

Supplementary table

Genes which related to **apoptosis, oxidative stress, immune/inflammatory, biological process, translation, cell differentiation, cell cycle, transcription, transport, metabolic process, cell component and signal transduction** altered significantly by intragastric administration with TiO₂ NPs for consecutive 3 months

SYMBOL	Sequence ID	Ontology	DiffScore	Detection Pval	SYMBOL	Sequence ID	Ontology	DiffScore	Detection Pval
apoptosis									
2810454F19Rik	NM_028364	apoptosis	13.34113	0	E2f1	NM_007891	apoptosis	-66	0
1700013A01Rik	NM_028844	apoptosis	-25.9805	0	Gcap27	NM_009750	apoptosis	-16	0
1500005N04Rik	NM_029634	positive regulation of apoptosis	15.91376	0	Figl1	NM_021891	negative regulation of apoptosis	-48	0.2478632
Apaf1	NM_009684	apoptosis	-19.2577	6.97E-08	Fkh118	NM_010226	anti-apoptosis	-14	0.01923077
Aqp2	NM_009699	apoptosis	17.52176	0	Fn1	NM_010233	anti-apoptosis	-15	0.09888433
Axud1	NM_153287	apoptosis	60.65972	0	Hsp90b1	NM_011631	anti-apoptosis	-22	0
Bcl2l1	NM_009743	apoptosis	18.72365	0	Id1	NM_010495	apoptosis	49.3	0
Bok	NM_016778	apoptosis	39.3093	0	Igsf4a	NM_207675	apoptosis	25.6	0
Ngfrap1	NM_009750	apoptosis	-15	0	Cib1	NM_011870	apoptosis	-14.5379	0
Ccl19	NM_011888	negative regulation of leukocyte apoptosis	83.2706	0	Ccl21a	NM_011124	negative regulation of leukocyte apoptotic process	28.85775	0
Igfbp3	NM_008343	positive regulation of apoptosis	17.4	0	Nrbp2	NM_144847	negative regulation of neuron apoptosis	14.2	0
Ckap2	NM_001004140	apoptosis	-68.3812	0.5929487	Nuak2	NM_028778	apoptosis	30.9	0
Cycs	NM_007808	apoptosis	-14.5329	8.24E-05	Phlda1	NM_009344	apoptosis	-17	0
Ddit4	NM_029083	apoptosis	18.33704	0	Rassf5	NM_018750	apoptosis	13	0
Dnase1	NM_010061	apoptosis	18.65256	0	Sgk1	NM_011361	apoptosis	64.1	0
Dymll1	NM_019682	apoptosis	-38.0102	0	Sh3rf1	NM_021506	induction of apoptosis	14.3	0.04636015
Dncl1	NM_019682	apoptosis	-75.7115	0	Tnfrsf12a	NM_013749	apoptosis	-15	0
Birc5	NM_009689	apoptotic process	-101.227	1.63E-06					

oxidative stress										
Akr1c18	NM_134066	oxidation-reduction process	-56.2408	0	Hpd	NM_008277	oxidation-reduction process	113.6206	0	
Cox8b	NM_007751	oxidation-reduction process	69.72996	0	Heph	NM_010417	oxidation-reduction process	-15.1767	0.008052	
Creg1	NM_011804	oxidation-reduction process	27.79984	0	Ifi30	NM_023065	oxidation-reduction process	-13.9242	0	
Cyb561	NM_007805	oxidation-reduction process	-16.0907	0	Iyd	NM_027391	oxidation-reduction process	27.34662	0	
Cygb	NM_030206	response to oxidative stress	18.93919	0	Ldhd	NM_027570	oxidation-reduction process	15.84247	0	
Cyp24a1	NM_009996	oxidation-reduction process	-33.7997	0	Lox	NM_010728	oxidation-reduction process	-19.6716	0.002137	
Cyp27a1	NM_024264	oxidation-reduction process	48.64927	0	Nup62	NM_053074	oxidation-reduction process	-13.5967	0	
Cyp27b1	NM_010009	oxidation-reduction process	27.61457	0	P4ha1	NM_011030	oxidation-reduction process	-19.0961	0	
Cyp2a4	NM_009997	oxidation-reduction process	73.28619	0	Pdia6	NM_027959	oxidation-reduction process	-24.685	0	
Cyp2d9	NM_010006	oxidation-reduction process	109.1682	0	Retsat	NM_026159	oxidation-reduction process	57.29923	0	
Cyp2f2	NM_007817	oxidation-reduction process	32.47501	0	Rrm2	NM_009104	oxidation-reduction process	-30.2434	0.076178	
Cyp4a12a	NM_177406	oxidation-reduction process	38.53539	0	Steap1	NM_027399	oxidation-reduction process	-16.318	0.182692	
Cyp4a12b	NM_172306	oxidation-reduction process	123.5998	0	Vkorc1	NM_178600	oxidation-reduction process	17.13114	0	
Cyp4a14	NM_007822	oxidation-reduction process	46.87622	0	Xdh	NM_011723	oxidation-reduction process	39.8019	0	
Cyp4f13	NM_022434	oxidation-reduction process	24.88494	0	Clpb	NM_009191	mitochondrion	13.08478	0	
Cyp7b1	NM_007825	oxidation-reduction process	14.40675	0	Mrrp10	NM_026154	mitochondrion	-19.2171	0	
Cxxc6	NM_027384	oxidation-reduction process	-17.9376	0.03312	Nudt19	NM_033080	mitochondrion	-17.5475	0	
Dhcr7	NM_007856	oxidation-reduction process	-18.1068	0	Pxmp2	NM_008993	mitochondrion	17.5127	0	
Dio1	NM_007860	oxidation-reduction process	-21.3069	9.65E-05	Tcigr1	NM_016921	mitochondrion	14.09068	0.000405	
Fmo5	NM_010232	oxidation-reduction process	14.16068	0.00048	Timm8a1	NM_013898	mitochondrion	-18.5733	0	
Gpx7	NM_024198	response to oxidative stress	-32.768	0.005342	Nox4	NM_015760	oxidation-reduction process	28.3864	0	
Cyp2a5	NM_007812	oxidation-reduction process	103.5242	5.38E-05	Pipox	NM_008952	oxidation-reduction process			
Cyp2d10	NM_010005	oxidation-reduction process	15.28741	0	Plod2	NM_011961	oxidation-reduction process			
Cyp2d22	NM_019823	oxidation-reduction process	16.013	0.004726	Prodh	NM_011172	oxidation-reduction process			
Cyp2d26	NM_029562	oxidation-reduction process	35.5621	0	Rdh16	NM_009040	oxidation-reduction process			

Immune/inflammatory response

Apoec1	NM_031159	defense response to virus	16.00352	0	Cxcl9	NM_008599	defense response to virus	13.47656	0
Bmp6	NM_007556	immune response	15.16573	0.008547	Ddb2	NM_028119	response to UV	18.61965	0.001368
EG630499	BQ951674	immune response	20.5081	5.71E-07	Defb29	NM_001001444	defense response	-20.4451	0
C2	NM_013484	innate immune response	27.31265	0	C1qb	NM_009777	innate immune response	15.05448	0
C8g	NM_027062	innate immune response	26.13273	0	Cfi	NM_007686	innate immune response	-54.6275	0
Camp	NM_009921	defense response	22.88932	0.002137	H2-Ab1	NM_207105	immune response	27.51588	0
Cd274	NM_021893	negative regulation of T cell proliferation	20.32364	0	H2-M3	NM_013819	alpha-beta T cell activation involved in immune response	23.87632	0
Cd276	NM_133983	T cell activation	-19.3847	0.186966	Igflr	NM_010513	immune response	14.67399	0
Cd55	NM_010016	innate immune response	-19.5801	0.016026	Mbl1	NM_010775	innate immune response	22.35688	0
Nrarp	NM_025980	negative regulation of T cell differentiation	-22.4732	0	Orml	NM_008768	regulation of immune system process	13.00049	0.004274
Cfd	NM_013459	innate immune response	52.09597	0	Serpinc1	NM_009776	innate immune response	16.3852	0
Fcgrt	NM_010189	immune response	15.38197	0	Tgfb3	NM_011578	immune response	13.34086	2.28E-06
Clec2d	NM_053109	cellular response	18.70972	0	Bcl6	NM_009744	B cell differentiation	67.88909	0
Coro1a	NM_009898	T cell homeostasis	14.31374	0.000272	Cd74	NM_010545	immune response	29.0302	0
120009022Rik	NM_025817	inflammatory response	-37.7737	0	F2r	NM_010169	inflammatory response	22.01432	0
Chst1	NM_023850	inflammatory response	14.40865	0	Tlr12	NM_205823	inflammatory response	16.13427	0

