

## **Supplementary information**

### **Ascorbic acid during the suckling period is required for proper DNA demethylation in the liver**

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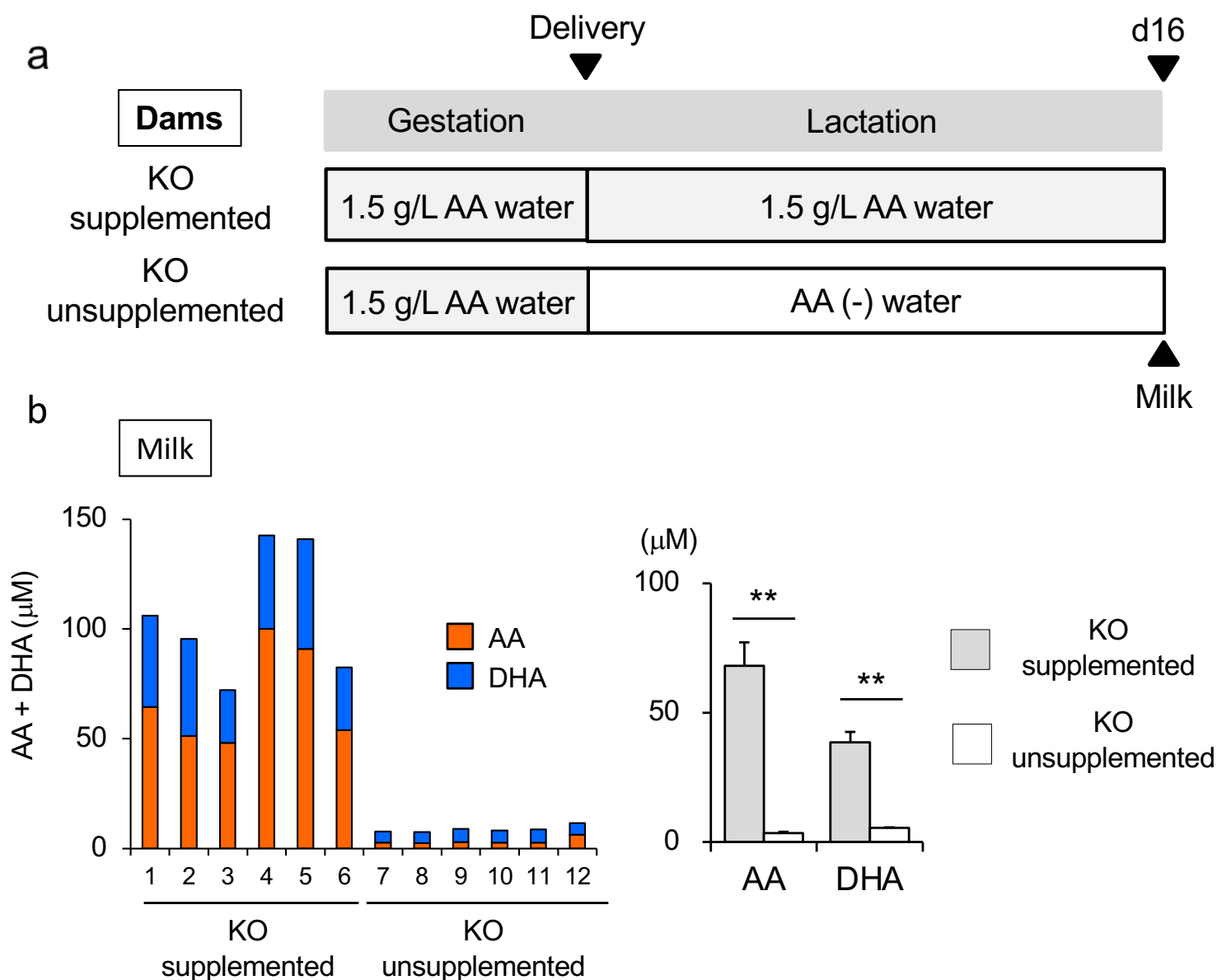
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### Supplementary Figure 1

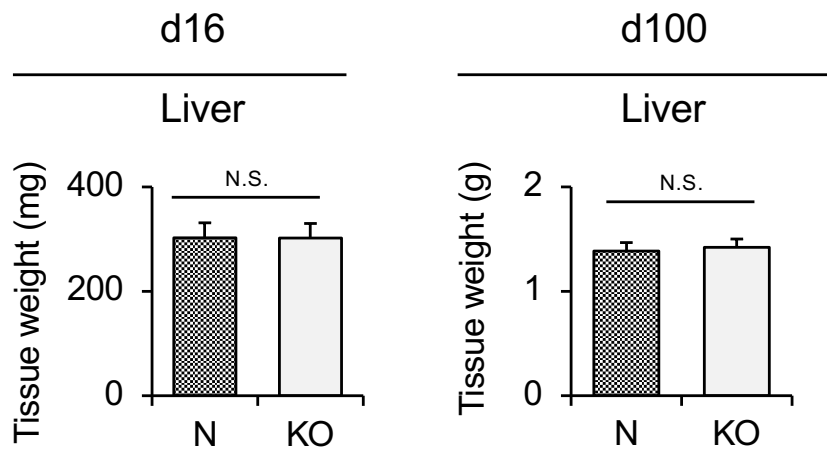
Administration of 1.5 g/L AA water to SMP30/GNL KO (KO) dams during the lactation period and AA levels in milk.

(a) Protocol of the preliminary experiment. (b) AA levels in the milk of each dam (left panel). Statistical analysis of AA and DHA levels in the milk of KO supplemented (n=6) and unsupplemented (n=6) dams (right panel).

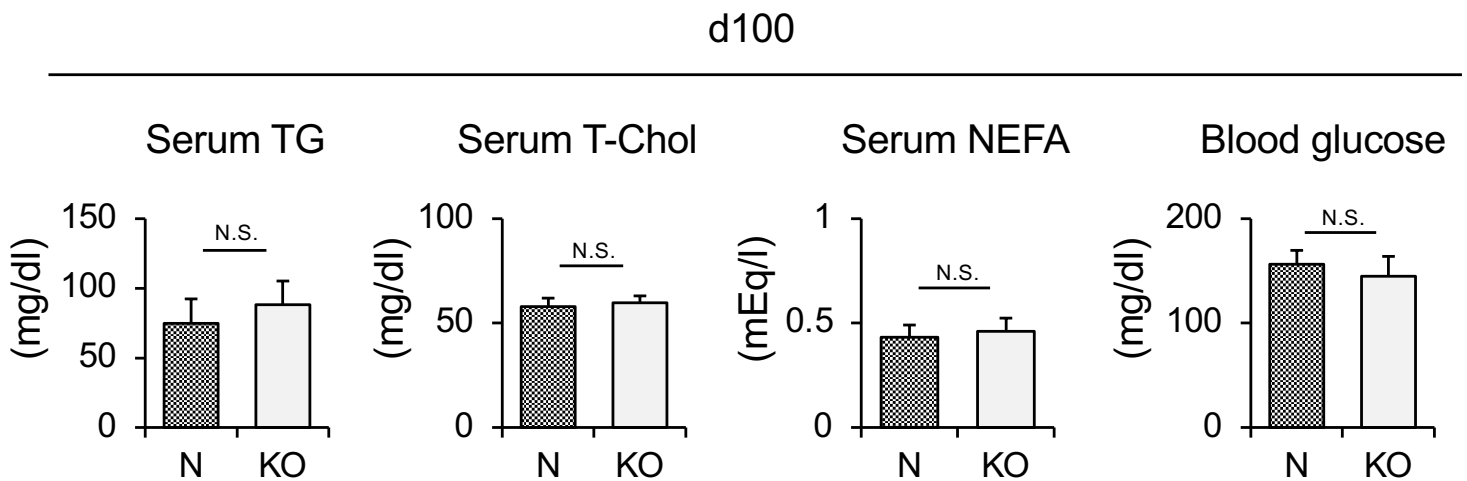
Statistical analysis using an unpaired Student's *t*-test.

Data are expressed as the mean  $\pm$  SEM. \*\**P* < 0.01 vs. KO supplemented dams.

a



b

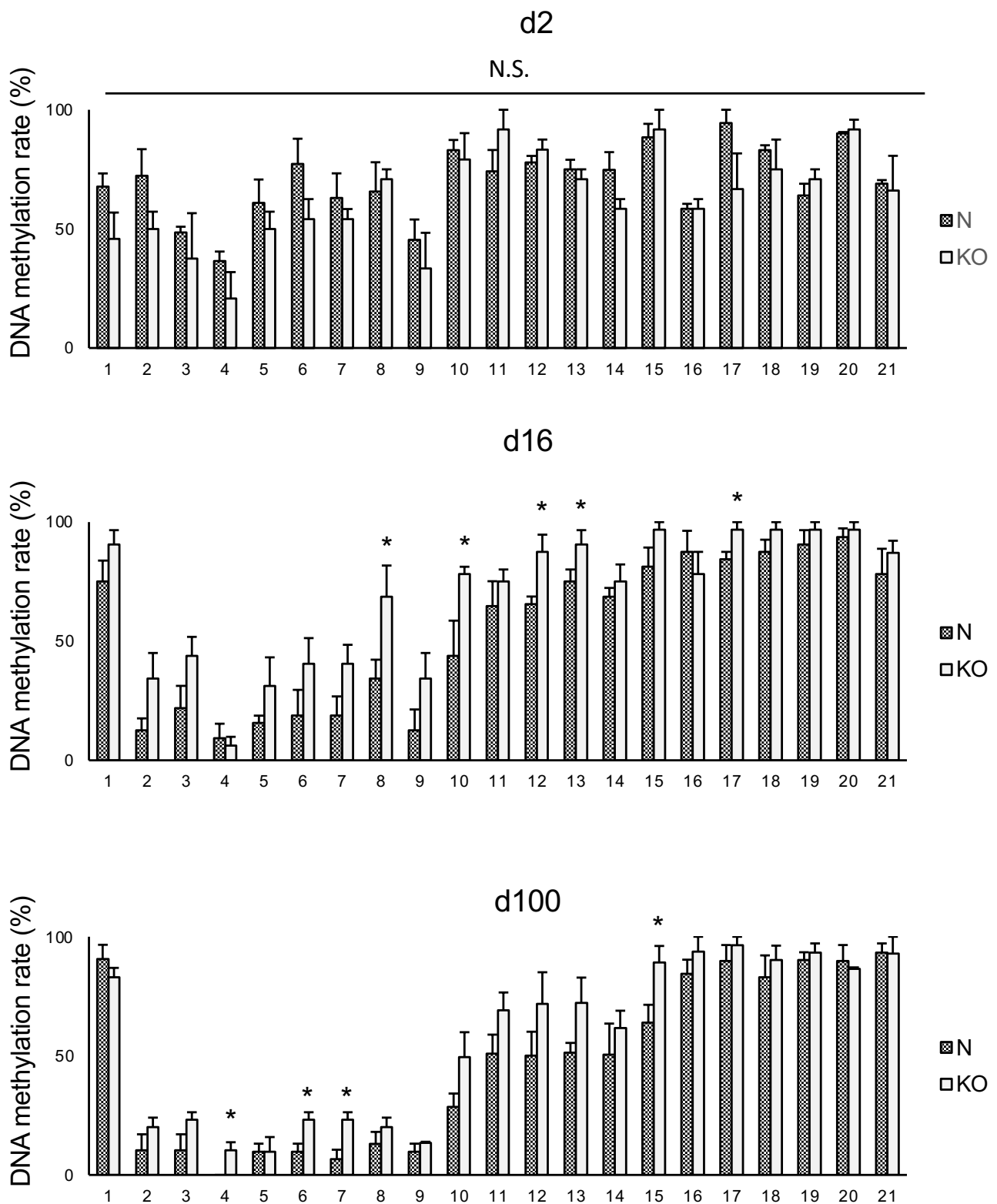


### Supplementary Figure 2

(a) Liver weights in KO and N offspring on d16 (left panel) and d100 (right panel) (n=6–8 per group).

(b) Serum TG, T-Chol, NEFA, and blood glucose concentrations on d100 (n=6–8 per group). Statistical analysis using an unpaired Student's *t*-test.

Data are expressed as the mean  $\pm$  SEM. N.S., not significant vs. N offspring.



### Supplementary Figure 3

Statistical analysis of DNA methylation rates at each CpG site of *Fgf21*.

N (n=4), KO (n=3–4). Statistical analysis using an unpaired Student's *t*-test.

Data are expressed as the mean  $\pm$  SEM. \**P* < 0.05; N.S., not significant vs. N offspring.

**Supplementary Table 1a: N vs KO 361 hypomethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P08214884	Irak3-Tmbim4	0.125921
A_68_P04499666	Camkk2	0.279317
A_68_P09233269	Acadv1-Dlgh4	0.312319
A_68_P02014894	Urm1	0.344014
A_68_P08357114	Trhde	0.34902
A_68_P01716664	Gja9	0.391103
A_68_P02014879	Urm1	0.395382
A_68_P12145566	C1ql4-2810451A06Rik	0.396091
A_68_P05957708	Nkx6-2	0.399
A_68_P05872318	Scnn1a	0.413974
A_68_P09560702	Tbx21	0.424432
A_68_P09449784	Chad	0.426009
A_68_P04844116	Cxcl4	0.461124
A_68_P06597280	Gramd1a	0.477726
A_68_P02023970	1110061N23Rik	0.481116
A_68_P06221701	Bag3	0.481848
A_68_P00632313	Mpz11	0.485613
A_68_P10712044	Ubqln1	0.496671
A_68_P10116466	Jag2	0.49781
A_68_P13434054	B3galt4	0.500667
A_68_P13174876	Dom3z	0.500697
A_68_P14209556	Rin1	0.506115
A_68_P08991491	1110036O03Rik	0.508581
A_68_P14181866	2700081O15Rik	0.513096
A_68_P13305263	Asah3-Clpp	0.514857
A_68_P13384331	Tefeb	0.51738
A_68_P13214276	Gpsm3	0.518699
A_68_P12120920	Aqp5	0.523591
A_68_P01560829	2810408M09Rik-Slc2a10	0.524824
A_68_P12864479	Popdc2	0.539121
A_68_P09437569	Zrsr1	0.540649
A_68_P06352181	BC053749-Hspb6	0.541929
A_68_P06117321	Rshl1	0.542194

A_68_P02203170	Elf5	0.546067
A_68_P09528972	Zfp454	0.546671
A_68_P13174873	Dom3z	0.548361
A_68_P09473033	Slc6a4	0.551388
A_68_P01390546	Tcfap2c	0.554509
A_68_P14274310	Xpnpep1	0.555075
A_68_P14305323	Gng3	0.560524
A_68_P00750173	Pde6d	0.568877
A_68_P14495356	I830134H01Rik-Cep55	0.572836
A_68_P07820591	Pcbp4	0.572952
A_68_P09547539	BC017647	0.575527
A_68_P03534967	Zfp593	0.581867
A_68_P07329396	Gm587	0.583631
A_68_P02602374	Gm128	0.584557
A_68_P07651775	Cspg5	0.584654
A_68_P06887581	Hsf4	0.587977
A_68_P09110706	Vamp2	0.588126
A_68_P04453213	Gpr81	0.588632
A_68_P01674549	2610528K11Rik	0.588811
A_68_P08214273	Dapk3	0.592258
A_68_P09153352	Rnf185	0.595229
A_68_P01674542	2610528K11Rik	0.597532
A_68_P12098583	Prph1	0.598549
A_68_P13920652	Npc1	0.598715
A_68_P13266254	Thbs2	0.602386
A_68_P13927242	Pcdhac2	0.602414
A_68_P01316736	Sh2d3c	0.604611
A_68_P13965496	Pstpip2	0.605318
A_68_P01519278	1700037H04Rik	0.605721
A_68_P05872300	Scnn1a	0.606359
A_68_P09547535	BC017647	0.606866
A_68_P07240689	Jund1	0.608162
A_68_P07864839	Gup1	0.608188
A_68_P01851539	Fkhl18	0.613074
A_68_P08829070	Galnt4	0.613235

A_68_P11632181	Jph4	0.616921
A_68_P09548393	Aoc3	0.622859
A_68_P03733795	Tcfap2e	0.623707
A_68_P14628736	6430550H21Rik	0.62502
A_68_P12465449	Kdelr3	0.62509
A_68_P12047179	Sh3bp1	0.625272
A_68_P00789035	Ankrd39	0.625876
A_68_P05240711	Rarres2	0.62619
A_68_P09099286	A830053O21Rik	0.627881
A_68_P00364377	Zfp451	0.627981
A_68_P08564779	Rps15	0.628822
A_68_P11217197	Ltb4r2	0.629809
A_68_P02681348	BC107364	0.632958
A_68_P00906158	Cxcr7	0.63305
A_68_P12543635	Mcm4-Prkdc	0.634384
A_68_P02898238	Cyr61	0.634977
A_68_P08002166	1700104A03Rik	0.635226
A_68_P04137921	Alox5ap	0.635499
A_68_P03957585	Necap2	0.636179
A_68_P04345682	2410025L10Rik	0.63642
A_68_P05030572	Cd27	0.639387
A_68_P04699015	Zp3	0.640996
A_68_P02267970	Chn1	0.642925
A_68_P09017457	2310040C09Rik	0.644335
A_68_P03751620	Zc3h12a	0.647902
A_68_P07374455	Rpl13	0.648297
A_68_P07140842	Pik3r2	0.649261
A_68_P05138684	Cand2	0.649927
A_68_P14545948	Ubqln2	0.650703
A_68_P08435891	Edg6	0.650775
A_68_P14235870	Scyl1	0.650869
A_68_P03743542	Zswim5	0.651373
A_68_P01851550	Fkhl18	0.652145
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A_68_P06053429	Tssc4	0.652901

A_68_P01239005	Cd40	0.653058
A_68_P09240367	Tbkbp1	0.653762
A_68_P14229760	Npas4	0.654225
A_68_P04112279	Gpr30	0.65575
A_68_P13355809	Grm4	0.656133
A_68_P09433957	0610009B22Rik	0.656763
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A_68_P12773755	EG328644	0.656902
A_68_P09042391	P2rx1	0.657686
A_68_P06596029	Ppp5c	0.657997
A_68_P09613199	Coro6	0.660504
A_68_P11423240	E130112L23Rik	0.661076
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A_68_P06900371	Ogfod1	0.662146
A_68_P06409764	Atp2a1	0.663605
A_68_P04092027	Dnajb5	0.664341
A_68_P01102474	Sox13	0.6644
A_68_P14311105	Kcnip2	0.666394
A_68_P13594483	Csnk1g3	0.667548
A_68_P00776589	Zfp142-Bcs1l	0.667806
A_68_P13056021	Tnf	0.667863
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A_68_P08025256	Pdzd3	0.670416
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A_68_P05234904	Vps24	0.717545
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A_68_P08636022	Myl6	0.723833
A_68_P01680617	Gyltl1b-Pex16	0.724056
A_68_P04422939	Ssh1-Dao1	0.72428
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A_68_P07287900	Gpr56	0.730926
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A_68_P07950323	Sh3px3	0.731444
A_68_P05389639	Ldhb	0.731474
A_68_P11613508	Kctd12	0.73185
A_68_P10446717	Irx4	0.73249
A_68_P09161409	Scrn2	0.732636
A_68_P13241937	Nfkbie	0.732862

A_68_P09104652	Aatk	0.733589
A_68_P14131501	Lox	0.734047
A_68_P03973054	Dvl1	0.734255
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A_68_P04698270	Fndc4	0.735177
A_68_P03867484	Clstn1	0.735425
A_68_P04218037	Tbx3	0.735503
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A_68_P05957743	Nkx6-2	0.741499
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A_68_P10337840	Npas3	0.745441
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A_68_P07291347	Calb2	0.746013
A_68_P03797739	Nrd1	0.746187
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A_68_P06935487	Arhgef7	0.746566
A_68_P07422403	Lyl1	0.746612
A_68_P06064392	Foxa3	0.74673
A_68_P10491539	Hist1h2ac-Hist1h2bc	0.747252
A_68_P06554044	Cd151	0.74777
A_68_P06026491	St8sia2	0.748199
A_68_P14751401	Usp11	0.7483
A_68_P00186067	A830006F12Rik	0.748319
A_68_P07309112	Dnase2a	0.748356
A_68_P13748923	Zadh2	0.748589
A_68_P02667260	Pcdh10	0.748733

A_68_P00722329	Des	0.748981
A_68_P12191245	Dgat1	0.748994
A_68_P12361670	Zfp385	0.749539
A_68_P03032928	Hcn3	0.749552
A_68_P08112408	Slc44a2	0.749614
A_68_P07512596	Apeh	0.749822
A_68_P01060395	Jph1	0.749868
A_68_P02254675	Trp53bp1	0.750289
A_68_P00957880	Eif5b	0.750973
A_68_P14299016	2900009I07Rik	0.751093
A_68_P02560176	Efna1	0.751514
A_68_P09134740	Colla1	0.7517
A_68_P10174581	Gsc	0.751757

**Supplementary Table 1b: N vs KO 2076 hypermethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P07868328	BC021608	149.5089
A_68_P12887690	Prodh	56.51778
A_68_P00618538	Etnk2	41.47804
A_68_P12362697	Gpt1	37.37363
A_68_P00900301	Pcmt1	35.40694
A_68_P12329747	Arid2	35.40673
A_68_P14169988	Abcc2	25.8389
A_68_P05887814	Echs1	21.04673
A_68_P08321362	Apon	20.82213
A_68_P05307915	Adipor2	19.10023
A_68_P02464513	Ccrn4l	17.55715
A_68_P05678107	Inmt	16.7483
A_68_P08974352	ENSMUST00000100735.1:-5885	16.20611
A_68_P09537504	Afmid	15.9442
A_68_P08563152	Ela2	15.63068
A_68_P05519173	Mkln1	15.6077
A_68_P03900413	Klhdc7a	13.73074
A_68_P13594309	Lipg	12.32939
A_68_P13318294	Ntn2l	12.10038
A_68_P07593875	Slc38a3	11.27771
A_68_P06842129	Miflip	10.56861
A_68_P05908415	2700050L05Rik	10.22173
A_68_P09723695	BC018371	10.10064
A_68_P05943561	Slc27a5	9.543653
A_68_P08066253	Slc38a3	9.35168
A_68_P07593867	Slc38a3	9.316429
A_68_P08691684	Atg5	9.177752
A_68_P08005788	Odf3l1	8.806411
A_68_P11542106	Itih1	8.359333
A_68_P04599720	Cxcl11	8.030745
A_68_P03805415	Ambp	7.904292
A_68_P04899477	Brap	7.728543
A_68_P07946875	Mst1	7.503386



