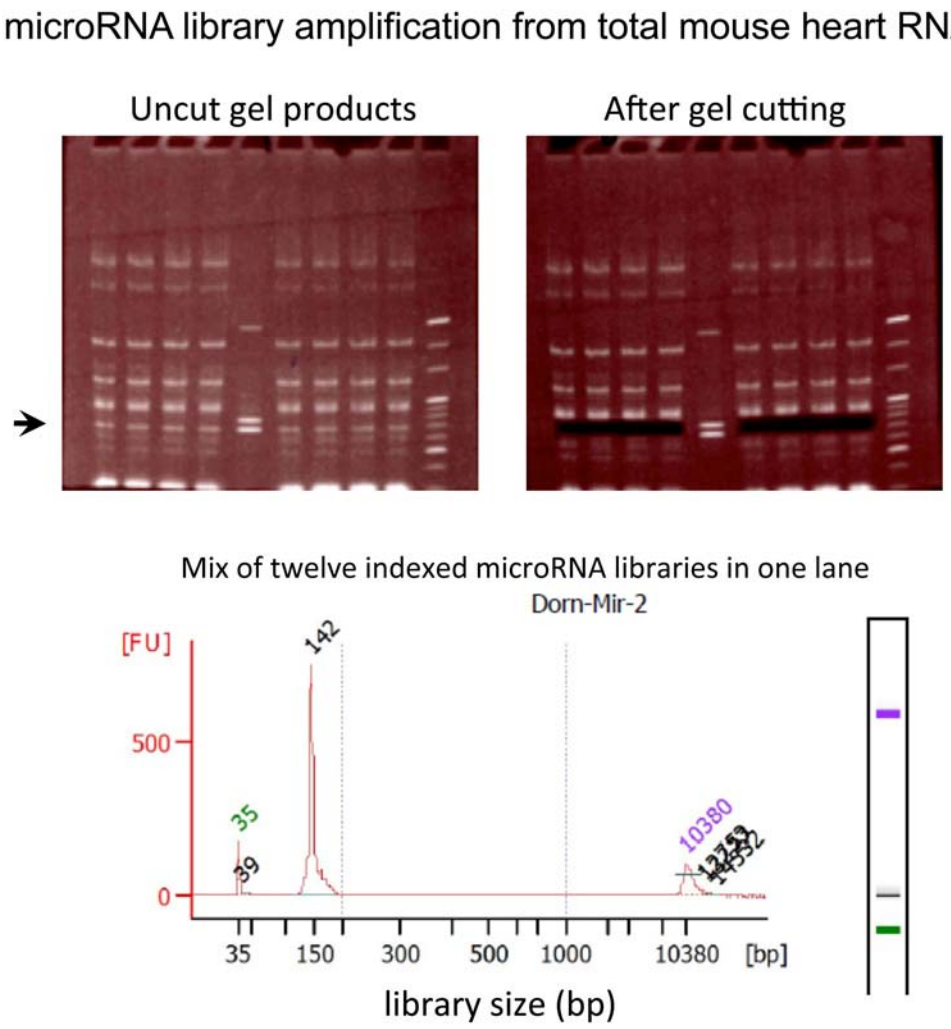
MicroRNAs can be packaged and secreted in exosomes as a form of epigenetic communication between cells or tissues (27). We considered that microRNA isolation and deep sequencing from total cardiac RNA might not distinguish between a bioactive population of microRNAs incorporated into the RISC apparatus, and those that might be sequestered for cellular export. To better define those microRNAs that regulate mRNA expression we isolated myocardial RISC complexes by immunoprecipitation of Argonaute 2 (28), extracted the associated microRNAs, and profiled them by deep sequencing. Comparative analysis of the total and RISC-associated miR fractions is presented in **Supplemental Figure S4**.