Cxcl3	NM_018866	inflammatory response	17.08886	0	Chuk	NM_007700	I-kappaB phosphorylation	-20.0663	0
Cxcl2	NM_013655	immune response	28.02162	0.019278	C3	NM_009778	inflammatory response	30.23413	0
Biological process									
0610006L08Rik	AK002255	Biological process	-34.19409	0	E030010A14Rik	NM_183160	Biological process	25.29927	0
0610007P22Rik	NM_026676	Biological process	15.82568	0	E130012A19Rik	NM_175332	Biological process	17.65043	0
0610008F07Rik	CA491940	Biological process	21.98411	0	E130102H24Rik	BI737778	Biological process	18.9307	0
0610009B22Rik	NM_025319	Biological process	-15.95189	0	EG434674	NM_001013820	Biological process	-75.3917	0
0610012H03Rik	NM_028747	Biological process	-21.02719	0	EG633640	NM_001039244	Biological process	-38.4617	0
0710001D07Rik	AK002941	Biological process	-13.75501	0	EG666009	XM_980899	Biological process	22.05245	0
1110021J02Rik	NM_026782	Biological process	-30.48447	0	EG667728	XM_003084919	Biological process	-43.0996	0
1110038B12Rik	CB575847	Biological process	29.55201	0	EG667977	AII15044	Biological process	28.65119	0
1110069O07Rik	NM_001029937	Biological process	-183.6978	0	Eif1ad	NM_027236	Biological process	-14.0614	0
11190002F15Rik	AK138072	Biological process	-59.74326	0.3589744	Elmod3	NM_144917	Biological process	21.08511	0
1190020J12Rik	NM_001081115	Biological process	32.40128	0	Epb4.1l4b	NM_019427	Biological process	-15.7936	0
1500012F01Rik	NM_001081005	Biological process	13.3711	0	Ergic2	NM_026168	Biological process	-14.485	0
1700007B13Rik	NM_027943	Biological process	25.79848	0	Esm1	NM_023612	Biological process	36.74471	0
1700016C15Rik	NM_027077	Biological process	-14.8869	0.02457265	Exdl2	NM_133798	Biological process	13.7948	0
1700029F09Rik	NM_029368	Biological process	-25.77884	0	Fam173b	NM_026546	Biological process	-17.7764	0
1700029G01Rik	NM_025856	Biological process	14.85722	0	Fbxo21	NM_145564	Biological process	26.23816	0
1700037H04Rik	NM_026091	Biological process	-25.53243	0	Fbxw17	NM_175401	Biological process	-22.7717	0
1700071K01Rik	NM_001033765	Biological process	-14.47385	0.008547009	Fcho1	NM_028715	Biological process	13.31341	0.005342
1700108L22Rik	NM_001040399	Biological process	-36.23967	0	Fmo4	NM_144878	Biological process	35.22079	0
1810015C11Rik	BI736050	Biological process	19.55207	0	G630016D24Rik	NM_001033805	Biological process	-17.8404	0.00641
1810019D21Rik	AK007545	Biological process	14.23328	0	Gas2l3	NM_001079876	Biological process	-35.723	0.110993
1810022K09Rik	NM_001099674	Biological process	-27.23269	0	Gins2	NM_178856	Biological process	-44.6598	0.000228
1810035L17Rik	NM_026958	Biological process	-15.1156	0	Glxr5	NM_028419	Biological process	-14.3374	0

1810044D09Rik	BI221477	Biological process	22.21508	0	Gm853	NM_001034872	Biological process	-85.8885	0
1810063B05Rik	NM_174987	Biological process	-17.06034	0	Gpr125	NM_133911	Biological process	-24.3886	0
2010003K15Rik	NM_001195596	Biological process	-23.61688	0	Gramd1b	NM_172768	Biological process	-28.8616	0
2010007K12Rik	NM_172879	Biological process	-16.99884	0	Gstm7	NM_026672	Biological process	15.23775	0
2010205O06Rik	NM_138646	blood coagulation	29.17507	0	Higd1c	NM_199477	Biological process	41.43023	0
2010305C02Rik	NM_027249	Biological process	-15.76085	0.002136752	Hist1h2ad	NM_178188	Biological process	-123.951	0
2010317E24Rik	NM_001081085	Biological process	-20.9388	0.3621795	Hist1h2af	NM_175661	Biological process	-64.6447	0
2200001I15Rik	NM_183278	Biological process	-28.9415	0	Hist1h2ag	NM_178186	Biological process	-41.5075	0.324786
2210013K02Rik	NM_023712	Biological process	-16.98704	0	Hist1h2ah	NM_175659	Biological process	-124.606	0
2210013O21Rik	DV046611	Biological process	-18.28412	0	Hist1h2ai	NM_178182	Biological process	-69.9658	0
2210408F21Rik	AK078276	Biological process	36.2524	0	Hist1h2ak	NM_178183	Biological process	-132.42	0
2310004I24Rik	NM_025510	Biological process	14.47395	0	Hist1h2an	NM_178184	Biological process	-111.759	0.008547
2310005L22Rik	CF616156	Biological process	-88.64561	0.003205128	Hist1h2ao	NM_178185	Biological process	-113.025	0
2310005N03Rik	NM_025511	Biological process	-28.58845	0	Hist1h3e	NM_178205	Biological process	-26.3771	0
2310007D09Rik	NM_027975	Biological process	-19.87851	0.6378205	Hist1h3h	NM_178206	Biological process	-15.6458	0.072437
2310008M10Rik	NM_025509	Biological process	-20.56657	0	Hist1h4h	NM_153173	Biological process	-44.4888	0.048995
2310028O11Rik	NM_001163006	Biological process	20.08894	0	Hist1h4k	NM_178211	Biological process	-31.3439	0.035385
2410006H16Rik	DV059485	Biological process	31.15622	0	Hist1h4m	NM_001195421	Biological process	-14.9323	0.000252
2410022L05Rik	NM_025556	Biological process	-34.9827	0	Hist2h2aa1	NM_178212	Biological process	-31.9299	7.91E-05
2610002M06Rik	NM_025921	Biological process	-13.05241	0.02029915	Hist2h2aa2	NM_013549	Biological process	-25.4512	0
2610017I09Rik	BC094545	Biological process	-16.38006	0	H2-M2	NM_008204	Biological process	86.8102	0
2610027C15Rik	NM_172145	Biological process	-14.71094	0	Hn1	NM_008258	Biological process	-30.8881	0.000128
2610301F02Rik	NM_001025576	Biological process	17.70654	0	Igh-VJ558	FR689186	Biological process	263.9346	0
2610510J17Rik	NM_028131	Biological process	-14.67168	0.008547009	Igk-C	AK036494	Biological process	374.3439	0
2700097O09Rik	NM_028314	Biological process	-13.94027	0	Igk-V	X59052	Biological process	67.93063	0
2810021O14Rik	NM_025480	Biological process	-18.02302	0	Igk-V33	U27111	Biological process	148.0846	0

2810025M15Rik	BC055845	Biological process	-15.02247	0	Igk-V5	AK036494	Biological process	226.8212	0
2810403A07Rik	NM_028814	Biological process	13.20499	0	Igl-V1	AF290571	Biological process	374.3439	0
2810455F06Rik	NM_177268	Biological process	19.65001	0	Iivb1	NM_173751	Biological process	14.80167	0.000266
2900016B01Rik	NM_029116	Biological process	-32.99736	0	Isg2012	NM_177663	Biological process	-14.6295	0
2900062L11Rik	NM_029823	Biological process	13.07155	0	Itprip	NM_027559	Biological process	16.67409	0
3110040M04Rik	AK014162	Biological process	-50.62803	0	Kene11	NM_021487	Biological process	-29.5313	0.029915
3110049J23Rik	NM_026085	Biological process	26.88698	0	Kctd9	NM_134073	Biological process	-16.1436	0
3110099E03Rik	AK085300	Biological process	-19.72748	0.03418804	Kdelr3	NM_134090	Biological process	-20.8355	0.21688
3321401G04Rik	NM_029930	Biological process	-17.05751	0.01668824	Ldoc11	NM_177630	Biological process	-15.981	0
3632451O06Rik	NM_026142	Biological process	-16.06631	0	Limch1	NM_001001980	Biological process	18.18798	0
4833408A19Rik	AK079024	Biological process	-33.19052	0	Lims2	NM_144862	Biological process	28.85672	0
4833427B12Rik	NM_178856	Biological process	-60.05292	0.007478632	Lhfp12	NM_172589	Biological process	-18.9274	0
4930402H24Rik	NM_029432	Biological process	13.3399	0	Lin54	NM_172714	Biological process	-14.1485	0
4930445K14Rik	BC037706	Biological process	13.6214	0	LOC665506	XM_977361	Biological process	43.04177	0
4930524N10Rik	BY715441	Biological process	16.14519	0.006410256	Ly6f	NM_008530	Biological process	-14.3412	0.000228
4930550C14Rik	NM_029247	Biological process	-16.78946	0	Lrrc66	NM_153568	Biological process	21.32035	0
4930579C24Rik	NM_029482	Biological process	-17.09586	0	Lsm4	NM_015816	Biological process	-13.7134	0
4931406C07Rik	NM_001199484	Biological process	-13.47776	0	Lztr1	NM_025808	Biological process	-21.0798	0
4931417G12Rik	NM_027633	Biological process	-14.45115	0	Med28	NM_025895	Biological process	-26.0304	0
4931426K16Rik	NM_027641	Biological process	-17.73932	0	Mfap4	NM_029568	Biological process	-28.2963	0.21688
4933412E12Rik	AK016788	Biological process	16.31104	0	Mfap5	NM_015776	Biological process	-19.5191	0.36218
4933427D14Rik	NM_028963	Biological process	21.88804	0	Mfsd7a	NM_172883	Biological process	13.21646	0
4933428G09Rik	NM_025755	Biological process	-14.79742	0.008547009	Mpv171	NM_033564	Biological process	-25.1092	0
4933437K13Rik	NM_028964	Biological process	41.14862	0	Mrp152	NM_026851	Biological process	-26.1321	0
4933439C20Rik	AK162734	Biological process	15.54885	0.0142473	Mrp154	NM_025317	Biological process	-14.5899	0
5031439G07Rik	NM_001033273	Biological process	-14.31245	0	Mrps18a	NM_026768	Biological process	-15.1914	0

