SUPPLEMENTARY INFORMATION

Deficiency of Capicua disrupts bile acid homeostasis.

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Supplementary Figures

Supplementary Tables

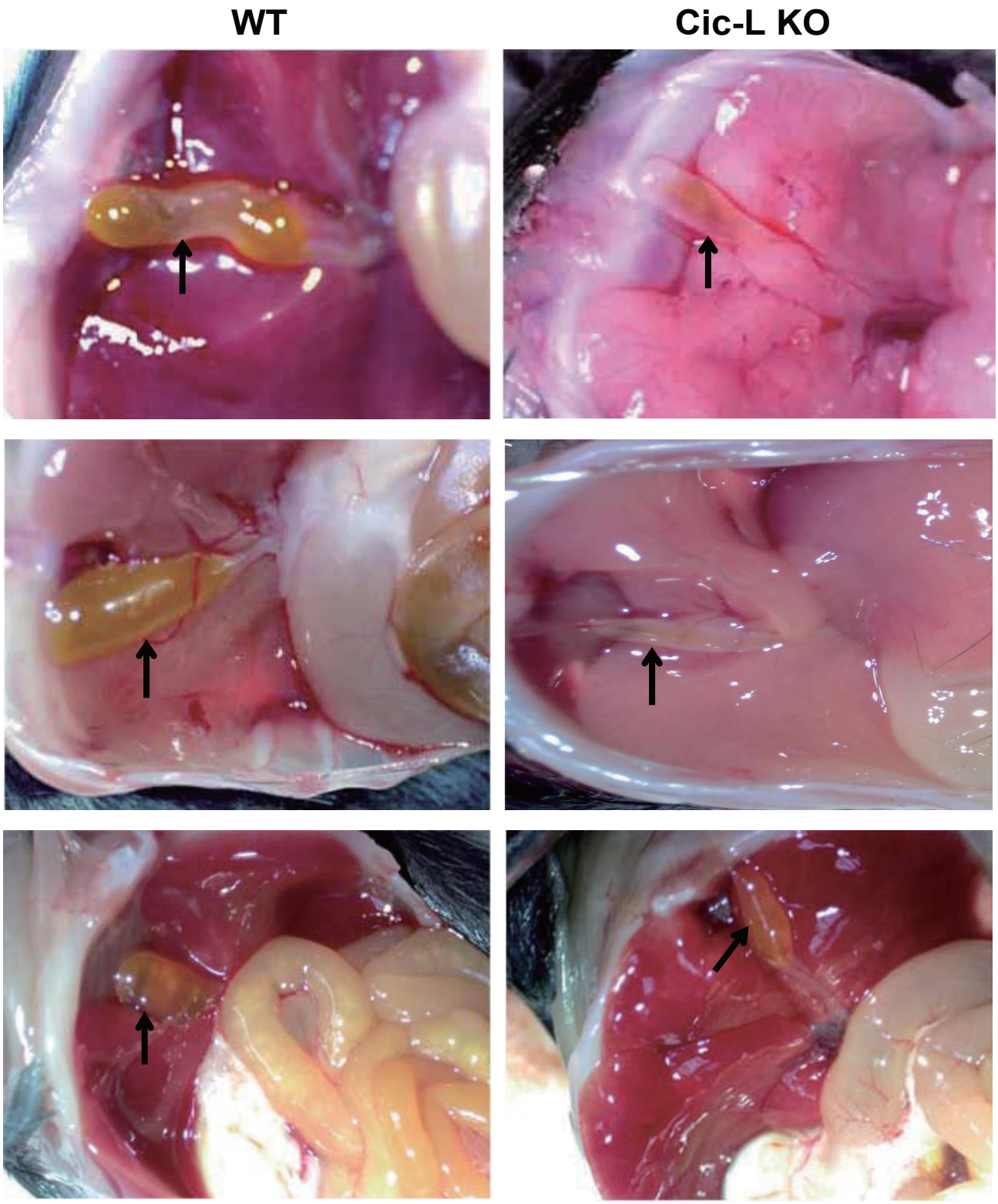

Fig. S1. Less amount of bile in gallbladders of 18 day-old Cic-L KO mice compared with WT littermates. Arrows indicate gallbladders. The pictures were taken after fasting overnight .

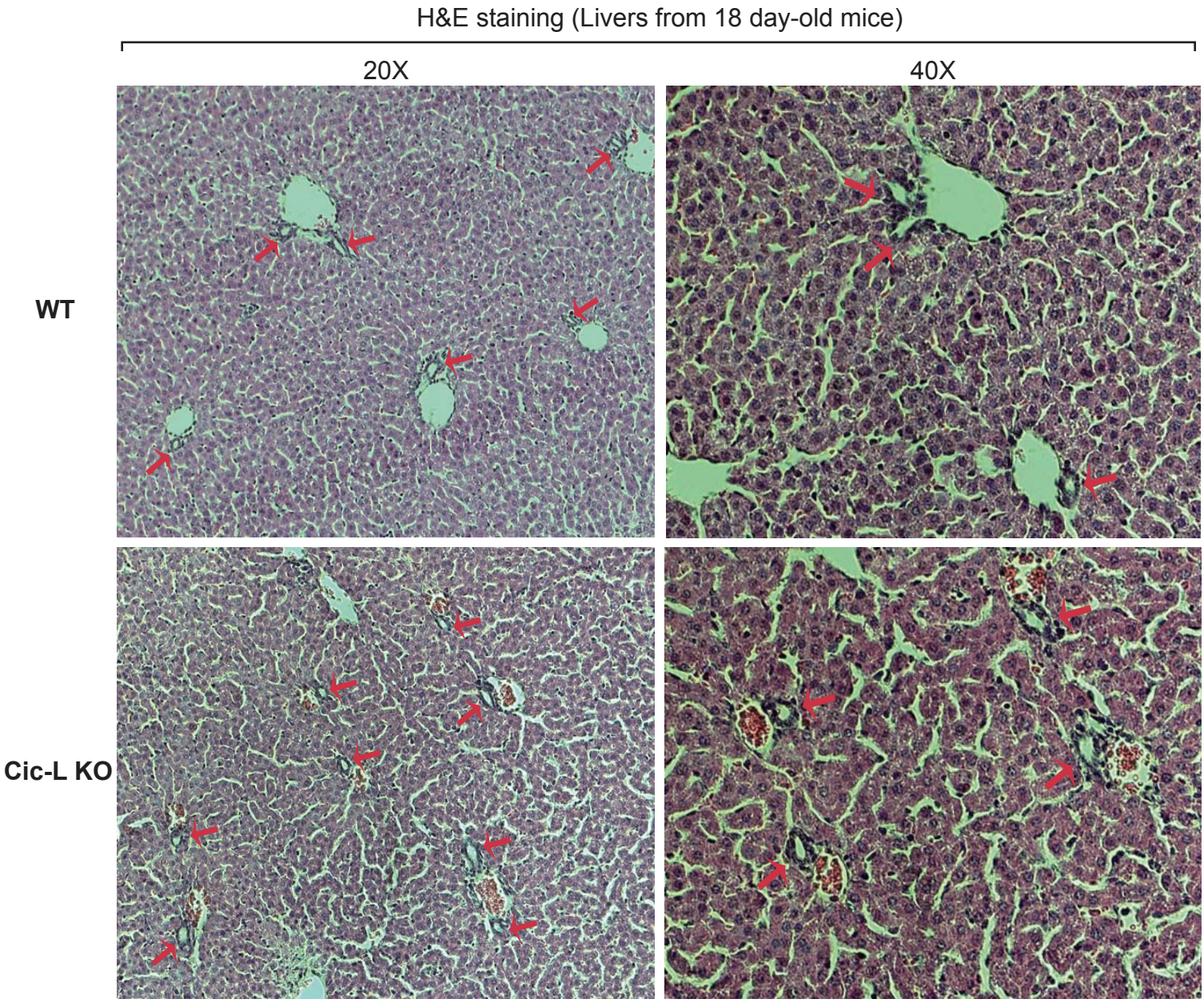

Fig. S2. Normal hepatic bile duct formation in Cic-L KO mice.
Liver tissues were prepared from WT and Cic-L KO mice at P18. The tissue sections were stained with hematoxylin and eosin (H&E). Arrows indicate hepatic bile ducts.