A_68_P03581859	St3gal3	7.389434
A_68_P09529779	Smarcd2-Tcam1	7.286503
A_68_P09726405	Ace	7.273568
A_68_P03733137	Rnfl86	7.273549
A_68_P11040896	Peci	7.174847
A_68_P03430349	2010305A19Rik	6.971917
A_68_P12362731	Mfsd3	6.899038
A_68_P06878871	Mtus1	6.818042
A_68_P12673756	Nr1i2	6.745857
A_68_P13360070	A_68_P13360070	6.741152
A_68_P06895632	Ces1	6.672445
A_68_P04281361	Hpd	6.622698
A_68_P06842128	Mlflip	6.576161
A_68_P13374816	Zbtb12	6.548569
A_68_P04983814	Abcb9	6.515812
A_68_P04376201	Micall2	6.515287
A_68_P07599181	6230410P16Rik	6.39384
A_68_P04281361	Hpd	6.213813
A_68_P00901045	4632411B12Rik	6.157244
A_68_P08439511	Ftcd	6.083482
A_68_P09529795	Smarcd2	5.906523
A_68_P01293034	4833422F24Rik	5.881187
A_68_P13499424	Slc29a1	5.799522
A_68_P05979604	Lsr	5.644396
A_68_P06410148	Zfp710	5.633832
A_68_P01163299	0610012H03Rik	5.543465
A_68_P13319154	9530058B02Rik	5.511274
A_68_P13318311	Ntn2l	5.48332
A_68_P14259005	AI450540	5.479673
A_68_P01219086	Pck1	5.389813
A_68_P09575212	Rsad1	5.372731
A_68_P05975621	Thrsp	5.360202
A_68_P12670694	Lpp	5.226043
A_68_P03900427	Klhdc7a	5.217989
A_68_P09152032	Rnfl35	5.197919

A_68_P09016285	Myo18a	5.172534
A_68_P07501017	Apoa5	5.107357
A_68_P14652218	ENSMUST00000037596.5:-3006	5.10705
A_68_P13695623	Ablim3	5.100664
A_68_P04599730	Cxcl11	4.951345
A_68_P06293260	Mir16	4.879288
A_68_P11718847	2200001I15Rik	4.835499
A_68_P08595238	2310011J03Rik	4.822747
A_68_P10766271	Slc12a7	4.79233
A_68_P08992028	Pnpo	4.763937
A_68_P03900439	Klhdc7a	4.763754
A_68_P11762025	Rnase13	4.641695
A_68_P04543843	Bri3	4.621074
A_68_P05640859	Fabp1	4.613207
A_68_P01293529	A530013C23Rik	4.598874
A_68_P07622451	Apoc3	4.578159
A_68_P12051107	Naprt1	4.569646
A_68_P06048161	Pak4	4.564847
A_68_P08364613	Gstt3	4.540542
A_68_P05811578	Akr1d1	4.526943
A_68_P11089043	Hmgcr	4.516345
A_68_P14367604	Chka	4.444416
A_68_P09582270	2010305C02Rik	4.435232
A_68_P02145945	Clp1	4.322997
A_68_P03375546	Slc25a34	4.182237
A_68_P04546813	Slc2a9	4.170806
A_68_P03059976	Ptgfr	4.147474
A_68_P02110645	Ccbl1	4.135499
A_68_P04081654	Dio1	4.128077
A_68_P07444192	Indol1	4.120093
A_68_P13396158	Dusp1	4.086357
A_68_P12208598	2810451A06Rik	4.079221
A_68_P06312658	Tmem147	4.075241
A_68_P01920530	Uap1l1	4.0708
A_68_P06459191	Saa4	4.066211

A_68_P07697198	Acaa1a	4.063827
A_68_P11936126	Josd1-Gtpbp1	4.005444
A_68_P11406546	Ang1	3.963736
A_68_P14030415	Etf1	3.946627
A_68_P05885085	Gfpt1	3.93886
A_68_P03625246	Zswim5	3.927893
A_68_P13070859	S3-12	3.850016
A_68_P13879820	Slc23a1	3.830024
A_68_P09628447	Arfl4	3.822164
A_68_P08173092	Cyp8b1	3.787066
A_68_P05932565	Polr2i	3.785788
A_68_P06096064	Adam12	3.772641
A_68_P07894607	E330026B02Rik	3.770963
A_68_P08433161	Gstt3	3.76907
A_68_P00846988	Wdr42a	3.759741
A_68_P04755481	Ociad2	3.757315
A_68_P12046833	ENSMUST00000083630.1:-3976	3.727492
A_68_P14275989	Tbc1d12	3.71587
A_68_P05596978	Rnf103	3.715107
A_68_P09620642	Dcxr	3.673635
A_68_P10554343	Pik3r1	3.667529
A_68_P10766266	Slc12a7	3.664243
A_68_P04101457	Gsh2	3.648931
A_68_P13322670	Prr3	3.621062
A_68_P14019783	Zfp532	3.619501
A_68_P10027436	Rgs6	3.611875
A_68_P09620647	Dcxr	3.609131
A_68_P10035212	Zfyve1	3.608449
A_68_P11558065	Dhrs4	3.572378
A_68_P12411237	Derl1	3.562609
A_68_P09289118	Aldh3a2	3.556626
A_68_P06214832	Aqp8	3.552239
A_68_P02421072	Dnajb4-Fubp1	3.547501
A_68_P06631626	Wtip	3.499663
A_68_P01249319	Sephs1	3.480791

A_68_P13107839	Abcg8	3.46978
A_68_P08416674	Pbld	3.462775
A_68_P03439290	1110049F12Rik	3.449798
A_68_P01717991	Btbd14a	3.436893
A_68_P00880269	Zfand2b	3.410346
A_68_P07920795	Apoa4	3.408297
A_68_P00121769	Rpe	3.390084
A_68_P07210491	F10	3.378174
A_68_P07897281	Rdx	3.362075
A_68_P07889364	Tex12	3.355204
A_68_P06223065	Sephs2	3.352343
A_68_P13586042	C3	3.338934
A_68_P01875370	Kcnb1	3.32409
A_68_P06926631	A230052G05Rik	3.317019
A_68_P08066246	Slc38a3	3.308154
A_68_P03526224	Cda	3.307556
A_68_P06099969	Cebpa	3.298459
A_68_P08064720	6230410P16Rik	3.289929
A_68_P09413265	Adam11	3.281643
A_68_P07384679	Pabpn1	3.251871
A_68_P05678119	Inmt	3.241554
A_68_P04277065	Cxcl1	3.232483
A_68_P03300156	Anp32b	3.218152
A_68_P01342780	Ccbl1	3.191739
A_68_P13013556	Ppl	3.188637
A_68_P06983908	5033428A16Rik	3.184366
A_68_P08717087	Tcba1	3.162999
A_68_P01619771	Insm1	3.162789
A_68_P00991622	Capn8	3.147283
A_68_P09483427	Sfrs2-2600014M03Rik	3.144074
A_68_P05338523	Cmas	3.141646
A_68_P00961427	Tada11	3.138739
A_68_P14332767	Ttc9c	3.115044
A_68_P05996158	Flt3l	3.111308
A_68_P14836142	Trex2	3.110182

A_68_P14217831	Klf9	3.106999
A_68_P09257037	ENSMUST00000083595.1:-5713	3.098821
A_68_P09804391	Siva1	3.083022
A_68_P01293546	A530013C23Rik	3.051482
A_68_P06041220	0610012D14Rik	3.030374
A_68_P04831083	Fndc4-Gckr	3.023787
A_68_P09606302	Ern1	3.02252
A_68_P03863568	Il11ra1	3.013612
A_68_P12156053	Tigd5	3.005614
A_68_P08449896	Foxo3a	2.996945
A_68_P09503245	BC018371	2.995543
A_68_P03733127	Rnf186	2.995411
A_68_P12138338	Hoxc13	2.993144
A_68_P02980842	Pex2	2.984359
A_68_P13594311	Lipg	2.981591
A_68_P08110716	Acp5	2.979295
A_68_P12843197	Ehhadh	2.979046
A_68_P13107615	Ticam1	2.974038
A_68_P01585335	NM_027230:-12014	2.964752
A_68_P07561473	2310005P05Rik	2.959764
A_68_P06473014	Slc27a5	2.956857
A_68_P11399794	Gjb2	2.954948
A_68_P05596974	Rnf103	2.947421
A_68_P01776420	Tcf15	2.943853
A_68_P03670798	Masp2	2.938985
A_68_P10766257	Slc12a7	2.938504
A_68_P07467134	Slc38a3	2.929505
A_68_P06023375	Insc	2.920786
A_68_P09210759	Ccdc49	2.912065
A_68_P01440416	Fbxw2	2.910985
A_68_P05640423	Ldhb	2.910001
A_68_P03300156	Anp32b	2.903748
A_68_P01361686	Agpat2	2.896085
A_68_P06318305	Igf1r	2.89603
A_68_P09383678	Pdk2	2.895932

A_68_P01139487	Wnt6	2.894217
A_68_P08183902	Hyal1	2.88674
A_68_P13152306	Slc9a3r2	2.882054
A_68_P04831083	Fndc4-Gckr	2.881455
A_68_P06328757	B3gnt8	2.878127
A_68_P06495435	Anpep	2.867574
A_68_P10662976	Fgfr4	2.866971
A_68_P13494922	Spsb3	2.857541
A_68_P06677187	Agt	2.848927
A_68_P01655861	F730014I05Rik	2.847079
A_68_P13428964	1700001C19Rik	2.840882
A_68_P02134180	Abl1	2.834028
A_68_P01902701	2700007P21Rik	2.830826
A_68_P09480262	BC018371	2.815238
A_68_P07697209	Acaa1a	2.814605
A_68_P04661116	Sema3c	2.812567
A_68_P00641555	Nr1i3	2.806854
A_68_P07561489	2310005P05Rik	2.782162
A_68_P11169779	Ndst2	2.764472
A_68_P04323144	Sult1d1	2.758509
A_68_P09136314	Baiap2	2.757393
A_68_P08824256	Traf3ip2	2.755806
A_68_P03522568	Nbl1	2.753369
A_68_P04222183	Smardc3	2.748406
A_68_P09295953	Pctp	2.747116
A_68_P09214836	Mpdu1	2.738918
A_68_P04323144	Sult1d1	2.738819
A_68_P03250140	Inpp5b	2.721431
A_68_P01176002	Clp1	2.71744
A_68_P07734324	Tusc2	2.710532
A_68_P12240032	Eppk1	2.706811
A_68_P07772617	Rab39	2.702879
A_68_P04590703	Stx1a	2.69696
A_68_P06376689	Npas1	2.691118
A_68_P13228675	Chd1	2.68884

A_68_P01309646	Gzfl	2.685509
A_68_P02564830	Igsf3	2.676821
A_68_P09148759	Igtp	2.671107
A_68_P01342773	Ccbl1	2.670489
A_68_P00418602	Adora1	2.670161
A_68_P10556434	Rnf44-BC040758	2.662607
A_68_P07124748	Lypla3	2.661755
A_68_P12476467	Pigp	2.639006
A_68_P04081647	Dio1	2.635988
A_68_P12635594	Ehhadh	2.633028
A_68_P13251244	Cyp4f13	2.628512
A_68_P02865901	Mef2d	2.618358
A_68_P05978278	Chst8	2.614958
A_68_P08437597	Trhde	2.610955
A_68_P05278653	Capza2	2.607221
A_68_P09559562	Shmt1	2.605692
A_68_P08223987	Wdr18	2.590578
A_68_P07306669	Car5a-Banp	2.58095
A_68_P13059000	Hmga1	2.567957
A_68_P02944888	Prune	2.565067
A_68_P08388906	1810043G02Rik	2.563427
A_68_P02726221	Dclre1b	2.560761
A_68_P09729896	Phb	2.560086
A_68_P11932638	Cacnb3	2.557921
A_68_P09845387	Ppp1r13b	2.557738
A_68_P10702707	Slc35d2	2.533268
A_68_P05433825	Gm839	2.533074
A_68_P00714552	Uap1	2.530881
A_68_P12051103	Naprt1	2.525914
A_68_P05893671	6330512M04Rik	2.521061
A_68_P04983819	Abcb9	2.518814
A_68_P07254767	Elmod2	2.51774
A_68_P08425563	Lss	2.511958
A_68_P08614767	Rap1b	2.496942
A_68_P10863296	Lect2	2.496456

A_68_P06873958	Ranbp10	2.496356
A_68_P02093470	U46068	2.488964
A_68_P09612757	Pcyl2	2.481565
A_68_P01797463	A530013C23Rik	2.481148
A_68_P08173101	Cyp8b1	2.475308
A_68_P13251243	Cyp4f13	2.475173
A_68_P05466381	Zc3hc1	2.471338
A_68_P05358495	Rassf8	2.470641
A_68_P09500328	Tspan10	2.468053
A_68_P03296780	Klhl9	2.464396
A_68_P08624242	Apba3	2.463312
A_68_P05439808	Irak2	2.457734
A_68_P08376605	Lrrc3	2.455004
A_68_P14081599	5730405I09Rik	2.449208
A_68_P13093038	1600002H07Rik	2.446507
A_68_P04114789	Add1	2.444557
A_68_P11865033	Lgals2	2.443036
A_68_P04107032	0610009O03Rik	2.441583
A_68_P04403090	Slc2a9	2.440666
A_68_P07946873	Mst1	2.440302
A_68_P02060698	4933440H19Rik	2.437239
A_68_P09398667	2210020M01Rik	2.434596
A_68_P05945054	Usf2	2.434095
A_68_P04390199	Ung	2.429486
A_68_P08533341	Nodal	2.424166
A_68_P03513611	St3gal3	2.422837
A_68_P04069200	Klf4	2.422161
A_68_P06624530	Centd2	2.420805
A_68_P09252755	ENSMUST00000100735.1:-6717	2.420324
A_68_P01582438	Surf2	2.417966
A_68_P02999674	Slc10a5	2.415681
A_68_P03087438	Pklr	2.408139
A_68_P06061704	Myo7a	2.407684
A_68_P08415566	Mettl7b	2.405015
A_68_P04107032	0610009O03Rik	2.402721



A_68_P05972322	Xylt1	2.401768
A_68_P02025392	Ntng2	2.399047
A_68_P03632444	2810405K02Rik	2.398607
A_68_P03359505	Trim62	2.398127
A_68_P12677554	Mrap	2.392233
A_68_P02764963	Tbl1xr1	2.387782
A_68_P09350828	Smcr8	2.374491
A_68_P13172382	Rhot2	2.366167
A_68_P10532742	Auh	2.364403
A_68_P06683149	Gtl3	2.357396
A_68_P10735929	Hmger	2.35734
A_68_P07142897	Taf1c	2.354426
A_68_P03496599	Il22ra1	2.347343
A_68_P11308601	Tgm1	2.346194
A_68_P06523791	Zfp94	2.343766
A_68_P02904357	Kcna3	2.335647
A_68_P02154342	NM_027230:-12364	2.329461
A_68_P01628111	Dab2ip	2.328603
A_68_P10573446	Larp5	2.324369
A_68_P08191110	Ifrd2	2.323141
A_68_P09697830	Sec14l4	2.32306
A_68_P00396257	Hhat	2.321683
A_68_P08064723	6230410P16Rik	2.320892
A_68_P14421027	Pdlim1	2.320329
A_68_P04909167	D5Wsu178e	2.319522
A_68_P09195968	Asgr1	2.312983
A_68_P01772350	Lcn12	2.312137
A_68_P07306676	Car5a	2.309876
A_68_P09350836	Smcr8	2.309123
A_68_P07248138	Kifc3	2.303954
A_68_P02454024	Mtmr11	2.296738
A_68_P04909167	D5Wsu178e	2.295616
A_68_P01700350	Set	2.294143
A_68_P09739582	Nfe2l1	2.292697
A_68_P03359505	Trim62	2.291905

A_68_P06372045	C730027J19Rik	2.291516
A_68_P09082170	Pitpna	2.287789
A_68_P01943462	Ctsz	2.281854
A_68_P12672593	Polr2h	2.276607
A_68_P08834117	Ddit4	2.268307
A_68_P04318728	Pebp1	2.267146
A_68_P13546277	Ptk7	2.260121
A_68_P02116222	Slco4a1	2.25961
A_68_P13319163	9530058B02Rik	2.248109
A_68_P06653585	Plekha4	2.243493
A_68_P07309218	Kifc3	2.242923
A_68_P06804280	Irf2	2.242819
A_68_P04608378	Rnf6-Cdk8	2.235086
A_68_P12448089	Csnk1e	2.230008
A_68_P04899482	Brap	2.227235
A_68_P08628191	Cdc34	2.223585
A_68_P04764801	Sh2b2	2.223334
A_68_P15086158	Bcor	2.222255
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A_68_P12980215	Cdgap	1.670838
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A_68_P14501275	Syvn1	1.66549
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A_68_P06166301	Sphk2	1.66475
A_68_P02004607	Gm1631	1.664048
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A_68_P10461509	Arid4b	1.661061
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A_68_P12080801	Krt18	1.660603
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A_68_P08833006	Bsg	1.634862
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A_68_P14319570	Fen1	1.516319
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A_68_P08297291	Map2k2	1.515346
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A_68_P15093622	Nxt2	1.514999
A_68_P12929782	Ap2m1	1.514902
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A_68_P10905572	Nrn1	1.34968
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A_68_P06929857	Tpm4	1.349483
A_68_P02390624	Crcr1	1.349158
A_68_P07172113	Kcnn1-A230052G05Rik	1.349071
A_68_P09369987	Apoh	1.349015
A_68_P14038094	Sh3tc2	1.348769
A_68_P07807897	Plscr2	1.348715
A_68_P00542050	Npas2	1.348586
A_68_P13388154	Bat5	1.348585
A_68_P12836522	Bdh1	1.348484
A_68_P13747694	Rnuxa	1.348397
A_68_P06035698	Plekhf1	1.348306
A_68_P00711134	Slc45a3	1.348202
A_68_P14849946	Kcnd1	1.347914
A_68_P10564825	Emb	1.34784
A_68_P03318310	Slc6a9	1.34777
A_68_P11517987	Lgi3	1.347758
A_68_P09089981	Tax1bp3	1.347588
A_68_P03452908	Olf157	1.347536
A_68_P02991577	Sec22b	1.347466
A_68_P08773234	Ikzf4	1.346955
A_68_P05918934	Peg3	1.346499
A_68_P02412661	Cyr61	1.346407
A_68_P12213551	Gpihbp1	1.346302
A_68_P03755813	Nans	1.346246
A_68_P12242254	Syng1	1.345938
A_68_P06522134	Vps33b	1.345822
A_68_P01498090	Plcg1	1.345814
A_68_P09629443	Kctd2	1.345761
A_68_P04193832	Nudt1	1.345384
A_68_P06983274	Jund1	1.345365
A_68_P03959086	Slc45a1	1.345095
A_68_P10202512	Lin52	1.344946
A_68_P11680943	Entpd4	1.344925
A_68_P04316025	Arhgap24	1.344622
A_68_P09776288	Acot1	1.344496

A_68_P14207949	D930010J01Rik	1.344216
A_68_P10251378	Glrx5	1.344153
A_68_P07939274	4931406C07Rik-Josd3	1.344001
A_68_P04331822	Cdc7	1.343979
A_68_P07688516	2200002K05Rik	1.343834
A_68_P07718457	Topbp1	1.343785
A_68_P09515612	Arl5c	1.34352
A_68_P06504997	Slc5a2	1.343518
A_68_P07887108	Dock6	1.343508
A_68_P00418617	Adora1	1.343472
A_68_P03273020	Srrm1	1.342971
A_68_P14423460	Ehd1	1.34275
A_68_P04629383	Pitpnm2	1.342653
A_68_P09340278	Cd300e	1.342653
A_68_P05255015	Hoxa2	1.342652
A_68_P03954968	Eno1	1.342574
A_68_P09459434	Dus11	1.342536
A_68_P01813685	Dolpp1	1.342438
A_68_P04836896	A330070K13Rik	1.342419
A_68_P04062108	Rpl11	1.342401
A_68_P13873326	Nfatc1	1.342216
A_68_P03439034	2810432D09Rik	1.342085
A_68_P09758153	Lrrc9	1.342081
A_68_P13436543	Bysl	1.34191
A_68_P08531371	Nfic	1.341815
A_68_P04944285	Zfand2a	1.341688
A_68_P02567209	Cth	1.341618
A_68_P14961796	Trpc5	1.341591
A_68_P07349274	Rbm13	1.341505
A_68_P09374043	Trim47	1.341361
A_68_P04803354	Arpc1b	1.341301
A_68_P00206509	St8sia4	1.341296
A_68_P12438489	Sfrs2ip	1.341195
A_68_P12930757	Usp25	1.341182
A_68_P00882129	2310038H17Rik	1.341068



A_68_P14109314	Osbpl1a	1.340885
A_68_P02219550	Traf1	1.340575
A_68_P08679914	Scyl2	1.340469
A_68_P04093287	Cited4	1.34041
A_68_P03930447	Cldn19	1.340004
A_68_P10050034	Trmt5	1.339914
A_68_P11924228	L3mbtl2	1.339842
A_68_P12189029	Card10	1.339354
A_68_P04493529	Tbx3	1.339308
A_68_P09512501	Butr1	1.339248
A_68_P00163908	Twist2	1.339236
A_68_P01248802	Lrrc4c	1.339142
A_68_P01823709	Nphp1	1.339022
A_68_P01075327	Nmur1	1.338942
A_68_P05653891	Pde3a	1.338797
A_68_P01396752	Itgb6	1.338786
A_68_P10703955	Bhmt	1.338775
A_68_P15177773	Nsbp1	1.338724
A_68_P11648927	Mettl6	1.338673
A_68_P08773799	Dnajc14	1.338628
A_68_P05150769	Tax1bp1	1.33797
A_68_P08979889	Krt42	1.337941
A_68_P04225894	Slc10a6	1.337922
A_68_P15175273	Tefe3	1.337766
A_68_P05428176	Slc2a3	1.337702
A_68_P13502362	Lsm2	1.337471
A_68_P09298703	Myo18a	1.337009
A_68_P12097337	Krt73	1.336887
A_68_P05233471	1110001J03Rik	1.336783
A_68_P03360536	2410166I05Rik	1.336782
A_68_P01092733	Lbr	1.336759
A_68_P03307859	Hp1bp3	1.336706
A_68_P00401634	Adora1	1.336581
A_68_P01553757	Mapk8ip1	1.336339
A_68_P10316211	Zfyve26	1.336171

