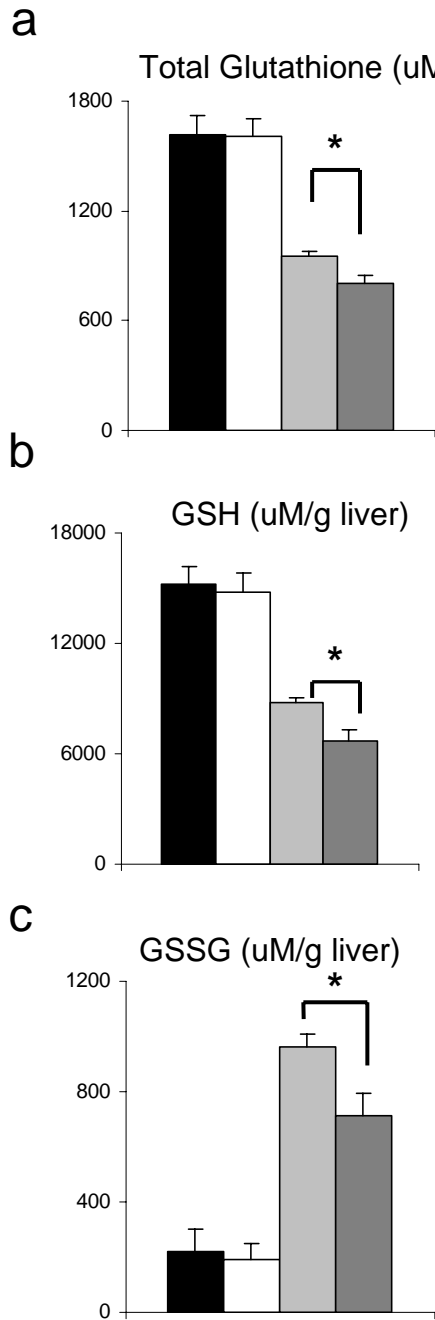


Supplementary Information

Hepatocyte-specific ablation of *Foxa2* alters bile acid homeostasis and results in ER stress.

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Supplementary Figure 1 *Foxa2* affects hepatic glutathione metabolism.

(a) Total hepatic glutathione content, as well as the reduced (GSH) (b) and oxidized (GSSG) (c) fraction, was measured in livers of wild-type and *Foxa2*-deficient mice. While glutathione levels do not differ in control and *Foxa2*^{loxP/loxP}*Alfp.Cre* mice on standard chow, all forms of hepatic glutathione (total, GSH, and GSSG) are significantly reduced in *Foxa2* mutants on cholic acid diet as compared to wildtype controls. The levels of oxidized glutathione, GSSG, are elevated in both groups with cholic acid feeding, but to a lesser extent in *Foxa2*^{loxP/loxP}*Alfp.Cre* mice.

Supplementary Table 1. Genome wide location analysis targets of Foxa2 in the liver.

Labeled DNA samples were hybridized to two arrays, the Mouse PromoterChip BCBC-5A and the Mouse PromoterChip BCBC-5B. Together, the two chips contain over 35,000 genomic elements, including promoter elements corresponding to over 20,000 genes, enhancers, microRNA regions, and highly conserved genomic regions. The Mouse PromoterChip BCBC-5A is comprised of 18,000 proximal and distal promoter regions, represented by either a 1 kb or 2 kb tile. All potential regulatory regions on the BCBC-5B chip are represented by a 1kb tile. Statistical analysis of the microarray data was performed using the significance of microarrays (SAM) package with a false discovery rate (FDR) of 10% and fold change cutoff of 1.4.

ID	Name	Fold Change	FDR (%)	RefSeq	Entrez Gene Symbol	Entrez Gene ID
P208056	0610038K03Rik	1.75	0.0	NM_026701	0610038K03Rik	68371
P200984	1110007F12Rik	2.78	0.0	NM_197986	1110007F12Rik	68487
P208603	1110008J03Rik	1.44	0.2	NM_029096	1110008J03Rik	100764
P208090	1110012L19Rik	2.12	0.0	NM_026787	1110012L19Rik	68618
P221498	ENHANCER:NM_025370	1.57	0.0	NM_025370	1110018J18Rik	66129
P223186	ENHANCER:NM_027872	2.77	0.0	NM_027872	1200006F02Rik	71706
P215972	ENHANCER:NM_027905	1.49	1.0	NM_027905	1300018J18Rik	223776
P208948	1500005A01Rik	1.69	0.1	NM_033146	1500005A01Rik	85308
P225609	PROMOTER:NM_028056	1.48	0.9	NM_028056	1600002H07Rik	72016
P216013	ENHANCER:NM_028166	2.41	0.0	NM_028166	1600014C10Rik	72244
P101568	1600020H07Rik	1.67	0.2	NM_019975	1600020H07Rik	56794
P206861	1600020H07Rik	1.77	0.0	NM_019975	1600020H07Rik	56794
P208612	1700009J07Rik	1.71	0.0	NM_029200	1700009J07Rik	75188
P219457	ENHANCER:NM_028491	1.90	0.0	NM_028491	1700040L02Rik	73287
P209820	1810023F06Rik	1.45	1.5	NM_145449	1810023F06Rik	217845
P223084	ENHANCER:NM_025604	1.46	0.5	NM_025604	1810042K04Rik	66506
P203324	1810048P08Rik	1.93	0.0	NM_133717	1810048P08Rik	69834
P209488	2010002N04Rik	1.56	0.2	NM_134133	2010002N04Rik	106878
P200262	2010016F14Rik	1.42	5.5	NM_010039	2010016F14Rik	68009
P206860	2310015I08Rik	1.61	0.1	NM_019974	2310015I08Rik	56538
P220290	PROMOTER:NM_178027	2.04	0.0	NM_178027	2310075A12Rik	69091
P215741	ENHANCER:NM_026527	1.45	0.0	NM_026527	2510006C20Rik	68044
P106227	2610042O14Rik	1.40	0.1	NM_025575	2610042O14Rik	66460
P215571	ENHANCER:NM_026013	1.75	0.0	NM_026013	2610318G18Rik	67171
P216039	ENHANCER:NM_028308	1.65	0.0	NM_028308	2700078K21Rik	101513
P106351	2810417H13Rik	1.52	0.0	NM_026515	2810417H13Rik	68026
P207763	2810443J12Rik	1.47	0.0	NM_026044	2810443J12Rik	67228
P224928	PROMOTER:NM_001007570	1.68	0.0	NM_00100757	2900084M01Rik	73095