RNA Sequencing. mRNA sequencing was performed essentially as described (23, 28), except we used Illumina HiSeq 2000 sequencers and library indexing rather than bar-coding. The total number of indexed mRNA sequence reads from the 12 cardiac transcriptome libraries was 188 million, of which 156 million (83.1%) aligned to NCBI release 37 of the mouse genome. The alignment percentage of RNA extracted from Argonaute 2 immunoprecipitates (the RISCome) was 64.3% (146 million aligned reads among 227 million raw reads). Sham-operated and pressure overloaded mouse heart mRNA-sequences aligned to 26,120 different annotated RNA elements (including noncoding RNA and microRNA precursors) in the NCBI mouse genome (Release 37). Of these, 19,331 (74%) were coding mRNAs; the remaining sequences corresponded to ribosomal and transfer RNAs. Using prior criteria that a meaningfully expressed transcript should be present at a level equivalent to at least 1 mRNA copy/cell (3 FPKM; fragment [reads] per kilobase of exon per million mapped reads) (23, 29), we identified 8,384 coding mRNAs (~43% of the mouse transcriptome) expressed in sham-operated hearts; aortic banding did not meaningfully change this number (8,676 coding mRNAs). Concordance of these cardiac transcriptomes with those from previous RNA-Seq studies was high (23, 28, 30-33).

Highly abundant cardiac mRNAs tend to encode contractile, structural, and mitochondrial proteins whereas transcriptional regulators are expressed at comparatively low levels (23, 34). We identified 787 highly abundant cardiac mRNAs (>100 FPKM; >33 copies/cell), 1,758 moderately abundant cardiac mRNAs (30-99 FPKM;10-32 copies/cell) and 5,820 low abundance cardiac mRNAs (3-29 FPKM; 1-10 copies/cell).

For microRNA deep sequencing (miR-Seq), libraries were prepared with TruSeq Small RNA Sample Prep Kits (Illumina) following the manufacturer's protocols. Briefly, small RNAs from 1 μg total mouse heart RNA were sequentially ligated with 3′ and 5′ adapters, followed by reverse transcription to produce single stranded cDNAs, which were then amplified by PCR with RNA PCR primer and indexing primer. The amplified libraries were size-selected/gel-purified and quantified (**Methods Figure 2**). Twelve libraries were pooled in equimolar (10 nmol/L) amounts and diluted to 14 pmol/L for cluster formation on a single flow cell lane, followed by single-end sequencing on an Illumina HiSeq 2000 sequencer. The analysis of microRNA deep sequencing

was performed by following the E-miR pipeline as described (35) with minor modifications to allow the Bowtie aligner to correctly map those miRs that arise from multiple genomic loci. The total number of reads from 12 miR-Seq libraries was 162 million; 123 million (75.7%) of all reads aligned to microRNAs.



Methods Figure 2. *Preparation of microRNA sequencing libraries from mouse hearts.* Top panels show agarose gel size-separated small RNA library after amplification. Arrow indicates proper size for microRNAs. Left is before gel cutting, right is after gel cutting. Bottom panel shows library size pherogram of DNA extracted from cut gel, illustrating enrichment in ~142 bp microRNA sequencing products.

Ten reference microRNAs used for cross-study normalization were identified using methods adapted from standard RT-qPCR normalization (24, 36). Reference microRNAs were selected over a range of absolute abundance, each with expression that showed no significant differences among the samples regardless of experimental condition, i.e. geometric coefficient of variation (geometric SD/mean) was <0.05 in TAC and sham operated hearts. Individual microRNA reads

in each microRNA library were adjusted to the sum of reads of the ten reference microRNAs in that library. These sequencing data, corrected for individual library sequencing depth and adjusted for the reference microRNAs, are reported as "reads".

Cardiac mRNAs and microRNAs regulated in response to pressure overloading were defined using a threshold of 25% (increased or decreased) and a FDR of 0.02 for each abundance category.

Modeling of miR-Seq and RNA-Seq data variance at different sample sizes. We determined the optimal number of biological replicates needed to determine differential expression of a single mRNA or microRNA from genome-wide expression data (37) by modeling shot noise and biological variance of n=3, 5, 7, and 9 biological replicates using the DESeq package (38) to calculate the degree of variance for each individual miR or mRNA from our own mouse heart RNA-Seq and microRNA-Seq data in closely matched control and aortic banded hearts, using sequencing libraries prepared concurrently and run simultaneously on Illumina HiSeq machines. Based on these data, the current study was performed on N=5 biological replicates per treatment group.