A_68_P09640992	Psmc3ip	1.336165
A_68_P06887604	Hsf4	1.336164
A_68_P06706147	BC021891	1.336058
A_68_P07337104	Gfod2	1.335881
A_68_P06926624	A230052G05Rik	1.335854
A_68_P01342599	2010011I20Rik	1.33585
A_68_P02265690	C230093N12Rik	1.335798
A_68_P09379981	Smarcd2-Tcam1	1.33561
A_68_P14525996	Timm8a1	1.335288
A_68_P09104644	Aatk	1.335067
A_68_P04735366	Ugt2a3	1.334872
A_68_P04308903	Areg	1.334266
A_68_P04062108	Rpl11	1.334152
A_68_P09582843	Itga3	1.334047
A_68_P09021305	Fmnl1	1.333958
A_68_P14711280	Gpr64	1.333822
A_68_P04162059	Zfp326	1.333766
A_68_P04580659	Mpv17	1.333711
A_68_P14431095	Chuk	1.333707
A_68_P05935174	Cd33	1.3337
A_68_P01869178	Foxa2	1.333583
A_68_P05543279	Kbtbd8	1.333445
A_68_P03533898	Nbl1	1.333352
A_68_P12809678	Tmem50b	1.333178
A_68_P10902235	Pitx1	1.333066
A_68_P04731732	Sdsl	1.332863
A_68_P02825852	Cd1d1	1.332847
A_68_P04275151	Arpc1b	1.332839
A_68_P04844132	Cxcl4	1.33282
A_68_P09880659	Acot1	1.33255
A_68_P14042310	Pcdhga8	1.332507
A_68_P07815979	Gk5	1.332291
A_68_P12751159	B830017H08Rik	1.33221
A_68_P01670540	Rpl35	1.332147
A_68_P04451113	Slc5a1	1.331686

A_68_P10105119	Acot5	1.331665
A_68_P03412051	1700018C11Rik	1.331334
A_68_P07278572	Spfh2	1.331234
A_68_P04597777	Corin	1.331151
A_68_P09378071	Pfn1	1.331113
A_68_P07540560	Aldh1a2	1.331025
A_68_P06373812	Ucp2	1.330931
A_68_P07561548	Clk3	1.33083
A_68_P06653589	Plekha4	1.330529
A_68_P01299923	Hoxd3	1.330252
A_68_P02576267	Gnb4	1.330108
A_68_P09190672	Nr1d1	1.330101
A_68_P08649165	Stk11	1.330069

**Supplementary Table 1c: N vs KO 574 hypomethylation genes on d100**

Probe Name	Gene Name	Methylation difference value
A_68_P01158774	Rpp38	0.117586
A_68_P04306467	Whsc2	0.44667
A_68_P04768574	Nkx6-1	0.450274
A_68_P04768574	Nkx6-1	0.456722
A_68_P11079538	Sirt5	0.469916
A_68_P05715101	Xpc	0.47726
A_68_P09018865	Cbx4	0.48022
A_68_P02314772	Mtx1-Thbs3	0.48654
A_68_P06626588	6430526N21Rik	0.505216
A_68_P08138715	Mcam	0.512579
A_68_P01143715	Bai3	0.520126
A_68_P14431113	Mxi1	0.521987
A_68_P03651216	Acot11	0.526222
A_68_P04365059	Klb	0.534576
A_68_P07679434	Atp1b3	0.535726
A_68_P05540049	Erc1	0.538101
A_68_P03883271	Scp2	0.544018
A_68_P11132389	Gnl3	0.550753
A_68_P06643826	Gpr4	0.554059
A_68_P09805220	Trib2	0.554567
A_68_P10745919	Ipo11	0.55673
A_68_P14628736	6430550H21Rik	0.556792
A_68_P13302036	Six2	0.55781
A_68_P07912195	Yap1	0.55967
A_68_P02367976	Isg2012	0.561072
A_68_P13730781	Sema6a	0.56479
A_68_P02919830	Lrrn6d	0.568718
A_68_P12871003	Sema5b	0.577088
A_68_P06843515	2810428I15Rik	0.578968
A_68_P06955360	Ank1	0.578969
A_68_P10309940	Gsc	0.581853
A_68_P01134685	Col19a1	0.583897
A_68_P05939018	A630091E08Rik	0.585316

A_68_P07923222	AI593442	0.586695
A_68_P08005788	Odf3l1	0.589204
A_68_P14157373	Sorcs1	0.589494
A_68_P05596974	Rnf103	0.590833
A_68_P01737808	Srp14	0.600586
A_68_P14240187	Sart1	0.601667
A_68_P08777976	A530089I17Rik	0.602493
A_68_P11820556	Tmem110	0.603203
A_68_P04028116	Cldn19	0.604347
A_68_P11922964	Klf10	0.605503
A_68_P05500620	Stk31	0.60648
A_68_P10176316	Zbtb25	0.61219
A_68_P04104973	Tpte2	0.612323
A_68_P00708979	Pax3	0.612669
A_68_P04742115	Pkd2	0.613064
A_68_P02865901	Mef2d	0.615885
A_68_P07107737	Gse1	0.616863
A_68_P10692125	Mtap1b	0.616997
A_68_P06699548	Pou4f2	0.622794
A_68_P01482084	Idh3b-Ebf4	0.624479
A_68_P11770812	Nefm	0.625311
A_68_P12189296	Letmd1	0.625624
A_68_P10411237	Atxn7l4	0.626317
A_68_P10375909	Six6os1	0.626728
A_68_P09966298	1810011O16Rik	0.626949
A_68_P06843937	Hydin	0.628241
A_68_P03226190	Pla2g2e	0.630122
A_68_P08913495	Hmha1	0.631253
A_68_P06984570	Psmc7	0.631504
A_68_P04104973	Tpte2	0.631847
A_68_P02709474	Foxo1	0.632642
A_68_P01413716	D430039N05Rik	0.635353
A_68_P11738050	Homez	0.639324
A_68_P08104050	Pcsk7	0.640161
A_68_P11559162	Nid2	0.642847

A_68_P12432050	Galnt6	0.643854
A_68_P07078935	Atbf1	0.644039
A_68_P09378399	Ppp1r1b	0.645095
A_68_P11019872	Ptch1	0.645149
A_68_P03226190	Pla2g2e	0.646786
A_68_P08777819	Nfic	0.647609
A_68_P13317398	Arhgdig	0.648079
A_68_P14075007	2810433K01Rik	0.651669
A_68_P09693315	2010305C02Rik	0.65459
A_68_P03139948	Zbtb7b	0.6547
A_68_P06327058	Slc28a1	0.655497
A_68_P05552653	Gabarapl1	0.655712
A_68_P10113786	Bcl11b	0.655849
A_68_P11799087	Lgals3	0.656278
A_68_P04834752	Cutl1	0.65636
A_68_P07640747	Fxyd6	0.657501
A_68_P13232871	Itfg3-Luc7l	0.657704
A_68_P05905001	Ccnd1	0.658338
A_68_P09782980	Kcnfl	0.658418
A_68_P11108606	Ripk1	0.658581
A_68_P13439820	Ptpns	0.65903
A_68_P01431419	Tcfap2c	0.659031
A_68_P01134681	Col19a1	0.660059
A_68_P06922018	Lrrc25	0.662443
A_68_P04137135	Smurf1	0.663187
A_68_P06668394	Igf2	0.664825
A_68_P06631626	Wtip	0.66487
A_68_P11404297	Selk	0.666577
A_68_P04661116	Sema3c	0.667061
A_68_P05301787	LOC380687	0.667457
A_68_P09195114	A830031A19Rik-Bcl11a	0.667459
A_68_P03184759	Gucyla3	0.668029
A_68_P15095336	Hdac8	0.669755
A_68_P05088298	Hipk2	0.669892
A_68_P09732738	1500005I02Rik	0.67009

A_68_P09498627	Mink1	0.670587
A_68_P12129669	Csad	0.670684
A_68_P06293636	Luzp2	0.670984
A_68_P08666230	Hnrph3	0.671512
A_68_P08504576	Cfd	0.672942
A_68_P03807576	Wdtd1	0.672964
A_68_P03495355	Mib2	0.673332
A_68_P04519541	Gfi1	0.673533
A_68_P05565689	Ptms	0.674708
A_68_P04178083	Phox2b	0.676166
A_68_P11486688	Lect1	0.676721
A_68_P06358071	Jmjd5	0.677043
A_68_P12254359	C730034F03Rik	0.677381
A_68_P06205022	Lhb	0.677382
A_68_P10787030	Nr2f1	0.678045
A_68_P11173846	Fgf17	0.678116
A_68_P07518868	Chrna5	0.678525
A_68_P09122772	Accn1	0.678624
A_68_P04519541	Gfi1	0.678924
A_68_P01804429	Pxmp4-Zfp341	0.678979
A_68_P04629065	Gfi1	0.679573
A_68_P12511902	Sim2	0.679789
A_68_P13620460	LOC639653	0.679809
A_68_P01875370	Kcnb1	0.680068
A_68_P09880778	Rps7	0.680826
A_68_P13786129	Zfp521	0.681316
A_68_P15206339	Sox3	0.681804
A_68_P02205842	Rya3	0.682398
A_68_P04216765	Hip1	0.682562
A_68_P01733029	Rassf2	0.683103
A_68_P13319154	9530058B02Rik	0.683382
A_68_P00719131	Lad1	0.683445
A_68_P05039877	Ccnd2	0.683838
A_68_P03786862	Tmem64	0.684374
A_68_P11936126	Josd1-Gtpbp1	0.684594

A_68_P02165297	Cpxm1-4933425O20Rik	0.684787
A_68_P06476351	Bcam	0.685215
A_68_P10132985	Id2	0.685735
A_68_P06075223	Aplp1	0.686026
A_68_P02046877	Egfl7	0.686442
A_68_P04107140	Dnajb6	0.687186
A_68_P04949699	Otof-1700001C02Rik	0.687455
A_68_P01831728	Ddx31	0.68769
A_68_P04935832	Affl1	0.688011
A_68_P01147199	Lmod1	0.688223
A_68_P01624279	A430105I19Rik-1810007E14Rik	0.688864
A_68_P05448318	Kcna5	0.68927
A_68_P14336883	AU041783	0.689526
A_68_P13555549	Ppm1b	0.689595
A_68_P08112343	C230081A13Rik-Hmg20a	0.690693
A_68_P13789140	Arhgap12	0.69101
A_68_P05969338	Htra1	0.691246
A_68_P02060987	Defb25-Rem1	0.691256
A_68_P02681301	Lhx8	0.692064
A_68_P13976384	Csnk1a1	0.69207
A_68_P11912864	Krt8	0.692364
A_68_P08990544	Cnot8	0.692458
A_68_P14314284	Trim8	0.692729
A_68_P07882801	Cplx3	0.692778
A_68_P00234397	Enah	0.692884
A_68_P03926726	Acot11	0.693338
A_68_P07453625	Ky	0.693542
A_68_P06387117	Hdgfrp3	0.693637
A_68_P02560192	Efna1	0.693787
A_68_P01294402	Tlk1	0.693973
A_68_P06739082	2310022B05Rik	0.694111
A_68_P13303514	Zfp101	0.694683
A_68_P02489623	Ankrd34	0.694873
A_68_P11433919	Tpt1	0.695004
A_68_P11927843	Prlr	0.695392



A_68_P09466672	Atp5g1	0.695604
A_68_P06237422	Msx3	0.695632
A_68_P04126741	AA407659	0.696251
A_68_P04730667	Ddx55	0.696903
A_68_P00271539	Accn4	0.697042
A_68_P10325481	Mycn	0.69712
A_68_P04262240	Mapk10	0.697561
A_68_P14260104	Spnb3	0.698115
A_68_P06373804	Ucp2	0.698182
A_68_P12204339	Panx2	0.69846
A_68_P07355188	Cdh11	0.698509
A_68_P08435891	Edg6	0.699009
A_68_P15144551	Sat1	0.699452
A_68_P09535003	B4galnt2	0.700355
A_68_P13398221	Tnrc5	0.700688
A_68_P03863568	Il11ra1	0.700935
A_68_P15022938	Irak1	0.701275
A_68_P03668203	Slc44a1	0.701482
A_68_P07304552	BC048644	0.701887
A_68_P08840096	Lrig3	0.701897
A_68_P07602168	Crabp1	0.701967
A_68_P06410543	Mesp1	0.702275
A_68_P13570124	1700106N22Rik	0.702611
A_68_P14242816	Sorbs1	0.702781
A_68_P13090914	Telo2	0.70373
A_68_P06208597	2900093B09Rik	0.703745
A_68_P04522816	Pdx1	0.703949
A_68_P10018570	Ap4s1	0.704897
A_68_P11319776	Stk24	0.704949
A_68_P00708991	Pax3	0.705136
A_68_P07428129	Irx3	0.705412
A_68_P06515895	Klk7	0.705658
A_68_P07142897	Taf1c	0.705989
A_68_P08773789	1110012D08Rik-Dnajc14	0.706013
A_68_P06922348	Insl3	0.706748

A_68_P13403566	Cend3	0.70681
A_68_P05217166	Ephb6	0.706857
A_68_P01797463	A530013C23Rik	0.707271
A_68_P01725854	Ctsa	0.707914
A_68_P12694774	Olig2	0.708003
A_68_P06756488	Zmat4	0.708105
A_68_P13463798	Zbtb22	0.708449
A_68_P07897281	Rdx	0.708498
A_68_P12725023	Ap2m1	0.708837
A_68_P09608031	Egfr	0.709227
A_68_P04949699	Otof-1700001C02Rik	0.709397
A_68_P13215738	Mrps18b	0.709609
A_68_P04808481	Ephb4	0.709773
A_68_P07809706	Rbms3	0.710201
A_68_P09536836	Pnmt	0.710279
A_68_P03087438	Pklr	0.710372
A_68_P10243773	Bcl11b	0.710504
A_68_P14224733	Map4k2	0.710717
A_68_P02095165	A930034L06Rik	0.71119
A_68_P12098370	Plec1	0.711219
A_68_P10800279	Pols	0.711318
A_68_P13453584	Prkce	0.711453
A_68_P00484490	Igfbp5	0.71166
A_68_P10400455	Calm1	0.711838
A_68_P08527794	Psap	0.712247
A_68_P00961427	Tada1l	0.712351
A_68_P11292465	Nfatc4	0.712508
A_68_P09846917	Rhob	0.712696
A_68_P06630253	Shkbp1	0.712726
A_68_P04696354	Iqce-AA881470	0.712747
A_68_P13158664	1300003B13Rik	0.713376
A_68_P14426150	Lzts2	0.713412
A_68_P13678065	Nfatc1	0.713504
A_68_P06826869	Pcm1	0.713608
A_68_P01687732	Gatm	0.713882

A_68_P00932178	Epha4	0.713892
A_68_P03738288	Serinc2	0.713937
A_68_P04475202	Caln1	0.713952
A_68_P06550934	Lrrc4b	0.714051
A_68_P10114516	BC048191:656	0.714552
A_68_P08513384	Slc35d3	0.714612
A_68_P01381082	Myt1	0.715598
A_68_P14228699	Eef1g	0.715616
A_68_P06506665	Apoe	0.715624
A_68_P10626473	BC003212:-702	0.715632
A_68_P09162950	Tmc6	0.716272
A_68_P01886185	Stmn3	0.716399
A_68_P01254928	Ntng2	0.71654
A_68_P13240096	Rpl7l1	0.716827
A_68_P10928545	Gcnt2	0.716852
A_68_P13651831	Sil1	0.717036
A_68_P03345996	Cdkn2a	0.7171
A_68_P13131084	Cd2ap	0.717138
A_68_P14301707	Rcor2	0.717149
A_68_P06506007	Gys1	0.717228
A_68_P00702326	ENSMUST00000083599.1:-2617	0.717343
A_68_P06515293	Opa3	0.717569
A_68_P07295590	5830457O10Rik	0.717591
A_68_P12730511	Senp5	0.717678
A_68_P12052833	AW549877	0.717799
A_68_P06948296	Dctn6	0.717894
A_68_P11280485	Jph4	0.717962
A_68_P13917502	Ccdc100	0.718234
A_68_P12963407	Igsf4d	0.718612
A_68_P03926726	Acot11	0.719132
A_68_P03581099	5430416O09Rik	0.719254
A_68_P09350088	Pmp22	0.719328
A_68_P04926196	Fzd10	0.719438
A_68_P00400062	Kif1a	0.71952
A_68_P04967489	Med28	0.719628

A_68_P02835248	Celsr2	0.719747
A_68_P02622581	Chrn2	0.719778
A_68_P08575022	Col13a1	0.719844
A_68_P02899649	Adamtsl4	0.720331
A_68_P01515364	ENSMUST00000083577.1:-5512	0.720383
A_68_P07570037	Kirrel3	0.720504
A_68_P14495624	Nkx2-3	0.721408
A_68_P14218567	Aldh18a1	0.721656
A_68_P07912188	Yap1	0.72185
A_68_P01782726	Evx2-Hoxd13	0.721966
A_68_P11569601	Ebf2	0.722002
A_68_P06685279	Gpr124	0.722235
A_68_P01966322	C430004E15Rik	0.722636
A_68_P07646992	Als2cl	0.722738
A_68_P07228622	Cotl1	0.722757
A_68_P10408377	Actr10	0.723072
A_68_P10949115	Fst	0.723107
A_68_P06764028	Spg7	0.723217
A_68_P09370370	Cbx8	0.723395
A_68_P09455667	Clk4	0.723549
A_68_P14425233	Ldb1	0.723554
A_68_P05840537	Tra2a	0.723616
A_68_P10021274	Fos	0.723796
A_68_P04606333	A930017N06Rik	0.723866
A_68_P06958349	Wrn	0.724148
A_68_P09015003	A230051G13Rik	0.724167
A_68_P06412434	Bnc1	0.724338
A_68_P09703855	Epn3	0.72453
A_68_P12129893	Cdc42ep1	0.724796
A_68_P07935467	Bsn	0.724924
A_68_P00536905	Btg2	0.725066
A_68_P09861753	Degs2	0.725268
A_68_P08033503	BC018242	0.725339
A_68_P04199774	Kctd10	0.72534
A_68_P04114789	Add1	0.725696

A_68_P13256078	Tbc1d22b	0.725803
A_68_P11576401	Wnt5a	0.725829
A_68_P06274233	Gdpd5	0.725896
A_68_P13431017	4930546H06Rik	0.726111
A_68_P07561476	2310005P05Rik	0.726183
A_68_P12730433	Igf2bp2	0.726511
A_68_P13267090	Hsp90ab1	0.726632
A_68_P09642978	Stx8	0.726649
A_68_P05822242	9630033F20Rik	0.726654
A_68_P08525614	Phlda1	0.72719
A_68_P05127678	Epha1	0.727376
A_68_P05985938	Rgs10	0.727446
A_68_P10642062	Lrrc16	0.727983
A_68_P02037117	Itga8	0.728134
A_68_P09723695	BC018371	0.728156
A_68_P01427925	Gata3	0.728227
A_68_P12310778	Krt18	0.72827
A_68_P14693838	Pcyt1b	0.728336
A_68_P08200511	Hmga2	0.728405
A_68_P04263889	Emilin1	0.728439
A_68_P05906531	2010208K18Rik	0.728507
A_68_P08288180	Tmtc2	0.728552
A_68_P01275047	Cdh22	0.728638
A_68_P07860043	Bace1	0.728797
A_68_P07231075	Tomm20	0.728863
A_68_P10480061	Foxf2	0.728968
A_68_P09415895	D11Bwg0434e	0.729111
A_68_P06098566	Rabac1	0.729684
A_68_P09306619	Metrl	0.729713
A_68_P05461859	Hoxa9	0.729962
A_68_P09457623	Ddc8	0.730038
A_68_P13186454	Kcnk12	0.730298
A_68_P11227662	Cab39l	0.730309
A_68_P07646962	Als2cl	0.730384
A_68_P05823725	Slc6a6	0.730605

A_68_P06437968	Pnkp	0.730685
A_68_P11625862	Kcnma1	0.7307
A_68_P02754662	Mab2112	0.730731
A_68_P01019049	Paqr8	0.73084
A_68_P03801846	Phf13	0.730934
A_68_P09906095	Frmd6	0.730935
A_68_P07862583	Calml4	0.731087
A_68_P06000741	Adck4	0.731108
A_68_P04264000	Mtif3	0.731196
A_68_P11068610	Ccdc127	0.731234
A_68_P01605724	Egfl7	0.731243
A_68_P13250291	Srrm2	0.731286
A_68_P14763789	Esx1	0.731302
A_68_P08133364	E330016A19Rik	0.731448
A_68_P09421796	Nog	0.731484
A_68_P11829712	Gjb2	0.731818
A_68_P06580232	Etfb	0.731825
A_68_P10757654	ENSMUST00000083641.1:-5603	0.73213
A_68_P04266446	Dok7	0.732252
A_68_P08159927	Nope	0.732276
A_68_P13753104	Proc	0.732658
A_68_P07663357	Megf11	0.732672
A_68_P04329254	Cdk2ap1	0.732682
A_68_P03214010	Eno1	0.732725
A_68_P07578383	Pknox2	0.73296
A_68_P14218841	Nrxn2	0.732987
A_68_P14809906	Ldoc1	0.733005
A_68_P14938222	Cited1	0.733277
A_68_P05933183	6330512M04Rik	0.733293
A_68_P03632444	2810405K02Rik	0.733335
A_68_P04359736	Epha5	0.733712
A_68_P04032944	Wasf2	0.733713
A_68_P03938697	Spen-B330016D10Rik	0.733786
A_68_P12766510	Hmgn1	0.733819
A_68_P10222137	Coch	0.733984