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P207586	3110001A13Rik	1.53	0.0	NM_025626	3110001A13Rik	66540
P101924	3230401D17Rik	1.44	0.0	NM_025699	3230401D17Rik	66680
P221186	PROMOTER:NM_173767	1.49	0.5	NM_173767	3830422K02Rik	233752
P208273	4632415L05Rik	1.48	1.1	NM_027561	4632415L05Rik	70808
P222929	ENHANCER:NM_026594	1.47	1.1	NM_026594	4930517K11Rik	68172
P220400	ENHANCER:NM_029236	1.42	0.0	NM_029236	4930556P03Rik	75284
P219707	ENHANCER:NM_029013	2.13	0.0	NM_029013	4933428M03Rik	74589
P200689	5330414O08Rik	1.53	0.0	NM_183270	5330414O08Rik	68185
P101921	5730449L18Rik	1.43	0.6	NM_025677	5730449L18Rik	66637
P101922	5730521E12Rik	1.46	0.0	NM_025684	5730521E12Rik	66650
P209975	8430408G22Rik	1.49	0.0	NM_145980	8430408G22Rik	213393
P207858	9130427A09Rik	1.80	0.0	NM_026240	9130427A09Rik	107022
P200713	9330169L03Rik	1.46	0.6	NM_175253	9330169L03Rik	77226
P217555	ENHANCER:NM_176838	1.47	0.4	NM_176838	9530027K23Rik	77411
P203465	A030009B12Rik	1.63	0.1	NM_026588	A030009B12Rik	68159
P201781	A830093M07	1.46	1.1	NM_177843	A830093M07	329436
P203151	A930025J12Rik	1.43	0.9	NM_173734	A930025J12Rik	211499
P201764	Aacs	1.50	0.0	NM_030210	Aacs	78894
P206362	Aass	1.44	1.5	NM_013930	Aass	30956
P104912	Abca1	1.43	0.6	NM_013454	Abca1	11303
P223618	ENHANCER:NM_022419	1.43	0.0	NM_022419	Abhd8	64296
P104005	Acaa1	1.40	0.7	NM_130864	Acaa1	113868
P104270	Acsl1	1.51	0.0	NM_007981	Acsl1	14081
P102130	Adfp	1.40	0.7	NM_007408	Adfp	11520
P204056	Afmid	1.44	0.4	NM_027827	Afmid	71562
P101287	Ahcy	1.43	0.0	NM_016661	Ahcy	269378
P206144	Ahsg	2.41	0.0	NM_013465	Ahsg	11625
P225740	PROMOTER:NM_001012310	1.42	0.6	NM_001012310	Al132487	104910
P200901	Al450540	1.43	0.3	NM_145505	Al450540	226252
P216574	ENHANCER:NM_133840	1.45	0.0	NM_133840	Al462438	98985
P224471	PROMOTER:NM_198027	1.49	0.0	NM_198027	Al839550	233065
P214956	ENHANCER:NM_021299	2.23	0.0	NM_021299	Ak3	56248
P100642	Akt1	1.60	0.0	NM_009652	Akt1	11651
P204051	Akt1	1.51	0.0	NM_009652	Akt1	11651
P101165	Aldh1a1	1.58	0.0	NM_013467	Aldh1a1	11668
P104030	Aldh6a1	3.05	0.0	NM_134042	Aldh6a1	104776
P209444	Aldh6a1	2.65	0.0	NM_134042	Aldh6a1	104776
P104050	Aldob	1.46	0.1	NM_144903	Aldob	230163
P102137	Ambp	1.61	0.0	NM_007443	Ambp	11699
P101089	Amfr	3.26	0.0	NM_011787	Amfr	23802
P100648	Amy2	1.43	0.6	NM_009669	Amy2	11723
P101414	Ap3m1	1.43	0.0	NM_018829	Ap3m1	55946
P102686	Ap3s1	2.16	0.0	NM_009681	Ap3s1	11777
P207011	Ap4m1	2.84	0.0	NM_021392	Ap4m1	11781
P103997	Apoa5	1.94	0.0	NM_080434	Apoa5	66113
P106583	Apoc1	1.82	0.4	NM_007469	Apoc1	11812
P104583	Apoe	1.74	0.0	NM_009696	Apoe	11816

P206150	Apoh	1.65	0.0	NM_013475	Apoh	11818
P202900	Apon	3.25	0.0	NM_133996	Apon	28194
P100027	App	1.80	0.0	NM_007471	App	11820
P100029	Aqp8	1.77	0.0	NM_007474	Aqp8	11833
P202535	Arhgap12	3.31	0.0	NM_029277	Arhgap12	75415
P105251	Arhgap23	1.42	0.0	NM_021493	Arhgap23	58996
P200324	Arrdc4	1.45	0.0	NM_025549	Arrdc4	66412
P205194	Atf4	1.55	0.1	NM_009716	Atf4	11911
P106319	Atg12l	1.71	0.1	NM_026217	Atg12l	67526
P105751	Atp5j	1.72	0.0	NM_016755	Atp5j	11957
P209441	AW011752	1.69	0.2	NM_134034	AW011752	104570
P222322	PROMOTER:NM_021345	1.56	0.0	NM_021345	AW742319	57874
P223130	PROMOTER:NM_177687	1.77	0.0	NM_177687	B230205M03	232430
P201366	B230380D07Rik	1.64	0.0	NM_172772	B230380D07Rik	235461
P102161	Baat	1.46	0.1	NM_007519	Baat	12012
P104861	Banf1	1.48	0.0	NM_011793	Banf1	23825
P202878	BC022623	1.44	0.0	NM_177632	BC022623	224093
P225092	PROMOTER:NM_001001737	1.81	0.0	NM_001001737	BC055757	414758
P201275	Bcas3	1.98	0.0	NM_138681	Bcas3	192197
P106599	Bmi1	1.47	0.0	NM_007552	Bmi1	12151
P102708	Bnip3	1.40	0.9	NM_009760	Bnip3	12176
P213666	ENHANCER:NM_009760	1.76	0.0	NM_009760	Bnip3	12176
P203032	Brca1	1.45	0.2	NM_009764	Brca1	12189
P209863	Btbd3	1.56	0.4	NM_145534	Btbd3	228662
P103646	C1r	1.48	0.0	NM_023143	C1r	50909
P220348	PROMOTER:NM_181344	2.57	0.0	NM_181344	C1rl	232371
P225606	PROMOTER:NM_029939	1.59	0.0	NM_029939	C330001K17Rik	77609
P102178	C4bp	2.76	0.0	NM_007576	C4bp	12269
P204179	C4bp	2.17	0.0	NM_007576	C4bp	12269
P103306	C6	1.89	0.0	NM_016704	C6	12274
P206427	C6	1.40	0.5	NM_016704	C6	12274
P202142	C730027P07Rik	1.70	0.2	NM_177743	C730027P07Rik	245050
P202149	C8b	1.61	0.0	NM_133882	C8b	110382
P220827	ENHANCER:NM_023341	1.64	0.0	NM_023341	Cabc1	67426
P216957	ENHANCER:NM_145575	1.59	0.0	NM_145575	Cald1	109624
P100697	Cat	1.48	0.3	NM_009804	Cat	12359
P209445	Cbll1	2.22	0.1	NM_134048	Cbll1	104836
P216104	ENHANCER:NM_028803	1.53	0.0	NM_007720	Ccr8	12776
P216614	ENHANCER:NM_133983	1.54	0.0	NM_133983	Cd276	102657
P209917	Cd300lf	1.51	0.0	NM_145634	Cd300lf	246746
P100850	Cd47	1.76	0.0	NM_010581	Cd47	16423
P100097	Cd9	1.41	0.0	NM_007657	Cd9	12527
P206883	Cdc42ep4	1.50	0.0	NM_020006	Cdc42ep4	56699
P201832	Cdca1	1.43	0.0	NM_023284	Cdca1	66977
P106620	Cdh2	1.42	0.1	NM_007664	Cdh2	12558
P100101	Cdk5	1.78	0.0	NM_007668	Cdk5	12568
P100719	Cebpz	1.73	0.0	NM_009882	Cebpz	12607
P225524	PROMOTER:NM_001024806	1.58	0.3	NM_00102480	Cebpz	12607