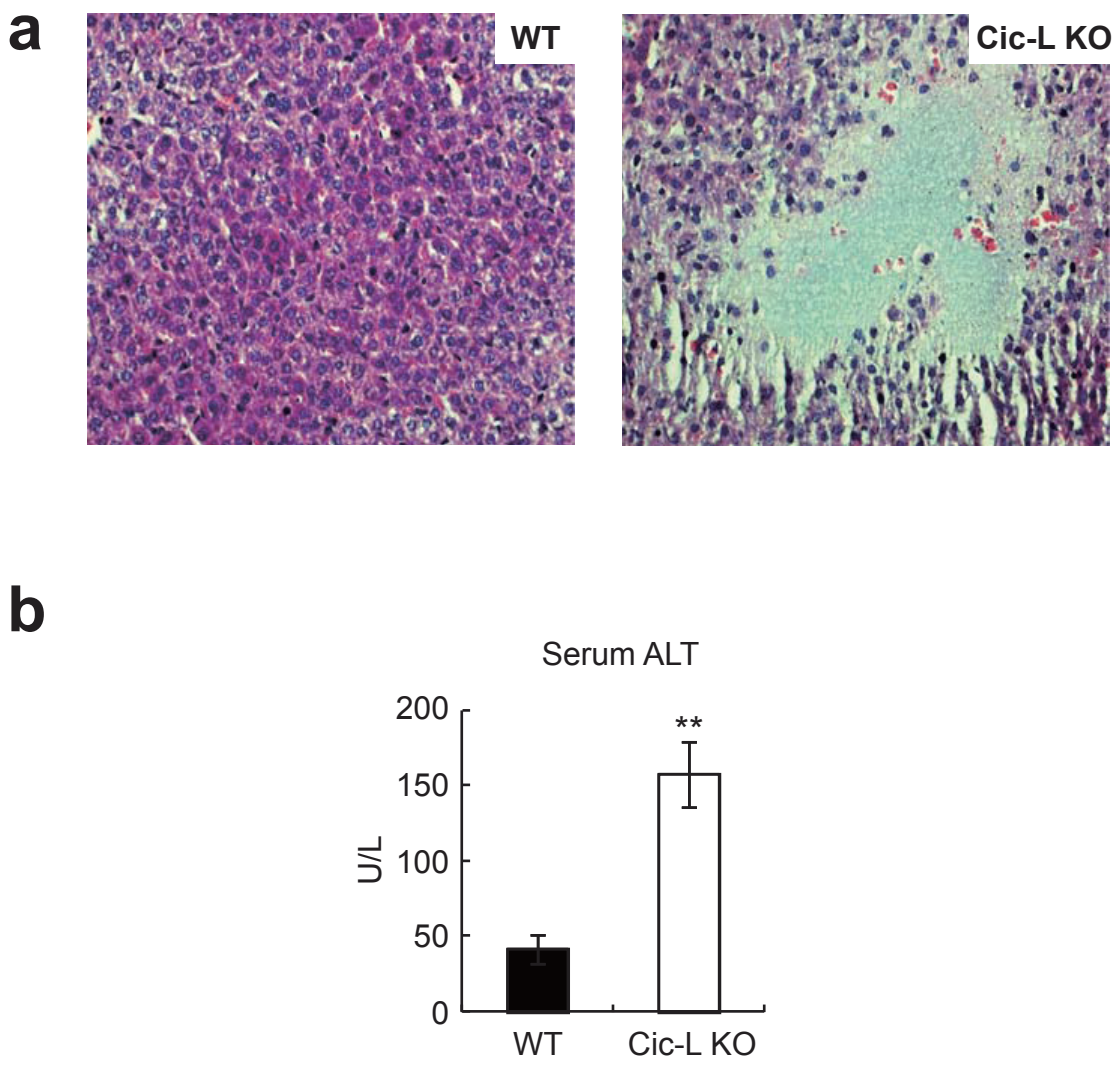

Fig. S3. Induction of cholestatic liver damage in Cic-L KO mice fed with cholic acid.
a) H&E staining showing necrotic area in liver section from Cic-L KO mouse. The liver tissues were dissected from 18 day-old WT and Cic-L KO mice fed with cholic acids through breast feeding from nursing female mice during post-natal growth. **b)** Significantly increased serum ALT levels in Cic-L KO mice fed cholic acids compared with WT at P18. Six mice per each genotype were used for this experiment. **P<0.01. Error bars indicate s.e.m.

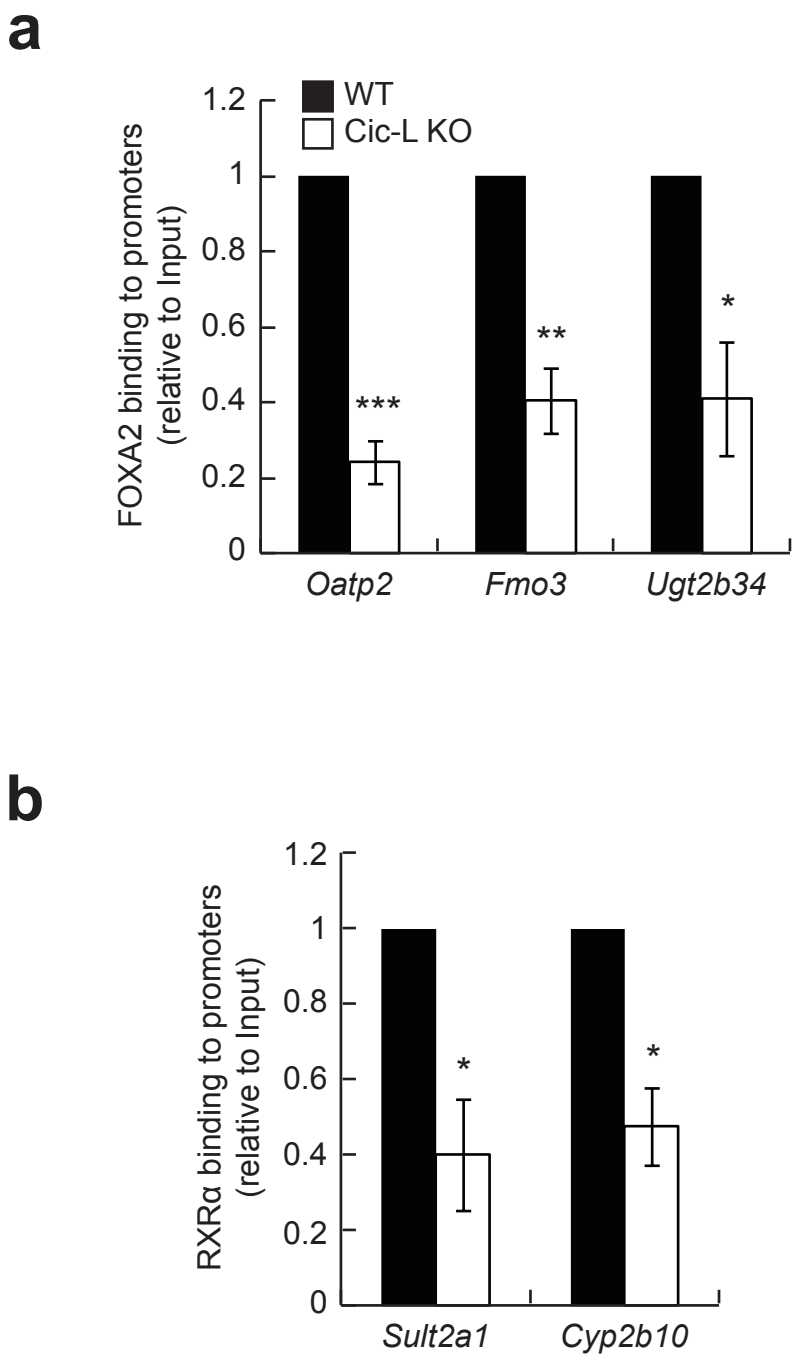

Fig. S4. Reduced target gene promoter occupancy of FOXA2 and RXRα in Cic-L KO liver.
a) ChIP-qPCR analysis for FOXA2 promoter occupancy of *Oatp2*, *Fmo3* and *Ugt2b34* in liver chromatin from WT or Cic-L KO mice at P18 (n=5~6 per each genotype). *P<0.05, **P<0.01, and ***P<0.001. All error bars show s.e.m. **b)** ChIP-qPCR analysis for RXRα promoter occupancy of *Sult2a1* and *Cyp2b10* in liver chromatin from WT or Cic-L KO mice at P18 (n=3~4 per each genotype). *P<0.05. All error bars show s.e.m.

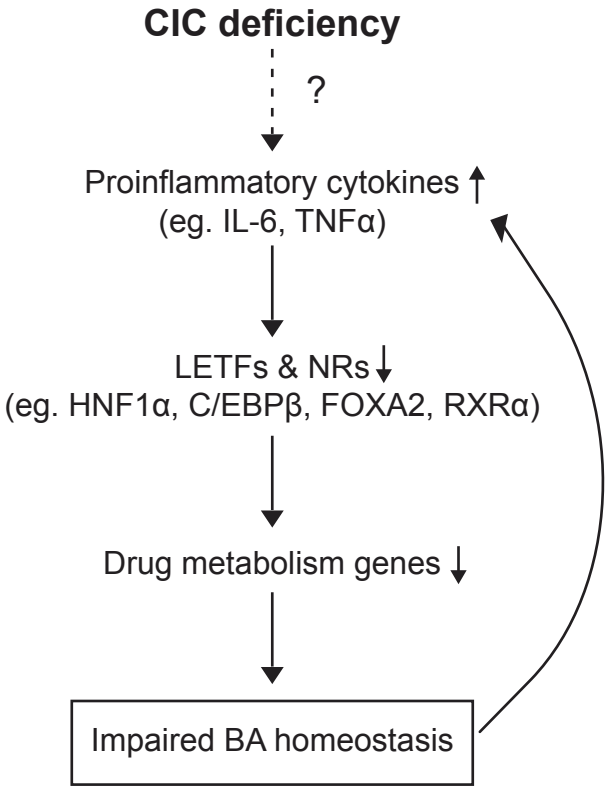

Fig. S5. A proposed model that describes how BA homeostasis is perturbed in Cic-L KO mice.
LETF and NR stand for liver-enriched transcription factor and nuclear receptor, respectively.
The question mark means unknown mechanism(s).

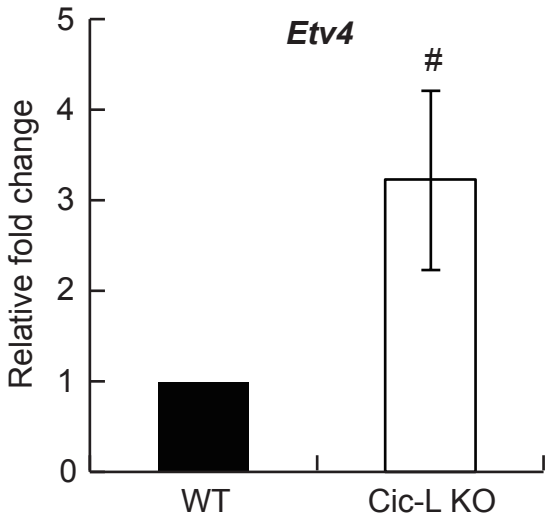

Fig. S6. Up-regulation of *Etv4* gene in Cic-L KO liver.
qRT-PCR analysis for levels of *Etv4* in livers from 18 day-old WT and Cic-L KO mice. n=8, # P=0.0597. Error bar shows s.e.m.