A_68_P00310817	Klf7	0.734238
A_68_P02567272	Ptbp2	0.734407
A_68_P08612220	Lrp1	0.734423
A_68_P00556271	Ctdsp1	0.734455
A_68_P01139487	Wnt6	0.73457
A_68_P01081579	Nmnat2	0.734572
A_68_P05313100	A_68_P05313100	0.734574
A_68_P02071843	Ifih1	0.734603
A_68_P04671528	Slc10a4	0.734638
A_68_P09467824	OTTMUSG00000003802	0.734834
A_68_P03167353	Ift80-Smc4	0.734841
A_68_P07836186	Yipf2	0.735095
A_68_P00029318	Irs1	0.735273
A_68_P03385664	Btf3l4-Txndc12	0.735303
A_68_P05287542	A_68_P05287542	0.735512
A_68_P07323106	Hapln4	0.735662
A_68_P02612525	Hdgf	0.735723
A_68_P13331861	Tgif	0.735743
A_68_P01021262	Fmn2	0.735776
A_68_P13074929	Psmb8	0.735827
A_68_P09345179	BB220380	0.735948
A_68_P05547796	Lrrc23	0.736307
A_68_P07842392	Paqr5	0.736478
A_68_P12599259	Etv5	0.736701
A_68_P00289278	Usp21	0.736871
A_68_P02294728	Lef1	0.736978
A_68_P12368109	Eppk1	0.737154
A_68_P01190215	Orc4l	0.73737
A_68_P11843718	Cbx6	0.737411
A_68_P08676565	9030224M15Rik	0.737513
A_68_P07467098	Cbl	0.737528
A_68_P09049316	Mrpl45	0.737562
A_68_P03127711	Sox2	0.737656
A_68_P04475206	Caln1	0.737808
A_68_P02349175	Dcamk1l	0.737811

A_68_P01887600	Shc4	0.737862
A_68_P11915779	Foxred2	0.737915
A_68_P11564468	9430077A04Rik-Prrxl1	0.738024
A_68_P12476467	Pigp	0.738032
A_68_P01767792	Tshz2	0.738188
A_68_P06895632	Ces1	0.738199
A_68_P02243584	Agpat7	0.738371
A_68_P09691900	Unc119	0.738813
A_68_P06736693	Csmd1	0.738884
A_68_P09697830	Sec14l4	0.73889
A_68_P02531278	Muc1	0.738954
A_68_P04182410	2810006K23Rik	0.739007
A_68_P08223563	Sbno2	0.73914
A_68_P07820492	Gsta2	0.739193
A_68_P04904123	Pdgfa	0.739559
A_68_P09021937	Rtn4	0.739617
A_68_P14505402	Asrgl1	0.73971
A_68_P05328185	Chd4	0.739797
A_68_P09853995	Tmem121	0.739967
A_68_P12835494	Smpd4	0.740147
A_68_P04730667	Ddx55	0.740272
A_68_P00344176	Sox17	0.740281
A_68_P12185368	Baspl	0.740289
A_68_P14935324	EG331392	0.740425
A_68_P05419197	Usp5-Cdca3	0.740584
A_68_P09683594	Cdc42ep4	0.740598
A_68_P13594311	Lipg	0.74084
A_68_P14444515	Lrfn4	0.740894
A_68_P08446316	Timp3	0.741042
A_68_P01421703	Tgif2	0.741047
A_68_P13916985	Gm672	0.741355
A_68_P07392546	C330011M18Rik	0.741362
A_68_P14344143	Wnt8b	0.741376
A_68_P07839049	Onecut1	0.741434
A_68_P01470919	Gm691	0.741559



A_68_P09233273	Acadvl-Dlgh4	0.741567
A_68_P00202781	Dars2	0.741642
A_68_P04245232	Kcnh2	0.741816
A_68_P05308590	Cav1	0.74192
A_68_P06193351	Dmpk	0.741963
A_68_P04886874	Fzd1	0.741973
A_68_P04233932	Cnot6l	0.742018
A_68_P10675635	Tmem174	0.74208
A_68_P04903904	BC019731	0.742136
A_68_P04070290	Dhcr24	0.742143
A_68_P07313708	Csmd1	0.742166
A_68_P06728417	Cyld	0.742198
A_68_P00694738	Aff3	0.742201
A_68_P09209213	Ubtf	0.742228
A_68_P06654006	Ifitm2	0.742233
A_68_P05954805	Tmem160	0.742255
A_68_P14501274	Syvn1	0.742268
A_68_P09638188	Rad51l3	0.742278
A_68_P10809479	Ndufs4	0.742407
A_68_P09176378	1810073N04Rik	0.742606
A_68_P10088239	Pum2	0.742624
A_68_P03612259	Dnajc8	0.742654
A_68_P10456926	Hist1h1b	0.742853
A_68_P14324730	Cpt1a	0.742853
A_68_P07596637	Vsig2	0.743085
A_68_P03952273	Gpr3-Cd164l2	0.743138
A_68_P08951831	Cct2	0.743156
A_68_P09143801	Pps	0.743194
A_68_P12277588	Hoxc9	0.743237
A_68_P02451509	2010016I18Rik	0.743456
A_68_P02653832	BC028528-Aph1a	0.743739
A_68_P08253385	ORF61-Cnn2	0.743837
A_68_P07433896	Ptger1	0.743898
A_68_P13070859	S3-12	0.744065
A_68_P04414063	Cdx2	0.744135

A_68_P06463897	Foxa3	0.744137
A_68_P01503212	Gm691	0.744166
A_68_P04793013	2700038N03Rik	0.744214
A_68_P08122742	Smad3	0.744219
A_68_P04178083	Phox2b	0.744279
A_68_P12332349	C1qtnf6	0.744305
A_68_P12092825	Sstr3	0.744308
A_68_P01120361	Igsf8	0.744486
A_68_P11766248	Cadps	0.744537
A_68_P14418019	Eef1g	0.744649
A_68_P08221853	Slc1a6	0.744795
A_68_P06261649	Lrrk1	0.744864
A_68_P07411833	Mmp15	0.744877
A_68_P03164989	Alx3	0.744943
A_68_P13522497	Foxp4	0.744954
A_68_P07398504	Sfrp1	0.745021
A_68_P13205279	Cyp1b1	0.745085
A_68_P04159074	3110082I17Rik	0.745143
A_68_P09050152	Ace	0.745194
A_68_P11213391	Kctd6	0.745237
A_68_P06201940	Usp47	0.745579
A_68_P13117095	Bak1	0.745621
A_68_P02040073	Tcp1l1l	0.746083
A_68_P04802046	Drd5	0.74617
A_68_P10852234	Tcfap2a	0.746173
A_68_P12397525	Top1mt	0.746175
A_68_P03832008	Pax5	0.746237
A_68_P08285737	Frs2	0.74626
A_68_P05936540	Atp1a3	0.746262
A_68_P06280706	Tmem126a	0.746266
A_68_P03506024	Sdc3	0.746499
A_68_P09611840	Tbx2	0.746576
A_68_P04337955	Rnf4	0.746695
A_68_P09036672	Plekhh3	0.746831
A_68_P08295564	4930404N11Rik	0.746885

A_68_P08756474	Dyrk2	0.746929
A_68_P06099522	Apoc1	0.747018
A_68_P07138762	Znrf1	0.747312
A_68_P09842319	Adssl1	0.747433
A_68_P07915233	Trip4	0.747483
A_68_P03801846	Phf13	0.747541
A_68_P09804391	Siva1	0.747647
A_68_P13125889	Akap8	0.747744
A_68_P02870026	2310007A19Rik-Tnrc4	0.74791
A_68_P08634266	Sf3a2	0.74793
A_68_P04205923	Spink2	0.747965
A_68_P05289468	Bcat1	0.748068
A_68_P10960928	Cd83	0.748074
A_68_P03954981	Eno1	0.748094
A_68_P08112656	Pafah1b2	0.748115
A_68_P13076456	Smoc2	0.748152
A_68_P08689401	Gpr6	0.748254
A_68_P09146494	Cnot6	0.74843
A_68_P09882292	Jundm2	0.748603
A_68_P01669852	Fpgs	0.748647
A_68_P08949156	Rassf3	0.748698
A_68_P14336503	Arhgap19	0.748776
A_68_P03984671	Lrp8	0.748798
A_68_P11454291	Dpysl2	0.748831
A_68_P03859452	Slc31a1	0.748991
A_68_P07587140	Thy1	0.749044
A_68_P02399008	4933421E11Rik	0.749187
A_68_P11623670	Gata4	0.749408
A_68_P03223989	Epha10	0.749467
A_68_P06771759	Snapc2	0.74955
A_68_P14270093	D030056L22Rik	0.749799
A_68_P07504222	Stt3b	0.749927
A_68_P10045379	Nfkbia	0.750031
A_68_P05906990	Snx26	0.750251
A_68_P08303985	Olig3	0.750339

A_68_P12225777	Tnfrsf13c	0.750418
A_68_P13139253	Rxrb	0.750468
A_68_P07335325	Fhod1	0.750607
A_68_P12081602	Rbm9	0.750625
A_68_P10262250	Cyp46a1	0.750654
A_68_P08668997	Snrpd3	0.750895
A_68_P08306365	Gli1	0.750942
A_68_P04533661	Rhof	0.750957
A_68_P08245924	Pias4-Eef2	0.751015
A_68_P09657177	Otx1	0.751015
A_68_P08061931	Lbxcor1	0.751092
A_68_P07673174	Aplp2	0.751115
A_68_P02885891	Edg1	0.751515
A_68_P01704130	C1ql3	0.751609
A_68_P02216243	Grem1	0.751653
A_68_P12464812	Pim3	0.751758

**Supplementary Table 1d: N vs KO 2330 hypermethylation genes on d100**

Probe Name	Gene Name	Methylation difference value
A_68_P04228571	Barhl2	3.337522
A_68_P14372856	1700019N19Rik	3.145096
A_68_P04403726	En2	3.115225
A_68_P05982951	Tnnt3	2.979039
A_68_P06457634	Adam12	2.937375
A_68_P02004720	Rab22a	2.851541
A_68_P01573803	Srxn1	2.82118
A_68_P04449097	Suds3	2.814325
A_68_P13225573	2310039H08Rik	2.808632
A_68_P11526170	Sox7	2.769721
A_68_P10379467	Slc25a21	2.753301
A_68_P05207111	Rerg	2.731487
A_68_P08382720	Msrb3	2.71797
A_68_P05804478	D6Wsu116e	2.706824
A_68_P10147998	Ppp2r5c	2.705301
A_68_P00332108	Prrx1	2.700878
A_68_P01675194	Dlx1	2.692303
A_68_P04613872	Fscn1	2.686821
A_68_P09701217	Grn	2.681831
A_68_P13219901	Cpne5	2.681237
A_68_P08644962	Pcmt1-Nup43	2.680099
A_68_P09663278	Rpl23a-Rab34	2.677353
A_68_P01110961	Nek2	2.676828
A_68_P08062567	Ei24	2.675238
A_68_P07794298	Qars	2.64844
A_68_P06307353	Tial1	2.643263
A_68_P06099687	Med25	2.635524
A_68_P05011836	Ppm1k	2.626684
A_68_P03496087	Rcc1	2.62644
A_68_P02385105	Ssr3	2.623533
A_68_P04449097	Suds3	2.617687
A_68_P00214101	Pkp1	2.611459
A_68_P02629065	Slc35a3	2.608849

A_68_P09624201	Poldip2	2.598509
A_68_P04137440	Nmu	2.592398
A_68_P13977860	Pcdhga5	2.58649
A_68_P12092853	Ppp1r1a	2.58383
A_68_P06300520	Bccip	2.582791
A_68_P10049305	Insm2	2.567687
A_68_P03496087	Rcc1	2.565922
A_68_P03493306	Rnf11	2.555736
A_68_P00560687	Lrrn2	2.548238
A_68_P06390013	Nfkbib-Sirt2	2.541628
A_68_P09638187	Rad51l3	2.540066
A_68_P12151832	Wnt10b	2.52726
A_68_P09377206	Nr1d1	2.524575
A_68_P04812922	Ugdh	2.519579
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A_68_P09531764	Dlx4	1.521754
A_68_P13626996	Spry4	1.521536
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A_68_P12600283	Pcyt1a	1.517737
A_68_P10699085	Sox4	1.517668
A_68_P12707523	Chrd	1.5176
A_68_P03584386	Bmp8b	1.51753
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A_68_P13992903	Gata6	1.51656
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A_68_P04930233	Rbm19	1.51503
A_68_P03296663	Rnf38	1.514947
A_68_P08523385	Smpd2	1.514766
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A_68_P02097439	Ptgis	1.513848
A_68_P12600716	Tiam1	1.513782
A_68_P09516342	Cdc27	1.513736
A_68_P01928464	Gm996	1.513504
A_68_P06458345	Sphk2	1.512936
A_68_P11331189	LOC432870	1.512829
A_68_P03630129	Thap3	1.512578
A_68_P08085317	Map2k5	1.512523



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A_68_P07804980	Pde4a	1.511336
A_68_P05591071	Pcbp1	1.510991
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A_68_P13441074	Pacsin1	1.510282
A_68_P13134961	Tnfrsf21	1.509398
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A_68_P07563562	Igsf4a	1.500649
A_68_P10402489	Slc25a29	1.500519
A_68_P13559195	Polh-Xpo5	1.500488
A_68_P10729669	Homer1	1.500433

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A_68_P08265273	Klf16	1.498033
A_68_P07954586	Epor	1.497437
A_68_P00396256	Hhat	1.49735
A_68_P00251563	Uap1	1.497242
A_68_P06678689	Xkr5	1.496959
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A_68_P02323952	Car3	1.494319
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A_68_P01342780	Ccb11	1.494124
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A_68_P13309401	Pbx2	1.491351

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A_68_P01771855	Snai1	1.489298
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A_68_P13680548	Rnf138	1.486838
A_68_P08718386	Inhbe	1.486021
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A_68_P13162670	Clps	1.484857
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A_68_P09104779	Slfn9	1.482459
A_68_P03831176	Cyp2j6	1.482146

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A_68_P05447286	Rpn1	1.479346
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A_68_P06841060	Pbx4	1.457646
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A_68_P09611938	Havcr2	1.437707
A_68_P11855904	Ly6d	1.43687
A_68_P04761495	Sdsl-Sds	1.436867
A_68_P07356122	Tk2-Cklf	1.436484
A_68_P05162900	Zfml	1.436461
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A_68_P03792681	Yrdc	1.436137
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A_68_P03465775	Cdc20	1.433773
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A_68_P12451534	Atf7	1.374133
A_68_P08714775	Tcba1	1.373898
A_68_P08936079	A_68_P08936079	1.373831
A_68_P04711913	Arl6ip4	1.373688
A_68_P02843046	Prkci	1.373503
A_68_P08288178	Tmtc2	1.373478
A_68_P11507565	Pcdh17	1.373314
A_68_P09393918	Nsf	1.373122
A_68_P06620448	5430432N15Rik	1.373091
A_68_P14729681	Utp14a	1.373044
A_68_P09644084	Srebf1	1.372953
A_68_P04071366	Plaa	1.372942
A_68_P10419758	Chx10	1.372918
A_68_P14930315	Phka2	1.372906
A_68_P09439572	Bcl6b	1.372588
A_68_P03214207	Slc9a1	1.372505
A_68_P03139924	Zbtb7b	1.372303
A_68_P00400070	Kif1a	1.372232
A_68_P12079965	2810451A06Rik	1.372009
A_68_P07098077	Helt	1.37197
A_68_P09018398	Gprc5c	1.371571
A_68_P11173734	Efs-II25	1.371543
A_68_P01542525	Ghrh	1.371424
A_68_P01305510	Ncoa5	1.371345
A_68_P09304808	Stac2	1.371162
A_68_P12059852	Smardc1	1.37113
A_68_P01897769	F730014I05Rik	1.370526
A_68_P03402252	Jmjd2a	1.370393
A_68_P01522585	Pxmp4	1.370355
A_68_P03560289	Elavl2	1.370244
A_68_P01776405	Olfml2a	1.370219
A_68_P11948519	Aqp5	1.369786
A_68_P09731018	Myo1c	1.369689

A_68_P01296062	Gm757	1.369492
A_68_P09128453	Cbx4	1.369373
A_68_P04567450	Klf3	1.369206
A_68_P07849832	Plod2	1.369079
A_68_P02824933	Acp6	1.368999
A_68_P11937879	BC030396	1.368711
A_68_P14473024	Cabp2	1.368553
A_68_P14029021	Galr1	1.368517
A_68_P09288447	Pycr1	1.368094
A_68_P14040519	Pcdhgb5	1.368076
A_68_P04528236	Trim50	1.36805
A_68_P11507594	Pcdh17	1.368004
A_68_P04306525	Zan	1.367971
A_68_P14329940	Emx2	1.367887
A_68_P08034953	Plod2	1.367712
A_68_P14977649	Ube2a	1.367694
A_68_P06657211	Zfp629	1.367464
A_68_P10509192	Pitx1	1.367427
A_68_P09926608	BC048191:-5384	1.367412
A_68_P08937904	Eef2	1.367389
A_68_P05308436	Sec61a1	1.367066
A_68_P10681710	Zfp367	1.366745
A_68_P12544071	Dirc2	1.366414
A_68_P08850557	Tpd5211	1.366224
A_68_P08108310	Dusp7	1.366104
A_68_P12461149	Krt2-25	1.365982
A_68_P01545930	Mrpl41-Pnpla7	1.36588
A_68_P04553689	Cenpc1-AI586015	1.365725
A_68_P03553494	Espn	1.365602
A_68_P03544448	Gnl2	1.365596
A_68_P03468979	Prdm16	1.365587
A_68_P09559324	Pdlim4	1.365574
A_68_P13406566	Tnfrsf21	1.365562
A_68_P04945505	Apbb2	1.365452
A_68_P09562188	4930412M03Rik	1.365373

A_68_P06122748	Car11	1.365326
A_68_P14204208	Cox8a	1.36519
A_68_P15210311	Sox3	1.365151
A_68_P09652799	Syngn2	1.365124
A_68_P07955703	5730536A07Rik	1.365076
A_68_P08710844	Trpm2-1810043G02Rik	1.364919
A_68_P09367780	Pfn1-Eno3	1.364641
A_68_P07533500	Xrn1	1.364598
A_68_P07800229	Tspan3	1.364446
A_68_P06621039	Sec23ip	1.364314
A_68_P00513237	Stk17b	1.364225
A_68_P11602112	Dnajc15	1.364046
A_68_P05987579	Rnf121	1.363856
A_68_P07889708	Mon1a	1.363671
A_68_P05584898	Bcat1	1.363543
A_68_P10254191	Egln3	1.363475
A_68_P06381447	Rasl2-9	1.363394
A_68_P10248353	Kcnk13	1.36297
A_68_P04345686	2410025L10Rik	1.362961
A_68_P04137812	Epo	1.362834
A_68_P06930178	B3gnt3	1.36283
A_68_P09207680	Utp18	1.362568
A_68_P06262927	Trim68	1.36233
A_68_P06843511	2810428I15Rik	1.362321
A_68_P10548283	Muted	1.362311
A_68_P09506627	Serpinf2	1.361829
A_68_P07319297	Rrad	1.361657
A_68_P08257942	BC030440	1.361606
A_68_P09086358	Gas2l1	1.361406
A_68_P13472163	Six2	1.361346
A_68_P07373423	A_68_P07373423	1.361299
A_68_P02991822	Tspan2	1.361271
A_68_P03975839	Prdm16	1.361225
A_68_P09431553	St6galnac2	1.36106
A_68_P14165549	Sh3pxd2a	1.36092



A_68_P03087427	Pklr	1.360755
A_68_P06189872	Mesp1	1.360117
A_68_P06767594	Fnta	1.359884
A_68_P08782489	Rkhd1	1.359853
A_68_P09330589	Rasd1	1.359832
A_68_P07960242	Angptl6-Ppan	1.359635
A_68_P09343918	BC030477	1.359591
A_68_P06275562	Uqcrc2	1.359574
A_68_P06957976	Dctd	1.359437
A_68_P12292478	Card10	1.359368
A_68_P09621168	Ankrd43	1.359124
A_68_P07023164	Sin3b	1.359102
A_68_P08049234	Copb2	1.3591
A_68_P00344185	Sox17	1.359051
A_68_P02752639	Hist2h2be	1.358796
A_68_P03926231	Necap2	1.358794
A_68_P08241070	D10Ert610e	1.35868
A_68_P02208449	Pdk1	1.358569
A_68_P07818869	Yap1	1.35845
A_68_P04715249	Tbx5	1.358255
A_68_P04573997	Akap9	1.358183
A_68_P04959693	Vps33a	1.358157
A_68_P01628470	Rassf2	1.35812
A_68_P07312427	Dynlrb2	1.357711
A_68_P12988162	Slc12a8	1.35762
A_68_P05744316	Pde3a	1.357319
A_68_P03447018	Cd72	1.357295
A_68_P05984752	Fah	1.357283
A_68_P09271419	Aatf	1.35714
A_68_P08935045	2310011J03Rik	1.35709
A_68_P11697259	Dis3	1.357089
A_68_P15210082	Praf2	1.357039
A_68_P09476913	Shbg	1.357021
A_68_P07308039	2410018C20Rik	1.35682
A_68_P00583491	Irf6	1.356818

A_68_P10325476	Mycn	1.356815
A_68_P09535305	Dhx33	1.356791
A_68_P10205334	Yy1	1.356638
A_68_P03107450	Creb3l4-Slc39a1	1.356226
A_68_P00395221	5330401P04Rik	1.355914
A_68_P01175967	Dgkz	1.355853
A_68_P04116773	Thrap2	1.3557
A_68_P07412696	Edc4	1.355528
A_68_P07590783	Traip	1.355514
A_68_P06787361	Tusc3	1.355374
A_68_P05288271	Ppih	1.355363
A_68_P00578461	Zc3h11a	1.354905
A_68_P15038878	Apln	1.354848
A_68_P13272683	Epas1	1.354825
A_68_P04071366	Plaa	1.354794
A_68_P13270003	Zfp598	1.354616
A_68_P01648426	3110001A13Rik	1.354465
A_68_P08628561	Lgr5	1.354383
A_68_P08526428	Ddit3	1.354312
A_68_P03346618	Id3	1.354262
A_68_P08151133	Ctnnb1	1.354251
A_68_P03041163	Sfrp2	1.354188
A_68_P00850156	Lhx9	1.354146
A_68_P01982873	BC066135	1.354133
A_68_P02650791	Setd7	1.35405
A_68_P01996978	2310042G06Rik	1.353975
A_68_P10900081	Mier3	1.353863
A_68_P09530012	1110014K08Rik	1.353795
A_68_P08873707	Rpl41	1.353531
A_68_P08215262	Cnn2	1.353368
A_68_P03629045	Lin28	1.353088
A_68_P13359198	Lrpprc	1.352684
A_68_P02942719	D3Ucla1	1.352676
A_68_P13733932	Map3k8	1.352645
A_68_P11042513	4930544M13Rik	1.352578