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P208972	Cecr6	1.40	0.0	NM_033567	Cecr6	94047
P204244	Cfi	1.41	0.6	NM_007686	Cfi	12630
P100110	Chd1	1.97	0.0	NM_007690	Chd1	12648
P100111	Chga	1.64	0.0	NM_007693	Chga	12652
P102104	Chmp5	1.57	0.9	NM_029814	Chmp5	76959
P100113	Chuk	1.82	0.1	NM_007700	Chuk	12675
P100723	Cish	1.67	0.0	NM_009895	Cish	12700
P102745	Cish	1.72	0.0	NM_009895	Cish	12700
P200974	Clcn7	1.87	0.0	NM_011930	Clcn7	26373
P216366	ENHANCER:NM_053109	2.04	0.0	NM_053109	Clec2d	93694
P215654	ENHANCER:NM_026230	1.45	0.3	NM_011999	Clec4a2	26888
P101143	Cln8	2.00	0.0	NM_012000	Cln8	26889
P104899	Cln8	2.58	0.2	NM_012000	Cln8	26889
P209025	Cml2	1.43	0.7	NM_053096	Cml2	93673
P201468	Cnr2	2.35	0.0	NM_009924	Cnr2	12802
P106630	Coch	1.54	0.2	NM_007728	Coch	12810
P107126	Col10a1	1.44	1.1	NM_009925	Col10a1	12813
P106631	Col11a1	1.45	0.1	NM_007729	Col11a1	12814
P106409	Col2a1	1.53	0.0	NM_031163	Col2a1	12824
P216441	ENHANCER:NM_130449	1.49	0.0	NM_130449	Colec12	140792
P206559	Copg	1.46	0.0	NM_017477	Copg	54161
P100125	Crkl	1.53	0.0	NM_007764	Crkl	12929
P201742	Cryl1	1.43	0.1	NM_030004	Cryl1	68631
P102057	Cs	2.54	0.0	NM_026444	Cs	12974
P217001	ENHANCER:NM_145953	1.90	0.0	NM_145953	Cth	107869
P101765	Ctnnbip1	1.40	0.4	NM_023465	Ctnnbip1	67087
P204486	Cxcl1	1.67	0.0	NM_008176	Cxcl1	14825
P205286	Cxcr4	1.48	0.1	NM_009911	Cxcr4	12767
P221319	ENHANCER:NM_025797	1.41	1.1	NM_025797	Cyb5	109672
P102225	Cyp17a1	1.61	0.1	NM_007809	Cyp17a1	13074
P102771	Cyp2a4	1.42	0.5	NM_009997	Cyp2a4	13086
P107146	Cyp2a4	1.54	0.0	NM_009997	Cyp2a4	13086
P106661	Cyp2a5	1.64	0.0	NM_007812	Cyp2a5	13087
P107140	Cyp2c37	1.46	0.5	NM_010001	Cyp2c37	13096
P102775	Cyp2c39	2.22	0.0	NM_010003	Cyp2c39	13098
P107152	Cyp2c40	1.60	0.0	NM_010004	Cyp2c40	13099
P100742	Cyp2d10	2.08	0.0	NM_010005	Cyp2d10	13101
P209291	Cyp2d13	1.90	0.0	NM_133695	Cyp2d13	68444
P103945	Cyp2d26	2.30	0.0	NM_029562	Cyp2d26	76279
P106397	Cyp2d26	1.56	0.0	NM_029562	Cyp2d26	76279
P102777	Cyp2d9	1.75	0.0	NM_010006	Cyp2d9	13105
P105721	Cyp2d9	1.91	0.1	NM_010006	Cyp2d9	13105
P103557	Cyp2e1	1.41	0.2	NM_021282	Cyp2e1	13106
P102778	Cyp2j5	1.74	0.0	NM_010007	Cyp2j5	13109
P225371	PROMOTER:NM_019792	1.74	0.0	NM_019792	Cyp3a25	56388
P225540	PROMOTER:NM_019792	1.59	0.0	NM_019792	Cyp3a25	56388
P224233	ENHANCER:NM_022434	2.26	0.0	NM_022434	Cyp4f14	64385
P102238	Cyp7b1	1.41	0.6	NM_007825	Cyp7b1	13123