microRNA RT-qPCR. Total RNA was extracted from sham and TAC operated hearts using TRIzol. For the data shown in **Supplemental Figure S2**, RT-PCR used NCode miRNA First-Strand cDNA Synthesis and qRT-PCR kits (Invitrogen). Briefly, microRNAs were polyadenylated and reverse transcribed with a universal primer. First strand cDNAs were amplified using an Invitrogen-supplied universal qPCR reverse primer with a forward primer designed to target the specific microRNA sequence of interest. Relative expression was evaluated by the delta Ct (cycle threshold) method, normalizing to 5S rRNA. The primer specific to miR-16 was 5'-TAGCAGCACGTAAATATTGGCG-3'; to miR-22 was 5'-AAGCTGCCAGTTGAAGAACTGT-3'; to miR-26a was 5'-TTCAAGTAATCCAGGATAGGCT-3'; to miR-1 was 5'-TGGAATGTAAAGAAGTATGTATAAAA-3'; and to 5S rRNA was 5'-AATACCGGGTGC TGTAGGCTTT-3'. Identities of PCR products were validated using Sanger sequencing.

For TR-qPCR confirmation of relative microRNA levels shown in **Figure 2d and Supplemental Figure 3b**, the NCode method was used to examine miR-1 and miR-27b (primer sequence 5'-TTCACAGTGGCTAAGTTCTGC-3'). All other miRs were examined using TaqMan MicroRNA Expression Assays (Applied Biosystems) on Trizol-extracted total RNA. Expression of each miR was determined by the delta Ct method, against the geometric mean of 12 unregulated reference miRs as described (36).

Proteomics. Sixty μg mouse ventricular homogenates of sham or TAC operated heart were labeled with Cy3 or Cy5 dyes (GE Healthcare), mixed and resolved in the first dimension on a pH gradient from 4 to 9, and the second dimension on 12% SDS-PAGE (Applied Biomics, Hayward, CA). Proteins were visualized using a Typhoon TRIO Laser Scanner and Image

QuanTL. In-gel analysis of differential protein expression used DeCyder software. Protein identification was by MALDI-TOF mass spectrometry and/or comparisons with a murine heart proteome atlas (39).

Gene functional analyses. Gene-ontology assignment was performed using BiNGO or DAVID Functional Annotation Bioinformatics Microarray analysis, as indicated. Categorical descriptors assigned to Gene Ontology ID numbers are in **Supplemental Table S5**. Statistically significant over-representation of GO categories was determined using hypergeometric testing and Benjamini-Hochberg false discovery rate adjustment in BiNGO (40). The online software suite MetaCore (http://www.genego.com) was used to compare actual to predicted RNA abundance in individual categories according to hypergeometric distribution.

Prediction of miR-mRNA interactions using TAC-regulated miRs and mRNAs. Whole-genome miR-mRNA prediction engines such as TargetScan necessarily sacrifice sensitivity in order to achieve a measure of specificity when predicting possible miR-mRNA interactions from all known miRs and mRNAs; tissue-specific expression patterns and expression levels are not taken into account. Previously, we described a search algorithm to determine miR-499 and mutant miR-499 binding sites in a set of cardiac mRNAs regulated by miR-499-programmed RISCs (41). We have expanded on this approach to develop a program in Perl (FastamiRs) that accesses the Smith-Waterman matching algorithm (42) in the Fasts package to determine all possible Watson-Crick hybridization events between a set of experimentally regulated miRs and a set of regulated mRNAs. These predictions are performed without any bias toward the 'seed' region of miRs, and thus FastamiRs represents a complementary approach to predictions which favor 'seed' sequence homology. The output of FastamiRs is configurable for the number of 'seed' nucleotides required, the number of contiguously bound nucleotides, the number of gaps in the alignment, and whether G:U nucleotide pairs are considered. FastamiRs is configurable for any miR sequence and for mRNA from any organism. For the analyses presented in this paper we set a requirement for binding of at least 5 out of 6 miR 'seed' nucleotides, at least one stretch of contiguous binding of 6 nucleotides, allowed for the possibility of G:U binding (43) and limited our search to the 3' UTR of mRNAs.

The software is available at http://epigenomics.wustl.edu/edwardsLab/index.php/downloads and requires the use of the Perl language (Unix/Linux, Mac OS X or a Windows unix emulator such as Cygwin), together with an existing installation of the Fasta package referred to above. As input, the user supplies a tab-delimited file of miR names and sequences, together with a fasta-format file containing the names and sequences of the mRNAs to be searched.