A_68_P11979317	Tssk5	1.352506
A_68_P12380453	Matn2	1.35234
A_68_P12267844	Krt18	1.352302
A_68_P04852339	A230097K15Rik	1.352224
A_68_P05286103	Wnk1	1.351995
A_68_P03261704	Dctn3	1.351677
A_68_P15121552	Morc4	1.351601
A_68_P05362381	Camk1	1.351543
A_68_P04157606	Xrcc2	1.351487
A_68_P12816958	Ephb3	1.351482
A_68_P07561567	Entpd3	1.351388
A_68_P14209540	Rin1	1.351306
A_68_P10141170	Prkch	1.351304
A_68_P06740718	2400003C14Rik	1.35104
A_68_P03876320	Zfp691	1.350926
A_68_P12183195	Nfe2	1.350856
A_68_P08902269	Slc35d3	1.350802
A_68_P01571536	Aurka-Cstf1	1.350651
A_68_P03785877	BC055111-Ttc22	1.350646
A_68_P02133880	Plxdc2	1.350433
A_68_P08642932	Smarcc2	1.350404
A_68_P08168098	Ankrd25	1.350332
A_68_P04667157	Snx17	1.350214
A_68_P14751401	Usp11	1.350082
A_68_P01833937	Pax6	1.350024
A_68_P03349816	Hkr3	1.350021
A_68_P01326999	Ndr3	1.349854
A_68_P09547541	BC017647	1.349829
A_68_P14345668	Slc22a8	1.349805
A_68_P04138127	Fzd10	1.349726
A_68_P07581372	Zmynd10	1.34956
A_68_P11281790	2600011E07Rik	1.349521
A_68_P01880312	Abtb2	1.349509
A_68_P08065769	Fbxl12	1.349498
A_68_P14204146	Hspa12a	1.349416

A_68_P14154165	Ina	1.349086
A_68_P11888728	Poldip3	1.348888
A_68_P02189747	Hrh3	1.348859
A_68_P09491191	D130058I21Rik	1.348836
A_68_P12229235	Rrm2b	1.348748
A_68_P13614347	B4galt6	1.348725
A_68_P07513276	Pcolce2	1.348558
A_68_P14251879	Mtvr2	1.348314
A_68_P12246601	Myo10	1.347759
A_68_P02376968	Gipc2	1.34724
A_68_P03413661	Padi4	1.347227
A_68_P13867090	Pard6g	1.347198
A_68_P10256825	Erh	1.347184
A_68_P03581861	St3gal3	1.346935
A_68_P02042838	Bub1	1.346842
A_68_P09349428	Pscd1	1.34676
A_68_P06975475	Gpr124	1.346702
A_68_P13450829	Tapbp	1.346546
A_68_P13760300	Cxxc1	1.346271
A_68_P02034225	Itga6	1.34623
A_68_P01668369	Slc35c1	1.346227
A_68_P05743578	Skap2	1.346152
A_68_P00932141	Epha4	1.345694
A_68_P03666605	Astn2	1.345672
A_68_P12569215	Dscr3	1.345575
A_68_P08358935	Lace1	1.34541
A_68_P12809557	B4galt4	1.345325
A_68_P11067498	Phactr1	1.345283
A_68_P12233069	Mb	1.344955
A_68_P06519012	AI480556-Rras	1.344768
A_68_P07281036	Gse1	1.344759
A_68_P02773136	5730470L24Rik	1.344748
A_68_P04780549	Scarb2	1.344603
A_68_P15158572	Ofd1	1.3446
A_68_P09262940	BC025575	1.344398

A_68_P09132227	Cacng4	1.344268
A_68_P06926957	Nob1	1.344266
A_68_P14674510	Slc6a8	1.344259
A_68_P02018771	Snap25	1.343965
A_68_P11526178	A_68_P11526178	1.343918
A_68_P14452830	Tle4	1.343911
A_68_P04442361	Msi1	1.343595
A_68_P06269772	Fzd4	1.343371
A_68_P11740899	Bmp4	1.343306
A_68_P03814073	Rbm35a	1.343292
A_68_P09555116	E130012A19Rik	1.343019
A_68_P13425847	Klc4-Mrpl2	1.342837
A_68_P06410140	Zfp710	1.342657
A_68_P07976988	4733401H18Rik-Dalrd3	1.342376
A_68_P04803354	Arpc1b	1.34237
A_68_P03126835	Shox2	1.342282
A_68_P00022370	Zfp451	1.342006
A_68_P15105004	RbmX	1.341812
A_68_P01463378	Psmf1	1.341786
A_68_P09885031	Btbd7	1.341409
A_68_P14420132	Ldb1	1.341373
A_68_P08817684	Sgk	1.34136
A_68_P00225465	Lamc2	1.341294
A_68_P03547730	Cc2d1b	1.341291
A_68_P04946573	Fbx15	1.341015
A_68_P04542655	Cdk8	1.340796
A_68_P02120879	3230401D17Rik	1.34075
A_68_P14299210	Foxb2	1.340422
A_68_P03226841	Pla2g2c	1.340313
A_68_P04153080	1200011O22Rik	1.3403
A_68_P05187965	Podxl	1.340224
A_68_P11260838	Bmpr1a	1.340096
A_68_P09116447	Tmem132e	1.340034
A_68_P06909746	Nup133	1.340005
A_68_P09390157	4933400C05Rik	1.339906

A_68_P09703832	Epn3	1.33988
A_68_P13106317	Tgif	1.339856
A_68_P07037040	Upfl	1.339657
A_68_P12240204	Rangap1	1.339423
A_68_P00542898	Nppc	1.339229
A_68_P14212477	Cpt1a	1.338795
A_68_P00859453	Lhx9	1.33871
A_68_P09485925	Rnfl35	1.338685
A_68_P14842575	Ubelx	1.338503
A_68_P02492290	Mcl1	1.338463
A_68_P02142088	3230401D17Rik	1.338314
A_68_P08883003	Ppa1	1.338308
A_68_P12608100	Lztr1	1.338218
A_68_P12815673	Dcbld2	1.33818
A_68_P04481832	9530056K15Rik	1.337965
A_68_P06897654	Slc35e1	1.337857
A_68_P02293891	Wdr3-Gdap2	1.337747
A_68_P06292783	Sae1	1.337643
A_68_P09207933	Sf3a1	1.337435
A_68_P01506207	Ndor1-C730025P13Rik	1.337302
A_68_P10419767	Chx10	1.337082
A_68_P02123487	Manbal	1.336735
A_68_P14467080	1810009A15Rik	1.336308
A_68_P14295260	Foxb2	1.336267
A_68_P11575462	Xpo4	1.33622
A_68_P05427993	Magi1	1.336187
A_68_P13172213	Ccnf	1.336111
A_68_P14229760	Npas4	1.336014
A_68_P10050034	Trmt5	1.336002
A_68_P10902235	Pitx1	1.335996
A_68_P13429542	Pbx2	1.335976
A_68_P08149916	Nt5e	1.335937
A_68_P09457380	Adamts2	1.335932
A_68_P08108313	Dusp7	1.335891
A_68_P00163908	Twist2	1.335701

A_68_P07518222	BC025114:843	1.335627
A_68_P12635588	Ehhadh	1.335376
A_68_P00931378	En1	1.335294
A_68_P05377564	Tacstd2	1.335229
A_68_P03350592	Txndc12	1.335144
A_68_P04562151	Hsd17b11	1.33507
A_68_P04137562	Nupl2	1.335036
A_68_P12862382	ORF28	1.334956
A_68_P01221321	0610011L14Rik	1.334937
A_68_P04203215	Rpl9-Lias	1.334619
A_68_P07349292	BC025816	1.334522
A_68_P13293615	Gbl	1.33426
A_68_P08995123	Nlgn2-1810027O10Rik	1.334214
A_68_P01337579	Dido1	1.334109
A_68_P07697198	Acaa1a	1.333893
A_68_P08197986	Snapc5	1.333865
A_68_P14804684	Zic3	1.333853
A_68_P09247554	Nf2	1.333698
A_68_P10666960	Jarid2	1.333693
A_68_P06307711	Med25	1.333618
A_68_P01092822	Fmo1	1.333542
A_68_P13388147	Bat5	1.333336
A_68_P03937868	Srrm1	1.333314
A_68_P08656295	Phyhipl	1.333274
A_68_P05419190	Smarcad1	1.333171
A_68_P14428140	Tlx1	1.333111
A_68_P11739540	Gjb2	1.333053
A_68_P02073678	2410042D21Rik	1.332855
A_68_P01018072	Ahctf1	1.332614
A_68_P05552654	Gabarapl1	1.332503
A_68_P05111640	Trim24	1.332475
A_68_P06706577	Irx5	1.332207
A_68_P02151088	Bpi	1.332199
A_68_P05917961	Syt3	1.33197
A_68_P07695540	2610101N10Rik	1.331769

A_68_P13081532	Hmgal	1.331669
A_68_P07036341	Foxl1	1.331611
A_68_P04090886	D4Wsu114e-Fv1	1.331582
A_68_P07723906	Sema3f	1.331402
A_68_P08297371	Dip3b	1.331343
A_68_P11213240	Top2b	1.331251
A_68_P04316294	Mapre3	1.331193
A_68_P05814338	Pdzm3	1.331166
A_68_P09178147	Osm	1.331118
A_68_P06572786	1500002O20Rik	1.331002
A_68_P02072158	Hspa5	1.330972
A_68_P14560505	Chst7	1.330844
A_68_P13747694	Rnuxa	1.330572
A_68_P03230057	Ubiad1-Frap1	1.330502
A_68_P14139346	Sall3	1.330424
A_68_P09084216	Aebp1	1.330364
A_68_P10219280	Plekhg3	1.330362



**Supplementary Table 2: 437 genes that were hypermethylated in KO offspring compared with those in N offspring both on d16 and d100**

1110008B24Rik
1600002H07Rik
1810009A15Rik
1810043G02Rik
1810054D07Rik
2310010M24Rik
2310011J03Rik
2400001E08Rik
2400006H24Rik
2410166I05Rik
2600011E07Rik
2610042O14Rik
2810030E01Rik-Mllt10
2810432D09Rik
2810432D09Rik
2810451A06Rik
4733401H18Rik-Dalrd3
4833422F24Rik
4930418G15Rik
5033414K04Rik
5330439J01Rik
5330439J01Rik
5730419I09Rik
5730470L24Rik
5730596B20Rik
5730596K20Rik
6230410P16Rik
6530401C20Rik
9130019P16Rik
A_68_P08936079
A230097K15Rik
Acaa1a
Acat3

Acp5
Actg1
Acvr1
Adam12
Adam12
Adcy9
Agpat2
AI450540
Akap12
Akr1a4
Aldh3a2
Ankrd43
Ap2a1
Arid1a
Arid1a
Arid1a
Arid2
Arid5b
Arl5c
Arl5c
Armet
Armet
Arpc1b
Atoh8
Atp5g2
Axud1
Axud1
B3gnt7
B3gnt7
B830017H08Rik
Baiap2
Bat5
BC018371
BC021891
BC024139

BC030396
BC030396
BC030440
BC030440
BC031181
BC048191:-5384
BC066135
Birc3
Brd7
Bst2
C230093N12Rik
Camk2g
Card10
Cartpt
Cdbl1
Ccdc3
Ccdc84
Cck
Ccnd3
Ccnf
Cdc20
Cdc20
Cdc7
Cdk8
Cdkn1c
Chd1
Chrd
Clta
Clta
Cnm2
Cops7a
Cpeb1
Cpn1
Cpt1a
Ctdsp1

Ctnbp2nl
Cxcr4
Cybase3
Cyld
D11Ert636e
D130058I21Rik
D130058I21Rik
D3Ucla1
D5Wsu178e
D630029K05Rik
D630029K05Rik
Ddit4
Der11
Dgkz
Dhrs4
Dmrt2
Dmrt2
Doc2b
Dock6
Dpf3
Dpysl3
Dusp1
Dusp6
Dzip1
Dzip1
E430028B21Rik
Efna1
EG328479
Egln3
Egr2
Egr3
Egr3
Ehd3
Ehhadh
Ela2

Elov11
Elov11
Emid2
Emid2
En1
En1
En2
En2
Epha4
Epha4
Esrrb
Etf1
Etv5
Etv5
F730014I05Rik
F730014I05Rik
Faim2
Fchsd1
Fchsd1
Fgf17
Fgf21
Fgf21-Fut1
Fkbp11
Fmnl1
Fmo1
Foxa2
Foxb2
Foxb2
Foxb2
Foxo3a
Foxo6
Fscn1
Fscn1
Fzd5
Fzd5

Gadd45g
Gas211
Gas211
Gata3
Gata3
Gata3
Gata5
Gfra4
Gfra4
Gja3
Gjb2
Gpbp1
Gpre5c
Gtf2h4
Gzf1
Hars2
Hhat
Hk2
Hkdc1
Hkr3
Hmga1
Hnrpd
Hoxb4
Hoxd3
Hoxd3
Hps6
Hrh3
Hrh3
Hs6st3
Hs6st3
Hsd17b11
Hspa12b
Icmt
Icmt
Id3

Igf1r
Igf1r
Il10
Ina
Ina
Ingl
Inhbe
Irf2
Irx5
Irx5
Isl2
Itih1
Jarid2
Jub
Jub
Jund1
Kcnab3
Khdrbs3
Klf9
Klh19
Krt18
Lama1
Ldb1
Ldb1
Lemd1
Lemd1
Lgi3
Lgr5
Lhx1
Lif
Lrpprc
Lrrc4c
Luzp2
Lynx1
Magi3

Mapre3
Mets2
Mdm1
Mfsd3
Mgat2
Mkln1
Mon2
Mvk
Mxi1
Myo10
Myo10
Myo10
Myo1c
Myo7a
Nbl1
Nek2
Neud4
Nfe2l1
Nfe2l1
Nfic
Nmur1
Notch1
Npr2
Nr1d1
Nr2e3
Nr2f2
Nr2f2
Nt5e
Ntng2
Oaz1
Pacsin1
Pacsin1
Pacsin3
Pah
Pax6



Pcdh10
Pcdh17
Pcdh17
Pcdhga5
Pcgf2
Pcgf5
Pcyt1a
Pcyt1a
Pcyt2
Pde3a
Pde3a
Pebp1
Peci
Pfn1
Phactr1
Phf5a
Pigz
Pik3r1
Pitpna
Pitx1
Pitx1
Pklr
Pla1a
Pla1a
Pla2g2c
Pla2g7
Plec1
Plec1
Plekhf1
Plekhg2
Plekhg2
Plekhg2
Pnpla2
Ppa1
Ppap2b

Ppap2b
Ppm1k
Ppp1r13b
Ppp2r2d
Ppp2r5c
Pptc7
Pptc7
Prdm1
Prdm5
Prodh
Psmd11
Ptger1
Ptprs
Qdpr
Rad9
Rassf3
Raver1
Rbm35a
Rbm9
Rcc2
Rcor2
Rdh7
Rgs6
Rnf121
Rnf135
Rnf185
Rnuxa
Rpl35
Rpp14
Saa4
Sall4
Scube3
Scube3
Scyl2
Sepx1

Sfrs2ip
Sgk
Sh2b2
Sh3pxd2a
Shc4
Six1
Six1
Six1
Slc10a6
Slc10a6
Slc23a2
Slc25a29
Slc2a9
Slc2a9
Slc35c1
Slc38a3
Slc44a2
Smad6
Smarcc2
Smarcc2
Smug1
Snf1lk
Sox2
Sphk2
Sphk2
Spnb2
Spryd4
Srebf1
Srebf1
Srebf1
Srrm1
St3gal3
Stk11
Stk11
Sulf2

Sulf2
Syngn1
Tal2
Tbl1xr1
Tbx3
Tcba1
Tcf2
Tcf7
Tcfap2c
Terf2
Tgm4
Tle4
Tle4
Tmem132a
Tmem26
Tnfrsf19l
Tnfrsf19l
Tob2
Tpd52
Tpt1
Trhde
Trmt5
Tssk4
Ttc12
Ttc33
Twist2
U46068
Uap1
Uap1
Ube2j2
Ube2j2
Ung
Ung
Usp2
Vps33b

Wasf3
Wnt2b
Wnt6
Yap1
Ypel4
Ypel4
Yy1
Zan
Zc3h11a
Zdhhc18
Zdhhc7
Zfp503
Zfp503
Zfp710
Zmynd10
Zswim5
Zswim5
Zswim5
Zyx

**Supplementary Table 3a: KOA vs KO 716 hypomethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P04039916	Nadk	0.33438
A_68_P13790503	3110002H16Rik	0.335319
A_68_P04677936	Polr2j	0.373654
A_68_P04737532	Cds1	0.379397
A_68_P11801698	Pou4f1	0.380366
A_68_P04039916	Nadk	0.384251
A_68_P03848124	Musk	0.386288
A_68_P04895996	Mapk10	0.3874
A_68_P10347437	Pax9	0.392248
A_68_P06926959	Nob1	0.403682
A_68_P13286098	Enpp4	0.403829
A_68_P07165457	Ints10	0.411601
A_68_P04621660	BC003324-6330548G22Rik	0.413014
A_68_P01769357	Mrg1	0.417223
A_68_P02043611	Disp2	0.420546
A_68_P07218631	Dusp4	0.427754
A_68_P06513729	E2f8	0.431134
A_68_P10030624	AW125753	0.431589
A_68_P03939278	Glipr2	0.432663
A_68_P10878754	Cks2	0.433079
A_68_P03695515	Lrrc47	0.439032
A_68_P09713729	Emid1	0.439182
A_68_P09322906	Lhx1	0.443472
A_68_P05422385	Dppa3	0.444436
A_68_P08466857	Lrig3	0.445734
A_68_P08514851	Nr2e1	0.447573
A_68_P10140483	Rrm2	0.448763
A_68_P04234539	Pdx1	0.451351
A_68_P13890291	BC019561	0.452449
A_68_P08981068	Pip5k2b	0.452795
A_68_P04621660	BC003324-6330548G22Rik	0.454152
A_68_P10941074	Zfyve16	0.458803
A_68_P11235588	Ccdc122	0.459644

A_68_P06751865	Slc7a6	0.460285
A_68_P10435877	Matn3	0.461617
A_68_P14335316	D19Wsul62e	0.464013
A_68_P14280877	Mxi1	0.46806
A_68_P09177142	Mpp3	0.470142
A_68_P09399954	Znhit3	0.470294
A_68_P04286123	Art3	0.472642
A_68_P07991425	Zic1	0.473978
A_68_P13797523	Pcdhga6	0.476046
A_68_P02367976	Isg20l2	0.476351
A_68_P08061094	2810417H13Rik	0.476609
A_68_P00783773	Ahctf1	0.477431
A_68_P02305769	Pld1	0.478533
A_68_P04568812	Hdh	0.479961
A_68_P00882730	Rnasel	0.48209
A_68_P13323539	Mapk14	0.483075
A_68_P09250456	Hoxb8	0.483086
A_68_P01173264	Dynlrb1	0.483994
A_68_P09477297	Hoxb5	0.485658
A_68_P11564443	9430077A04Rik-Prrxl1	0.487194
A_68_P00674953	Tor3a	0.490288
A_68_P07861271	Oaz2	0.491995
A_68_P12887986	Bcl6	0.492441
A_68_P07349283	Rbm13	0.492655
A_68_P10631307	Otp	0.495329
A_68_P05213176	Vamp8	0.496142
A_68_P07862963	lhpk2	0.496748
A_68_P04917693	Eif3s9	0.49723
A_68_P03722059	Dhrs3	0.498595
A_68_P13298312	Epas1	0.498837
A_68_P10193185	Plek2	0.499316
A_68_P03307855	Hp1bp3	0.503824
A_68_P12968677	Opa1	0.504315
A_68_P12536557	BC027231	0.50987
A_68_P03208679	Hes5	0.509889

A_68_P03944620	E130114P18Rik	0.51431
A_68_P07041328	Tll1	0.514337
A_68_P12836214	Setd4-Cbr1	0.515803
A_68_P11653564	Rhobtb2	0.516433
A_68_P02650795	Setd7	0.516998
A_68_P09049964	Gria1	0.517365
A_68_P00572751	Cfc1	0.517766
A_68_P07550953	Zfp445	0.517841
A_68_P11145651	Klf5	0.520795
A_68_P06907386	Mrps31	0.522736
A_68_P06127908	Pak1	0.523321
A_68_P06506665	Apoe	0.52476
A_68_P04480991	Wfs1	0.526861
A_68_P02755413	Polr3gl	0.527058
A_68_P03123565	She	0.527206
A_68_P08694627	Dna21	0.52751
A_68_P08215908	Suox	0.528381
A_68_P11350422	Anxa7	0.530776
A_68_P11656442	Gfra2	0.532242
A_68_P13251243	Cyp4f13	0.535215
A_68_P03968118	Car8	0.535363
A_68_P09568010	Ormdl3	0.535565
A_68_P00931382	En1	0.536037
A_68_P13255091	Pcaf	0.536308
A_68_P03771652	Tmem68	0.536744
A_68_P04480991	Wfs1	0.538198
A_68_P13032833	Eif2b5	0.538408
A_68_P13696223	Onecut2	0.538472
A_68_P03944620	E130114P18Rik	0.53884
A_68_P05951989	Bub3	0.53905
A_68_P03208679	Hes5	0.539328
A_68_P04039488	9630013D21Rik	0.539866
A_68_P12636173	Lsg1	0.540489
A_68_P07036094	Mcm5	0.543046
A_68_P04926197	Fzd10	0.543071



A_68_P04398639	Evi5	0.544129
A_68_P02983152	Pcdh10	0.544519
A_68_P11483530	Ebf2	0.545231
A_68_P09273682	Becn1	0.545993
A_68_P00576308	Mosc2	0.547011
A_68_P01617284	4930402H24Rik	0.547219
A_68_P05889182	Xrcc1	0.547257
A_68_P14431113	Mxi1	0.549289
A_68_P10157596	Dicer1	0.550286
A_68_P11079538	Sirt5	0.550441
A_68_P08701847	Rbms2	0.550909
A_68_P09245911	Ifi47	0.55136
A_68_P06428107	Zfp36	0.553325
A_68_P02173326	Smtnl1-Timm10	0.554928
A_68_P02938391	Tmem79-Smg5	0.556032
A_68_P12550711	Stch	0.556045
A_68_P08532207	Slc35e3	0.556395
A_68_P00581118	Rbbp5	0.556687
A_68_P13551633	Socs5	0.562088
A_68_P03353696	Sdc3	0.562721
A_68_P09018865	Cbx4	0.564329
A_68_P14979287	Kif4	0.56485
A_68_P10857139	Cdc14b	0.56525
A_68_P14108737	ENSMUST00000083658.1:429	0.566965
A_68_P00303096	Lamc2	0.567207
A_68_P01085703	Ptp4a1	0.567396
A_68_P06599540	Armc5	0.567641
A_68_P15175265	Tefe3	0.567909
A_68_P11450608	Rhobtb2	0.568469
A_68_P07096563	B130050I23Rik	0.568706
A_68_P11069441	Plk2	0.568849
A_68_P02940604	Mgst2	0.570302
A_68_P05715101	Xpc	0.570338
A_68_P13515259	Pim1	0.570383
A_68_P11505019	Zfp503	0.571278