P106669	Cyp7b1	1.47	0.1	NM_007825	Cyp7b1	13123
P221622	PROMOTER:NM_177764	1.60	0.0	NM_177764	D430014M15	269902
P201340	D630039A03Rik	2.50	0.3	NM_178727	D630039A03Rik	242484
P212582	miRNA:mmu-mir-21_U_1	1.77	0.9	NM_010015	Dad1	13135
P220228	PROMOTER:NM_010196	1.64	0.0	NM_007916	Ddx19a	13680
P100150	Dhcr7	1.47	3.6	NM_007856	Dhcr7	13360
P106371	Dhrs1	1.44	0.1	NM_026819	Dhrs1	52585
P207537	Dhrs7	1.54	0.0	NM_025522	Dhrs7	66375
P215385	ENHANCER:NM_025522	1.60	0.0	NM_025522	Dhrs7	66375
P200614	Dhx38	1.57	0.0	NM_178380	Dhx38	64340
P225374	PROMOTER:NM_144831	1.54	0.0	NM_144831	Dhx8	217207
P104862	Dmtf1	1.62	0.0	NM_011806	Dmtf1	23857
P103876	Dnajb11	1.43	0.5	NM_026400	Dnajb11	67838
P206851	Dnase2b	2.03	0.0	NM_019957	Dnase2b	56629
P100750	Dpm1	1.64	0.2	NM_010072	Dpm1	13480
P217627	ENHANCER:NM_177688	1.49	0.0	NM_177688	E130307C13	232440
P209989	E430026E19Rik	1.56	0.0	NM_146008	E430026E19Rik	216198
P206667	Ebag9	1.48	0.3	NM_019480	Ebag9	55960
P204342	Ect2	1.43	0.3	NM_007900	Ect2	13605
P101400	Eef1b2	2.15	0.0	NM_018796	Eef1b2	55949
P206594	Eef1b2	2.65	0.0	NM_018796	Eef1b2	55949
P204066	Efcfbp1	1.43	0.4	NM_178617	Efcfbp1	69352
P107164	Efna1	2.06	0.0	NM_010107	Efna1	13636
P205363	Eif1a	4.29	0.0	NM_010120	Eif1a	13664
P206167	Eif4a2	1.46	0.0	NM_013506	Eif4a2	13682
P100178	Es1	1.90	0.0	NM_007954	Es1	13884
P213010	ENHANCER:NM_007954	1.91	0.0	NM_007954	Es1	13884
P219651	ENHANCER:NM_007962	1.52	0.0	NM_007962	Eva1	14012
P209945	Evc2	1.48	0.6	NM_145920	Evc2	68525
P208873	F13b	1.78	0.0	NM_031164	F13b	14060
P102801	F2rl2	1.41	0.5	NM_010170	F2rl2	14064
P102803	F7	2.37	0.0	NM_010172	F7	14068
P213790	ENHANCER:NM_010173	1.93	0.0	NM_010173	Faah	14073
P213792	ENHANCER:NM_010176	1.98	0.0	NM_010176	Fah	14085
P101429	Fbp1	1.70	0.0	NM_019395	Fbp1	14121
P200538	Fbxo4	1.68	0.2	NM_134099	Fbxo4	106052
P205389	Fdft1	1.50	0.1	NM_010191	Fdft1	14137
P213796	ENHANCER:NM_010191	1.76	0.0	NM_010191	Fdft1	14137
P201290	Fem1a	1.72	0.1	NM_010192	Fem1a	14154
P222499	PROMOTER:NM_181849	1.74	0.0	NM_181849	Fgb	110135
P200297	Fgl2	1.59	0.0	NM_008013	Fgl2	14190
P101691	Figl1	1.46	0.0	NM_021891	Figl1	60530
P214719	ENHANCER:NM_018881	1.93	0.0	NM_018881	Fmo2	55990
P100196	Fmo3	3.40	0.0	NM_008030	Fmo3	14262
P213033	ENHANCER:NM_008030	2.30	0.0	NM_008030	Fmo3	14262
P102860	Foxa2	3.38	0.0	NM_010446	Foxa2	15376
P103989	Foxp2	1.47	0.5	NM_053242	Foxp2	114142
P106437	Foxp2	1.66	0.0	NM_053242	Foxp2	114142
P102821	Ftl1	1.47	0.0	NM_010240	Ftl1	14325

P102822	Fts	1.42	0.1	NM_010241	Fts	14339
P101278	G1p2	1.45	0.4	NM_015783	G1p2	53606
P101612	Gabarapl1	1.71	0.0	NM_020590	Gabarapl1	57436
P206936	Gabarapl1	2.56	0.0	NM_020590	Gabarapl1	57436
P106722	Gabpa	1.60	0.0	NM_008065	Gabpa	14390
P100204	Ganab	1.54	0.0	NM_008060	Ganab	14376
P213050	ENHANCER:NM_008086	1.49	0.0	NM_008086	Gas1	14451
P213821	ENHANCER:NM_010257	2.13	0.0	NM_010257	Gast	14459
P106724	Gata3	1.45	0.1	NM_008091	Gata3	14462
P101248	Gcat	1.74	0.1	NM_013847	Gcat	26912
P103263	Gcat	1.67	0.0	NM_013847	Gcat	26912
P218825	ENHANCER:NM_025638	1.58	0.4	NM_025638	Gdpd1	66569
P209127	Ghitm	1.44	0.3	NM_078478	Ghitm	66092
P208896	Gimap3	1.41	0.0	NM_031247	Gimap3	83408
P104012	Glcci1	1.44	0.7	NM_133236	Glcci1	170772
P217167	ENHANCER:NM_153547	2.28	0.0	NM_153547	Gnl3	30877
P200584	Gnpda2	1.47	0.1	NM_027681	Gnpda2	67980
P204470	Gpam	3.13	0.0	NM_008149	Gpam	14732
P207157	Gpr35	1.44	0.1	NM_022320	Gpr35	64095
P203572	Gprc5c	1.41	2.4	NM_147217	Gprc5c	70355
P223094	PROMOTER:NM_182805	1.41	0.9	NM_182805	Gpt1	76282
P106737	Gstm2	1.45	1.1	NM_008183	Gstm2	14863
P105680	Gyk	1.45	0.0	NM_008194	Gyk	14933
P106743	Gys3	1.42	0.0	NM_008195	Gys3	14936
P203888	H13	1.65	0.0	NM_010376	H13	14950
P210031	Habp2	2.54	0.0	NM_146101	Habp2	226243
P202201	Hadha	1.57	0.0	NM_178878	Hadha	97212
P215268	ENHANCER:NM_024284	4.19	0.0	NM_024284	Hagh	14651
P102846	Hao1	1.47	0.0	NM_010403	Hao1	15112
P213863	ENHANCER:NM_010403	1.60	0.0	NM_010403	Hao1	15112
P200191	Hbs1l	1.91	0.0	NM_019702	Hbs1l	56422
P219874	ENHANCER:NM_026101	1.45	0.0	NM_026101	Herc4	67345
P103206	Hgd	2.36	0.0	NM_013547	Hgd	15233
P206184	Hgd	1.75	0.0	NM_013547	Hgd	15233
P103523	Hirip5	1.41	0.2	NM_020045	Hirip5	56748
P219424	PROMOTER:NM_178187	1.44	0.5	NM_178187	Hist1h2ae	319166
P221855	PROMOTER:NM_178186	1.60	0.0	NM_178186	Hist1h2ag	319167
P219095	PROMOTER:NM_178182	1.42	0.3	NM_178182	Hist1h2ai	319191
P102221	Hivep1	1.71	0.0	NM_007772	Hivep1	110521
P100269	Hpgd	1.98	0.0	NM_008278	Hpgd	15446
P206642	Hps1	1.47	1.1	NM_019424	Hps1	192236
P206531	Hpxn	2.24	0.0	NM_017371	Hpxn	15458
P206190	Hspa1l	1.56	0.2	NM_013558	Hspa1l	15482
P213135	ENHANCER:NM_008321	2.39	0.0	NM_008321	Id3	15903
P104692	Idh1	2.36	0.0	NM_010497	Idh1	15926
P106790	Igfbp1	2.82	0.0	NM_008341	Igfbp1	16006
P100840	Igfbp4	1.54	0.6	NM_010517	Igfbp4	16010
P205522	Igfbp4	1.57	0.0	NM_010517	Igfbp4	16010
P100842	Il11ra1	1.41	1.9	NM_010549	Il11ra1	16157