Supplemental Methods References

1. Sakata Y, Hoit BD, Liggett SB, Walsh RA, Dorn GW 2nd (1998) Decompensation of pressure-overload hypertrophy in G alpha q-overexpressing mice. *Circulation* 97:1488-1495.
2. Diwan A, et al. (2008) Nix-mediated apoptosis links myocardial fibrosis, cardiac remodeling, and hypertrophy decompensation. *Circulation* 117:396-404.
3. Park JY, et al. (2011) Comparative analysis of mRNA isoform expression in cardiac hypertrophy and development reveals multiple post-transcriptional regulatory modules. *PLos One* 6:e22391.
4. Tatsuguchi M, et al. (2007) Expression of microRNAs is dynamically regulated during cardiomyocyte hypertrophy. *J Mol Cell Cardiol* 42:1137-1141.
5. Marioni JC, Mason CE, Mane SM, Stephens M, Gilad Y (2008) RNA-seq: an assessment of technical reproducibility and comparison with gene expression arrays. *Genome Res* 18:1509-1517.
6. Asmann YW, et al. (2009) 3' tag digital gene expression profiling of human brain and universal reference RNA using Illumina Genome Analyzer. *BMC Genomics* 10:531.
7. Fu X, et al. (2009) Estimating accuracy of RNA-Seq and microarrays with proteomics. *BMC Genomics* 10:161.
8. Mane SP, et al. (2009) Transcriptome sequencing of the Microarray Quality Control (MAQC) RNA reference samples using next generation sequencing. *BMC Genomics* 10:264.
9. Feng L, et al. (2010) Power of deep sequencing and agilent microarray for gene expression profiling study. *Mol Biotechnol* 45:101-110.
10. Woodhouse SD, et al. (2010) Transcriptome sequencing, microarray, and proteomic analyses reveal cellular and metabolic impact of hepatitis C virus infection in vitro. *Hepatology* 52:443-453.
11. Brooks MJ, Rajasimha HK, Roger JE, Swaroop A (2011) Next-generation sequencing facilitates quantitative analysis of wild-type and Nrl(-/-) retinal transcriptomes. *Mol Vision* 17:3034-3054.
12. Chen H, et al. (2011) Genome-Wide Gene Expression Profiling of Nucleus Accumbens Neurons Projecting to Ventral Pallidum Using both Microarray and Transcriptome Sequencing. *Front Neurosci* 5:98.
13. Frank S, et al. (2011) Pseudomonas putida KT2440 genome update by cDNA sequencing and microarray transcriptomics. *Environ Microbiol* 13:1309-1326.
14. Lahiry P, et al. (2011) Transcriptional profiling of endocrine cerebro-osteodysplasia using microarray and next-generation sequencing. *PLos One* 6:e25400.
15. Liu P, et al. (2011) Transcriptome profiling and sequencing of differentiated human hematopoietic stem cells reveal lineage-specific expression and alternative splicing of genes. *Physiol Genomics* 43:1117-1134.
16. Llorens F, et al. (2011) Multiple platform assessment of the EGF dependent transcriptome by microarray and deep tag sequencing analysis. *BMC Genomics* 12:326.
17. Roy NC, Altermann E, Park ZA, McNabb WC (2011) A comparison of analog and Next-Generation transcriptomic tools for mammalian studies. *Briefings Funct Genomics* 10:135-150.