5033411D12Rik	NM_138654	Biological process	29.28766	0	Mrps21	NM_078479	Biological process	-16.875	0
5430434G16Rik	AK139147	Biological process	15.30595	0	Myo15b	XR_106391	Biological process	-16.969	0
5730406M06Rik	NM_025669	Biological process	14.53958	0	Narf	NM_026272	Biological process	-16.953	0
5730409K12Rik	XR_105990	Biological process	35.14519	0	Ndufa12l	NM_001127346	Biological process	-24.7187	0
5730494M16Rik	NM_001004361	Biological process	-13.53179	0.05205137	Ndufb5	NM_025316	Biological process	-19.9057	0
5730528L13Rik	NM_028137	Biological process	-29.046	0.00534188	Ndufc1	NM_025523	Biological process	-15.6343	0
5730593N15Rik	NM_175263	Biological process	29.73115	0	Nola2	NM_026631	Biological process	-23.1544	0.010869
5830406C17Rik	NM_029508	Biological process	16.42609	0	Notum	NM_175263	Biological process	16.23046	0
6330405H19	AK165889	Biological process	28.64615	0	Nrm	NM_134122	Biological process	-51.9536	0
6430511F03	NM_001163610	Biological process	15.33238	0	Nt5dc2	NM_027289	Biological process	-19.0716	0
8430408G22Rik	NM_145980	Biological process	124.8389	0	Nudt8	NM_025529	Biological process	-26.1359	0
9130204K15Rik	AK078931	Biological process	-14.6316	0	Nup210	NM_018815	Biological process	-19.423	0
9430052C07Rik	BQ945265	Biological process	-14.49644	0	Nus1	NM_030250	Biological process	-23.8521	0
9830002I17Rik	NM_029932	Biological process	46.95831	0	Ociad2	NM_026950	Biological process	27.26688	0
9930031P18Rik	AK079445	Biological process	13.55618	0	Oip5	NM_001042653	Biological process	-24.1901	0.72907
A130010C12Rik	AK037356	Biological process	23.35464	0	Olfm4	NM_001030294	Biological process	-16.674	0
A130038J17Rik	AK037696	Biological process	34.30087	0	Ostf1	NM_017375	Biological process	-13.3296	0
A130082M07Rik	AK038154	Biological process	17.73857	0	Parp3	NM_145619	Biological process	-13.562	0.005342
A330017A19Rik	XR_105845	Biological process	15.49185	0	Pdzd11	NM_028303	Biological process	-13.9162	0
AA415398	NM_001004178	Biological process	23.92108	0	Peg13	AY151252	Biological process	13.24409	0
AA467197	NM_001004174	Biological process	15.56708	0	Phf7	NM_027949	Biological process	21.08285	0
Abca8a	NM_153145	Biological process	26.86917	0	Plekha6	NM_182930	Biological process	13.32253	0
Abhd1	NM_021304	Biological process	210.8899	0	Plekha8	NM_001164361	Biological process	-34.3941	0
Acaa1b	NM_146230	Biological process	24.79694	0	Ppil1	NM_026845	Biological process	26.64953	0
Acp6	NM_019800	Biological process	-16.42099	0	Ppmr	X65588	Biological process	13.68874	0
Aasm2	NM_146197	Biological process	-20.00204	0	Prkcdpb	NM_028444	Biological process	-14.5715	0

Adhb	AK142824	Biological process	-19.29189	0.659188	Prodh2	NM_019546	Biological process	36.10522	0
Afap111	NM_178928	Biological process	-30.37736	0	Prr15	NM_030024	Biological process	-20.2209	0
Agxt211	NM_027907	Biological process	24.39673	0	Pxmp4	NM_021534	Biological process	-22.2665	0
AI324046	AI324046	Biological process	244.0379	0.00026605	Rab711	NM_144875	Biological process	-17.5885	0
AI427122	NM_001033210	Biological process	-14.06748	0	Raly1	NM_178631	Biological process	19.71551	0.001068
AI448196	NM_001202500	Biological process	-22.93309	0.008547009	Rassf3	NM_138956	Biological process	15.06312	0
AI607873	NM_001204910	Biological process	69.37775	0	Rassf4	NM_178045	Biological process	16.12972	0.002188
AI747699	NM_001013770	Biological process	-25.86747	0	Rbm47	NM_178446	Biological process	-51.7839	0.009011
Akap8l	NM_017476	Biological process	13.15244	0	Retnlg	NM_181596	Biological process	39.59544	0
Akirin1	NM_023423	Biological process	-17.54078	0	Rmnd5b	NM_025346	Biological process	-16.3242	0.000228
Als2cr4	NM_001033449	Biological process	-18.63046	0.000340094	Rnase4	NM_201239	Biological process	34.99548	0
Amotl2	NM_019764	Biological process	17.44737	0	Rnfl14	NM_030743	Biological process	23.96171	0
Ang	NM_201239	Biological process	39.72548	0	Rnfl83	NM_153504	Biological process	15.9281	0
Angptl7	NM_001039554	Biological process	-15.41774	0	Rnfl86	NM_025786	Biological process	21.52164	0
Ankrd37	NM_001039562	Biological process	-13.39932	0.1474359	Rprd11b	NM_027434	Biological process	-16.5886	0
Ankrd56	NM_175270	Biological process	26.34032	0	Rrp12	NM_199447	Biological process	-15.9967	0
Art4	NM_026639	Biological process	19.85931	0	Samd9l	NM_010156	Biological process	-19.1844	0
AU022508	NM_133791	Biological process	13.56999	0	Sdf211	NM_022324	Biological process	-14.6896	0
AW124722	AW124722	Biological process	36.04227	0	Sec14l3	NM_001029937	Biological process	-39.9883	0.004936
B130019G13Rik	NM_001033312	Biological process	-13.47504	0	Sectm1b	NM_026907	Biological process	17.69743	0
B230322F03Rik	AK045908	Biological process	15.55134	0	Slc46a3	NM_027872	Biological process	16.41096	0
B230339H12Rik	NM_172282	Biological process	-15.33886	0	Smpd13b	NM_133888	Biological process	16.11299	0
B230342M21Rik	NM_133898	Biological process	20.33934	0	Shhg11	NM_175692	Biological process	19.7443	0
B930041F14Rik	NM_178699	Biological process	34.58308	0	Snx21	NM_133924	Biological process	14.17439	2.05E-05
BC003324	BC003324	Biological process	-15.84271	0	Snx7	NM_029655	Biological process	-33.6819	0
BC008150	BC008150	Biological process	20.22752	0	Spatat6	NM_026470	Biological process	-18.2212	0