P201292	Il4ra	2.86	0.2	NM_010557	Il4ra	16190
P216283	ENHANCER:NM_031168	1.70	0.0	NM_031168	Il6	16193
P100845	Il6st	1.57	0.0	NM_010560	Il6st	16195
P224499	ENHANCER:NM_008382	1.84	0.0	NM_008382	Inhbe	16326
P217161	ENHANCER:NM_153526	1.42	1.4	NM_153526	Insig1	231070
P106455	Insig2	1.57	0.0	NM_133748	Insig2	72999
P218901	ENHANCER:NM_008406	2.65	0.0	NM_008406	Itih1	16424
P100298	Itm2b	1.64	0.2	NM_008410	Itm2b	16432
P102382	Itm2b	1.43	0.1	NM_008410	Itm2b	16432
P202225	Itpkc	1.49	0.0	NM_181593	Itpkc	233011
P102899	Itpr1	1.63	0.0	NM_010585	Itpr1	16438
P225225	PROMOTER:NM_001017426	2.08	0.0	NM_001017426	Jmjd3	216850
P100301	Junb	1.66	0.0	NM_008416	Junb	16477
P102386	Junb	2.09	0.0	NM_008416	Junb	16477
P100096	Kai1	3.71	0.0	NM_007656	Kai1	12521
P225020	PROMOTER:NM_028805	1.92	0.0	NM_028805	Katnb1	74187
P217004	ENHANCER:NM_145958	1.81	0.3	NM_145958	Kbtbd2	210973
P205552	Kif9	1.47	0.3	NM_010628	Kif9	16578
P103649	Klf15	2.56	0.0	NM_023184	Klf15	66277
P213169	ENHANCER:NM_008453	2.15	0.0	NM_008453	Klf3	16599
P221876	PROMOTER:NM_177771	4.22	0.0	NM_177771	Klhl18	270201
P204605	Klkb1	1.69	0.3	NM_008455	Klkb1	16621
P101724	Kng1	2.92	0.0	NM_023125	Kng1	16644
P207220	Kng1	1.75	0.0	NM_023125	Kng1	16644
P225091	PROMOTER:NM_201375	2.50	0.0	NM_201375	Kng2	385643
P202483	Ldlr	1.46	0.0	NM_010700	Ldlr	16835
P213181	ENHANCER:NM_008498	1.56	0.0	NM_008498	Lhx1	16869
P219411	ENHANCER:NM_013584	3.29	0.0	NM_013584	Lifr	16880
P102363	Lipc	1.87	0.0	NM_008280	Lipc	15450
P225286	PROMOTER:NM_001013775	1.96	0.0	NM_001013775	LOC381806	381806
P203557	Lrg1	1.89	0.0	NM_029796	Lrg1	76905
P202639	Lrp1	2.72	0.0	NM_008512	Lrp1	16971
P216025	ENHANCER:NM_028233	1.61	0.0	NM_028233	Lrpprc	72416
P203526	Lrrc33	1.84	0.0	NM_146069	Lrrc33	224109
P202309	Lrrc41	1.47	0.2	NM_153521	Lrrc41	230654
P202496	Lrrk1	1.90	0.1	NM_146191	Lrrk1	233328
P200752	Lyn	2.44	0.0	NM_010747	Lyn	17096
P100873	Mad	1.92	0.0	NM_010751	Mad	17119
P100875	Mafg	1.43	0.0	NM_010756	Mafg	17134
P102933	Mafg	1.44	0.2	NM_010756	Mafg	17134
P213965	ENHANCER:NM_010757	1.50	0.3	NM_010757	Mafk	17135
P217768	ENHANCER:NM_178920	2.92	0.0	NM_178920	Mal2	105853
P104887	Mapkbp1	1.42	0.0	NM_011941	Mapkbp1	26390
P216485	ENHANCER:NM_133653	2.25	0.0	NM_133653	Mat1a	11720
P219210	ENHANCER:NM_010776	1.70	0.0	NM_010776	Mbl2	17195
P201411	Mcm4	1.75	0.0	NM_008565	Mcm4	17217
P221804	ENHANCER:NM_008587	1.48	0.0	NM_008587	Mertk	17289

P225825	PROMOTER:NM_001012323	3.21	0.0	NM_001012323 3	MGC107671	381530
P202727	Mgea6	1.73	0.0	NM_146034	Mgea6	217615
P214770	ENHANCER:NM_019580	1.57	0.0	NM_019580	MGI:1891827	56209
P219417	ENHANCER:NM_030237	1.85	0.0	NM_030237	MGI:1930801	79401
P223166	PROMOTER:NM_176846	2.74	0.0	NM_176846	MGI:2443248	320051
P104092	MGI:2672795	1.42	0.0	NM_153069	MGI:2672795	259301
P101668	Mkks	1.44	0.3	NM_021527	Mkks	59030
P216376	ENHANCER:NM_053163	1.46	0.0	NM_053163	Mrpl36	94066
P202215	Mrps2	1.41	1.1	NM_080452	Mrps2	118451
P213230	ENHANCER:NM_008630	1.43	0.0	NM_008630	Mt2	17750
P200579	Mtac2d1	1.41	2.4	NM_028924	Mtac2d1	74413
P103329	Mtx2	1.46	0.9	NM_016804	Mtx2	53375
P102442	Mug1	1.44	0.1	NM_008645	Mug1	17836
P103965	Mup1	2.34	0.0	NM_031188	Mup1	17840
P106415	Mup1	2.74	0.0	NM_031188	Mup1	17840
P225576	PROMOTER:NM_008647	3.22	0.0	NM_008647	Mup2	17841
P225724	PROMOTER:NM_008647	3.26	0.0	NM_008647	Mup2	17841
P225381	PROMOTER:NM_010845	3.94	0.0	NM_010845	Mup3	17842
P102443	Mup4	4.19	0.0	NM_008648	Mup4	17843
P106853	Mup4	1.51	0.0	NM_008648	Mup4	17843
P218527	PROMOTER:NM_008649	3.65	0.0	NM_008649	Mup5	17844
P209735	Myh2	1.44	0.2	NM_144961	Myh2	17882
P101252	Ndrp2	1.43	0.2	NM_013864	Ndrp2	29811
P205664	Ndufa2	1.45	0.2	NM_010885	Ndufa2	17991
P106370	Ndufa8	1.45	0.0	NM_026703	Ndufa8	68375
P106489	Ndufs8	3.37	0.0	NM_144870	Ndufs8	225887
P209175	Nek8	1.79	0.0	NM_080849	Nek8	140859
P102450	Nkx2-5	1.56	0.9	NM_008700	Nkx2-5	18091
P106029	Nqo2	2.04	0.0	NM_020282	Nqo2	18105
P206033	Nr0b2	2.40	0.0	NM_011850	Nr0b2	23957
P200647	Nr1i2	2.88	0.0	NM_010936	Nr1i2	18171
P209921	Nup43	1.46	0.0	NM_145706	Nup43	69912
P223526	ENHANCER:NM_010959	1.71	0.0	NM_010959	Oit3	18302
P219712	PROMOTER:NM_146465	1.44	3.6	NM_146465	Olf108	258457
P220731	PROMOTER:NM_146270	1.99	0.0	NM_146270	Olf370	258267
P206127	Omd	1.96	0.0	NM_012050	Omd	27047
P224652	PROMOTER:NM_001003949	2.28	0.0	NM_001003949 9	ORF61	216157
P100939	Pa2g4	1.55	0.0	NM_011119	Pa2g4	18813
P206669	Panx1	1.41	0.2	NM_019482	Panx1	55991
P200625	Pcgf5	1.41	0.0	NM_029508	Pcgf5	76073
P102981	Pck1	1.44	0.0	NM_011044	Pck1	18534
P104133	Pck1	1.72	0.3	NM_011044	Pck1	18534
P205702	Pck1	1.69	0.0	NM_011044	Pck1	18534
P102473	Pde6d	1.43	0.9	NM_008801	Pde6d	18582
P101226	Pdk4	1.41	0.9	NM_013743	Pdk4	27273
P206280	Pdk4	2.09	0.0	NM_013743	Pdk4	27273
P204782	Pemt	1.73	0.2	NM_008819	Pemt	18618