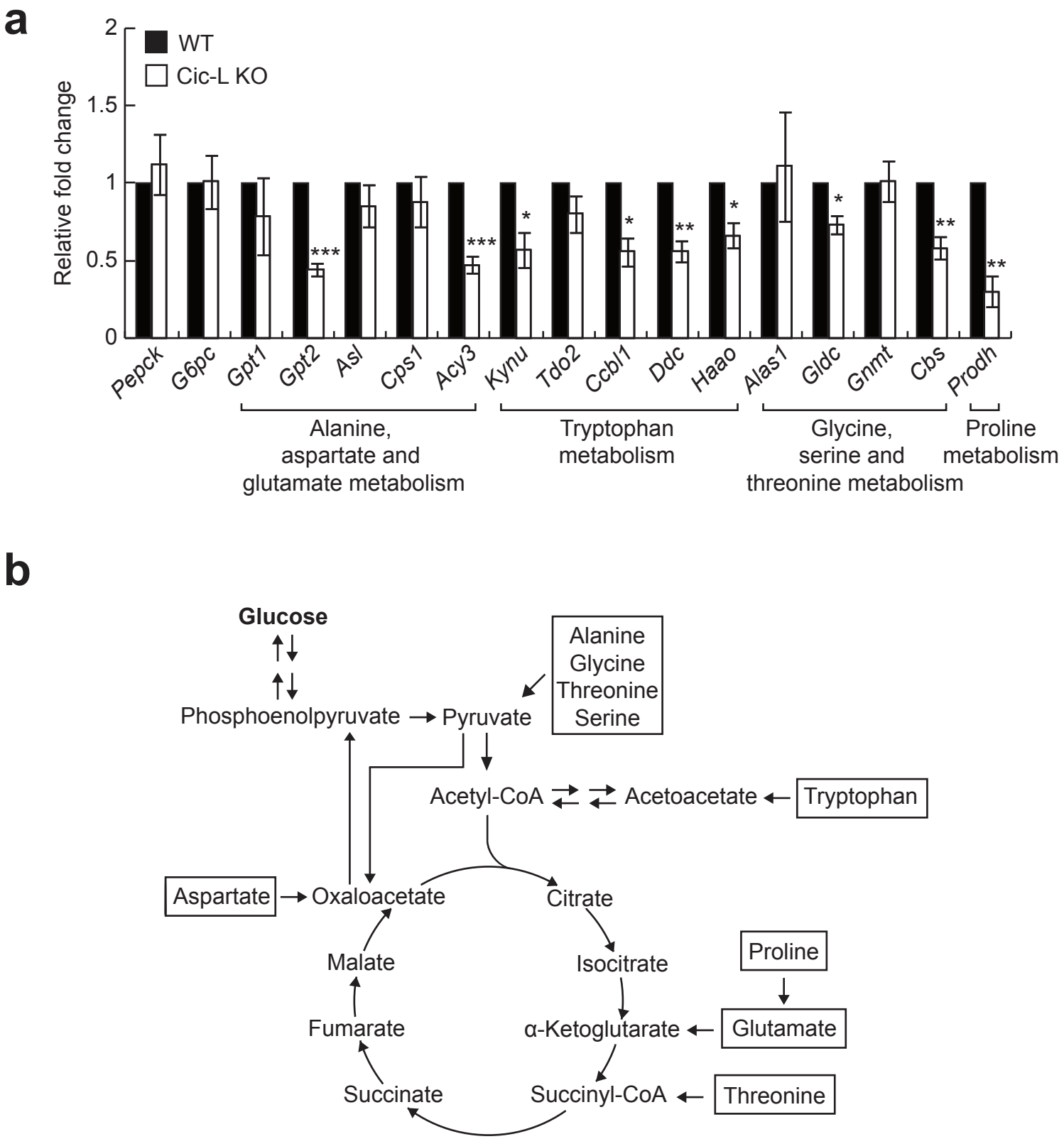

Fig. S7. Down-regulation of amino acid metabolism genes in Cic-L KO liver.
a) qRT-PCR analysis for levels of genes involved in gluconeogenesis and amino acid metabolism in liver of WT and Cic-L KO mice at P18 (n=5). Pepck, phosphoenolpyruvate carboxykinase; G6pc, glucose 6-phosphatase; Gpt1, glutamic pyruvic transaminase, soluble; Gpt2, glutamic pyruvate transaminase 2; Asl, argininosuccinate lyase; Cps1, carbamoyl-phosphate synthetase 1; Acy3, aspartoacylase 3; Kynu, kynureninase; Tdo2, tryptophan 2,3-dioxygenase; Ccbl1, cysteine conjugate-beta lyase 1; Ddc, dopa decarboxylase; Haao, 3-hydroxyanthranilate 3,4-dioxygenase; Alas1, aminolevulinic acid synthase 1; Gldc, glycine decarboxylase; Gnmt, glycine N-methyltransferase; Cbs, cystathionine beta-synthase; Prodh, proline dehydrogenase. *P<0.05, **P<0.01, and ***P<0.001. All error bars show s.e.m. **b)** Schematic illustration showing conversion of amino acids to the intermediates of carbohydrate metabolism that can subsequently give rise to glucose.

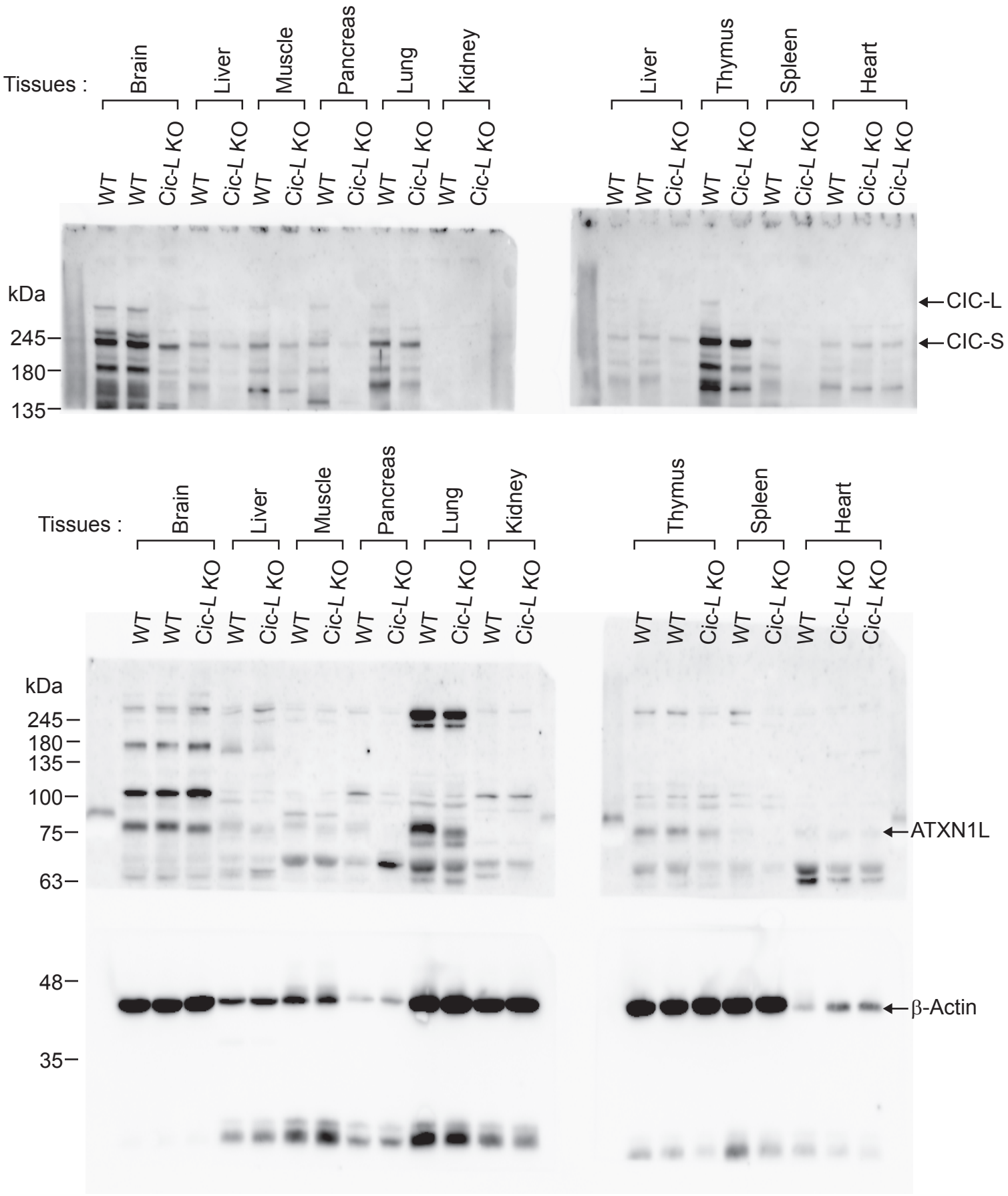

Fig. S8. Unprocessed western blot images for Figure 1
The western blot images were obtained using ImageQuant LAS 4000 (GE Healthcare Life Science).