BC013529	BC013529	Biological process	-15.12104	0	Spc24	NM_026282	Biological process	-14.8279	2.80E-05
BC014795	BC014795	Biological process	-19.59739	0	Spns1	NM_023712	Biological process	-16.808	0
BC016495	BC016495	Biological process	-35.29659	0	Ssr2	NM_025448	Biological process	-16.7915	0
BC017612	BC017612	Biological process	13.03029	0	Stbd1	NM_175096	Biological process	-13.5439	0
BC018371	BC018371	Biological process	-16.77128	0.01602564	Stk32a	NM_178749	Biological process	15.06824	0.000252
BC021785	BC021785	Biological process	19.9457	0	Svopl	NM_177200	Biological process	23.76056	5.14E-06
BC032203	BC032203	Biological process	17.12109	0	Tacstd2	NM_020047	Biological process	-16.2128	0
BC034507	BC034507	Biological process	-14.64119	0.00534188	Tbc1d10a	NM_134023	Biological process	19.12517	0
BC043944	BC043944	Biological process	17.85679	0	Tchh11	NM_027762	Biological process	-17.8138	0
BC085271	BC085271	Biological process	-14.60567	0	Tmc4	NM_181820	Biological process	14.29195	0
Bcas2	NM_026602	Biological process	-23.59542	0	Tmem100	NM_026433	Biological process	13.97692	0
Bhlhb9	NM_198161	Biological process	-27.77673	0	Tmem169	NM_175564	Biological process	-75.5541	0
Bxdc1	NM_023323	Biological process	-17.3447	0.00011186	Tmem16j	NM_178381	Biological process	-13.7019	0.005342
Bzap1	NM_172449	Biological process	15.04527	0	Tmem29	NM_001164683	Biological process	-14.4338	0
C030032G2IRik	BI650552	Biological process	26.05196	0	Tmem56	NM_178936	Biological process	13.70409	0
C1qtmf3	NM_030888	Biological process	-31.27738	0	Tmem86a	NM_026436	Biological process	-24.1271	0
C230078M08Rik	BC150866	Biological process	-14.48003	0	Tmigd1	NM_025655	Biological process	-13.7528	0.004274
Creb12	NM_177687	Biological process	14.03311	0	Trappc1	NM_001024206	Biological process	-16.6954	0
C4a	NM_011413	biological process	-13.98016	0.003739667	Trim47	NM_172570	Biological process	-27.624	0
C730025P13Rik	NM_177344	Biological process	-22.78876	0	Trim7	NM_053166	Biological process	17.90689	0
C77604	NM_001008705	Biological process	-15.16954	0	Troap	NM_030159	Biological process	-23.6183	0.240385
C85492	NM_153540	Biological process	17.17782	0	Trp53imp2	NM_178111	Biological process	-18.938	0
Ccdc28b	NM_025455	Biological process	-21.45357	0.02017271	Tyms-ps	M30774	Biological process	-18.1945	0
Ccdc6	NM_001111121	Biological process	-33.98211	0	Uap111	NM_001033293	Biological process	-34.472	0
Creld2	NM_029720	Biological process	-15.91821	0	Ugt1a7c	NM_145079	Biological process	200.6048	0
Ccl21c	NM_023052	Biological process	33.97845	0	Vasn	NM_139307	Biological process	14.66453	0

Cdca2	NM_175384	Biological process	-69.17947	0.05662393	Xlr4a	NM_021365	Biological process	20.49694	2.80E-05
Cdca3	NM_013538	Biological process	-56.04836	0.03205642	Xpnp2	NM_133213	Biological process	-21.0864	0
Cenpi	NM_145924	Biological process	-19.34624	0.5961539	Zfp282	NM_146175	Biological process	-16.8664	0
Cenpl	NM_027429	Biological process	-44.06356	0	Zfp533	NM_178723	Biological process	35.18403	0
Cenpm	NM_025639	biological process	-22.00993	0.392827	Zfp579	NM_026741	Biological process	13.62199	0
Cenpn	NM_028131	Biological process	-17.71201	0.03739316	Zfp68	NM_013844	Biological process	35.97963	0.005342
Cenpp	NM_025495	Biological process	-22.14549	0.03739316	Zfp810	NM_145612	Biological process	-19.7563	0
Cenpt	NM_177150	Biological process	-23.693	0	Col4a1	NM_009931	cellular response to amino acid stimulus	-89.8031	0.00641
Chchd7	NM_181391	Biological process	-15.09117	0	Dpp7	NM_031843	proteolysis	-14.8673	0.110993
Chd9	NM_177224	Biological process	13.00764	0.00068403	Ifit3	NM_010501	cellular response to interferon-alpha	18.87765	0.000228
Citm3	NM_178669	Biological process	-14.30297	0	Rnase1	NM_011271	endonuclease activity	56.32358	0
Cntm6	NM_026036	Biological process	-35.90944	0	Serpina3n	NM_009252	response to cytokine stimulus	15.44321	0
Cnih4	NM_030131	Biological process	-14.50795	0	2700094K13Rik	NM_001033166	cell redox homeostasis	-53.6904	0
Col27a1	NM_025685	Biological process	15.58485	2.05E-05	Csprs	NM_033616	Biological process	13.45273	0
Cox7a2	NM_009945	Biological process	-13.86336	0	Cyp2d12	NM_201360	Biological process	137.4507	0
Cpm	NM_027468	Biological process	13.49046	0	Cyp4a31	NM_201640	Biological process	30.24836	0
D15Ert682e	NM_028003	Biological process	-19.7373	0	Defb19	NM_145157	Biological process	-30.36063	0
D630023F18Rik	NM_175293	Biological process	-28.20999	0	Dleu2	AK140953	Biological process	47.19983	0
D630029K05Rik	AK085456	Biological process	36.12284	0	Dhrs7	NM_025522	Biological process	21.79137	0.324786
D6Mit97	BF785914	Biological process	374.3439	0	Dnajc12	NM_013888	Biological process	17.47228	0
D930048N14Rik	BC075670	Biological process	25.93578	0	Dnajc13	NM_001163026	Biological process	22.98237	0
Deakd	NM_026551	Biological process	-16.45015	0	Drcnmb1a	NM_053090	Biological process	-13.51308	0
Dcun1d5	NM_029775	Biological process	-18.30021	0	Ddit4l	NM_030143	Biological process	-21.26032	0.008547
Odc1	NM_013614	kidney development	-45.3672	0				0	0

translation									
2810423O19Rik	NM_198931	protein dephosphorylation	18.84997	0	Map3k6	NM_016693	phosphorylation	29.47405	0
9430080K19Rik	NM_008696	protein phosphorylation	-25.4938	0	Pbk	NM_023209	peptidyl-serine phosphorylation	-98.573	0.005342
Camk2n2	NM_028420	phosphorylation	14.76745	0	Pip5k1b	NM_008846	phosphorylation	-13.1792	0
Eef2	NM_007907	translation	43.14189	0	Plk3	NM_013807	phosphorylation	30.00504	0
Eif4b	NM_145625	translation	15.43015	0.00393	Pomt2	NM_153415	protein O-linked glycosylation	-16.5341	0
Eif4e13	NM_023314	translation	-24.3173	0	Rpl22	NM_009079	translation	31.34038	0
Ar1l	NM_025859	Golgi organization	-17.4517	0	Stk32b	NM_022416	phosphorylation	14.08118	0
Erp29	NM_026129	protein secretion	-24.1862	0	Serpina1b	NM_009243	protein N-linked glycosylation	79.56782	0
Fbxo25	NM_025785	protein ubiquitination	-17.6475	0	Serpina1d	NM_009246	protein N-linked glycosylation	62.17025	0
Galnt1	NM_013814	protein O-linked glycosylation	-17.7672	0.00026	Tesk1	NM_011571	protein phosphorylation	-13.918	0
Lgals4	NM_010706	protein binding	29.45535	0					
cell differentiation									
Cebpa	NM_007678	brown fat differentiation	16.27397	0	Ndr2	NM_013864	cell differentiation	23.91835	0
Corin	NM_016869	neuron differentiation	-33.202	0	Neurog2	NM_009718	cell differentiation	42.48978	0.006781
D0H4S114	NM_053078	regulation of neuron differentiation	-78.947	0	Ngef	NM_019867	cell differentiation	17.36056	0
Ggnbp1	NM_027544	cell differentiation	30.79735	0.00741	Osr2	NM_054049	cell differentiation	-40.1019	0
Hspg2	NM_008305	chondrocyte differentiation	-19.2076	0.08540	Rps3a	NM_016959	cell differentiation	-17.2009	0
Lhx1	NM_008498	cell differentiation	16.29161	0	Lrg1	NM_029796	brown fat cell differentiation	17.11863	0
Tmem176b	NM_023056	cell differentiation	-16.3732	0	Zfp35	NM_011755	cell differentiation	-45.3949	0