A_68_P14458023	Prkg1	0.572162
A_68_P07339397	4921524J17Rik	0.572609
A_68_P11419740	Nkx3-1	0.573838
A_68_P00149897	Tagln2	0.574717
A_68_P12816944	Ephb3	0.575738
A_68_P03819892	4922503N01Rik	0.576167
A_68_P02189368	Eif2ak4	0.576285
A_68_P12755374	App	0.577126
A_68_P14438125	Actr1a	0.577142
A_68_P09591872	Nsg2	0.577258
A_68_P02455823	Polr3gl	0.577305
A_68_P13883491	Pcdha9	0.577378
A_68_P12853498	Mx2	0.578649
A_68_P00242827	EG277333	0.578667
A_68_P12063911	A_68_P12063911	0.579329
A_68_P07835083	Entpd3	0.579778
A_68_P05885506	Dbx1	0.580525
A_68_P11752826	Socs4	0.580606
A_68_P11111042	Tcfap2a	0.581459
A_68_P07893192	Folr4	0.58195
A_68_P09437147	Pfn1-Eno3	0.582255
A_68_P01127576	Tsga10-EG623661	0.58265
A_68_P03127713	Sox2	0.582879
A_68_P01725957	Pfdn4	0.583498
A_68_P01197065	2700007P21Rik	0.584847
A_68_P13895708	Slc12a2	0.584985
A_68_P09474540	Hoxb3	0.58501
A_68_P09997292	Id2	0.585413
A_68_P01963949	Rbm39	0.585492
A_68_P00206509	St8sia4	0.585526
A_68_P02060987	Defb25-Rem1	0.585842
A_68_P06266771	Ilk	0.586458
A_68_P00588267	Cflar	0.586902
A_68_P04586625	Fbxl10	0.587923
A_68_P05970380	Capns1	0.588775

A_68_P10895011	Cltb	0.590025
A_68_P08999972	Tbx21	0.590125
A_68_P08621597	D10Wsu102e	0.593262
A_68_P07788751	1300017J02Rik	0.59338
A_68_P06294286	Epn1	0.594456
A_68_P10301168	Tgfb3-1700019E19Rik	0.595093
A_68_P08815423	Tsfm	0.595449
A_68_P10341311	Vsnl1	0.595459
A_68_P10745919	Ipo11	0.597311
A_68_P07498420	Sin3a	0.597796
A_68_P08890336	Spock2	0.600832
A_68_P04040117	4732473B16Rik	0.60207
A_68_P07361088	Rhou	0.602513
A_68_P08172363	Spa17	0.602686
A_68_P13117095	Bak1	0.603753
A_68_P05912818	Mkrm3	0.603907
A_68_P08656285	Phyhipl	0.604453
A_68_P05416729	Cxcl12	0.604653
A_68_P03751631	Zc3h12a	0.604911
A_68_P05807222	Trim24	0.604918
A_68_P06284631	Tbc1d17	0.605519
A_68_P01943851	AA467197	0.605597
A_68_P10205319	Yy1	0.606662
A_68_P00820783	Capn8	0.606844
A_68_P04000865	Rnf207-Rpl22	0.607215
A_68_P07554616	Rbms3	0.607697
A_68_P09078515	Meis1	0.608781
A_68_P14160293	Emx2	0.609316
A_68_P00316905	Tcfcp211	0.610395
A_68_P07853424	Cgnl1	0.610782
A_68_P11073758	Zfp366	0.611014
A_68_P12487908	1700021K19Rik-Fytd1	0.611418
A_68_P04970366	Chst12	0.612011
A_68_P01454242	ENSMUST00000083520.1:-1564	0.612698
A_68_P03685403	Dmrta2	0.613915

A_68_P08077145	Nedd4	0.614169
A_68_P03079741	Map2k1ip1	0.615654
A_68_P01569256	Traf6	0.616308
A_68_P03353902	1110049F12Rik	0.61634
A_68_P08395277	Smarcc2	0.61691
A_68_P12901529	Hunk	0.617503
A_68_P04340618	Ung	0.617519
A_68_P07950291	Sh3px3	0.617946
A_68_P02110665	Stam2	0.618036
A_68_P06099522	Apoc1	0.618205
A_68_P00236760	Tmem163	0.618859
A_68_P11137005	Spry2	0.618875
A_68_P11516634	Plekhc1	0.618895
A_68_P09038979	Kremen1	0.618943
A_68_P03685403	Dmrta2	0.6193
A_68_P14350160	Gfra1	0.619379
A_68_P05732741	Ccnd2	0.619453
A_68_P08997356	Ankrd40	0.620263
A_68_P13067632	Pkd1	0.62063
A_68_P14385037	Smarca2	0.621384
A_68_P07614034	Jam3	0.621407
A_68_P14257641	Stambpl1	0.621458
A_68_P14802381	Plxna3	0.622124
A_68_P13643168	Gata6	0.6229
A_68_P01011002	Elk4	0.622918
A_68_P13330489	Ehd3	0.623348
A_68_P10556075	Hivep1	0.623367
A_68_P09817295	Dlst	0.623716
A_68_P13006429	Ufd11	0.623814
A_68_P07179412	Rbpms	0.623953
A_68_P09632282	Dusp3	0.624543
A_68_P10265199	Kns2	0.624648
A_68_P00129085	1110058L19Rik	0.624708
A_68_P11828305	ENSMUST00000083663.1:-2499	0.625622
A_68_P03211661	2610204G22Rik	0.625705

A_68_P09805220	Trib2	0.6261
A_68_P01641588	Serinc3	0.626813
A_68_P04178087	Phox2b	0.626975
A_68_P02251924	Uckl1	0.627475
A_68_P12422403	Ep300	0.627625
A_68_P07491070	Ephb1	0.629197
A_68_P11922964	Klf10	0.630402
A_68_P08778846	Gja1	0.630408
A_68_P11739627	Gata4	0.631572
A_68_P00494851	Degs1	0.631716
A_68_P08284201	Wif1	0.631745
A_68_P03869852	Pax7	0.631814
A_68_P06934687	Jph3	0.632188
A_68_P04040117	4732473B16Rik	0.632617
A_68_P06874491	3110005G23Rik	0.632634
A_68_P14115940	Smad7	0.633235
A_68_P14187519	Lbx1	0.633418
A_68_P02617476	Uox	0.63346
A_68_P14385433	Pik3ap1	0.634476
A_68_P03628649	Toe1-Mutyh	0.63461
A_68_P08256155	Moxd1	0.635139
A_68_P07791783	Suhw4	0.635868
A_68_P04562414	Stx1a	0.636046
A_68_P08803717	Hsd17b6	0.63753
A_68_P13439820	Ptprs	0.638461
A_68_P07923222	AI593442	0.638891
A_68_P13883460	Pcdha9	0.638949
A_68_P04575353	Gbas	0.639651
A_68_P15201288	Zfx	0.639693
A_68_P07813354	Gclc	0.640072
A_68_P14735269	Gria3	0.640582
A_68_P06320275	Cyfip1	0.6408
A_68_P08156834	1110032A03Rik	0.640898
A_68_P00934875	Rxrg	0.64105
A_68_P00718610	Rrs1	0.641141

A_68_P11539394	Gpc5	0.641244
A_68_P09314768	Grn	0.641465
A_68_P04365068	Klb	0.641597
A_68_P03342791	Arhgef19	0.642442
A_68_P10913242	Wrnip1	0.642767
A_68_P05939018	A630091E08Rik	0.643065
A_68_P05217166	Ephb6	0.643151
A_68_P06592634	Cd3eap-Ppp1r13l	0.643194
A_68_P00793519	Ihh	0.64424
A_68_P02153759	Cstf3	0.644402
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A_68_P02145945	Clp1	0.744424
A_68_P10390439	C130076O07Rik	0.744766
A_68_P08969524	Pdxk	0.744987
A_68_P14245824	Rcl1	0.745044
A_68_P14844556	Rs1	0.745045
A_68_P12081602	Rbm9	0.745046
A_68_P14554584	Pdk3	0.745052
A_68_P05193381	Phf14	0.745277
A_68_P14612493	Pnck	0.745332
A_68_P09350828	Smcr8	0.745427
A_68_P04044353	Med18	0.745706
A_68_P07582959	Endod1	0.745813
A_68_P09143801	Pps	0.745821
A_68_P14313887	Shoc2	0.745899
A_68_P02979898	Arhgef2	0.746071
A_68_P12138338	Hoxc13	0.74619
A_68_P02116516	Zcchc3	0.746193
A_68_P08985425	Crhr1	0.746215
A_68_P04836173	Ift81	0.746275
A_68_P13359198	Lrpprc	0.746291
A_68_P05182308	Gpr85	0.746631

A_68_P06643189	Rps19	0.746757
A_68_P03747411	Tesk1	0.74684
A_68_P03747745	Ptprf	0.74713
A_68_P09563208	5730593N15Rik	0.747144
A_68_P04688861	Actr3b	0.747413
A_68_P12500585	Hira	0.748553
A_68_P12069845	5730557B15Rik	0.748675
A_68_P06924340	Foxf1a	0.748685
A_68_P02381326	Slc25a24	0.748822
A_68_P01697623	Pbx3	0.748902
A_68_P03898253	D630039A03Rik	0.749022
A_68_P02046834	Egfl7	0.749039
A_68_P10645306	Nfil3	0.74924
A_68_P09258755	A630050E13Rik	0.749273
A_68_P02711184	Rap1a	0.749381
A_68_P09240372	Tbkbp1	0.749805
A_68_P09292536	Gria1	0.749929
A_68_P09595945	Cdc6	0.749965

**Supplementary Table 3b: KOA vs KO 172 hypermethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P07263831	Shcgp1	2.132419
A_68_P14368537	Ankrd1	1.771911
A_68_P13823227	Pcdhga11	1.703845
A_68_P15081221	Wdr13	1.700032
A_68_P03224123	Spata21	1.632593
A_68_P09009571	Olfir223	1.631738
A_68_P03224123	Spata21	1.606029
A_68_P05448315	Kcna5	1.596381
A_68_P01519278	1700037H04Rik	1.593843
A_68_P08377436	Ascl1	1.564098
A_68_P06550934	Lrrc4b	1.554605
A_68_P07829944	Paqr9	1.534036
A_68_P03075997	Dcamk12	1.529319
A_68_P06683149	Gtl3	1.512552
A_68_P07341251	Spata4	1.509469
A_68_P03251705	Ccnc	1.505269
A_68_P10499714	Irf4	1.501672
A_68_P09361410	Alox15	1.500519
A_68_P04331228	Dtx1	1.500433
A_68_P09891693	Cdk11	1.498414
A_68_P10356757	Trim9	1.49836
A_68_P04844116	Cxcl4	1.489747
A_68_P03912425	Aqp7	1.488285
A_68_P12255657	Baiap212	1.477926
A_68_P00072270	Ptpn14	1.477407
A_68_P12074308	Galr3	1.466488
A_68_P04300636	Pxn	1.447611
A_68_P07024704	1700029J07Rik	1.443679
A_68_P05958477	Tmem16e	1.441569
A_68_P09440376	Spag5	1.439846
A_68_P14099757	B230399E16Rik	1.439474
A_68_P09922529	Ptprn2	1.439467
A_68_P03406403	Ubx3	1.436197

A_68_P05934226	Kcnc3	1.434424
A_68_P07620405	Gtf2a2	1.430305
A_68_P02203172	Elf5	1.42878
A_68_P12151832	Wnt10b	1.42828
A_68_P03991577	Nfx1	1.426525
A_68_P05111640	Trim24	1.423991
A_68_P13355809	Grm4	1.423196
A_68_P10492735	Pitrm1	1.423047
A_68_P07945909	Slc25a20	1.421333
A_68_P03759607	1810019J16Rik	1.4211
A_68_P04806722	Rint1	1.420651
A_68_P06099228	2310044H10Rik	1.420063
A_68_P08980029	Krt27	1.419464
A_68_P04390199	Ung	1.419038
A_68_P13436841	Brd2	1.417372
A_68_P08481839	Pesk4	1.415729
A_68_P10401129	Sgpp1	1.415716
A_68_P10190658	Msgn1	1.413983
A_68_P05321956	Kcnd2	1.412861
A_68_P05958473	Tmem16e	1.412171
A_68_P01134681	Col19a1	1.410497
A_68_P00400075	Kif1a	1.409992
A_68_P01499103	Ggta1	1.406855
A_68_P14103036	Gm672	1.405967
A_68_P09329905	Sp2	1.402671
A_68_P12079965	2810451A06Rik	1.402134
A_68_P12382326	A4galt	1.400838
A_68_P03639993	Matn1	1.400078
A_68_P01552185	Prosapip1	1.39921
A_68_P12120913	Aqp5	1.397422
A_68_P03107074	Ccdc39	1.397366
A_68_P12441858	Adamts20	1.397252
A_68_P13927242	Pcdhac2	1.397074
A_68_P13090368	BC008155	1.396857
A_68_P11679711	Dnajc3	1.393891

A_68_P13488443	Prss34	1.392889
A_68_P13340765	2410015M20Rik-Rpl36	1.392881
A_68_P10006453	Foxg1	1.391241
A_68_P14271693	Dmrt1	1.389175
A_68_P04671528	Slc10a4	1.389035
A_68_P12003446	Oxct1	1.387786
A_68_P10147998	Ppp2r5c	1.387527
A_68_P10168388	Otub2	1.387269
A_68_P09143803	Pps	1.387207
A_68_P06046412	H47	1.387182
A_68_P01442677	Adam33	1.384526
A_68_P04607980	Rpl6	1.383943
A_68_P00711135	Slc45a3	1.383073
A_68_P00366170	1110034B05Rik	1.383055
A_68_P05944068	Art1	1.382583
A_68_P05123645	Edem1	1.380316
A_68_P08688126	Pip5k2c	1.379071
A_68_P13551185	H2-M10.2	1.378498
A_68_P09229843	Sec14l1	1.375964
A_68_P00179487	Dusp27	1.375781
A_68_P00331311	EG240916	1.37409
A_68_P05889184	Xrcc1	1.373265
A_68_P12433410	Letmd1	1.372015
A_68_P04964830	Ache	1.371675
A_68_P03809570	Ubap2	1.370658
A_68_P09443620	Tef7	1.36996
A_68_P06900371	Ogfod1	1.369856
A_68_P11758642	Zic2	1.369756
A_68_P01944492	4930526D03Rik	1.368976
A_68_P05085703	Itp1	1.367395
A_68_P06526842	Dpysl4	1.36715
A_68_P03472730	Pou3f1	1.367121
A_68_P06996032	Bcar1	1.365262
A_68_P01381082	Myt1	1.364911
A_68_P13937104	Myo5b	1.364284

A_68_P03702179	Asph	1.363066
A_68_P01591335	Rtel1	1.362107
A_68_P14385196	Cabp4	1.361633
A_68_P14362302	Rps6ka4	1.361527
A_68_P00708957	Pax3	1.361
A_68_P00174516	Chrnd	1.359577
A_68_P09115945	BC022224	1.358838
A_68_P10626468	BC003212:608	1.358025
A_68_P09977013	Psm6	1.357984
A_68_P11288375	Grid1	1.357733
A_68_P09585043	Lig3	1.357034
A_68_P07257166	Ssbp4-Lrrc25	1.356851
A_68_P06523723	Htra1	1.356832
A_68_P04456805	Aym1	1.356668
A_68_P02301827	Tpd52	1.355564
A_68_P00216168	1500015O10Rik	1.354775
A_68_P00445737	En1	1.354372
A_68_P10845417	Pak1ip1	1.353697
A_68_P14408920	Sart1	1.352719
A_68_P04538401	Rxfp2	1.352173
A_68_P01695051	Jag1	1.351864
A_68_P13387156	Ntn2l	1.35018
A_68_P08013981	Foxb1	1.349942
A_68_P07296135	BC003267	1.349777
A_68_P05950428	Smpd1	1.349644
A_68_P13770976	Cdh2	1.349552
A_68_P00406171	Sccpdh	1.348715
A_68_P02110645	Ccbl1	1.348042
A_68_P09101722	Coasy	1.347497
A_68_P03526224	Cda	1.345901
A_68_P07773646	Sorl1	1.345321
A_68_P10057181	Prkcm	1.345045
A_68_P09403409	Gal3st1	1.344925
A_68_P14280238	Pik3ap1	1.343834
A_68_P10336558	Clec14a	1.343737

A_68_P10220901	Cdk11	1.343247
A_68_P06519231	4933417E01Rik	1.343013
A_68_P09588060	Osm	1.343004
A_68_P04163384	Steap1	1.341706
A_68_P12283480	Zfpm2	1.341623
A_68_P14479477	Adrb1	1.340918
A_68_P06063501	Ap2s1	1.340393
A_68_P05960647	4930451I11Rik	1.339685
A_68_P02298774	Amigo1	1.33957
A_68_P03720734	Mmel1	1.339139
A_68_P05284645	Rbm28	1.338891
A_68_P03759607	1810019J16Rik	1.338293
A_68_P06897654	Slc35e1	1.338042
A_68_P08526444	Ddit3	1.337769
A_68_P08976649	Cnp1	1.3371
A_68_P09609496	Rab5c	1.337036
A_68_P04262918	Zfp316	1.336621
A_68_P00471093	Rgs7	1.336466
A_68_P07921855	Tmem30a	1.336448
A_68_P12262296	Upk3a	1.33564
A_68_P13155345	A_68_P13155345	1.33554
A_68_P10561599	Prss16	1.334579
A_68_P10997971	Hist1h4i	1.334085
A_68_P03324692	H6pd	1.332751
A_68_P00418602	Adora1	1.332424
A_68_P11564485	Prrx11	1.332232
A_68_P01293034	4833422F24Rik	1.331791
A_68_P07688663	Atm	1.331726
A_68_P03978053	Grhl3	1.331699
A_68_P03720734	Mmel1	1.331498
A_68_P02251909	Uck11	1.331232
A_68_P00303681	Igfbp5	1.331168
A_68_P07842272	Usp4	1.330904
A_68_P08817669	Sgk	1.330577

**Supplementary Table 4: 163 common genes between the genes hypomethylated in KOA offspring compared with KO offspring and those, that were hypermethylated in the KO offspring compared with N offspring on d16**

1110008J03Rik
1110008J03Rik
1110049F12Rik
1500031L02Rik
2700007P21Rik
6230416J20Rik
6230416J20Rik
Abcg8
Abcg8
Acot7
Actg1
Acy1
Adam11
Agxt2l2
AI593442
Aldoa
Ambp
Apoa4
Arhgef19
Arhgef19
Armc5
Athl1
B3gnt8
BC021891
BC021891
BC030396
Bhlhb2
Bnc1
Btbd14a
Capn8
Capns1
Casd1



Ccdc122
Cdgap
Cldn19
Clp1
Clp1
Csnk1g2
Ctnbp2nl
Cxcl1
Cxcl1
Cxcl4
Cybase3
Cyp4f13
Cyp4f13
Ddx11
Defb25-Rem1
Dgkq
Dio1
Dio1
Dio1
Dio1
Dmrt2
Dnmt3a
Dnmt3a
EG232599
Egfl7
Egfl7
Egfl7
Ehd3
En1
Epb4.111
Errfi1
Errfi1
Errfi1
Etf1
Evi5

Evi5
Fbx110
Fbx110
Fkbp11
Flrt2
Gnai2
Gnptab
Gpc4
Grhl2
Gtf2h4
Hand2
Hoxb13
Hoxb2
Hoxb5
Hoxb7
Hoxc13
Hoxd3
Hp1bp3
Hp1bp3
Hsd17b6
Hsf4
Ifi47
Indol1
Indol1
Irak2
Jarid2
Kcnc3
Kdelr1
Lgals3
Lhx1
Lrig3
Lrpprc
Med18
Mid1ip1
Mxi1

Myo1c
Nmt2
Nmt2
Nrn1
Nxt2
Olfr503
Osbp11a
Palmd
Palmd
Pax7
Pcdh10
Pcdha9
Phf14
Phox2b
Ptprf
Ptprf
Ptprs
Rbm13
Rbm9
Rbms2
Rdx
Rps6ka5
Rps6ka5
Rtn3
Sacm11
Sema3b
Sh3tc2
Slc12a9
Slc19a1
Slc1a3
Slc37a1
Slc37a1
Slc37a1
Slc7a11
Slc7a6

Smarcc2
Smcr8
Smcr8
Snag1
Snape2
Sox2
Srebf1
St8sia4
Stx1a
Tagln2
Tbkbp1
Tcfe3
Tcfe3
Timm8a1
Tnfrsf11a
Tpd52
Tsfm
Tsga10-EG623661
Ung
Ypel4
Yy1
Zfp326
Zfp503
Zfp503
Zfp532
Zfp536

**Supplementary Table 5**

- a** The number of genes with DNA methylation changes in the liver of KOA offspring compared with N offspring on d16.

	Number of genes		
	Total number	DNA hypomethylation	DNA hypermethylation
<b>d16</b>	28983	150	1034

- b** Pathway analysis of genes that were DNA hypermethylated in KOA offspring relative to those in N offspring on d16.