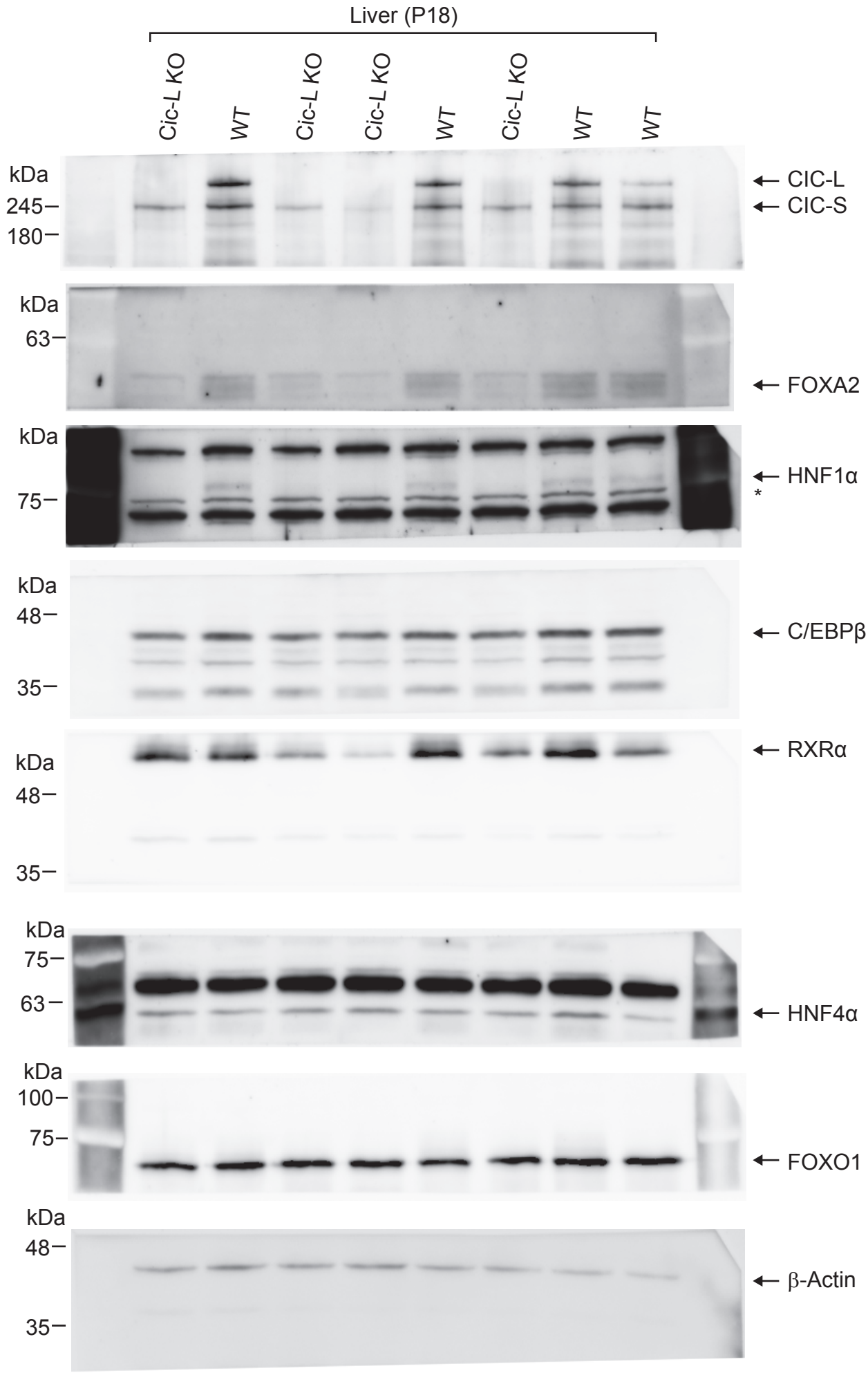

Fig. S9. Unprocessed western blot images for Figure 4
The western blot images were obtained using ImageQuant LAS 4000 (GE Healthcare Life Science).

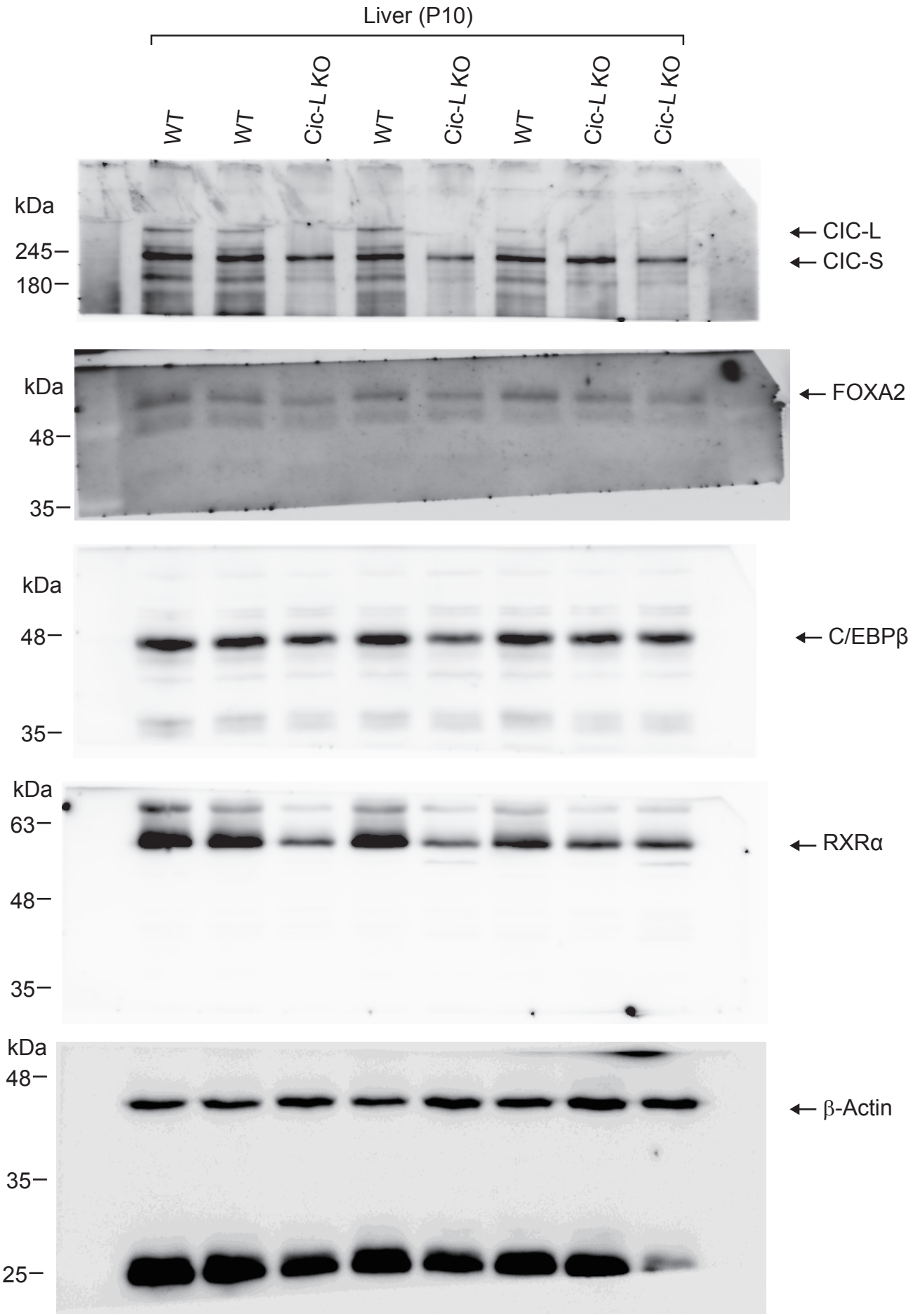

Fig. S10. Unprocessed western blot images for Figure 5
The western blot images were obtained using ImageQuant LAS 4000 (GE Healthcare Life Science).

Table S1. The list of DEGs in liver of Cic-L KO mice at P18.

EntrezID	Symbol	log2-Fold change(KO/WT)	P-value
13094	Cyp2b9	-5.35159353	5.31E-10
243881	Cyp2b23	-2.867553588	1.36E-09
13089	Cyp2b13	-4.013761539	2.06E-09
17837	Mug2	-3.807150287	2.98E-09
22359	Vldlr	1.956292088	5.04E-09
18113	Nnmt	-2.242423226	3.29E-08
14262	Fmo3	-2.934028571	3.82E-08
18212	Ntrk2	-1.919589564	4.01E-08
434083	Mug4	-2.981337528	4.45E-08
11813	Apoc2	-1.96573123	5.56E-08
13107	Cyp2f2	-3.179891635	5.63E-08
171281	Acot3	2.416869064	6.28E-08
12577	Cdkn1c	1.622199205	8.27E-08
110959	Nudt19	1.293263545	1.14E-07
16002	Igf2	1.882493948	1.20E-07
19079	Prkab1	0.747136323	1.93E-07
432720	Akr1c19	1.41379507	1.95E-07
12012	Baat	-1.386707446	2.28E-07
17842	Mup3	-2.799980089	2.31E-07
13009	Csrp3	-1.052793183	3.08E-07
103988	Gck	-2.416064066	3.19E-07
64385	Cyp4f14	-2.34790353	3.20E-07
13119	Cyp4a14	1.007499195	3.39E-07
319476	Lrtm1	-2.403211176	3.59E-07
319765	Igf2bp2	0.666957138	3.87E-07
13909	EG13909	-1.406009488	3.93E-07
16008	Igfbp2	1.939300629	3.99E-07
20862	Stfa2	1.500508254	4.40E-07
331535	Serpina7	1.876530789	4.54E-07
11997	Akr1b7	1.488773986	5.12E-07
56741	Nope	0.942113591	5.27E-07
105349	Akr1c18	1.986469202	5.99E-07
12445	Ccnd3	0.776927337	6.58E-07
56508	Rapgef4	-0.9873712	6.63E-07
20861	Stfa1	1.532858135	6.87E-07
66350	Pla2g12a	0.714805284	7.33E-07
68939	Rasl11b	0.843826482	7.40E-07
333182	Cox6b2	1.221296419	7.54E-07

22695	Zfp36	-0.853954351	7.62E-07
108682	Gpt2	-1.450054381	7.77E-07
107770	Tm6sf2	0.826308057	8.14E-07
68728	Trp53inp2	-1.070417981	8.44E-07
13087	Cyp2a5	-1.315812843	8.66E-07
72361	2210023G05Rik	-0.693396701	9.86E-07
72027	Slc39a4	0.875367401	1.00E-06
23882	Gadd45g	-1.713252162	1.03E-06
12070	Ngfrap1	0.802115118	1.03E-06
17840	Mup1	-0.894175311	1.04E-06
20342	Selenbp2	-1.633144231	1.09E-06
12700	Cish	-2.077501782	1.13E-06
13649	Egfr	-1.002526407	1.25E-06
12709	Ckb	0.733272346	1.27E-06
227693	Zer1	0.875093891	1.34E-06
15374	Hn1	0.612440454	1.49E-06
19125	Prodh	-1.855641256	1.87E-06
433016	EG433016	1.07159697	2.06E-06
107375	Slc25a45	-0.767042209	2.11E-06
14955	H19	0.820448706	2.16E-06
29869	Ulk2	-0.823911984	2.24E-06
15375	Foxa1	-0.887554234	2.41E-06
67893	Tmem86a	0.906542015	2.47E-06
13370	Dio1	-0.963913577	2.54E-06
20440	St6gal1	0.98827576	2.54E-06
22433	Xbp1	-0.762558408	2.63E-06
67528	Nudt7	-1.122148306	2.73E-06
66078	Tsen34	0.87882804	2.81E-06
16319	Incenp	0.528078276	2.94E-06
1E+08	LOC100046232	-0.589164469	2.96E-06
72040	Mupcdh	-1.005311212	3.05E-06
67442	Retsat	0.845257367	3.17E-06
13108	Cyp2g1	-0.52452326	3.23E-06
11814	Apoc3	-1.131935401	3.29E-06
101488	Slco2b1	-1.102632585	3.32E-06
1E+08	Dnajc3	-0.704280505	3.51E-06
100637	B230342M21Rik	-0.723125214	3.76E-06
72278	Ccpg1	-1.722289245	3.91E-06
14245	Lpin1	-1.260716454	3.97E-06
53897	Gal3st1	0.6219085	4.01E-06
28194	Apon	-1.162144592	4.05E-06