P213291	ENHANCER:NM_008819	2.05	0.0	NM_008819	Pemt	18618
P202813	Per1	2.66	0.0	NM_011065	Per1	18626
P223553	ENHANCER:NM_011066	2.29	0.0	NM_011066	Per2	18627
P200826	Pes1	1.50	0.1	NM_022889	Pes1	64934
P100928	Pfdn2	1.61	1.1	NM_011070	Pfdn2	18637
P102988	Pfdn2	1.55	0.7	NM_011070	Pfdn2	18637
P103719	Phf10	1.43	0.3	NM_024250	Phf10	72057
P104065	Pi4k2a	1.99	0.0	NM_145501	Pi4k2a	84095
P103522	Pigo	1.46	0.3	NM_020035	Pigo	56703
P214045	ENHANCER:NM_011082	2.23	0.0	NM_011082	Pigr	18703
P106410	Pik3ap1	1.46	0.1	NM_031376	Pik3ap1	83490
P214650	ENHANCER:NM_016915	1.97	0.0	NM_016915	Pla2g6	53357
P204800	Pld2	1.52	0.2	NM_008876	Pld2	18806
P217810	ENHANCER:NM_182930	1.88	0.0	NM_182930	Plekha6	240753
P217201	ENHANCER:NM_153804	4.75	0.0	NM_153804	Plekhg3	263406
P102511	Plg	1.49	0.2	NM_008877	Plg	18815
P214343	ENHANCER:NM_011961	2.37	0.0	NM_011961	Plod2	26432
P214602	ENHANCER:NM_016784	1.94	0.0	NM_016784	Plrg1	53317
P215475	ENHANCER:NM_025802	1.53	0.0	NM_025802	Pnpla2	66853
P102568	Polr2c	1.45	3.6	NM_009090	Polr2c	20021
P217832	ENHANCER:NM_183308	1.44	0.0	NM_183308	Pon2	330260
P200119	Pot1	1.95	0.0	NM_133931	Pot1	101185
P214064	ENHANCER:NM_011144	1.89	0.0	NM_011144	Ppara	19013
P103009	Pparg	1.70	0.0	NM_011146	Pparg	19016
P221335	PROMOTER:NM_011151	1.67	0.9	NM_011151	Ppm1b	19043
P208977	Prcc	1.91	0.0	NM_033573	Prcc	94315
P100920	Prdx1	1.45	0.0	NM_011034	Prdx1	18477
P100021	Prdx6	1.69	0.2	NM_007453	Prdx6	11758
P106925	Prkar2a	1.55	0.0	NM_008924	Prkar2a	19087
P103012	Prkdc	1.54	0.2	NM_011159	Prkdc	19090
P207541	Prlpk	1.56	0.0	NM_025532	Prlpk	66392
P214076	ENHANCER:NM_011173	2.20	0.0	NM_011173	Pros1	19128
P103016	Psen2	1.47	0.0	NM_011183	Psen2	19165
P205763	Psen2	2.27	0.0	NM_011183	Psen2	19165
P214439	ENHANCER:NM_013640	2.55	0.0	NM_013640	Psmb10	19171
P205766	Psme1	1.60	0.0	NM_011189	Psme1	19186
P225318	PROMOTER:NM_026873	1.53	0.0	NM_026873	Ptcd2	68927
P100183	Ptk2	1.53	0.7	NM_007982	Ptk2	14083
P215140	ENHANCER:NM_023268	1.62	0.0	NM_023268	Qscn6	104009
P202873	Rab3b	1.49	0.0	NM_023537	Rab3b	69908
P220416	ENHANCER:NM_009023	1.70	0.0	NM_009023	Rapsn	19400
P225664	PROMOTER:NM_028478	2.48	0.0	NM_028478	Rassf6	73246
P210463	Rbbp5	4.08	0.0	NM_172517	Rbbp5	213464
P219945	PROMOTER:NM_080436	2.33	0.0	NM_080436	Rdh1	107605
P104456	Rdh16	1.58	0.9	NM_009040	Rdh16	19683
P204889	Rdh16	1.50	0.2	NM_009040	Rdh16	19683
P206556	Rdh7	2.22	0.0	NM_017473	Rdh7	54150
P210193	Rdh9	1.78	0.0	NM_153133	Rdh9	103142
P100471	Rdx	2.85	0.0	NM_009041	Rdx	19684