cell cycle

2310036D04Rik	NM_172134	cell proliferation	51.6045	0	Gadd45a	NM_007836	cell cycle	-20.1331	0
2410004L22Rik	NM_029621	cell cycle	-18.4405	0.034188	Gsg2	NM_010353	cell cycle	-14.4744	0
3000004C01Rik	NM_197959	cell cycle	-27.3561	0.206717	H2afx	NM_010436	cell cycle	-41.5763	0
3110013H01Rik	NM_028448	cell cycle	17.46578	0	Hist1h2bh	NM_178197	nucleosome assembly	13.90894	0
583041I120	NM_009873	cell cycle	-13.8899	0	Hist2h2ab	NM_178213	nucleosome assembly	-47.0121	0.534188
8030404L10Rik	NM_029633	cell cycle	14.64067	0	Hist2h2ac	NM_175662	nucleosome assembly	-37.5296	0
App12	NM_145220	cell cycle	13.53945	0	Hist2h2be	NM_178214	nucleosome assembly	-35.8407	0.00137
Arpp19	NM_021548	cell cycle	-18.7416	0	Id3	NM_008321	regulation of cell cycle	17.92796	0
Aurka	NM_011497	cell cycle	-67.6762	0.069444	Idb4	NM_031166	G1/S transition of mitotic cell cycle	14.88236	0
Aurkb	NM_011496	cell cycle	-51.6149	0.05235	Incnp	NM_016692	cell cycle	-43.3679	0.029915
Bub1b	NM_009773	cell cycle	-27.68126	0.01216533	Kif11	NM_010615	cell cycle	-41.8867	0.185897
Brn1	NM_144818	cell cycle	-31.7441	0.041667	Kif20b	NM_183046	cell cycle	-123.719	0.021368
C030025P15Rik	NM_007708	G2/M transition of mitotic cell cycle	-13.6021	3.65E-05	Kif2c	NM_134471	cell cycle	-17.8288	0.253205
Ccdc5	NM_146089	cell cycle	-21.2509	0	Knsl5	NM_024245	cell cycle cytokinesis	-45.6772	0
Ccdc99	NM_027411	cell cycle	-30.7973	0.199786	KIF23	NM_024245	cell cycle cytokinesis	-23.2248	0.082694
Ccnb1	NM_172301	cell cycle	-85.6847	0.824839	Kntc1	NM_001042421	cell cycle	-41.8437	0.077991
Cone2	NM_009830	cell cycle	-16.37	0.344017	Mad2l1	NM_019499	cell cycle	-47.7398	0.022149
Cenpa	NM_007681	establishment of mitotic spindle orientation	-106.28	0	Mapk13	NM_011950	cell cycle	-26.4613	0
Cdc20	NM_023223	cell cycle	-101.603	0.000593	Mcm2	NM_008564	cell cycle	-28.8593	0
Cdca5	NM_026410	cell cycle	-27.5849	0.047009	Mcm5	NM_008566	cell cycle	-87.7255	0
Cdca8	NM_026560	cell cycle	-74.2616	0.010401	Mcm6	NM_008567	cell cycle	-35.5179	0.040331
Cdc2a	NM_007659	cell cycle	-32.6364	0.038237	Mcm3	NM_008563	cell cycle	-26.4047	0.200855

Cdkn3	NM_028222	cell cycle	-50.8193	0.145546	Mll5	NM_026984	cell cycle	-15.443	0
Cdt1	NM_026014	cell cycle	-36.4028	0	Nasp	NM_016777	cell cycle	-16.6459	0.021085
Chaf1a	NM_013733	cell cycle	-40.645	0.005342	Ncapd2	NM_146171	cell cycle	-15.7145	0.006055
Chaf1b	NM_028083	cell cycle	-56.7691	0.021368	Ncaph	NM_144818	cell cycle	-75.7788	0.018162
Clspn	NM_175554	cell cycle	-16.2008	0.013507	Plkl1	NM_011121	cell cycle	-88.097	0.008547
Crip2	NM_024223	positive regulation of cell proliferation	-14.588	0	Plk2	NM_152804	mitotic cell cycle	-20.5194	0.005342
D930046M13Rik	NM_177354	cell cycle	-18.1144	0.122863	Prok1	NM_001044382	positive regulation of cell division	-15.9922	0.317611
Dbf4	NM_013726	cell cycle	-35.8938	0.004274	Rcc1	NM_133878	cell cycle	-16.6287	0
Dusp1	NM_013642	cell cycle	41.13778	0	Sass6	NM_028349	cell cycle	-15.378	0.125
Dync1li1	NM_146229	cell cycle	-14.1888	0	Sesn2	NM_144907	cell cycle arrest	63.87074	0
Dynlt3	NM_025975	cell cycle	-27.8052	0	Sgol2	NM_199007	cell cycle	-56.1981	0.443376
E4f1	NM_007893	cell cycle	13.10419	0	Snflk	NM_010831	cell cycle	15.39599	0
Esco2	NM_028039	cell cycle	-92.0228	0.149573	Spc25	NM_025565	cell cycle	-29.7315	0
Fam107a	NM_183187	regulation of cell growth	50.40599	0	Txnip	NM_023719	cell cycle	24.80585	0
F630043A04Rik	NM_198605	cell cycle	-22.4798	0.755342	Zwint	NM_025635	cell cycle	-15.672	0
Gadd45g	NM_011817	regulation of cell cycle	20.54953	0	Cdca7	NM_025866	cell division	-32.8327	0.087607
tanscription									
Hoxa5	NM_010453	transcription, DNA-dependent	17.73564	0	Zfp191	NM_021559	regulation of transcription, DNA-dependent	25.02455	0
Hoxc9	NM_008272	transcription, DNA-dependent	15.45063	0	1110004P21Rik	NM_023603	regulation of transcription, DNA-dependent	25.11979	0
Idb2	NM_010496	negative regulation of transcription, DNA-dependent	14.97894	0	Kctd1	NM_134112	regulation of transcription, DNA-dependent	-16.7143	0

Nfkbia	NM_010907	positive regulation of transcription, DNA-dependent	15.13402	0.016688	Klf1	NM_010635	positive regulation of transcription, DNA-dependent	19.76525	0
Bcl6b	NM_007528	negative regulation of transcription from RNA polymerase II promoter	-29.9219	0.016026	Dnajb6	NM_011847	negative regulation of transcription, DNA-dependent	19.8432	0
Cbx7	NM_144811	regulation of transcription, DNA-dependent	41.24406	0	Meox1	NM_010791	regulation of transcription, DNA-dependent	-21.6323	0
C130020C13Rik	NM_175231	regulation of transcription, DNA-dependent	-14.5069	0	Myst2	NM_177619	regulation of transcription, DNA-dependent	-15.4778	0
Col4a2	NM_009932	transcription, DNA-dependent	-74.2871	0	Mbnl2	NM_175341	RNA splicing	-16.0521	0
Med21	NM_025315	regulation of transcription, DNA-dependent	-26.8955	0	Ndn	NM_010882	transcription, DNA-dependent	-30.333	0
Dnajb11	NM_026400	mRNA modification	-22.9017	0	Apitd1	NM_027263	transcription initiation, DNA-dependent	-19.3198	0.014957
D12Wsu95e	NM_198023	regulation of transcription, DNA-dependent	-23.3615	0	Nfx1	NM_023739	regulation of transcription, DNA-dependent	15.41298	0
Dscr6	NM_133229	negative regulation of transcription from RNA polymerase II promoter	-13.1011	0	Trps1	NM_032000	negative regulation of transcription, DNA-dependent	-28.6263	0
1810073H04Rik	NM_001081074	mRNA processing	-15.1651	0	4632419I22Rik	NM_027421	snRNA processing	-15.9037	0.016026
Fbp3	NM_001033389	positive regulation of transcription, DNA-dependent	-15.9139	0	Pou2af1	NM_011136	regulation of transcription, DNA-dependent	66.75111	0
Foxm1	NM_008021	regulation of transcription, DNA-dependent	-25.0275	0.002717	Rbm35a	NM_194055	mRNA processing	38.94757	0
Foxq1	NM_008239	regulation of transcription, DNA-dependent	27.64632	0	Snai2	NM_011415	regulation of transcription, DNA-dependent	-14.2763	0.001068

Hdac11	NM_144919	regulation of transcription, DNA-dependent	23.28886	0	Tbx10	NM_011533	regulation of transcription, DNA-dependent	-121.12	0
Hic2	NM_178922	regulation of transcription, DNA-dependent	14.22406	0	Tbx13	NM_011533	regulation of transcription, DNA-dependent	-48.2394	0.128205
Hist2h3b	NM_178215	regulation of gene silencing	-23.0697	0	Phf10	NM_024250	transcription, DNA-dependent	-24.0347	0
Hist1h3a	NM_013550	regulation of gene silencing	-16.9043	0.383547	Tut1	NM_197993	mRNA processing	19.05613	0
Hmgb2	BI655593	negative regulation of transcription, DNA-dependent	-22.2317	0	Tsc22d3	NM_010286	regulation of transcription, DNA-dependent	54.82657	0
Hmgn3	NM_026122	positive regulation of transcription from RNA polymerase II promoter	-16.3502	0	Tdg	NM_172552	negative regulation of transcription from RNA polymerase II promoter	-13.1788	0.208896
Hnflb	NM_009330	transcription, DNA-dependent	-32.066	0	Wtip	NM_207212	transcription, DNA-dependent	20.09834	0
transport									
Hbb-b1	NM_016956	oxygen transport	-13.0813	7.90E-09	Slc13a3	NM_054055	transport	15.98298	0
Hven1	NM_028752	transport	-14.0487	0.058076	Sv2a	NM_022030	transport	-36.3054	0
Kir4.2	NM_019664	transport	62.4084	0	Sycn	NM_026716	exocytosis	95.5387	0
Laptm5	NM_010686	transport	24.79488	0	Syp	NM_009305	transport	23.23504	0
Lman2l	NM_001013374	protein transport	-14.0152	0	Syp12	NM_008596	transport	-59.9993	0
Mfsd2	NM_029662	transmembrane transport	-112.311	0	Tfrc	NM_011638	endocytosis	-67.6119	0
Mfsd7c	NM_145447	transmembrane transport	27.75059	0	Timm10	NM_013899	transport	-18.8285	0
Nup160	NM_021512	transport	-111.162	0.095085	Tmem48	NM_028355	transport	-34.4614	0.003205
Nup12	NM_153092	transport	-13.7153	0	Trpm6	NM_153417	transport	17.18743	0.00012
Osta	NM_145932	transport	-31.6714	0	Ttyh3	NM_175274	transport	-13.0907	0
Pigr	NM_011082	transport vesicle	136.4072	0	Ucp1	NM_009463	transport	30.94071	0