216440	Os9	-0.793405511	4.07E-06
16005	Igfals	-1.173432179	4.08E-06
21763	Tex2	-0.641430205	4.18E-06
21415	Tcf3	0.470172428	4.43E-06
63828	Fn3k	-0.628116239	4.86E-06
14228	Fkbp4	-1.055716566	4.87E-06
110855	Pde6c	1.100843181	4.89E-06
19240	Tmsb10	0.953781839	5.17E-06
11690	Alox5ap	0.74861558	5.28E-06
94179	Krt23	0.794191063	5.40E-06
16000	Igf1	-0.961568427	5.54E-06
17992	Ndufa4	-0.761337672	5.60E-06
14528	Gch1	-0.661889732	5.63E-06
12368	Casp6	0.982383358	5.69E-06
14071	F9	-0.509926638	5.89E-06
20202	S100a9	0.870778664	5.96E-06
17841	Mup2	-0.931016981	6.08E-06
11854	Rhod	0.519697777	6.19E-06
12279	C9	-1.097218111	6.28E-06
1E+08	LOC100048613	0.513216744	6.60E-06
75600	Calml4	0.672603611	6.67E-06
13122	Cyp7a1	-2.111278953	6.68E-06
21664	Phlda1	-1.753173761	6.76E-06
18574	Pde1b	0.58197213	7.02E-06
26932	Ppp2r5e	-0.699757196	7.05E-06
76282	Gpt1	-1.321023169	7.45E-06
14863	Gstm2	-1.037649276	7.56E-06
23986	Peci	1.076330523	7.58E-06
11576	Afp	2.135277464	7.89E-06
64697	Keg1	-0.841057423	7.94E-06
69065	Chac1	-1.406518598	8.02E-06
74053	Grip1	0.469724506	8.03E-06
11668	Aldh1a1	-1.10309199	8.15E-06
12444	Ccnd2	0.53143448	8.71E-06
231670	Fbxo21	0.764849385	8.86E-06
66131	Tipin	0.687939228	8.98E-06
14635	Galk1	0.843724752	8.99E-06
76574	Mfsd2	-1.117392525	9.07E-06
58805	Mlxipl	-0.9585543	9.22E-06
70237	Bhlhb9	0.566682684	9.68E-06
18483	Palm	0.478174876	9.71E-06

57436	Gabarapl1	-0.616704103	9.80E-06
13170	Dbp	0.90255058	1.00E-05
140488	Igf2bp3	0.714656625	1.02E-05
20393	Sgk1	1.010582671	1.03E-05
233016	Blvrb	0.945315122	1.15E-05
64075	Smoc1	-0.432170268	1.16E-05
15220	Foxq1	-1.76434661	1.17E-05
223775	Pim3	-0.630569294	1.22E-05
69169	Faim3	0.850928895	1.23E-05
67475	Ero1lb	-0.746183224	1.23E-05
66664	Tmem41a	0.4830539	1.25E-05
213393	8430408G22Rik	0.947199004	1.27E-05
17237	Mgrn1	0.50399404	1.27E-05
11799	Birc5	0.769467688	1.34E-05
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319171	Hist1h2ao	0.789550857	1.39E-05
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243382	Ppm1k	0.693233514	1.40E-05
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16691	Krt8	0.603852198	1.43E-05
12795	Plk3	-1.025166393	1.43E-05
67760	Slc38a2	-0.976383097	1.47E-05
104174	Gldc	-0.565025421	1.49E-05
70789	Kynu	-0.735073166	1.53E-05
63986	Gmfg	0.620687079	1.56E-05
16363	Irf2	-0.553589341	1.57E-05
22129	Ttc3	0.546650805	1.57E-05
67759	5033414D02Rik	0.650855061	1.61E-05
19299	Abcd3	-0.772318985	1.64E-05
381246	Xkr9	-0.728926909	1.67E-05
52829	D4Bwg0951e	-0.614326527	1.68E-05
14756	Gpld1	-0.549006792	1.69E-05
235493	BC031353	-0.998710997	1.69E-05
11529	Adh7	-0.596787648	1.70E-05
52589	Ncald	0.645785181	1.76E-05
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18045	Nfyb	0.511721655	1.83E-05

15483	Hsd11b1	0.517012196	1.86E-05
56473	Fads2	0.825179625	1.88E-05
52815	Ldhd	-0.458470727	1.88E-05
66116	Cml1	-1.253337817	1.90E-05
27219	Sgk2	0.636866742	1.91E-05
1E+08	LOC100043257	0.849185358	1.93E-05
11611	Agxt	0.43658412	1.93E-05
56459	Sae1	0.879440288	1.96E-05
19653	Rbm4	-0.474392585	1.96E-05
13046	Cugbp1	-0.794193104	1.97E-05
103140	Gstt3	-1.392011963	1.98E-05
11639	Ak3l1	0.782389865	2.02E-05
110323	Cox6b1	0.518778774	2.06E-05
66522	Pgpep1	0.529502363	2.10E-05
110382	C8b	-0.701914789	2.12E-05
73723	Sh3bgrl3	0.774525	2.25E-05
27362	Dnajb9	-0.608315909	2.29E-05
27360	Add3	0.622945099	2.33E-05
15902	Id2	0.550996981	2.36E-05
59083	Fetub	-0.675762925	2.41E-05
21877	Tk1	0.760955368	2.46E-05
213391	Rassf4	0.616964402	2.49E-05
14469	Gbp2	0.790124359	2.55E-05
20621	Snn	0.672339396	2.55E-05
11671	Aldh3a2	0.579635281	2.55E-05
12515	Cd69	0.46090678	2.60E-05
69083	Sult1c2	0.722606581	2.63E-05
242785	Klhl21	-0.6555994	2.65E-05
12443	Ccnd1	0.581165099	2.69E-05
209186	Acnat2	-0.72417695	2.74E-05
13088	Cyp2b10	-0.838636271	2.76E-05
11857	Arhgdib	1.026065305	2.84E-05
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30045	Dnajc12	0.956688512	3.00E-05
76263	Gstk1	-0.550784154	3.00E-05
71819	Kif23	0.525059311	3.06E-05
27053	Asns	1.041375478	3.09E-05
66427	Cyb5b	-0.588807514	3.09E-05
66990	Tmem134	0.500631018	3.10E-05

214597	Sidt2	-0.456766307	3.11E-05
12908	Crat	0.504750487	3.24E-05
14127	Fcer1g	0.690321174	3.26E-05
14711	Gnmt	-0.579844117	3.31E-05
66530	Ubxn6	-0.509495017	3.33E-05
93673	Cml2	-0.793391657	3.35E-05
20230	Satb1	0.597726159	3.39E-05
68591	Mocos	-0.746025838	3.41E-05
171207	Arhgap4	0.548267151	3.57E-05
74032	4632417N05Rik	-0.77953975	3.57E-05
16906	Lmnb1	0.627340365	3.65E-05
68196	Hsbp1	0.769906141	3.67E-05
12512	Cd63	0.60155881	3.68E-05
16168	Il15	0.63198671	3.69E-05
22637	Zap70	-0.442819107	3.71E-05
16601	Klf9	-0.83879364	3.73E-05
243537	Uroc1	0.753357495	3.80E-05
1E+08	LOC100046802	0.710507608	4.01E-05
72972	Gcap14	0.433353769	4.03E-05
66442	Spc25	0.625004758	4.14E-05
17219	Mcm6	0.536167566	4.16E-05
15937	Ier3	0.521139267	4.17E-05
97998	Depdc6	-0.809298952	4.30E-05
13449	Dok2	0.513083381	4.39E-05
229681	St7l	-0.491392059	4.42E-05
67245	Peli1	-0.48377206	4.54E-05
104086	Cyp27a1	-0.873725462	4.55E-05
22381	Wbp5	0.439353607	4.57E-05
226105	Cyp2c70	-0.748674065	4.57E-05
19116	Prlr	-1.557350072	4.68E-05
11461	Actb	0.585313592	4.72E-05
19141	Lgmn	1.122455174	4.74E-05
74761	Mxra8	0.484240778	4.80E-05
17217	Mcm4	0.615608427	4.85E-05
83814	Nedd4l	-0.524621089	4.87E-05
12069	Bex2	0.539963395	4.99E-05
14792	Lpcat3	0.71676978	5.01E-05
233406	Prc1	0.748552192	5.07E-05
223646	Naprt1	0.512751276	5.09E-05
12411	Cbs	-0.488046772	5.13E-05
66438	Hamp2	-1.941838967	5.18E-05

103655	Sec14l4	-0.590352635	5.20E-05
217707	Coq6	0.583085384	5.27E-05
13733	Emr1	1.232198158	5.29E-05
110196	Fdps	-0.788014248	5.32E-05
229905	Ccbl2	1.007064641	5.38E-05
28250	Slco1a4	-0.572543186	5.43E-05
246256	Fcgr4	0.476152921	5.49E-05
12696	Cirbp	0.67741828	5.58E-05
12608	Cebpb	-0.706952324	5.59E-05
16668	Krt18	0.583967695	5.61E-05
15242	Hhex	-0.795053569	5.73E-05
53313	Atp2a3	0.593794431	5.75E-05
60525	Acss2	-0.482495916	5.76E-05
26362	Axl	0.653672342	5.87E-05
54139	Irf6	-0.849790134	5.90E-05
12125	Bcl2l11	0.578072304	5.90E-05
67711	Nsmce1	0.467831894	5.91E-05
18383	Tnfrsf11b	0.706325867	5.99E-05
14873	Gsto1	-0.591556681	6.04E-05
14605	Tsc22d3	-1.029527048	6.07E-05
620807	620807	-0.451276494	6.10E-05
12262	C1qc	0.956259615	6.34E-05
16149	Cd74	1.063811092	6.34E-05
15170	Ptpn6	0.568399002	6.36E-05
20568	Slpi	0.667912615	6.55E-05
68177	Ebpl	0.72329497	6.60E-05
677289	ENSMUSG00000043795	0.601817205	6.72E-05
68743	Anln	0.634167099	6.76E-05
94219	Cnnm2	-0.506553331	6.78E-05
13074	Cyp17a1	-0.703524749	6.82E-05
55938	Apom	0.892544238	6.84E-05
13057	Cyba	0.716627068	6.85E-05
56807	Scamp5	0.472652603	6.90E-05
68352	0610012D14Rik	-0.727402097	7.00E-05
231507	Plac8	0.671264822	7.19E-05
20303	Ccl4	0.525587464	7.20E-05
116914	Slc19a2	0.714558205	7.34E-05
67878	Tmem33	-0.537448087	7.44E-05
19718	Rfc2	0.625304915	7.47E-05
108995	Tbc1d10c	0.569386879	7.53E-05
12721	Coro1a	0.738241961	7.73E-05