Pathway	<i>P</i> -values
beta-Alanine metabolism	3.80E-05
Renal cell carcinoma	1.20E-03
Axon guidance	2.60E-03
PPAR signaling pathway	3.10E-03
Pyruvate metabolism	1.00E-02
Cysteine and methionine metabolism	1.60E-02
Lysosome	2.00E-02
Galactose metabolism	3.30E-02
Tryptophan metabolism	3.50E-02
Fc gamma R-mediated phagocytosis	3.60E-02
Glycolysis / Gluconeogenesis	3.60E-02

**Supplementary Table 6a: N vs KOA 1034 hypermethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P08659099	Atp2b1	5.619649
A_68_P12362697	Gpt1	5.149239
A_68_P08321362	Apon	4.589806
A_68_P05887814	Echs1	4.528749
A_68_P11542106	Itih1	4.368549
A_68_P08974352	ENSMUST00000100735.1:-5885	4.026455
A_68_P05932565	Polr2i	3.996813
A_68_P07593867	Slc38a3	3.856302
A_68_P10973374	Slc17a3	3.335603
A_68_P10134551	Lrfn5	3.289013
A_68_P01293034	4833422F24Rik	3.240662
A_68_P03900413	Klhdc7a	3.172417
A_68_P08514851	Nr2e1	3.168675
A_68_P08066253	Slc38a3	3.084246
A_68_P09620647	Dcxr	2.996779
A_68_P04983814	Abcb9	2.95639
A_68_P05416729	Cxcl12	2.87807
A_68_P03307859	Hp1bp3	2.805745
A_68_P08778846	Gjal	2.723943
A_68_P03430349	2010305A19Rik	2.719414
A_68_P05519173	Mkln1	2.689089
A_68_P11972358	Cbx7	2.630877
A_68_P03733137	Rnf186	2.594756
A_68_P08992028	Pnpo	2.593888
A_68_P03900439	Klhdc7a	2.586357
A_68_P06602919	Ucp3	2.554169
A_68_P08122216	Clpx	2.5448
A_68_P03353696	Sdc3	2.542607
A_68_P10766266	Slc12a7	2.527982
A_68_P12303780	Hoxc13	2.511596
A_68_P04376201	Micall2	2.50517
A_68_P00873631	Ube2f	2.491692
A_68_P04970366	Chst12	2.454741

A_68_P12254132	1810015C04Rik	2.439941
A_68_P14652218	ENSMUST00000037596.5:-3006	2.377726
A_68_P08176000	Myo1e	2.370593
A_68_P09620642	Dcxr	2.363741
A_68_P13319154	9530058B02Rik	2.355943
A_68_P05943561	Slc27a5	2.321858
A_68_P08364613	Gstt3	2.285871
A_68_P13070859	S3-12	2.278895
A_68_P04621660	BC003324-6330548G22Rik	2.275243
A_68_P06410148	Zfp710	2.248696
A_68_P13374816	Zbtb12	2.232155
A_68_P05307915	Adipor2	2.200657
A_68_P12651548	Pla1a	2.188295
A_68_P13360070	A_68_P13360070	2.185616
A_68_P11937882	BC030396	2.179033
A_68_P06121225	Dll3	2.178701
A_68_P03123565	She	2.171821
A_68_P07210491	F10	2.154816
A_68_P03375546	Slc25a34	2.14218
A_68_P03496599	Il22ra1	2.105849
A_68_P04010940	Foxd2	2.087417
A_68_P07688624	Gramd1b	2.080436
A_68_P11040896	Peci	2.078433
A_68_P04081654	Dio1	2.069482
A_68_P07238996	Ell	2.069469
A_68_P09257037	ENSMUST00000083595.1:-5713	2.068223
A_68_P09628447	Arfl4	2.065944
A_68_P01219086	Pck1	2.053895
A_68_P03496599	Il22ra1	2.036504
A_68_P04390199	Ung	2.026332
A_68_P02145945	Clp1	2.024907
A_68_P15077935	Sox3	2.022275
A_68_P08005788	Odf3l1	2.01059
A_68_P09103592	Igf2bp1	1.995923
A_68_P00945758	Cacna1e	1.980567

A_68_P15077927	Prkx	1.970641
A_68_P00783024	Farp2	1.964128
A_68_P06677187	Agt	1.956564
A_68_P10666960	Jarid2	1.955235
A_68_P02110645	Ccbl1	1.950816
A_68_P04324543	Nat8l	1.946424
A_68_P07622451	Apoc3	1.940699
A_68_P04835083	Fbxw8	1.939241
A_68_P13107839	Abcg8	1.938998
A_68_P09669340	Rab11fip4	1.937035
A_68_P00880269	Zfand2b	1.936263
A_68_P02504542	Zfp697	1.931372
A_68_P11180833	Itih3	1.924031
A_68_P09252755	ENSMUST00000100735.1:-6717	1.922781
A_68_P00458829	Rab17	1.920212
A_68_P06166301	Sphk2	1.91819
A_68_P09295953	Pctp	1.912085
A_68_P01309646	Gzf1	1.884655
A_68_P07444192	Indol1	1.883396
A_68_P01342780	Ccbl1	1.881844
A_68_P01359867	Nxt1	1.879403
A_68_P04914473	Rac1	1.870577
A_68_P09455667	Clk4	1.869642
A_68_P07361088	Rhou	1.869463
A_68_P13172382	Rhot2	1.868646
A_68_P07178590	Sf3b3-Cog4	1.865421
A_68_P13107615	Ticam1	1.863384
A_68_P10766271	Slc12a7	1.855035
A_68_P04983819	Abcb9	1.854886
A_68_P06519231	4933417E01Rik	1.851113
A_68_P08183902	Hyal1	1.850573
A_68_P14987574	Sms	1.84811
A_68_P07697198	Acaal1a	1.84407
A_68_P03896383	Prdm16	1.841264
A_68_P07282392	Ier2	1.841222



A_68_P03987047	Arhgef19	1.838936
A_68_P12051107	Naprt1	1.837565
A_68_P00662466	Il1r1	1.832005
A_68_P02283357	Schip1	1.831677
A_68_P00041396	Mgat4a	1.830827
A_68_P06041220	0610012D14Rik	1.823279
A_68_P03797750	Cdc42	1.821291
A_68_P14844618	Hmgb3	1.81758
A_68_P03396713	Cpne3-2410005O16Rik	1.798519
A_68_P01628111	Dab2ip	1.797675
A_68_P07023164	Sin3b	1.796968
A_68_P01647847	Atp5e	1.794192
A_68_P08416674	Pbld	1.791727
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A_68_P06872414	Efcbp2	1.35301
A_68_P09349698	2400006H24Rik	1.352811
A_68_P03720734	Mmel1	1.352229
A_68_P04567641	A230097K15Rik	1.352088
A_68_P12713735	Atp5o	1.352055
A_68_P13981763	Mapk4	1.352013
A_68_P10157510	A_68_P10157510	1.351816
A_68_P01345408	Api5	1.351781
A_68_P08903907	Tspan31-Centg1	1.351778
A_68_P09628625	Tmem88	1.351453
A_68_P06984570	Psmc7	1.3512
A_68_P10760640	Gas1	1.35105

A_68_P07401386	B3gnt3	1.35097
A_68_P14061985	Egr1	1.350666
A_68_P05548217	Chd4	1.35064
A_68_P00719128	Lad1	1.350552
A_68_P13349409	Sfrs3	1.35002
A_68_P07074552	Usp38	1.349978
A_68_P06626995	Hmx2	1.34984
A_68_P14461348	Cdca5	1.349516
A_68_P13134961	Tnfrsf21	1.349149
A_68_P08666230	Hnrph3	1.349019
A_68_P05231743	Zfp384	1.348981
A_68_P13556997	Tsga2	1.348651
A_68_P06087354	Pnpla2	1.34814
A_68_P09645952	OTTMUSG00000000934	1.347966
A_68_P09548393	Aoc3	1.347929
A_68_P12242248	Syngn1	1.347821
A_68_P06438476	Saps1	1.347799
A_68_P04546156	Trfr2	1.347261
A_68_P00626532	Atf3	1.347158
A_68_P05679178	Camk1	1.347021
A_68_P04731285	Kl	1.346698
A_68_P09413265	Adam11	1.34647
A_68_P14431117	Sfl	1.346376
A_68_P11247425	Entpd4	1.346079
A_68_P12255657	Baiap2l2	1.345019
A_68_P05228148	H1fx	1.344989
A_68_P09645961	OTTMUSG00000000934	1.344915
A_68_P09582843	Itga3	1.344811
A_68_P13067632	Pkd1	1.344641
A_68_P06393479	A830041P22Rik-BC028440	1.344343
A_68_P14849214	ENSMUST00000037596.5:-5074	1.344303
A_68_P08314943	Oaz1	1.344037
A_68_P12151407	2010109I03Rik	1.344025
A_68_P12018996	Pfkm	1.34388
A_68_P11972173	Rabl4	1.343842



A_68_P09009571	Olfir223	1.343837
A_68_P13834333	Srfbp1	1.343547
A_68_P04966921	Rpl21	1.34327
A_68_P05448304	Kcna5	1.34313
A_68_P09434018	Cntnap1	1.343124
A_68_P08882556	Ptbp1	1.343073
A_68_P13465706	Caskin1	1.342849
A_68_P15092233	Armxc2	1.342413
A_68_P06431967	Siglecf	1.342322
A_68_P06765322	Wwc2	1.342304
A_68_P06275315	Rgs10	1.34221
A_68_P09598068	Acox1	1.34209
A_68_P06184102	Ech1	1.341959
A_68_P02032727	Arl6ip6	1.341798
A_68_P01606835	Prnd	1.341071
A_68_P01986063	Mcm8	1.341042
A_68_P00064328	Mpz11	1.340992
A_68_P03984305	Nfib	1.340978
A_68_P09359466	Sphk1	1.340949
A_68_P15009258	Gm784	1.340896
A_68_P08066246	Slc38a3	1.340809
A_68_P10492574	Ippk	1.340586
A_68_P03245499	Ripk2	1.340568
A_68_P12451934	Card10	1.340293
A_68_P00451766	Nmnat2	1.340258
A_68_P12449654	Ankrd46	1.34017
A_68_P09136314	Baiap2	1.33999
A_68_P04834404	Lphn3	1.339827
A_68_P07359887	Cox4i1	1.339736
A_68_P03953505	Ppp1r8	1.338938
A_68_P10293201	Sel1l	1.338653
A_68_P05099470	Cpne9	1.338103
A_68_P01963655	4932418E24Rik	1.337979
A_68_P06985598	Pkd112	1.337707
A_68_P12908674	Magmas	1.337585

A_68_P13075867	Mas1-Mrgprh	1.337503
A_68_P00991622	Capn8	1.337252
A_68_P03920582	Fgr	1.337216
A_68_P14989894	Ap1s2	1.336982
A_68_P13434054	B3galt4	1.33697
A_68_P13503529	C130040N14Rik	1.336904
A_68_P07574923	Coro2b	1.336902
A_68_P09736098	Hba-a1	1.336646
A_68_P05904665	Hpxn	1.33661
A_68_P02091744	Ncoa5	1.33604
A_68_P04277969	Rnf32	1.336019
A_68_P10974783	Prr7	1.335538
A_68_P09559562	Shmt1	1.335522
A_68_P01722996	Pck1	1.335297
A_68_P13119759	Nkx2-5	1.335287
A_68_P09307716	Doc2b	1.335262
A_68_P01640329	Btbd3	1.334992
A_68_P05891727	Grik5-Zfp574	1.334977
A_68_P08935364	Fyn	1.334879
A_68_P04731732	Sdsl	1.334687
A_68_P08173101	Cyp8b1	1.334479
A_68_P02160813	Inpp5e	1.334385
A_68_P05402372	Itp2	1.334203
A_68_P02442112	Car14	1.334153
A_68_P00999801	Avpr1b	1.334075
A_68_P11406546	Ang1	1.333952
A_68_P06078807	Zfp446	1.333811
A_68_P01275891	Figf	1.333792
A_68_P03274719	Cd72	1.333666
A_68_P08894637	Tle2	1.333629
A_68_P09538169	D11Ert18e	1.333536
A_68_P09229843	Sec14l1	1.333494
A_68_P02989786	Neurog2	1.333308
A_68_P07876589	Fbxo9-Ick	1.333285
A_68_P04608378	Rnf6-Cdk8	1.333156

A_68_P03673261	B3galt6	1.333018
A_68_P08073169	Apeh	1.332935
A_68_P02046877	Egfl7	1.332874
A_68_P11311203	Lrtm1	1.332561
A_68_P02305769	Pld1	1.332537
A_68_P11019594	Uimc1-Zfp346	1.33245
A_68_P08629268	Hkdc1	1.33233
A_68_P03854965	Marcks11	1.332236
A_68_P04636799	Nub1	1.332012
A_68_P05342558	Gfpt1	1.331959
A_68_P14314015	Ehd1	1.331856
A_68_P12871001	Sema5b	1.331684
A_68_P12584046	2310061J03Rik	1.331668
A_68_P01424824	Rbl1	1.331663
A_68_P12017322	Cbx7	1.331613
A_68_P06653585	Plekha4	1.331332
A_68_P06406870	Zik1	1.33098
A_68_P06243313	Klk10	1.33087
A_68_P11609980	Jub	1.330582
A_68_P07010746	Abhd8	1.330312
A_68_P01717991	Btbd14a	1.330029
A_68_P03535794	Tal2	1.330011

**Supplementary Table 6b: N vs KOA 150 hypomethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P12755374	App	0.047829
A_68_P07910003	Elavl3	0.135364
A_68_P12853498	Mx2	0.150429
A_68_P04734427	Shroom3	0.175271
A_68_P01769357	Mrg1	0.187045
A_68_P10449774	2410002O22Rik-Trim23	0.288886
A_68_P12217051	9130401M01Rik	0.292903
A_68_P02404444	Cxxc4	0.305886
A_68_P13251244	Cyp4f13	0.367237
A_68_P09049964	Gria1	0.417974
A_68_P13251243	Cyp4f13	0.420593
A_68_P07592424	Lbxcor1	0.421406
A_68_P14259486	Rfx3	0.425236
A_68_P06810073	Aadat	0.430781
A_68_P14586192	Irs4	0.435363
A_68_P10208303	Brms11	0.458816
A_68_P12423891	Rnd1	0.465988
A_68_P14659932	Slc25a5	0.481463
A_68_P06177032	Rgs9bp	0.500148
A_68_P05492016	Mkrm1	0.522946
A_68_P12536557	BC027231	0.527749
A_68_P03944620	E130114P18Rik	0.550509
A_68_P01268520	Zfhx1b	0.556625
A_68_P12360632	Zhx2	0.560654
A_68_P04895996	Mapk10	0.561765
A_68_P04277065	Cxcl1	0.561935
A_68_P04480991	Wfs1	0.56214
A_68_P05918908	Peg3	0.571169
A_68_P00552426	Dst	0.572084
A_68_P04262240	Mapk10	0.574887
A_68_P03075963	Rap1gds1	0.57979
A_68_P05122196	Fkbp14-Plekha8	0.58038
A_68_P03545245	Casp8ap2	0.58824

A_68_P04846731	Rasgef1b	0.597842
A_68_P05162900	Zfml	0.602215
A_68_P08629638	Ddt	0.60239
A_68_P13119458	Dscr111	0.607516
A_68_P08440358	Ahi1	0.60832
A_68_P11564394	9430077A04Rik	0.612977
A_68_P14628736	6430550H21Rik	0.619227
A_68_P09233032	Anxa6	0.61975
A_68_P07327905	Slc6a2	0.62084
A_68_P09296258	Hspa4	0.637876
A_68_P13992999	Pcdhgb2	0.641232
A_68_P09689225	Wbp2	0.643284
A_68_P03553526	Vamp3	0.645106
A_68_P14001180	Aldh7a1	0.650569
A_68_P09955204	Fut8	0.655423
A_68_P04763153	Rasal1	0.657537
A_68_P04247170	Zfp326	0.658156
A_68_P14292416	Hps6	0.660772
A_68_P11328115	Otx2	0.660979
A_68_P09134526	Lhx1	0.662558
A_68_P03553526	Vamp3	0.666399
A_68_P04277062	Cxcl1	0.673531
A_68_P07704674	Opcml	0.675132
A_68_P14519995	Bmx	0.677734
A_68_P11069910	Gcnt2	0.679741
A_68_P14336511	Arhgap19	0.68037
A_68_P04218037	Tbx3	0.681135
A_68_P09575135	BC025575	0.681867
A_68_P02032707	Prpf40a	0.684072
A_68_P01024689	Mosc2	0.684117
A_68_P09095193	Rhbdd3	0.684994
A_68_P10561224	Fbxl21	0.685629
A_68_P11960760	Pick1	0.687702
A_68_P11825632	Ptprg	0.690785
A_68_P06075223	Aplp1	0.692372

A_68_P00221558	Prrx1	0.692959
A_68_P04844116	Cxcl4	0.694124
A_68_P13657420	Pias2	0.695675
A_68_P00098491	Astn1	0.696062
A_68_P07379781	Tomm20	0.696558
A_68_P11465874	Tsc22d1	0.699961
A_68_P02070587	Zswim3	0.700566
A_68_P00478505	Pax3	0.701502
A_68_P07949632	Gramd1b	0.701855
A_68_P02870031	Tnrc4	0.702077
A_68_P00287878	B3gat2	0.702756
A_68_P06428107	Zfp36	0.705494
A_68_P07432747	E130303B06Rik	0.706874
A_68_P14103036	Gm672	0.708007
A_68_P13625730	Cbln2	0.711191
A_68_P13166533	Ddah2	0.713225
A_68_P06633063	Stk32c	0.714689
A_68_P14209573	Rin1	0.715253
A_68_P08111988	Armet	0.716054
A_68_P03211661	2610204G22Rik	0.717515
A_68_P03780585	Arhgef19	0.717638
A_68_P13365467	Rab11b	0.719827
A_68_P03704070	Dlgap3	0.720437
A_68_P09782980	Kcnf1	0.72053
A_68_P12157937	Cacnb3	0.721433
A_68_P06660297	Zfp536	0.721824
A_68_P03676855	Zfp189	0.721846
A_68_P02733796	2010200O16Rik-Taf13	0.722795
A_68_P02244930	Zfp533	0.723196
A_68_P01529996	Fnbp4	0.723251
A_68_P06099522	Apoc1	0.725501
A_68_P04040117	4732473B16Rik	0.725666
A_68_P14844556	Rs1	0.72603
A_68_P08462448	Hint3	0.726933
A_68_P12636185	Lsg1	0.726944

A_68_P07827956	Tbx20	0.727394
A_68_P06632773	Fxyd7	0.72763
A_68_P09528972	Zfp454	0.728529
A_68_P06322596	Kcnj11	0.729121
A_68_P10569036	Cep72	0.729511
A_68_P11486688	Lect1	0.733807
A_68_P06143604	Nell1	0.734952
A_68_P10891937	Foxq1	0.736229
A_68_P03895474	Sesn2	0.73625
A_68_P11226211	Hs6st3	0.736393
A_68_P00012012	Klf7	0.736507
A_68_P13166532	Ddah2	0.736669
A_68_P04993451	Ptpn11	0.736854
A_68_P13382521	Notch4	0.737645
A_68_P04544688	Tmem129-Tacc3	0.738028
A_68_P04519890	Kctd10	0.738175
A_68_P11738050	Homez	0.738653
A_68_P04810796	Stk32b	0.739159
A_68_P07099607	BC056474	0.739524
A_68_P11989894	Ptger4	0.740476
A_68_P07178595	Sf3b3	0.741103
A_68_P10195731	Arg2	0.742162
A_68_P14645891	Gemin8	0.742614
A_68_P00488032	Clk1	0.742704
A_68_P12291916	BC026404:12631	0.742741
A_68_P07154161	Eif4ebp1	0.742875
A_68_P03484743	Pax7	0.743264
A_68_P06770253	Fanca	0.743514
A_68_P01193243	Clp1	0.743544
A_68_P13271870	Gtf2h4	0.743926
A_68_P02401082	Ccdc109b	0.745035
A_68_P04677545	Msx1	0.745201
A_68_P03328804	Ube2j2	0.745247
A_68_P10022213	Foxa1	0.745399
A_68_P03630403	Asah3l	0.74561

A_68_P13340774	2410015M20Rik	0.746131
A_68_P04552017	Dpp6	0.746241
A_68_P10801669	Mterfd1	0.746333
A_68_P00351468	Creg2	0.746835
A_68_P03332653	Foxe3	0.747046
A_68_P13090368	BC008155	0.747122
A_68_P06740725	2400003C14Rik	0.747455
A_68_P05344583	Tnfrsf1a	0.747548
A_68_P02280033	Mafb	0.748266
A_68_P01569256	Traf6	0.748417
A_68_P09596165	Rap2ip	0.749031
A_68_P11235588	Ccdc122	0.749449



**Supplementary Table 7a: N vs A 560 hypomethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P08365020	Tbc1d15	0.500869
A_68_P07008633	Casp3	0.505797
A_68_P03003821	Wnt2b	0.51527
A_68_P13848882	Dym	0.522551
A_68_P06140698	Arnt2	0.524945
A_68_P09691322	1200011M11Rik	0.527728
A_68_P14154116	Rbm4b	0.532604
A_68_P09444605	Car4	0.538766
A_68_P03872557	Tgfbr1	0.543096
A_68_P12490512	Adamts1	0.543226
A_68_P11097546	Sox4	0.547857
A_68_P09350088	Pmp22	0.549097
A_68_P14498430	Prkg1	0.552351
A_68_P01214289	Nmt2	0.557171
A_68_P13129521	Crebl1	0.558529
A_68_P01575537	Sfrs6	0.560647
A_68_P12654503	Rsl1d1	0.564131
A_68_P05149207	Ptcd3-Rpo1-4	0.56449
A_68_P02060727	Slc25a25	0.565203
A_68_P06001672	Foxi2	0.569377
A_68_P06536662	Ccdc106	0.574652
A_68_P11632577	Zfp395	0.577971
A_68_P08062569	Ei24	0.580041
A_68_P08848709	Kcnmb4	0.580792
A_68_P06164674	1810054G18Rik	0.581639
A_68_P02559788	Pitx2	0.581992
A_68_P06076158	Isoc2b	0.586721
A_68_P10987283	3110031B13Rik	0.58899
A_68_P07532442	Aph1b	0.589121
A_68_P08077709	BC024479	0.589562
A_68_P10286533	Cdca4	0.589872
A_68_P11399114	Apex1	0.590815
A_68_P11342429	Samd4	0.590989