0610009O04Rik	NM_028746	amino acid transport	transmembrane	-17.954	0.016026	Slc15a2	NM_021301	transport	-13.5588	0
2310046K01Rik	NM_027172	transport		-34.4349	0	Slc22a2	NM_013667	transport	-13.9243	0
Abcc4	NM_001033336	drug transport	transmembrane	70.03412	0	Slc22a7	NM_144856	transport	-48.7456	0
Afm	NM_145146	transport		-19.0492	0.119658	Slc22a8	NM_031194	transport	61.11576	0
Apom	NM_018816	lipid transport		73.07208	0	Slc22a9	NM_019723	transport	-29.559	0.042462
Aqp1	NM_007472	ammonium transport		13.77774	0	Slc25a3	NM_133668	transport	-14.7523	0
Aqp4	NM_009700	carbon dioxide transport		43.52991	0.001427	Slc26a4	NM_011867	transport	13.38967	0
Catsper2	NM_153075	calcium ion transport	transmembrane	18.54971	0	Slc34a3	NM_080854	transport	-16.2252	0
Clenka	NM_024412	chloride transport		20.93297	0	Slc35b1	NM_016752	transport	-21.6347	0
Clic4	NM_013885	transport		-21.4792	0	Slc41a2	NM_177388	transport	-21.9756	0
Clic1	NM_033444	chloride transport		-13.4448	0	Slc5a6	NM_177870	transport	-48.4167	0
Cp	NM_007752	copper ion transport		17.04005	0.008349	Slc6a12	NM_133661	transport	14.14436	0
D330038K10Rik	NM_173028	transport		-26.1597	0.384684	Slc6a18	NM_001040692	transport	16.59364	0
Fabp3	NM_010174	transport		-23.3842	0	Slco2b1	NM_175316	transport	21.94858	0
Havr1	NM_134248	phagocytosis, engulfment		-32.3456	0	Stard5	NM_023377	transport	15.40509	0
Rab3d	NM_031874	transport		21.02452	0	Vamp2	NM_009497	protein transport	14.02804	0
Rbp1	NM_011254	transport		-42.1358	0	Vamp3	NM_009498	protein transport	-29.035	0
Slc10a6	NM_029415	transport		25.4842	0.000252	Vps36	NM_027338	protein transport	-26.5625	0
Slc12a3	NM_019415	transport		21.44701	5.38E-05	Slc26a6	NM_134420	bicarbonate transport	-45.2886	0
Sri	NM_025618	Calcium ion transport		-16.7724	0.002028					
metabolic process										
Dgkdl	NM_177646	diacylglycerol process	metabolic	-35.5269	0	Nt5e	NM_011851	AMP catabolic process	-42.3625	0

1190003J15Rik	NM_029821	metabolic process	52.01244	0	Nf5c3	NM_026004	metabolic process	-14.1477	0
1810014F10Rik	NM_026928	fucose process	-15.5213	0	Shmt2	NM_028230	L-serine biosynthetic process	13.19365	0
2410016F01Rik	NM_022423	metabolic process	-13.3851	0	Oplah	NM_153122	glutathione metabolic process	15.12472	0
7330410H16Rik	NM_181315	metabolic process	-16.8729	0	Pde6d	NM_008801	metabolic process	-13.0084	0.000359
A4galt	NM_001170954	metabolic process	16.97297	0	Pdk3	NM_145630	carbohydrate metabolic process	-35.0831	0
Aacs	NM_030210	fatty acid metabolic process	-20.3332	0	Pecr	NM_023523	metabolic process	-21.2613	0
Abcb1b	NM_011075	metabolic process	57.6721	0	Phgdh	NM_016966	metabolic process	-18.3876	0
Acaa1a	NM_130864	metabolic process	13.60968	0	Plec3	NM_152813	lipid metabolic process	17.76329	0
Acaa2	NM_177470	metabolic process	13.09163	0.000266	Pnpla2	NM_025802	metabolic process	37.53623	0
Acat3	NM_153151	metabolic process	13.44101	0	Pnpla7	NM_146251	lipid metabolic process	13.24166	0
Acmsd	NM_001033041	metabolic process	-34.461	0	Ppara	NM_011144	lipid metabolic process	37.89764	0
Acot11	NM_025590	metabolic process	-16.2622	2.47E-06	Proc	NM_008934	metabolic process	38.37151	0
Acot3	NM_134246	metabolic process	21.57422	0	Psat1	NM_177420	metabolic process	19.73827	0
Acs11	NM_007981	metabolic process	49.04991	0	Rad51c	NM_053269	DNA metabolic process	-47.0828	0.000913
Acm3	NM_016870	metabolic process	-40.5458	0.001653	Rarres2	NM_027852	retinoid metabolic process	41.5925	0
Acss2	NM_019811	metabolic process	16.28706	0	Rev3l	NM_011264	nucleobase-containing compound metabolic process	-13.7126	0
Mccc1	NM_023644	metabolic process	-16.5403	0.017094	Mmp2	NM_008610	metabolic process	-69.0088	0
Mdh2	NM_008617	NADH metabolic process	-28.9855	0	Hmgcs2	NM_008256	cholesterol biosynthetic process	137.8433	0
Mgam	NM_001171003	metabolic process	18.11528	0	Mocs1	NM_028464	metabolic process	24.91979	0
Mgst1	NM_019946	glutathione metabolic process	25.7503	0	Naprt1	NM_172607	NAD biosynthetic process	15.13564	0

Adamts2	NM_175643	metabolic process	-17.9824	0.003531	Schip1	NM_013928	estrogen process	metabolic	-19.879	0
Agx2	NM_001031851	metabolic process	-15.138	0	Sepp1	NM_009155	selenium compound	metabolic process	-15.6316	0
Akr1b7	NM_009731	cellular lipid metabolic process	-19.9474	0	Serpina6	NM_007618	glucocorticoid	metabolic process	-82.4484	0.48718
Aldh1a1	NM_013467	metabolic process	17.13326	0.002137	Slc27a1	NM_011977	metabolic process	metabolic process	18.05086	0
Aldh2	NM_009656	metabolic process	22.04252	0	Soat1	NM_009230	lipid	metabolic process	-14.4668	0.001329
Aldh3a1	NM_007436	cellular metabolic process	15.19247	0.00641	St8sia1	NM_011374	lipid	metabolic process	-23.6356	0.148443
Alg12	NM_145477	metabolic process	-13.422	0	Sult1a1	NM_133670	metabolic process	metabolic process	13.41486	0
Apob	NM_009693	cholesterol metabolic process	92.1614	0	Tk1	NM_009387	thymidine	metabolic process	-19.9444	0.000905
Arg2	NM_009705	arginine metabolic process	-24.25	0.008547	Tgm1	NM_019984	protein	metabolic process	-27.8261	0
Atp6v1a	NM_007508	ATP metabolic process	-14.4806	0	Thg1l	NM_001080969	metabolic process	metabolic process	61.03534	0
AU014645	NM_001033201	RNA process	-14.4392	0	Top2a	NM_011623	ATP	catabolic process	-38.0146	0.37346
Car13	NM_024495	one-carbon metabolic process	-20.952	0.005342	Ube2v1	NM_023230	metabolic process	metabolic process	13.08269	0
Car14	NM_146104	metabolic process	21.66726	0	Ugp2	NM_139297	metabolic process	metabolic process	23.0245	0
Car3	NM_007606	one-carbon metabolic process	67.68891	0	Upb1	NM_133995	metabolic process	metabolic process	20.23326	0
Hmgcr	NM_008255	cholesterol biosynthetic process	-29.847	0.04594	Pdss1	NM_019501	isoprenoid	isoprenoid	-20.7671	0
Mvd	NM_138656	cholesterol biosynthetic process	-19.3896	0	Pigz	NM_172822	GPI anchor	biosynthetic process	98.01265	0
		biosynthetic process					biosynthetic process	biosynthetic process		