641240	LOC641240	0.864299053	7.80E-05
12457	Ccrn4l	-0.638300743	7.99E-05
103149	Upb1	0.457395477	8.09E-05
217721	Mfsd7c	0.584217321	8.10E-05
74186	Ccdc3	0.456373702	8.13E-05
320405	Cadps2	-0.571240341	8.28E-05
12505	Cd44	0.457721119	8.32E-05
19252	Dusp1	-1.003308256	8.51E-05
21835	Thrsp	-0.679763647	8.55E-05
319173	Hist1h2af	0.53684064	8.74E-05
16792	Laptm5	0.789564707	8.76E-05
13124	Cyp8b1	-0.825461237	8.84E-05
72657	2700094K13Rik	0.609057355	9.10E-05
23833	Cd52	0.676752865	9.31E-05
101602	AI467606	0.523975708	9.32E-05
76933	Ifi27	0.815209898	9.35E-05
22172	Tyms-ps	0.603054669	9.67E-05
114301	Palmd	0.451393573	0.0001009
71375	Foxn3	-0.47744807	0.0001022
100689	Spon2	0.548100206	0.0001026
67064	Chmp1b	-0.46870149	0.0001028
20454	St3gal5	-0.521763608	0.0001033
76267	Fads1	0.506188377	0.000104
11522	Adh1	-0.596539418	0.0001061
13048	Cux2	1.181224845	0.0001064
56878	Rbms1	0.629856758	0.0001072
20384	Sfrs5	0.998253031	0.0001087
22418	Wnt5a	0.428113448	0.0001096
226418	Yod1	-0.700969306	0.0001105
18817	Plk1	0.556748443	0.0001117
233575	Frag1	0.515797212	0.0001122
14600	Ghr	-0.572169948	0.0001125
232493	Gys2	0.725574999	0.0001126
14232	Fkbp8	-0.512089339	0.0001153
77889	Lbh	0.47641329	0.0001165
12338	Capn6	0.487461462	0.0001166
12452	Ccng2	-0.728975197	0.0001171
16541	Napsa	0.455487257	0.0001195
14678	Gnai2	0.521426503	0.0001201
18718	Pip4k2a	0.43209028	0.0001221
224045	Eif2b5	-0.445958012	0.0001223

207818	BC004728	-0.502042512	0.0001224
74155	Errfi1	-0.78055217	0.000123
11655	Alas1	-0.955305876	0.0001254
105855	Nckap1l	0.461965198	0.0001266
70266	Ccbl1	-0.639913651	0.0001281
14229	Fkbp5	-0.428111105	0.0001282
18636	Cfp	0.58721647	0.0001286
26897	Acot1	0.794041105	0.0001293
83669	Wdr6	0.448017839	0.0001304
67235	Zkscan14	-0.50270938	0.0001331
84112	Sucnr1	-0.54043829	0.0001338
230991	B930041F14Rik	0.523703595	0.0001353
21826	Thbs2	0.569126654	0.0001361
228769	Psmf1	0.437242749	0.0001371
106582	Nrm	0.485317286	0.0001373
54711	Plagl2	0.475135241	0.0001373
231801	Agfg2	0.479105854	0.0001387
56695	Pnkd	-0.593593131	0.0001388
110033	Kif22	0.482430661	0.0001416
52150	Kcnk6	0.45297374	0.0001426
14961	H2-Ab1	0.83687407	0.0001434
74126	Syvn1	-0.561160749	0.000146
13167	Dbi	0.5740559	0.0001471
52033	Pbk	0.850877091	0.0001481
69008	Cab39l	-0.581520057	0.0001488
245688	Rbbp7	0.703394791	0.0001503
17434	Mocs2	0.487785521	0.0001504
21912	Tspan7	0.508287511	0.0001518
227929	Cytip	0.673144819	0.0001519
79059	Nme3	-0.491098275	0.0001524
217732	2310044G17Rik	-0.559200699	0.000153
16855	Lgals4	0.516927358	0.0001533
20193	S100a1	-0.529042851	0.000154
20970	Sdc3	0.623655637	0.0001543
19682	Rdh5	0.463982663	0.0001551
225341	Lims2	-0.44629879	0.000157
52639	Wipi1	-0.540780163	0.0001574
13007	Csrp1	0.462621864	0.0001589
66938	1700029G01Rik	0.449549693	0.0001667
319176	Hist2h2ac	0.443201495	0.0001673
19049	Ppp1r1b	0.573300521	0.0001677

192197	Bcas3	-0.731087246	0.000168
50500	Ttpa	-0.457919577	0.0001718
20201	S100a8	0.604743225	0.000172
66885	Acadsb	-0.666816366	0.0001734
240549	EG240549	0.457540179	0.0001748
12317	Calr	-0.684879483	0.000176
14734	Gpc3	0.585588486	0.0001797
16854	Lgals3	0.885465985	0.0001798
22171	Tyms	0.528782426	0.0001806
67738	Ppid	-0.544528149	0.0001816
67163	Ccdc47	-0.518723883	0.0001825
17167	Marco	1.336349193	0.0001828
66411	Tbcb	0.561062592	0.000184
74191	P2ry13	0.70135508	0.000187
213550	Dis3l	-0.578421008	0.0001878
14289	Fpr2	0.854182844	0.0001883
21939	Cd40	0.541736929	0.0001912
70564	5730469M10Rik	0.583130038	0.0001914
246277	Csad	0.60205117	0.0001927
11841	Arf2	0.542640652	0.0001967
23959	Nt5e	-0.581844097	0.0001969
66039	D14Ertd449e	-0.549464815	0.0001981
16145	Igtp	0.537347466	0.0002032
24108	Ubd	0.452025893	0.0002037
27413	Abcb11	-0.44112266	0.000207
56744	Cxcl4	0.54216019	0.0002096
70024	Mcm10	-0.765395747	0.00021
13849	Ephx1	-0.5126001	0.0002123
68337	Crip2	0.558953342	0.0002128
654426	LOC654426	0.469153297	0.0002248
14261	Fmo1	-0.644517771	0.0002281
71833	Wdr68	0.441021859	0.0002288
14998	H2-DMa	0.643263895	0.0002323
20195	S100a11	0.428889191	0.0002338
80884	Maged2	0.573701483	0.000235
53902	Rcan3	0.457848763	0.000237
76184	Abca6	-0.692930557	0.0002419
110095	Pygl	-0.536170147	0.0002428
56868	Psg23	-0.655944055	0.0002435
232334	Vgll4	-0.554250954	0.0002505
18946	Pnliprp1	0.837958919	0.0002521

50905	Il17rb	0.576918521	0.0002556
210973	Kbtbd2	-0.464055117	0.0002578
227231	Cps1	-0.485036553	0.0002613
52670	Cpsf4l	-0.490278937	0.000262
12306	Anxa2	0.772432676	0.0002627
18405	Orm1	-1.12292007	0.0002656
60596	Gucy1a3	0.47086201	0.0002663
54396	Iigp2	0.500713546	0.0002689
17195	Mbl2	-0.696543812	0.0002695
66270	Fam134b	-0.697248962	0.0002727
12615	Cenpa	0.689218768	0.000274
20878	Aurka	0.474836359	0.0002741
68777	Tmem53	0.506342721	0.0002767
14314	Fstl1	0.441496323	0.0002782
66234	Sc4mol	-0.49427578	0.0002805
76893	Lass2	-0.554595621	0.0002896
22628	Ywhag	-0.498870866	0.0002907
76846	Rps9	-0.502717644	0.0002989
13195	Ddc	-0.54880374	0.0002997
22352	Vim	0.450000604	0.0003006
56150	Mad2l1	0.700309628	0.0003017
15505	Hsph1	-0.456914121	0.0003056
545670	Cyp4a31	0.534707414	0.0003059
231070	Insig1	0.575380391	0.0003059
107766	Haao	-0.440968554	0.0003085
64209	Herpud1	-0.495299004	0.0003107
110172	Slc35b1	-0.668267416	0.0003115
117198	Ivns1abp	-0.464558487	0.0003123
72084	Pigx	0.468263798	0.0003129
69219	Ddah1	0.464520539	0.0003189
17294	Mest	0.464344942	0.0003215
74144	Robo4	0.547540594	0.000324
20219	Apcs	0.702461679	0.0003241
22139	Ttr	0.645807021	0.0003278
69786	Tprkb	-0.475265125	0.000328
21946	Pglyrp1	0.509781503	0.0003287
18073	Nid1	0.552860186	0.0003314
15926	Idh1	-0.677451079	0.000336
14710	Gngt2	0.489111453	0.0003383
98878	Ehd4	0.515218002	0.0003409
102294	Cyp4v3	-0.507581996	0.0003414

69386	Hist1h4h	-0.447271217	0.0003432
320024	Aadacl1	0.483760624	0.0003508
11732	Ank	-0.429538434	0.000358
18173	Slc11a1	0.522339422	0.0003629
243085	Ugt2b35	-0.824135862	0.0003642
110454	Ly6a	0.810808001	0.0003676
380712	Tlcd2	-0.515211607	0.0003702
12508	Cd53	0.663045279	0.0003727
14871	Gstt1	-0.501277653	0.0003747
19074	Prg2	0.631702424	0.0003773
14121	Fbp1	1.028942804	0.0003826
71724	Aox3	-0.685538301	0.0003831
12260	C1qb	0.926889409	0.0003832
11723	Amy2	-0.798780217	0.0003915
22146	Tuba1c	-0.958011523	0.0004001
12401	Serpina6	-0.514014079	0.0004043
114143	Atp6v0b	-0.463659574	0.0004057
28028	Mrpl50	0.438243343	0.0004116
75541	1700019G17Rik	-0.685853051	0.0004136
68738	Acss1	0.429369331	0.0004143
12916	Crem	-0.526445283	0.0004155
18616	Peg3	0.495386	0.0004266
11861	Arl4a	0.521916746	0.0004323
19369	Raet1b	0.582492207	0.0004346
16362	Irf1	0.45465556	0.0004358
65972	Ifi30	0.501326432	0.0004361
18041	Nfs1	-0.427242161	0.0004378
69772	Bdh2	-0.455992748	0.0004404
330192	Vps37b	0.43007268	0.0004422
1E+08	LOC100040919	0.440241984	0.0004463
14827	Pdia3	-0.429362655	0.0004499
71699	Slc41a3	0.569280317	0.0004551
100647	Upk3b	0.540376817	0.0004557
66377	Ndufc1	0.482875268	0.0004588
66866	Nhlrc2	0.558905214	0.0004597
19419	Rasgrp1	0.608214359	0.0004674
16592	Fabp5	0.560625991	0.0004706
20352	Sema4b	0.504745848	0.0004714
15331	Hmgn2	0.515444583	0.0004714
114644	Slc13a3	0.603989015	0.0004731
17118	Marcks	0.526124586	0.0004897