A_68_P06824946	Foxfla	0.591817
A_68_P09921275	Ubx4	0.592623
A_68_P09172983	Sec14l4	0.593475
A_68_P01869178	Foxa2	0.59376
A_68_P09729901	Phb	0.59491
A_68_P00314170	Idh1	0.596116
A_68_P12412863	Osr2	0.598148
A_68_P06244528	Tufm	0.598853
A_68_P14410370	Nkx2-3	0.598946
A_68_P01360285	Rbpsuhl	0.599538
A_68_P08697303	Helb	0.599588
A_68_P01528714	Rpl12	0.600795
A_68_P07037395	Ap3m2-1700041G16Rik	0.601063
A_68_P10774084	Hist1h2bm	0.601549
A_68_P06052141	Unc45a-Hd3c3	0.601628
A_68_P04106454	BC057022	0.60198
A_68_P07909840	Sin3a	0.602733
A_68_P03570669	Fabp3	0.602833
A_68_P14256098	Npas4	0.603714
A_68_P10243773	Bcl11b	0.603817
A_68_P05706787	Plxnd1	0.606406
A_68_P06573939	Kcna7	0.606601
A_68_P02577702	Sox2	0.60721
A_68_P05795898	Bhlhb3	0.609601
A_68_P06075074	Ntrk3	0.609628
A_68_P06352184	BC053749	0.610676
A_68_P00657988	Farslb	0.612033
A_68_P05972664	2210013K02Rik	0.612501
A_68_P03352387	BC057893	0.613578
A_68_P11484995	3632451O06Rik	0.614658
A_68_P05127678	Epha1	0.616216
A_68_P14720303	Dnase1l1-Taz	0.616454
A_68_P03556612	Mllt3	0.61666
A_68_P03899353	A430005L14Rik	0.616919
A_68_P13918711	1700034H14Rik	0.617072

A_68_P07296368	Sall1	0.617074
A_68_P06233151	Tmem126b	0.61718
A_68_P01436221	ENSMUST00000083577.1:189	0.61836
A_68_P07152542	Rab20	0.619436
A_68_P11726126	Fgf9	0.619572
A_68_P09739785	Per1	0.620738
A_68_P05156924	Dysf	0.621153
A_68_P12005671	Prpf40b	0.621408
A_68_P04677560	Msx1	0.622712
A_68_P09136741	Naglu	0.622956
A_68_P12223496	Kcnq3	0.623809
A_68_P09632522	Smurf2	0.624083
A_68_P06599561	Armc5	0.624283
A_68_P08649166	Stk11	0.624447
A_68_P07561476	2310005P05Rik	0.624928
A_68_P11724373	Ngdn	0.625187
A_68_P01674481	Nusap1	0.628065
A_68_P11173083	Abhd6	0.628118
A_68_P05488834	Tac1	0.62836
A_68_P06464534	Spnb4-Blvrb	0.628566
A_68_P03746961	Akr1a4	0.628687
A_68_P07901779	Htr1b	0.628812
A_68_P05899940	Qpctl-Snrpd2	0.628999
A_68_P13693986	Pou4f3	0.629258
A_68_P02286790	Crabp2	0.62966
A_68_P06096075	Adam12	0.630096
A_68_P10241916	Vsnl1	0.63036
A_68_P12016231	Serhl	0.631152
A_68_P11569601	Ebf2	0.631364
A_68_P05308590	Cav1	0.632142
A_68_P03022365	Rusc1	0.632663
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A_68_P09736143	Ush1g	0.739376
A_68_P14281775	Emx2	0.739497
A_68_P03676855	Zfp189	0.7395
A_68_P01403762	Cat	0.739656
A_68_P12042664	Cdc42ep1	0.739659
A_68_P05860624	Bid	0.739662
A_68_P07561953	Aph1c	0.739677
A_68_P04793013	2700038N03Rik	0.739793
A_68_P10580665	Hist1h2bk	0.740135
A_68_P05519173	Mkln1	0.740277
A_68_P05057768	Hk2	0.741122
A_68_P03888951	Mllt3	0.741147
A_68_P07231075	Tomm20	0.741439
A_68_P04671642	Unc84a	0.741594
A_68_P07748509	Rpp25	0.74173
A_68_P03619421	Olfr1333	0.741823
A_68_P04363207	Kntc1	0.741833
A_68_P09694614	Lsmd1	0.741962
A_68_P09042588	Tcf2	0.742079
A_68_P04629383	Pitpnm2	0.742114
A_68_P10022016	Mamdc1	0.74217
A_68_P11465793	Tsc22d1	0.742228
A_68_P03230060	Frap1	0.742246
A_68_P08698911	Naca	0.742353
A_68_P14407497	Scd2	0.742518
A_68_P14998770	Rpl36a	0.742596
A_68_P07561489	2310005P05Rik	0.742667
A_68_P13194682	Cfb	0.742776
A_68_P08200250	Ipmk	0.742925
A_68_P05599948	C1r	0.74305
A_68_P07353001	Upf1	0.743093
A_68_P07945856	Cdv3	0.743102
A_68_P02272810	Plcb1	0.743121
A_68_P09559259	Ngfr	0.743245
A_68_P08428861	Stat6	0.743478

A_68_P04534962	Triap1	0.743704
A_68_P11564466	9430077A04Rik	0.743751
A_68_P02033228	A930012O16Rik	0.743871
A_68_P10478798	Foxf2	0.743999
A_68_P04691965	Ogfod2	0.744179
A_68_P00844649	Ptma	0.74434
A_68_P13242268	Bat3	0.744418
A_68_P09080012	Gtlf3b	0.744614
A_68_P08269534	Cs	0.744634
A_68_P00991622	Capn8	0.744674
A_68_P11400722	Rem2	0.744709
A_68_P06928687	Got2	0.744755
A_68_P00127657	Wnt6	0.744911
A_68_P15153209	D0HXS9928E	0.745325
A_68_P08237398	Pa2g4	0.745513
A_68_P11886679	Itga5	0.746148
A_68_P01845807	Sephs1	0.746187
A_68_P00516296	Nit1	0.746433
A_68_P12635594	Ehhadh	0.746435
A_68_P13899746	Epb4.114a	0.746769
A_68_P14757489	Zcchc12	0.747434
A_68_P02294720	Lef1	0.747676
A_68_P03666611	Astn2	0.747785
A_68_P10743304	Hist1h3g	0.747804
A_68_P13240096	Rpl7l1	0.74782
A_68_P03068794	Kcnmb2	0.74788
A_68_P00563810	Mgst3	0.748033
A_68_P09379018	Mnt	0.748343
A_68_P12019183	Sert1	0.74851
A_68_P01933643	Ggta1	0.748572
A_68_P00317122	Cxcr4	0.748644
A_68_P05259006	Tpi1	0.748674
A_68_P13230250	Ankrd12	0.748925
A_68_P07872982	ENSMUST00000034643.3:-4289	0.749137
A_68_P01853107	Zbtb43	0.7495



A_68_P02517306	Efna4	0.749648
A_68_P02241425	Inoc1	0.749996

**Supplementary Table 7b: N vs A 409 hypermethylation genes on d16**

Probe Name	Gene Name	Methylation difference value
A_68_P01442677	Adam33	2.34309
A_68_P14809906	Ldoc1	2.182542
A_68_P06186495	Lrrc27	2.09403
A_68_P13883453	Pcdha8	2.056548
A_68_P12138338	Hoxc13	2.016236
A_68_P10815405	Sfxn1	2.004238
A_68_P03540115	Espn-Hes2	2.000182
A_68_P13883460	Pcdha9	1.960946
A_68_P04945718	Preb-Tcf23	1.951468
A_68_P04945718	Preb-Tcf23	1.928502
A_68_P11534471	Lgals3	1.909895
A_68_P14270379	Nt5dc3	1.895435
A_68_P07737935	Fxyd2	1.891944
A_68_P02189755	Hrh3	1.887435
A_68_P00795918	Srp9	1.887293
A_68_P06376689	Npas1	1.885412
A_68_P02421072	Dnajb4-Fubp1	1.880806
A_68_P12773755	EG328644	1.874945
A_68_P04101457	Gsh2	1.834503
A_68_P05495854	Casd1	1.805508
A_68_P07425330	Arrdc2	1.80279
A_68_P01139487	Wnt6	1.790663
A_68_P01668312	E2f1	1.787956
A_68_P09804391	Siva1	1.787582
A_68_P12268481	Aqp2	1.771162
A_68_P01717991	Btbd14a	1.769291
A_68_P09165274	Nxn-Timm22	1.745295
A_68_P04346888	Ppp2r2c	1.741594
A_68_P03400995	Txn1	1.734468
A_68_P09177324	Olf30	1.732713
A_68_P03974013	Gja4	1.729471
A_68_P01498685	A430105I19Rik	1.724954
A_68_P02564830	Igsf3	1.724518

A_68_P10614127	Ror2	1.722767
A_68_P12751159	B830017H08Rik	1.70917
A_68_P03228980	Acot7	1.707831
A_68_P08143591	Pdcd6ip	1.700578
A_68_P06208098	Hras1	1.698275
A_68_P13127671	Sox8	1.697824
A_68_P09018398	Gprc5c	1.682796
A_68_P03301110	Galnt12	1.678821
A_68_P12097344	Krt73	1.673928
A_68_P13365866	Ihpk3	1.670431
A_68_P05370614	Lrrc23	1.668623
A_68_P12068740	Pp11r	1.6674
A_68_P05278653	Capza2	1.660087
A_68_P08799615	Cdc216	1.656491
A_68_P13291042	Fkbp1	1.655958
A_68_P08137775	Trim29	1.644358
A_68_P13191224	Sema6b	1.642482
A_68_P07663357	Megf11	1.638227
A_68_P10027436	Rgs6	1.635025
A_68_P06318305	Igf1r	1.633508
A_68_P02779323	Trim45	1.626551
A_68_P08717087	Tcba1	1.625998
A_68_P04964439	Tmem132d	1.624712
A_68_P01383195	B230120H23Rik	1.617043
A_68_P14275989	Tbcd12	1.61573
A_68_P09922529	Ptpn2	1.612314
A_68_P11941919	EG432987	1.612227
A_68_P09483960	Cxcl16	1.611037
A_68_P05970860	Phox2a	1.607537
A_68_P06152331	Bcl3	1.599857
A_68_P02483040	Ppa2	1.589217
A_68_P06926631	A230052G05Rik	1.587101
A_68_P00505719	3322402L07Rik	1.584498
A_68_P06565632	Lrrc27	1.584281
A_68_P05033637	Ltbr	1.583232

A_68_P04646216	BC004044	1.579388
A_68_P12117966	LOC554292	1.575279
A_68_P06983908	5033428A16Rik	1.570745
A_68_P13365875	Ihpk3	1.564213
A_68_P09949390	Btbd7	1.558795
A_68_P11215454	Olfm4	1.557819
A_68_P07897281	Rdx	1.554041
A_68_P03405759	Txlna	1.553528
A_68_P09513483	Vmo1	1.552141
A_68_P03400995	Txn1	1.549803
A_68_P03300156	Anp32b	1.549295
A_68_P12240046	Eppk1	1.544518
A_68_P06664663	Tex101	1.542541
A_68_P08660202	Myf6	1.540616
A_68_P08449896	Foxo3a	1.538192
A_68_P09309985	Krt35	1.534781
A_68_P10614129	Ror2	1.532037
A_68_P13176689	Cul7	1.53041
A_68_P00119253	B4galt3	1.52864
A_68_P01159756	Hrh3	1.528635
A_68_P13075872	Mas1-Mrgprh	1.528059
A_68_P11680943	Entpd4	1.525934
A_68_P00331311	EG240916	1.525499
A_68_P13496188	Traf7	1.52355
A_68_P11932638	Cacnb3	1.522527
A_68_P10512750	Thbs4	1.521117
A_68_P11855904	Ly6d	1.515977
A_68_P03819458	Rbp7	1.515733
A_68_P14243676	1700019N19Rik	1.515392
A_68_P11650775	Pnoc	1.514185
A_68_P11253316	Slc22a17	1.513158
A_68_P09017696	Krt42	1.510214
A_68_P11899315	BC024139	1.509074
A_68_P12129679	Csad	1.50561
A_68_P13927246	Pcdhac2	1.504887

A_68_P14346771	Ms4a7	1.504333
A_68_P12129693	Csad	1.503652
A_68_P06871160	Bst2-1110012M11Rik	1.500908
A_68_P12093074	Arhgap8	1.500185
A_68_P05596978	Rnf103	1.49965
A_68_P03625246	Zswim5	1.49615
A_68_P07871025	Htr1b	1.496005
A_68_P03300156	Anp32b	1.495502
A_68_P05904416	Klk15	1.495005
A_68_P07129218	Pkd1l2-Bcmo1	1.494286
A_68_P03555189	Bai2	1.49364
A_68_P08045042	Cacna2d2	1.493452
A_68_P11281788	2600011E07Rik	1.491899
A_68_P06631626	Wtip	1.491517
A_68_P04646216	BC004044	1.491433
A_68_P08675788	Slc17a8	1.490621
A_68_P03974014	Gja4	1.489772
A_68_P08980029	Krt27	1.487658
A_68_P12092825	Sstr3	1.486341
A_68_P06387117	Hdgfrp3	1.485299
A_68_P01757681	Creb3l1	1.481582
A_68_P01334676	9230107O10Rik	1.476058
A_68_P04331232	Dtx1	1.476011
A_68_P03370361	Cer1	1.474334
A_68_P01979586	Mmp24	1.473049
A_68_P04318728	Pebp1	1.472847
A_68_P01295326	Lamc3	1.471722
A_68_P04308903	Areg	1.470039
A_68_P10356757	Trim9	1.46986
A_68_P01619771	Insm1	1.462248
A_68_P09583142	P2rx1	1.461627
A_68_P07024704	1700029J07Rik	1.459602
A_68_P07559432	D930028F11Rik	1.459294
A_68_P07453357	Cd109	1.457014
A_68_P05893671	6330512M04Rik	1.45689

A_68_P13977860	Pcdhga5	1.456032
A_68_P01531594	Mdk	1.455592
A_68_P03361261	Ubx3	1.454801
A_68_P05590714	Ret	1.453914
A_68_P14323852	Psd	1.451816
A_68_P07400685	Vac14	1.451249
A_68_P10324890	Dio3	1.451129
A_68_P06751294	Slc12a3	1.45073
A_68_P10739130	Hrh2	1.45014
A_68_P01887581	Shc4	1.447136
A_68_P11650789	Pnoc	1.445781
A_68_P07423734	Slc7a5	1.444347
A_68_P04873423	Kcnh2	1.44317
A_68_P05804599	Mrpl19	1.441819
A_68_P11971534	Kcns2	1.439005
A_68_P10573446	Larp5	1.435129
A_68_P09156504	Mfap4	1.434511
A_68_P13293615	Gbl	1.433212
A_68_P12461149	Krt2-25	1.433036
A_68_P12233648	Osmr	1.432645
A_68_P03075997	Dcamk12	1.432491
A_68_P12323106	Jrk	1.431737
A_68_P13553860	BC031441-Ebi3	1.431056
A_68_P01654378	Cst11	1.431036
A_68_P10096901	Bdkrb1	1.428969
A_68_P00789268	Myog	1.428938
A_68_P06096064	Adam12	1.427533
A_68_P05936205	Ifitm5	1.426306
A_68_P04854579	Hspb8	1.425306
A_68_P05372329	8430419L09Rik	1.425188
A_68_P04799896	Trim56	1.424642
A_68_P07453364	Cd109	1.42401
A_68_P14156202	Pdcd4	1.423262
A_68_P04506925	Gpr81	1.422663
A_68_P12438489	Sfrs2ip	1.422363

A_68_P12224465	Fbln1	1.421897
A_68_P06422662	Dmkn	1.421556
A_68_P05596974	Rnf103	1.421527
A_68_P00556266	Ctdsp1	1.420307
A_68_P03970943	Espn	1.420068
A_68_P09611938	Havcr2	1.418968
A_68_P10151513	Psma6	1.41846
A_68_P04799035	Nsg1	1.418253
A_68_P13103833	Smoc2	1.418214
A_68_P13166506	Ddah2	1.418187
A_68_P02009521	1190002A17Rik	1.417585
A_68_P03709353	Plcl4	1.417371
A_68_P03899301	Zbtb8	1.417202
A_68_P12362731	Mfsd3	1.416568
A_68_P11906547	Bai1	1.416568
A_68_P13385328	4930546H06Rik	1.416153
A_68_P12406891	Aqp6	1.415879
A_68_P03568532	Tspan1	1.415876
A_68_P08210289	9-Mar	1.415831
A_68_P00451766	Nmnat2	1.415778
A_68_P09631017	Csf2	1.414005
A_68_P07173287	EG13909	1.413959
A_68_P04425904	Wasf3	1.413345
A_68_P13190929	Zbtb9	1.413282
A_68_P11308601	Tgm1	1.412908
A_68_P12215401	Sstr3	1.412418
A_68_P07215117	Sfrp1	1.412338
A_68_P00528102	A130010J15Rik	1.412154
A_68_P03553498	Espn	1.41195
A_68_P12462764	Top1mt	1.411599
A_68_P02716554	Adh1	1.411018
A_68_P11658283	Kcnk5	1.41094
A_68_P07822241	Nr2e3	1.410808
A_68_P12323097	Jrk	1.410734
A_68_P09677979	Krt35	1.409825

A_68_P07565599	Gnb5	1.408292
A_68_P04316294	Mapre3	1.407638
A_68_P06633818	Gm1082	1.405985
A_68_P00993107	Lemd1	1.405865
A_68_P03413661	Padi4	1.404845
A_68_P13166533	Ddah2	1.404057
A_68_P06728122	Enpp6	1.403461
A_68_P12460882	Yaf2	1.402574
A_68_P14131435	Cdx1-Pdgfrb	1.402354
A_68_P02865901	Mef2d	1.402333
A_68_P05226947	Abcc9	1.401101
A_68_P03912407	Aqp7	1.400689
A_68_P06053429	Tssc4	1.400163
A_68_P06408617	Lsp1	1.400086
A_68_P06549860	2310033E01Rik	1.399809
A_68_P14605117	1700045I19Rik	1.399771
A_68_P00363449	Teddm1	1.399699
A_68_P12341775	Plec1	1.399275
A_68_P03854965	Marcksl1	1.398753
A_68_P12111323	Plec1	1.398476
A_68_P05938143	Klk15	1.398238
A_68_P07195280	Comp	1.397532
A_68_P08963632	Slc5a4a	1.397503
A_68_P09107785	Tcap	1.397479
A_68_P14261086	Syt7	1.39648
A_68_P09620647	Dcxr	1.395695
A_68_P00169777	Ikbke	1.395683
A_68_P09444804	Pyy	1.395386
A_68_P07319284	Rrad	1.39505
A_68_P05958473	Tmem16e	1.394619
A_68_P03457502	Zmynd12	1.394521
A_68_P02023974	1110061N23Rik	1.394486
A_68_P09459558	Tcf7	1.393455
A_68_P03226841	Pla2g2c	1.392659
A_68_P12298037	Lynx1	1.392549



A_68_P03448458	Sesn2	1.392427
A_68_P07820591	Pcbp4	1.39238
A_68_P02501124	Nexn	1.391383
A_68_P03720734	Mmel1	1.391196
A_68_P09483427	Sfrs2-2600014M03Rik	1.390894
A_68_P00444553	Darc	1.390467
A_68_P03909943	Arid1a	1.389192
A_68_P05972322	Xylt1	1.388761
A_68_P05244159	ENSMUST00000083652.1:2772	1.388054
A_68_P04528236	Trim50	1.387044
A_68_P01512424	Nr5a1	1.386465
A_68_P06129246	Ptgir	1.386124
A_68_P00052299	Gpc1	1.385347
A_68_P12273277	Acvrl1	1.384572
A_68_P06544745	Rpl13a	1.384276
A_68_P05208549	Dync1i1	1.383989
A_68_P09006081	Hoxb4	1.383845
A_68_P04543788	Epo	1.383701
A_68_P13658376	LOC639653	1.382952
A_68_P11939489	Zfp251	1.382311
A_68_P13396934	Pspn	1.382199
A_68_P01606835	Prnd	1.382113
A_68_P06620448	5430432N15Rik	1.381823
A_68_P09624543	Krt19	1.381113
A_68_P07317287	Aktip	1.380563
A_68_P03287181	C1qdc2	1.380508
A_68_P08800400	Polr3b	1.380063
A_68_P01655397	BC050777	1.379852
A_68_P02071364	Wisp2	1.379713
A_68_P13697471	Pcdha5	1.379344
A_68_P13456368	H2-M10.1	1.379336
A_68_P02989352	Dcamk12	1.379329
A_68_P01781180	Bcas1	1.378844
A_68_P12298006	Lynx1	1.377705
A_68_P05879159	Suclg1	1.377306

A_68_P03413661	Padi4	1.376063
A_68_P04324543	Nat8l	1.376043
A_68_P07349274	Rbm13	1.375987
A_68_P09309975	Krt35	1.375793
A_68_P07506801	Cck	1.375411
A_68_P03448375	Tnfsf8	1.37474
A_68_P13467225	Arhgap28	1.374529
A_68_P04873423	Kcnh2	1.374163
A_68_P04222183	Smarcd3	1.373947
A_68_P05772946	Il17ra	1.373931
A_68_P07615452	Mst1r	1.373718
A_68_P04502132	Cldn13	1.372323
A_68_P09926896	2810002I04Rik	1.372186
A_68_P06865553	Chrn3	1.371884
A_68_P10096903	Bdkrb1	1.370888
A_68_P04966920	Rpl21	1.37029
A_68_P03974035	Gja4	1.369796
A_68_P12092110	Krt79	1.36939
A_68_P11438500	D14Ert449e-C330003B14Rik	1.368955
A_68_P09536877	Pnmt	1.368951
A_68_P07349292	BC025816	1.368751
A_68_P13058565	Slc22a2	1.368585
A_68_P13196755	Grm4	1.368241
A_68_P11528226	BC055107	1.367413
A_68_P03909943	Arid1a	1.366859
A_68_P09168909	Ngfr	1.366606
A_68_P13568346	Ly6g6c	1.366322
A_68_P01275517	Urm1	1.366155
A_68_P05617222	Fxyd4	1.365609
A_68_P07682087	ENSMUST00000083662.1:-4036	1.365597
A_68_P09448685	2210403B10Rik	1.364972
A_68_P11230853	Jub	1.364946
A_68_P10355900	Ckb-6720458F09Rik	1.363708
A_68_P03899398	N28178	1.363475
A_68_P12441858	Adamts20	1.363237

A_68_P00661821	Cnm4	1.362611
A_68_P01782935	Ggtl3	1.362086
A_68_P12193009	Krt79	1.361886
A_68_P11042513	4930544M13Rik	1.360955
A_68_P04966043	0610009O03Rik	1.359467
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A_68_P05915391	1700008P20Rik	1.347339
A_68_P00634491	Tmem58	1.347231
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