Car9	NM_139305	one-carbon process	25.12955	1.03E-05	1500015O10Rik	NM_024283	cyclin catabolic process	-24.4898	0.098291
Cidea	NM_007702	lipid metabolic process	73.7076	0	2410015N17Rik	NM_023203	nucleoside triphosphate catabolic process	-20.8657	0
Chst3	NM_016803	carbohydrate metabolic process	-18.6522	0	2610207P08Rik	NM_026001	RNA catabolic process	-21.2691	0
Chst7	NM_021715	carbohydrate metabolic process	-20.5578	0	Abcc6	NM_018795	ATP catabolic process	14.28068	0
Cml4	NM_023455	metabolic process	14.26884	0	Ar14a	NM_007487	GTP catabolic process	14.26012	0.103672
Cndp1	NM_177450	metabolic process	49.97351	0	Atp10d	NM_153389	ATP catabolic process	-17.415	0
Cndp2	NM_023149	metabolic process	-17.7169	0	Clpx	NM_011802	ATP catabolic process	15.6439	0
Cpb2	NM_019775	metabolic process	-44.1734	0.000491	Dnajb2	NM_178055	ER-associated protein catabolic process	13.06809	0
Cpe	NM_013494	peptide process	18.15287	0	Fbxo2	NM_176848	protein catabolic process	-13.158	0
Ctps	NM_016748	glutamine process	-27.0776	0	Hras1	NM_008284	GTP catabolic process	-17.5152	0
Ddc	NM_016672	carboxylic metabolic process	19.948	0.003572	Mgll	NM_011844	acylglycerol process	13.61841	0
Decr2	NM_011933	metabolic process	16.13747	0	Nt5c	NM_015807	deoxyribonucleotide catabolic process	-14.398	0
Dhdh	NM_027903	metabolic process	20.92931	0.007365	Psmb5	NM_011186	proteasomal ubiquitin-dependent protein catabolic process	-13.5789	0
Mthfd2	NM_008638	metabolic process	-18.2857	0.005151	Prkag3	NM_153744	fatty acid biosynthetic process	18.73279	7.91E-05
Mtrp	NM_008642	cholesterol process	29.14847	0	Ptgis	NM_008968	fatty acid biosynthetic process	13.39598	

Dnmt1	NM_010066	metabolic process	-15.7024	0	Rnaseh2b	NM_026001	RNA catabolic process	-25.3776	0
Enpp1	NM_008813	3'-phosphoadenosine 5'-phosphosulfate metabolic process	14.65909	0	Rbm8a	NM_025875	nuclear-transcribed catabolic process, mRNA process,	-37.196	2.28E-06
Enpp5	NM_032003	metabolic process	13.16757	0	Trim63	NM_001039048	nonsense-mediated decay proteasomal	-15.1668	0
Eraf	NM_133245	hemoglobin process metabolic	-26.8637	0.07265	Tuba1a	NM_011653	GTP catabolic process	-19.8711	0.05735
Es22	NM_133660	metabolic process	15.23675	0	Tuba1b	NM_011654	GTP catabolic process	-20.9481	0
Fen1	NM_007999	metabolic process	-25.0497	0	Tubb2c	NM_146116	GTP catabolic process	-15.0473	0
Ftcd	NM_080845	metabolic process	25.15024	0.000416	Tubb5	NM_011655	GTP catabolic process	-14.2874	0.003837
G6pc	NM_008061	metabolic process	42.81719	0	Tubb6	NM_026473	GTP catabolic process	-25.8553	0.019231
Gnmt	NM_010321	S-adenosylhomocysteine metabolic process	23.79311	1.63E-06	Tubg1	NM_134024	GTP catabolic process	-13.6329	0
Gsta2	NM_008182	metabolic process	47.39519	0	Ubd	NM_023137	ubiquitin-dependent catabolic process protein	15.86665	0
Gsta3	NM_010356	metabolic process	40.84407	0	Zfp36	NM_011756	mRNA catabolic process	25.04429	0
Serpinh1	NM_009825	collagen process biosynthetic	-99.0544	0	Scd1	NM_009127	fatty acid biosynthetic process	17.46294	0
Nans	NM_053179	metabolic process	-19.8874	0	Myo5a	NM_010864	metabolic process	-29.6273	0.094674
2010001M09Rik	NM_027222	positive regulation of immunoglobulin biosynthetic process	80.19955	0	Gchfr	NM_177157	negative regulation of biosynthetic process	31.94091	0
Lyz2	NM_017372	metabolic process	23.37959	0	Gpt1	NM_182805	biosynthetic process	52.47594	0
Nr1h3	NM_013839	cellular lipid process metabolic	-50.3543	0					

Gstk1	NM_029555	metabolic process	22.82957	0	Lyz	NM_013590	metabolic process	17.82854	0
Gstp2	NM_181796	metabolic process	60.22166	0	Hya1l	NM_008317	metabolic process	16.58008	3.65E-05
Gstt1	NM_008185	glutathione process	52.21402	0	Agps	NM_172666	lipid biosynthetic process	-14.9357	0
Gstt2	NM_010361	glutathione process	18.13774	0	Ak31l	NM_021299	ADP biosynthetic process	-19.8567	0
Gusb	NM_010368	metabolic process	-13.5004	0	Alas1	NM_020559	biosynthetic process	15.23939	0
Hao3	NM_019545	metabolic process	19.85823	0	Alas2	NM_009653	biosynthetic process	-19.7045	0
Hsd11b1	NM_008288	metabolic process	-30.9663	0.000266	Aldh11l	NM_027406	biosynthetic process	21.07118	0
Hsd17b2	NM_008290	metabolic process	33.57007	0	Alg1	NM_145362	biosynthetic process	40.64841	0
5430426F23Rik	NM_023792	coenzyme a process	-14.4982	0	Ass1	NM_007494	arginine biosynthetic process	13.69421	0
Ith1l	NM_008406	hyaluronan process	36.14559	0	Atp12a	NM_138652	ATP biosynthetic process	-79.4129	0.067308
Chst1l	NM_021439	carbohydrate process	-14.4217	0.000252	Atp5a1	NM_007505	ATP biosynthetic process	-22.9414	0
Ireb2	NM_022655	metabolic process	-20.795	0	Immp2l	NM_053122	metabolic process	35.471	0
Kmo	NM_133809	metabolic process	14.55305	0	Kynu	NM_027552	metabolic process	48.8839	0
Degs2	NM_027299	ceramide process	21.80249	0	Elovl2	NM_019423	fatty acid biosynthetic process	-22.9484	0.119658
Lrat	NM_023624	retinol metabolic process	27.36704	0	Fpgt	NM_029330	GDP-L-fucose biosynthetic process	14.46022	0
Cellular component									
2610110G12Rik	NM_028476	Cellular component	13.3198	0	Psmc3ip	NM_008949	nucleus	-21.1945	0
Abhd2	NM_018811	integral to membrane	-13.6163	2.70E-05	S3-12	NM_020568	cytoplasm	39.01733	0
Cabp2	NM_013878	Golgi apparatus	-18.1624	0.098291	Shfm1	NM_009169	proteasome complex	-17.4677	0
Ccdc50	NM_026202	cytoplasm	-15.2109	0.004623	Smcp	NM_008574	cytoplasm	-61.5544	0

Fga	NM_010196	extracellular space	51.35006	0	Tmod3	NM_016963	cytoskeleton	-14.705	0
Fstl1	NM_008047	extracellular region	-71.276	0	Tpm4	NM_001001491	cytoskeleton	-16.6039	0
Fus	NM_139149	cytoplasm	13.14109	4.62E-05	Acta2	NM_007392	cytoskeleton	-19.4536	0.002326
Glipr1	NM_028608	extracellular region	15.84268	0	Arpc2	NM_029711	cytoskeleton	-18.9344	0
Guca2a	NM_008190	extracellular region	16.83464	0	Dctn1	NM_007835	cytoskeleton	-20.0498	0
H2afz	NM_016750	chromosome	-13.639	0	Fgf10	NM_008002	actin cytoskeleton reorganization	15.2742	0.028909
Herpud1	NM_022331	endoplasmic reticulum	15.59876	0	Flrt1	NM_201411	integral to membrane	35.90355	0
Hmgn2	NM_016957	nucleus	-34.1507	0.017279	Flrt3	NM_178382	integral to membrane	-22.0091	0
Hspel	NM_008303	cytoplasm	-31.3728	0	Gabarapl1	NM_020590	cytoskeleton	20.65706	0
Inmt	NM_009349	cytoplasm	17.43349	0	Gtse1	NM_013882	cytoskeleton	-25.1866	0.117478
Inpp5k	NM_008916	cytosol	14.83196	0	H2-Q8	NM_023124	integral to membrane	16.0895	3.65E-05
Ints7	NM_178632	nucleus	-14.9497	0	Kif22	NM_145588	cytoskeleton	-91.0548	0.007479
Ipnk	NM_027184	nucleus	16.67279	0.000266	Kif4	NM_008446	cytoskeleton	-24.6434	0.126589
Mcm10	NM_027290	nucleus	-26.7486	0.005043	Ly6a	NM_010738	anchored to membrane	-23.7218	0
Mfap2	NM_008546	platelet formation	-13.0803	0.047046	Ly6c1	NM_010741	anchored to membrane	23.48117	0
Mkml	NM_018810	chromatin binding	-18.9252	0.001329	Marcks	NM_008538	cytoskeleton	-23.6489	0
Pif1	NM_172453	nucleus	-16.8245	0.075855	Plekha7	NM_172743	cytoskeleton	25.12792	0
Plekhh1	NM_013746	cytoplasm	55.56799	0	S100a8	NM_013650	cytoskeleton	97.00845	0
Plekhh2	NM_001033150	cytoplasm	22.34214	0	S100a9	NM_009114	cytoskeleton	106.6895	0
Pole4	NM_025882	nucleus	-18.5546	0	Sntg2	NM_172951	cytoskeleton	33.89816	0
Prep	NM_054077	extracellular region	17.43962	0	Trpv4	NM_022017	actin cytoskeleton reorganization	-14.8109	0
Ccdc80	NM_026439	extracellular matrix organization	-13.6749	0	Spry3	NM_001030293	protein binding	-19.3695	0.463675
Col4a4	NM_007735	extracellular matrix	-29.53	0	Stl3	NM_133726	cytoplasm	-14.0968	0
Col4a5	NM_007736	structural constituent collagen	-74.5682	0	Tcf19	NM_025674	nucleus	-42.7251	0.014957