18. Thiagarajan RD, et al. (2011) Refining transcriptional programs in kidney development by integration of deep RNA-sequencing and array-based spatial profiling. *BMC Genomics* 12:441.
19. Wang Y, et al. (2011) Evaluation of the coverage and depth of transcriptome by RNA-Seq in chickens. *BMC Bioinf* 12 Suppl 10:S5.
20. Leimena MM, et al. (2012) Comparative analysis of Lactobacillus plantarum WCFS1 transcriptomes by using DNA microarray and next-generation sequencing technologies. *Appl Environ Microbiol* 78:4141-4148.
21. Ning K, Fermin D, Nesvizhskii AI (2012) Comparative analysis of different label-free mass spectrometry based protein abundance estimates and their correlation with RNA-Seq gene expression data. *J Proteome Res* 11:2261-2271.
22. Raghavachari N, et al. (2012) A systematic comparison and evaluation of high density exon arrays and RNA-seq technology used to unravel the peripheral blood transcriptome of sickle cell disease. *BMC Med Genomics* 5:28.
23. Matkovich SJ, Zhang Y, Van Booven DJ, Dorn GW 2nd (2010) Deep mRNA sequencing for in vivo functional analysis of cardiac transcriptional regulators: application to Galphaq. *Circ Res* 106:1459-1467.
24. Peltier HJ, Latham GJ (2008) Normalization of microRNA expression levels in quantitative RT-PCR assays: identification of suitable reference RNA targets in normal and cancerous human solid tissues. *RNA* 14:844-852.
25. Takamizawa J, et al. (2004) Reduced expression of the let-7 microRNAs in human lung cancers in association with shortened postoperative survival. *Cancer Res* 64:3753-3756.
26. Mayer C, Grummt I (2006) Ribosome biogenesis and cell growth: mTOR coordinates transcription by all three classes of nuclear RNA polymerases. *Oncogene* 25:6384-6391.
27. Valadi H, et al. (2007) Exosome-mediated transfer of mRNAs and microRNAs is a novel mechanism of genetic exchange between cells. *Nat Cell Biol* 9:654-659.
28. Matkovich SJ, Van Booven DJ, Eschenbacher WH, Dorn GW 2nd (2011) RISC RNA sequencing for context-specific identification of in vivo microRNA targets. *Circ Res* 108:18-26.
29. Mortazavi A, Williams BA, McCue K, Schaeffer L, Wold B (2008) Mapping and quantifying mammalian transcriptomes by RNA-Seq. *Nat Methods* 5:621-628.
30. Dorn GW 2nd, et al. (2011) MARF and Opa1 control mitochondrial and cardiac function in Drosophila. *Circ Res* 108:12-17.
31. Zhang Y, et al. (2011) Nuclear effects of g-protein receptor kinase 5 on histone deacetylase 5-regulated gene transcription in heart failure. *Circ: Heart Failure* 4:659-668.
32. Xiang SY, et al. (2011) RhoA protects the mouse heart against ischemia/reperfusion injury. *J Clin Invest* 121:3269-3276.
33. Zhang Y, et al. (2011) Receptor-independent protein kinase Cα (PKCα) signaling by calpain-generated free catalytic domains induces HDAC5 nuclear export and regulates cardiac transcription. *J Biol Chem* 286:26943-26951.
34. Kim JB, et al. (2007) Polony multiplex analysis of gene expression (PMAGE) in mouse hypertrophic cardiomyopathy. *Science* 316:1481-1484.
35. Buermans HP, Ariyurek Y, van Ommen G, den Dunnen JT, t Hoen PA (2010) New methods for next generation sequencing based microRNA expression profiling. *BMC Genomics* 11:716.

36. Vandesompele J, et al. (2002) Accurate normalization of real-time quantitative RT-PCR data by geometric averaging of multiple internal control genes. *Genome Biol* 3:RESEARCH0034.
37. Fang Z, Cui X (2011) Design and validation issues in RNA-seq experiments. *Briefings Bioinf* 12:280-287.
38. Anders S, Huber W (2010) Differential expression analysis for sequence count data. *Genome Biol* 11:R106.
39. Raddatz K, Albrecht D, Hochgrafe F, Hecker M, Gotthardt M (2008) A proteome map of murine heart and skeletal muscle. *Proteomics* 8:1885-1897.
40. Maere S, Heymans K, Kuiper M (2005) BiNGO: a Cytoscape plugin to assess overrepresentation of gene ontology categories in biological networks. *Bioinformatics* 21:3448-3449.
41. Dorn GW 2nd, Matkovich SJ, Eschenbacher WH, Zhang Y (2012) A Human 3' miR-499 Mutation Alters Cardiac mRNA Targeting and Function. *Circ Res* 110:958-967.
42. Pearson WR, Lipman DJ (1988) Improved tools for biological sequence comparison. *Proc Natl Acad Sci USA* 85:2444-2448.
43. Varani G, McClain WH (2000) The G x U wobble base pair. A fundamental building block of RNA structure crucial to RNA function in diverse biological systems. *EMBO Rep* 1:18-23.