22156	Tuft1	-0.854126026	0.0004946
71782	Ankle2	-0.429377662	0.0005
11829	Aqp4	0.459065625	0.0005018
56720	Tdo2	-0.663360503	0.0005037
19038	Ppic	0.481138895	0.0005312
16402	Itga5	0.435812085	0.0005341
17194	Mbl1	-0.494552582	0.0005462
230514	Leprot	0.507927533	0.0005511
223697	Unc84b	0.436994829	0.0005517
71910	Ppapdc1b	0.592652845	0.0005539
110391	Qdpr	-0.602860816	0.0005661
17536	Meis2	0.531697594	0.0005703
20422	Shfm1	0.624263658	0.0005769
11905	Serpinc1	-0.579236242	0.000583
76737	Creld2	-0.600468623	0.000585
66875	1200016B10Rik	-0.518409779	0.0005965
67707	Mrpl24	-0.659682617	0.0006004
22256	Ung	0.448815946	0.0006014
67554	Slc25a30	-0.782617754	0.0006077
19241	Tmsb4x	0.633075918	0.0006087
72472	Slc16a10	-0.46850448	0.0006093
14870	Gstp1	0.646309543	0.0006349
67398	Srpr	-0.529434468	0.0006374
15267	Hist2h2aa1	-0.542059608	0.000638
56876	Nelf	-0.801614064	0.0006471
106869	Tnfaip8	0.494620243	0.0006485
78894	Aacs	-0.521534909	0.0006589
14312	Brd2	-0.616008619	0.0006625
66540	3110001A13Rik	-0.458768825	0.0006677
71670	Acy3	-0.473374092	0.0006714
56176	Pigp	0.567761561	0.0006756
13823	Epb4.1l3	0.465644496	0.0006825
76654	Upp2	-0.625341781	0.0007002
99237	Tm9sf4	-0.447407642	0.0007047
266781	Snx17	0.489238081	0.0007116
108099	Prkag2	-0.617787622	0.0007134
56177	Olfm1	0.439195207	0.0007161
22329	Vcam1	0.567189005	0.000717
26900	Ddx3y	-0.493306535	0.000718
320806	Gfm2	-0.454721165	0.0007222
22592	Ercc5	-0.633179138	0.0007334

14793	Cdca3	0.442045394	0.0007362
20216	Acsm3	0.508500216	0.0007552
109900	Asl	-0.513333045	0.0007562
171282	Acot4	0.695954193	0.0007725
20133	Rrm1	0.475624399	0.0007726
20692	Sparc	0.43823957	0.0007733
232086	Tmem150	0.437256529	0.0007765
68276	Toe1	0.42748389	0.0007786
18631	Pex11a	-0.523169895	0.0007792
15481	Hspa8	-0.626643999	0.0007817
23821	Bace1	0.599950842	0.0007885
29811	Ndrg2	-0.539687039	0.0008124
67072	Cdc37l1	-0.498235253	0.0008241
72042	Cotl1	0.548658727	0.0008258
14969	H2-Eb1	0.615139881	0.0008345
1E+08	LOC100046918	0.604465552	0.0008371
107995	Cdc20	0.514399293	0.000841
70556	Slc25a33	0.628086837	0.0008441
12350	Car3	0.593030652	0.000862
21672	Prdx2	0.490209542	0.0008621
93694	Clec2d	-0.775877447	0.0008639
231532	Arhgap24	-0.43355657	0.0008676
67701	Wfdc2	-0.630855077	0.0008736
26358	Aldh1a7	-0.698333827	0.0008758
17084	Ly86	0.472205932	0.0008804
21677	Tead2	0.428460706	0.0008838
12575	Cdkn1a	-0.511983967	0.000886
13653	Egr1	-1.401970037	0.0008924
68465	Adipor2	-0.535657009	0.0008996
66917	Chordc1	-0.6154191	0.0009127
56200	Ddx21	-0.545179112	0.0009316
1E+08	LOC100045567	0.498468526	0.0009525
210808	9030625A04Rik	0.509941759	0.0009598
12362	Casp1	0.570148399	0.0009836
15216	Hfe	0.536066619	0.000995
239743	Klhl6	0.509245985	0.0009993
18302	Oit3	0.567266807	0.001001
0	0	0.502615927	0.0010248
333331	LOC333331	0.496369618	0.0010445
226519	Lamc1	0.553623083	0.0010499
16439	Itpr2	-0.487489001	0.0010523

215627	Zbtb8b	-0.517760612	0.001069
1E+08	OTTMUSG00000000971	0.467022163	0.0010951
60599	Trp53inp1	-0.51557159	0.0010983
14287	Fpgs	-0.629140167	0.0011097
12738	Cldn2	-0.600825429	0.0011144
74764	Klc4	-0.432378626	0.0011232
53877	Ear4	0.657520466	0.0011314
15081	H3f3b	0.51636157	0.0011342
208171	Tmprss7	0.430787153	0.0011501
56356	Gltp	0.518962507	0.001151
56422	Hbs1l	0.434582857	0.0011511
67892	1810063B05Rik	0.487611711	0.0011558
70425	Csnk1g3	-0.463362449	0.0011761
21885	Tle1	-0.482402662	0.0011796
66704	Rbm4b	-0.581175892	0.0011962
17533	Mrc1	0.578153844	0.0011971
74007	Btbd11	0.54770297	0.0012478
100763	Ube3c	-0.490595563	0.0012603
54353	Skap2	0.562392805	0.0013233
70335	Reep6	-0.491619455	0.0013246
69981	Tmem30a	-0.482487757	0.0013624
18670	Abcb4	-0.457179751	0.0013727
20088	Rps24	0.585596625	0.001375
14081	Acsl1	0.619140612	0.0013819
56715	Rabgef1	-0.555496889	0.0013846
234875	Ttc13	-0.534660719	0.0013936
230558	C8a	-0.833316806	0.0014604
26364	Cd97	0.539364397	0.0015133
17304	Mfge8	0.455096046	0.0015198
99375	Cul4a	-0.43337233	0.0016209
209086	Samd9l	-0.530649639	0.0016407
18242	Oat	0.593864256	0.0016473
225160	Thoc1	-0.451326284	0.0016477
217258	Abca8a	0.59419322	0.0016624
26382	Fgd2	0.469609328	0.0016752
252972	Tpcn1	-0.543168436	0.0016981
14533	Bloc1s1	0.527257945	0.0017319
75613	Med25	0.4304285	0.0017466
52430	Echdc2	0.464601134	0.0017511
52040	Ppp1r10	-0.635418627	0.0017825
97484	Cog8	-0.440376278	0.0018023

12753	Clock	-0.513586447	0.0018922
207781	5830404H04Rik	-0.476132872	0.0018963
109113	Uhrf2	-0.433143998	0.002009
104759	Pld4	0.458133048	0.0020488
15439	Hp	0.59636019	0.0020888
52468	Ctdsp2	0.456260119	0.0020944
12739	Cldn3	0.488425715	0.0021295
18845	Plxna2	-0.56759905	0.002157
69237	Gtpbp4	-0.440525764	0.0021911
17110	Lyz	0.627022608	0.0021952
52830	Pnrc2	0.494956353	0.0022403
238330	6430527G18Rik	-0.449131351	0.0022626
20491	Sla	0.46010821	0.0022684
100715	Papd4	0.427224422	0.0022888
56085	Ubqln1	-0.476823481	0.0023075
12527	Cd9	0.504890627	0.0023274
71712	1200002N14Rik	0.460400829	0.002336
245828	Trappc1	0.462642272	0.0023429
16427	Itih4	0.475459062	0.0023479
22376	Was	0.627226475	0.0023789
12007	Azgp1	-0.737618544	0.0024271
236920	Stard8	0.465336002	0.0024532
75292	Prkd3	-0.495352709	0.0024576
15139	Hc	0.458341584	0.0026467
108907	Nusap1	0.472650584	0.0026575
71911	Bdh1	0.493997024	0.0027147
66925	Sdhd	-0.441411859	0.002719
50762	Fbxo6	-0.469102611	0.00273
68349	Ndufs3	0.502487619	0.002744
13112	Cyp3a11	0.572558495	0.0027878
227731	Slc25a25	-0.735360201	0.0028213
216871	Gltpd2	-0.496213512	0.0028249
12737	Cldn1	0.463031993	0.0029293
239122	Setdb2	-0.467063309	0.0029784
17524	Mpp1	0.574947432	0.0029846
56451	Suclg1	0.427214633	0.0030462
20324	Sdpr	0.448468473	0.0031201
13636	Efna1	0.504044743	0.0031423
100727	Ugt2b34	-0.604127649	0.0031494
21817	Tgm2	-0.565343094	0.0031563
15040	H2-T23	0.745940872	0.0032338