D630040I23Rik	NM_201411	integral to membrane	42.71896	0	Them2	NM_025790	cytoplasm	-16.1401	0
E130010M05Rik	NM_007735	collagen	-45.0311	0	Timd2	NM_134249	plasma membrane	19.31788	0
E1av1I	NM_010485	cytoplasm	-14.3118	0	Tnnt1	NM_011618	tropoin complex	15.04938	0
E1n	NM_007925	extracellular matrix organization	-126.558	0.024573	Wdfy1	NM_027057	cytosol	-21.3266	0
E14	NM_178059	cytoplasm	-14.9892	0	2700060E02Rik	NM_026528	cytoskeleton	-17.8208	1.88E-06
Col6a3	XM_003085326	extracellular matrix	-24.8757	0.03764	Tgolin1	NM_009443	Golgi apparatus	13.99989	0
C1sh	NM_009895	activation of protein kinase C activity by G-protein coupled receptor protein signaling pathway	-38.22456	0	Errfi1	NM_133753	negative regulation of epidermal growth factor receptor signaling pathway	51.17677	0
Ctgf	NM_010217	intracellular signal transduction	14.83047	0	Per1	NM_011065	signal transduction	35.68152	0
Dag1	NM_010017	NLS-bearing import into nucleus	-14.03697	0	Per2	NM_011066	signal transduction	17.99669	0.003026
Dgkg	NM_138650	intracellular signal transduction	102.9636	0	Sh3bp2	NM_011893	SH3 domain binding	-75.0519	0
Dok4	NM_053246	MAPKK cascade	-20.83082	0	BC040758	BC040758	cell adhesion	-18.8796	0
E430001K23Rik	NM_138650	intracellular signal transduction	20.21286	0.00534188	Cd34	NM_133654	cell adhesion	-21.4587	0
Emd	NM_007927	regulation of canonical Wnt receptor signaling pathway	13.89235	0	Zc3h15	NM_026934	cytokine-mediated signaling pathway	-23.3384	0
C493	NM_010740	cell adhesion	-29.6149	0	Cldn1	NM_016674	cell junction	19.89177	0
Egr1	NM_007913	BMP signaling pathway	-20.12943	0	Cldn12	NM_022890	cell junction	-19.1516	0
Erb2	NM_001003817	cell surface receptor linked signaling pathway	13.75799	0	Nckap11	NM_153505	B cell receptor signaling pathway	15.78384	0

Ccgr	NM_008101	G-protein receptor signaling pathway	coupled	17.09542	0	Gna14	NM_008137	G-protein receptor protein signaling pathway	coupled	-104.013	0.4284188
Col4a3	NM_007734	cell adhesion	coupled	-27.1379	0	Col5a1	NM_015734	cell adhesion	coupled	-74.6412	0
Gnaq	NM_008139	G-protein receptor signaling pathway	coupled	-34.14516	0.3103922	Gng12	NM_025278	G-protein receptor protein signaling pathway	coupled	-16.66137	0.00011186
Col6a1	NM_009933	cell adhesion	coupled	-31.0921	0.029075	Col6a2	NM_146007	cell adhesion	coupled	-29.3723	0.03125
Gpr23	NM_175271	G-protein receptor signaling pathway	coupled	-15.20435	0.001370284	Gpr88	NM_022427	G-protein receptor protein signaling pathway	coupled	-65.60125	0.292735
Col8a1	NM_007739	cell adhesion	coupled	-17.0852	0.000165	C920006C10Rik	NM_133766	cell-cell adhesion	coupled	-13.5957	0
Pdlim4	NM_019417	metal ion binding	coupled	14.52085	0	D14Erttd171e	NM_177814	cell junction	coupled	-14.6108	0
Prickle3	NM_175097	metal ion binding	coupled	-19.70836	0	Lamc1	NM_010683	cell adhesion	coupled	-50.962	0
Hes1	NM_008235	Notch signaling pathway	coupled	16.05576	0	Iqgap3	NM_001033484	Ras protein transduction	signal	-16.49386	0.769874
Igh-6	Z95476	B cell receptor signaling pathway	coupled	80.21376	0	Ighg	AK131185	B cell receptor signaling pathway	coupled	229.8634	0
Mcam	NM_023061	cell adhesion	coupled	-16.8567	1.04E-07	Nid1	NM_010917	cell adhesion	coupled	-22.4405	0.019113
Lgals3bp	NM_011150	cell adhesion	coupled	-18.4092	0	Nid2	NM_008695	cell adhesion	coupled	-45.21	0
Irs2	NM_001081212	signal transduction	coupled	34.28046	0	Nphp4	NM_153424	cell junction	coupled	-13.313	0.008547
Lgals1	NM_008495	signal transduction	coupled	-25.66809	0	Pcdh24	NM_001033364	cell adhesion	coupled	-15.849	0
Mas1	NM_008552	signal transduction	coupled	-32.80442	0	Tgfb1	NM_009369	cell adhesion	coupled	13.61811	0
Ncf4	NM_008677	cell communication	coupled	13.74411	0	Vcl	NM_009502	cell adhesion	coupled	-17.4275	0
Fgg	NM_133862	signal transduction	coupled	45.89006	0	Col15a1	NM_009928	cell adhesion	coupled	-59.8793	0
Fzd6	NM_008056	signal transduction	coupled	-14.04562	0	Col16a1	NM_028266	cell adhesion	coupled	-14.5355	0
Cldn6	NM_018777	cell junction	coupled	-15.9369	0.002137						

Acvr1	NM_007394	BMP signaling pathway	-13.61456	0	Sh3tc2	NM_172628	binding	22.20255	0
Adrb2	NM_007420	G-protein coupled receptor protein signaling pathway	-24.46138	0	Rgs11	NM_001081069	G-protein coupled receptor protein signaling pathway	18.93368	0
Adipoq	NM_009605	adiponectin-mediated signaling pathway	50.4836	0	Rasgrp3	NM_207246	Ras protein signal transduction	-14.2104	0
Agrap	NM_009642	G-protein coupled receptor protein signaling pathway	-23.98177	0	Arhgef11	NM_001003912	G-protein coupled receptor protein signaling pathway	13.2442	0
Aplnr	NM_011784	G-protein coupled receptor protein signaling pathway	-46.25639	0.03418804	Npb	NM_153288	G-protein coupled receptor protein signaling pathway	-15.4529	0
Apoe	NM_009696	Cdc42 protein signal transduction	47.79893	0	Smoc1	NM_022316	signal transduction	31.1172	0
Robld3	NM_031248	activation of MAPKK activity	-15.9922	0	Soes2	NM_007706	intracellular signal transduction	-59.4885	0
Arhgef3	NM_027871	intracellular signal transduction	19.35631	0	Sostdc1	NM_025312	Wnt receptor signaling pathway	-19.0935	0
Cav1	NM_007616	MAPKK cascade	-13.47767	0	Sparc	NM_009242	signal transduction	-59.6037	0.001835
Cd3g	NM_009850	cell surface receptor linked signaling pathway	16.71161	0.00534188	Spsb2	NM_013539	intracellular signal transduction	-20.8633	0
Cdc42ep4	NM_020006	Rho protein signal transduction	13.01725	0	Tbxa2r	NM_009325	signal transduction	-28.8648	2.28E-06
Ceacam2	NM_007543	signal transduction	25.58617	5.14E-06	Trf	NM_133977	SMAD protein signal transduction	63.4724	0