P207224	Renbp	1.51	0.0	NM_023132	Renbp	19703
P106117	Retn	1.54	0.0	NM_022984	Retn	57264
P212837	ENHANCER:NM_007485	1.51	0.0	NM_007485	Rhod	11854
P207606	Ribc1	1.41	0.6	NM_025660	Ribc1	66611
P214119	ENHANCER:NM_011278	1.48	0.0	NM_011278	Rnf4	19822
P103448	Rpl21	1.48	0.0	NM_019647	Rpl21	19933
P214781	ENHANCER:NM_019647	2.07	0.0	NM_019647	Rpl21	19933
P215168	ENHANCER:NM_023544	2.25	0.0	NM_023544	Rsc1a1	69994
P219373	ENHANCER:NM_011315	2.84	0.0	NM_011315	Saa3	20210
P205816	Saa4	1.42	0.1	NM_011316	Saa4	20211
P206490	Sah	2.87	0.0	NM_016870	Sah	20216
P215387	ENHANCER:NM_025535	1.82	0.0	NM_025535	Sara2	66397
P206439	Scarb1	1.43	0.7	NM_016741	Scarb1	20778
P224655	PROMOTER:NM_029022	1.56	0.0	NM_029022	Scrn3	74616
P217056	ENHANCER:NM_146126	2.06	0.0	NM_146126	Sdh1	20322
P100546	Sephs2	2.16	0.0	NM_009266	Sephs2	20768
P217937	ENHANCER:NM_199314	1.56	2.1	NM_199314	Serpina11	380780
P100542	Serpina1a	1.53	0.0	NM_009243	Serpina1a	20700
P102591	Serpina1a	2.17	0.0	NM_009243	Serpina1a	20700
P106976	Serpina1a	1.48	0.0	NM_009243	Serpina1a	20700
P204994	Serpina1b	3.83	0.0	NM_009244	Serpina1b	20701
P102592	Serpina1d	1.87	0.0	NM_009246	Serpina1d	20703
P218322	PROMOTER:NM_009247	2.08	0.0	NM_009247	Serpina1e	20704
P204997	Serpina3m	1.50	0.4	NM_009253	Serpina3m	20717
P104193	Serpina6	6.15	0.0	NM_007618	Serpina6	12401
P204206	Serpina6	2.42	0.0	NM_007618	Serpina6	12401
P209171	Serpinc1	1.51	0.1	NM_080844	Serpinc1	11905
P100420	Serpinf2	2.09	0.0	NM_008878	Serpinf2	18816
P102512	Serpinf2	2.87	0.0	NM_008878	Serpinf2	18816
P213312	ENHANCER:NM_008878	1.63	0.0	NM_008878	Serpinf2	18816
P104910	Sh3d19	1.57	0.4	NM_012059	Sh3d19	27059
P101009	Sin3a	1.41	0.2	NM_011378	Sin3a	20466
P223114	PROMOTER:NM_013768	1.41	1.7	NM_013768	Skb1	27374
P207166	Slc13a2	1.57	0.0	NM_022411	Slc13a2	20500
P202146	Slc17a2	2.30	0.0	NM_144836	Slc17a2	218103
P202941	Slc25a10	1.43	0.5	NM_013770	Slc25a10	27376
P103052	Slc25a14	1.44	0.1	NM_011398	Slc25a14	20523
P210040	Slc25a25	1.55	0.1	NM_146118	Slc25a25	227731
P217442	ENHANCER:NM_175090	1.74	0.0	NM_175090	Slc31a1	20529
P100206	Slc37a4	1.81	0.1	NM_008063	Slc37a4	14385
P215998	ENHANCER:NM_028092	1.42	1.1	NM_028092	Slc39a5	72002
P209274	Slc6a12	2.56	0.0	NM_133661	Slc6a12	14411
P206859	Son	1.42	0.0	NM_019973	Son	20658
P214882	ENHANCER:NM_019972	3.20	0.0	NM_019972	Sort1	20661
P215010	ENHANCER:NM_021507	4.33	0.0	NM_021507	Sqrdl	59010
P217096	ENHANCER:NM_146258	1.46	0.0	NM_146258	Stard13	243362
P221090	ENHANCER:NM_023377	1.96	0.0	NM_023377	Stard5	170460
P105190	Stat2	1.72	0.0	NM_019963	Stat2	20847
P216318	ENHANCER:NM_033074	1.71	0.0	NM_033074	Tars	110960

P215451	ENHANCER:NM_025706	2.77	0.0	NM_025706	Tbc1d15	66687
P203393	Tbc1d17	2.57	0.0	NM_144924	Tbc1d17	233204
P202855	Tbl1xr1	1.74	0.1	NM_175304	Tbl1xr1	81004
P106414	Tcfap4	1.47	0.5	NM_031182	Tcfap4	83383
P225477	PROMOTER:NM_009340	1.43	0.6	NM_009340	Tcp10a	21460
P102621	Terf2	1.47	0.6	NM_009353	Terf2	21750
P102622	Tex261	1.40	1.3	NM_009357	Tex261	21766
P213515	ENHANCER:NM_009379	1.44	0.6	NM_009379	Thpo	21832
P213517	ENHANCER:NM_009383	1.60	0.0	NM_009383	Tial1	21843
P209508	Timd2	1.48	0.0	NM_134249	Timd2	171284
P103269	Timm10	1.44	0.1	NM_013896	Timm10	30056
P101039	Tjp2	1.54	0.1	NM_011597	Tjp2	21873
P100585	Tk1	1.46	0.4	NM_009387	Tk1	21877
P101043	Tnfrsf1a	1.44	0.0	NM_011609	Tnfrsf1a	21937
P100595	Tpst2	1.89	0.0	NM_009419	Tpst2	22022
P104542	Tpst2	1.87	0.0	NM_009419	Tpst2	22022
P106350	Trap1	1.56	0.0	NM_026508	Trap1	68015
P207249	Trim13	1.45	0.0	NM_023233	Trim13	66597
P217405	ENHANCER:NM_173378	1.91	0.0	NM_173378	Trp53bp2	209456
P209510	Trpm8	1.48	1.3	NM_134252	Trpm8	171382
P213537	ENHANCER:NM_009437	1.72	0.0	NM_009437	Tst	22117
P216295	ENHANCER:NM_031201	2.04	0.0	NM_031201	Tsta3	22122
P216072	ENHANCER:NM_028639	1.62	0.0	NM_028639	Ttc7	225049
P104951	Ttr	2.02	0.0	NM_013697	Ttr	22139
P103478	Tusc2	2.05	0.0	NM_019742	Tusc2	80385
P223882	PROMOTER:NM_175646	1.66	0.0	NM_175646	Txnl4b	234723
P105188	Ube2l6	1.41	0.0	NM_019949	Ube2l6	56791
P101121	Ubl3	1.65	0.0	NM_011908	Ubl3	24109
P101064	Ufd1l	1.84	0.0	NM_011672	Ufd1l	22230
P205963	Ufd1l	1.84	0.1	NM_011672	Ufd1l	22230
P210288	Ugt2b34	1.49	0.2	NM_153598	Ugt2b34	100727
P202901	Ugt2b35	1.42	0.2	NM_172881	Ugt2b35	243085
P100615	Uox	1.51	0.0	NM_009474	Uox	22262
P205095	Uox	1.43	0.0	NM_009474	Uox	22262
P209730	Uroc1	3.73	0.0	NM_144940	Uroc1	243537
P104843	Vars2	1.40	0.9	NM_011690	Vars2	22321
P205970	Vars2	1.43	0.6	NM_011690	Vars2	22321
P100621	Vdr	1.47	0.0	NM_009504	Vdr	22337
P214994	ENHANCER:NM_021455	1.93	0.0	NM_021455	Wbscr14	58805
P203317	Wdr23	1.85	0.0	NM_133734	Wdr23	28199
P101616	Wdr46	2.81	0.0	NM_020603	Wdr46	57315
P206940	Wdr46	2.50	0.1	NM_020603	Wdr46	57315
P217896	ENHANCER:NM_198606	1.67	0.0	NM_198606	Wdsof1	223499
P102667	Zbtb17	1.40	0.1	NM_009541	Zbtb17	22642
P203904	Zbtb5	1.58	0.1	NM_173399	Zbtb5	230119
P103547	Zc3h8	1.41	0.2	NM_020594	Zc3h8	57432
P201551	Zdhhc17	3.04	0.0	NM_172554	Zdhhc17	320150
P103509	Zfp111	1.45	0.3	NM_019940	Zfp111	56707
P219825	ENHANCER:NM_019747	1.55	0.0	NM_019747	Zfp113	56314