52538	Acaa2	0.477693658	0.0032491
23991	Cib1	-0.440371775	0.0032754
14685	Gnat1	0.502585374	0.0033323
234199	Fgl1	0.650653302	0.003374
66841	Etfdh	0.499879159	0.0033873
23872	Ets2	0.589581825	0.0035703
13688	Eif4ebp2	0.503848449	0.0035962
11363	Acadl	0.571243614	0.0036115
268697	Ccnb1	0.537765836	0.0037063
19294	Pvrl2	-0.45652104	0.0038228
23945	Mgll	-0.495120287	0.0038504
16431	Itm2a	0.451916664	0.003878
11607	Agtr1a	0.447017166	0.0038805
18708	Pik3r1	-0.463652234	0.003889
83429	Ctns	-0.54587859	0.0038958
55949	Eef1b2	0.490409913	0.0039081
71982	Snx10	-0.561700924	0.0040719
19043	Ppm1b	-0.530468335	0.0042763
21780	Tfam	0.474629949	0.0043318
12796	Camp	0.468797048	0.0043554
72465	Zfp131	-0.440391478	0.0044848
217869	Eif5	0.476014462	0.0045509
108176	Npm3-ps1	-0.428438267	0.0047478
14991	H2-M3	0.445756223	0.0050002
53861	Zranb2	-0.432576045	0.0050288
19731	Rgl1	0.453284016	0.0050651
215751	BC013529	-0.43193746	0.0051156
278180	Vsig4	0.557675343	0.0051832
12408	Cbr1	0.431559033	0.0052716
66359	2310005N03Rik	0.459919343	0.0053423
76187	Adhfe1	0.578382902	0.0055678
16561	Kif1b	-0.48543779	0.0056206
75599	Pcdh1	-0.509910379	0.0058261
27060	Tcirg1	0.430302257	0.0059119
72106	2610003J06Rik	-0.438259448	0.0059493
26914	H2afy	0.467805407	0.0060004
70686	Dusp16	-0.504061985	0.0060529
110842	Etfa	0.433962072	0.0062107
223631	BC025446	-0.466224175	0.0066796
13421	Dnase1l3	0.500647052	0.0067074
71839	Osgin1	0.493837768	0.0069453

54401	Ywhab	-0.488717142	0.0069859
14130	Fcgr2b	0.5302505	0.007147
15944	Irgm1	0.68094327	0.0072674
66049	Rogdi	0.429922601	0.0073789
55963	Slc1a4	0.44713656	0.0075711
1E+08	LOC100044862	-0.469704752	0.0078375
19736	Rgs4	-0.528577291	0.0082755
74117	Actr3	0.559906457	0.0088843
69674	Mif4gd	-0.577885956	0.0094863
1E+08	LOC100048622	0.454750675	0.0098363
12033	Bcap29	0.466509316	0.0101493
17105	Lyz2	0.597593736	0.0103917
64384	Sirt3	0.436052025	0.0108412
219132	D14Ertd668e	-0.437187678	0.0109077
26876	Adh4	-0.431327054	0.0134259
55978	Ift20	-0.45543279	0.0135297
16819	Lcn2	0.571991632	0.0147178
20848	Stat3	0.508216222	0.0155279
66113	Apoa5	-0.506793242	0.0156707
101214	Tra2a	-0.454643448	0.0160552
1E+08	LOC100047935	0.445686546	0.0168691
20249	Scd1	0.459295081	0.0204228
231386	Ythdc1	-0.429129931	0.0344539
15510	Hspd1	-0.500109793	0.04821

Table S2. Primers for quantitative real-time PCR

Genes	Forward primer	Reverse primer
Rplp0	ACTGGTCTAGGACCCGAGAAG	TCCCACCTTGTCTCCAGTCT
Cyp2b9	GCTCATTCTCTGGTCAGATGTTT	CGCTTGTGGTCTCAGTTCCA
Cyp2b10	AAAGTCCCGTGGCAACTTCC	TTGGCTCAACGACAGCAACT
Cyp2b13	TTTTCTTCCAGTGTGTTACAGCC	AACGCAGGAACTGTTCATCTG
Cyp2c70	AGTATGGCCCTGTGTTTACTGT	GCCTTGGCTGGTTCTACTGAG
Cyp2f2	GGACCCAAACCTCTCCCAATC	CCGTGAACACCGACCCATAC
Aldh1a1	ATACTTGTCGGATTTAGGAGGCT	GGGCCTATCTTCCAAATGAACA
Aldh1a7	ACTTGGAAGTTAGGCCCTGC	TGTGAAGGACACTTTGTCGATG
Adh1	GCAAAGCTGCGGTGCTATG	TCACACAAGTCACCCCTTCTC
Adh4	TGGCAGTCCCCTTTGCATT	ACTACCGGGAAGAGAGCTTTC
Ces2g	AGGTCCAAGGCAGGCTCAT	GGCCCTCCATATTCATCGTAACA
Ces3b	AGCTCCTAGCAGACCAGCAAT	AAGGGCCGTGAAATCTCCAAC
Fmo1	ACAGCCGACAGTATAAACATCCA	CCCTCCAGTAGTGCTGAGGAA
Fmo3	ACTGGTGGTACACAAGGCAG	ATGGTCCCATCCTCAAACACA
Gstk1	GGTCCTATGCAGATACCAACAC	GTACTGGCCTTTTCGGGGAA
Gstm2	ACACCCGCATACAGTTGGC	TGCTTGCCCAGAAACTCAGAG
Gsto1	ATCCGGCACGAAGTCATCAAT	TGACAGATTCGGTGACCAAGT
Ugt2b34	TGAAGTGATGGTTCTGAGACCT	ACTGCTTTGGCAGCTCATAAAT
Ugt2b35	CCTGCTAAGCCCTTGCCTAAG	AAATTGCGTTGGCCCTTTCTT
Sult2a1	GATCCAAACTGTGCCCATTTG	GATGGGAAGATGGGAGGTTATG
Shp	TGGGTCCCAAGGAGTATGC	GCTCCAAGACTTCACACAGTG
Cyp7a1	TCAAGCAAACACCATTCCTG	GGCTGCTTTCATTGCTTCA
Cyp27a1	CCTCACCTATGGGATCTTCATC	TTTAAGGCATCCGTGTAGAGC
Cyp8b1	CAGGAAGTTCCGTCGATTTG	GGCCCCAGTAGGGAGTAGAC
Baat	AGGTAAAGGAAAGCCGCATC	GTCAATGACCCCTGGAAAAG
Ntcp	CAAACCTCAGAAGGACCAAACA	GTAGGAGGATTATTCCCGTTGTG
Bsep	TCTGACTCAGTGATTCTTCGCA	CCCATAAACATCAGCCAGTTGT
Oatp2	GCTTTTCCAAGATCAAGGCATTT	CGTGGGGATACCGAATTGTCT
Oatp-b	CTCAGGACTCACATCAGGATGC	CTCTTGAGGTAGCCAGAGATCA
Mdr1	CTGTTGGCGTATTTGGGATGT	CAGCATCAAGAGGGGAAGTAATG
Mdr2	CAGCGAGAAACGGAACAGCA	TCAGAGTATCGGAACAGTGTCA
Mrp2	GTGTGGATTCCCTTGGGCTTT	CACAACGAACACCTGCTTGG
Mrp3	CTGGGTCCCCTGCATCTAC	GCCGTCTTGAGCCTGGATAAC
Mrp4	GGCACTCCGGTTAAGTAACTC	TGTCACTTGGTCGAATTTGTTCA
Hnf1α	AACACCTCAACAAGGGCACTC	CCCCACTTGAAACGGTTCCT
C/ebpβ	GGGTTTCGGGACTTGATGCAAT	CAACAACCCCGCAGGAACATCT
Rxrα	GGACTGCCTGATTGACAAGC	TTCAGCCCCATGTTTGCCTC
Foxa2	CCCTACGCCAACATGAACTCG	GTTCTGCCGGTAGAAAGGGA

Il-1β	GCAACTGTTCCTGAACTCAACT	ATCTTTTGGGGTCCGTCAACT
Il-6	TAGTCCTTCCTACCCCAATTTCC	TTGGTCCTTAGCCACTCCTTC
Tnfα	CACCACCATCAAGGACTCAA	AGGCAACCTGACCACTCTCC
Pepck	AGATGGAGGAAGAGGGCATC	GGTCAGTGAGAGCCAACCA
G6pc	AGTTGTTGCTGGAGTCCTGTC	GGCTGGCATTATAGATGCTGT
Gpt1	TCCAGGCTTCAAGGAATGGAC	CAAGGCACGTTGCACGATG
Gpt2	AACCATTCACTGAGGTAATCCGA	GGGCTGTTTAGTAGGTTTGGGTA
Asl	CTATGACCGGCATCTGTGGAA	AGCAACCTTGTCCAACCCTTG
Cps1	ACATGGTGACCAAGATTCCTCG	TTCCTCAAAGGTGCGACCAAT
Acy3	GCACCCACGGGAATGAGATG	GAGCGGTTGAGATCACGGTC
Kynu	GTCAAGCCTGCGTTAGTGG	GGAGGGTTTGAAATTCGGAATCC
Tdo2	TGGCAATTACTTGCAGTTGGA	GTGCTCGTCATGGATTTTGTTC
Ccbl1	CGAAGGCTGGAAGGGATCG	GCGGTGAGAAGTCAGGGAA
Ddc	TAGCTGACTATCTGGATGGCAT	GTCCTCGTATGTTTCTGGCTC
Haao	GAACGCCGTGTGAGAGTGAA	CCAACGAACATGATTTTGAGCTG
Alas1	TCGCCGATGCCCATTCTTATC	GGCCCCAACTTCCATCATCT
Gldc	CTCCTGCCCAGACACGATG	GGACCGTCTTCTCGATGAGC
Gnmt	AAGAGGGCTTCAGCGTGATG	CTGGCAAGTGAGCAAAACTGT
Cbs	GGGACAAGGATCGAGTCTGGA	AGCACTGTGTGATAATGTGGG
Prodh	GCACCACGAGCAGTTGTTC	CTTTGTTGTGCCGGATCAGAG
Etv4	CGCACAGACTTCGCCTACG	CAGACATCATCTGGGAATGGTC
*Oatp2**	CGACTTGTTCTCCTTTTATCAG	TAGCACCTACATCAGGTTGC
*Fmo3**	TGGAAATCAGTAGGCATAGG	ACACTACTAGAAAAGTTGGACTCG
*Ugt2b34**	CATGTCCCATTTATGGCTTAG	GAACATTGTATGAAATAGACTCTTAATGAC
*Sult2a1**	GTCCTATTACGTCTTCCTG	GTAACCTTTGACTGTAGGTG
*Cyp2b10**	GCACTCCAGTGACTTAGG	CCACCATCAACTTGCCTG

* : The primer pairs used for ChIP-qPCR.