P217920	ENHANCER:NM_199029	1.78	0.0	NM_199029	Zfp395	380912
P218249	PROMOTER:NM_016683	1.42	0.0	NM_016683	Zfp95	22757
P202461	Zfp96	1.44	0.9	NM_016684	Zfp96	22758
P218783	ENHANCER:NM_026670	1.94	0.0	NM_026670	Zmym1	68310
P210455	Zswim4	1.61	0.1	NM_172503	Zswim4	212168
P100192	NM_008015	1.49	3.0	NM_008015		
P100280	NM_008322	2.12	0.0	NM_008322		
P101607	NM_020573	1.86	0.0	NM_020573		
P105574	NM_008252	1.43	1.9	NM_008252		
P204742	NM_008735	1.58	0.0	NM_008735		
P210547	NM_172674	1.42	0.0	NM_172674		
P210840	CONSERVED:ADCYAP1_cnr_c	1.57	0.0			
P211136	CONSERVED:CR846394	1.46	0.0			
P211139	CONSERVED:CR846399	1.44	0.0			
P211140	CONSERVED:CR846400	2.05	0.0			
P211253	CONSERVED:CR846531	2.57	0.0			
P212585	miRNA:mmu-mir-21_U_4	1.67	0.0			
P212702	miRNA:mmu-mir-31_D_5	1.47	0.5			
P215520	ENHANCER:NM_025888	1.47	0.0			
P218075	CONSERVED:SCGN_cnr_d	1.59	0.0			
P218145	CONSERVED:TTR_cnr_a	2.91	0.0			
P221473	PROMOTER:NM_009245	7.66	0.0	NM_009245		
P225841	chr14_58250184:58251184_mouse	1.59	0.0			
P225855	chr8_119864402:119865402_mouse	1.43	0.6			
P225863	chr4_113467283:113468283_mouse	1.41	3.6			
P225944	chr1_91328020:91329020_mouse	1.50	0.0			
P225965	chr5_120331016:120332016_mouse	1.71	0.0			
P225992	chr14_112743810:112744810_mouse	1.53	0.0			
P226029	chr4_123063315:123064315_mouse	1.46	1.1			
P226037	chr5_23475653:23476653_mouse	2.01	0.0			
P226111	chr4_52840062:52841062_mouse	1.99	0.0			
P226137	chr8_72246317:72247317_mouse	1.50	0.3			
P226241	chr8_106507302:106508302_mouse	1.45	0.6			
P226277	chr18_13151580:13152580_mouse	2.69	0.0			
P226376	chr1_93064523:93065523_mouse	1.55	0.3			
P226397	chr3_30365995:30366995_mouse	1.43	0.0			
P226601	chr1_82757348:82758348_mouse	1.53	0.0			

P226634	chr13_111874563:111875563_mouse	1.43	0.0			
P226644	chr17_85190676:85191676_mouse	2.96	0.0			
P226653	chr4_58599909:58600909_mouse	1.57	0.0			
P226671	chr1_40561676:40562676_mouse	1.78	0.4			
P226712	chr18_43738911:43739911_mouse	1.47	0.0			
P226743	chr15_41803278:41804278_mouse	1.51	0.0			
P226784	chr2_27532637:27533637_mouse	2.03	0.0			
P226885	chr6_121748411:121749411_mouse	2.65	0.0			
P226889	chr9_70494179:70495179_mouse	2.01	0.0			
P226963	chr7_98299720:98300720_mouse	1.42	1.7			
P227187	chr4_99561791:99562791_mouse	2.19	0.0			
P227327	chr16_21476449:21477449_mouse	1.49	0.0			
P227438	chr2_134574804:134575804_mouse	1.92	0.0			
P227568	chr1_105100414:105101414_mouse	1.60	0.0			
P227627	chr19_6849812:6850812_mouse	1.70	0.0			
P227635	chr15_102886875:102887875_mouse	1.42	0.0			
P227677	chr14_107902391:107903391_mouse	1.52	0.0			
P227730	chr4_152600769:152601769_mouse	1.48	0.0			
P227769	chr8_108880115:108881115_mouse	1.82	0.0			
P227787	chr11_48495625:48496625_mouse	1.74	1.7			

Supplementary Table 2. Biochemical pathways as Foxa2 targets in the liver.

The DAVID 2007 suite of software, including the EASE analysis tool, was used to determine enriched GO Biological Functional Categories in the set of 574 promoter/enhancer regions bound by Foxa2 by location analysis. Each notable category associated with steroid and lipid metabolism is listed with its EASE score, a statistical measure corresponding to the probability that the category is over-represented in the target list compared to all the genes represented on the two enhancer/promoter array used in the location analysis.

System	Category	EASE Score
GO Biological Process	Steroid Biosynthesis	0.00187
GO Biological Process	Steroid Metabolism	0.000493
GO Molecular Function	Lipid Biosynthesis	0.00410
GO Biological Process	Lipid Metabolism	0.000000549
GO Biological Process	Lipid Transporter Activity	0.00308

Supplementary Table 3. Clinical parameters for control and cholestatic patients

Patient	Diagnosis	Age (months)	Total bilirubin (mg/dL)	Conjugated bilirubin (mg/dL)	ALP (U/L)	GGT (U/L)	ALT (U/L)	AST (U/L)	Albumin (g/dL)
Control 1	Hepatitis B Virus	179	11.7	6	289	57	801	1399	2.3
Control 2	Ornithine transcarbamylase deficiency	13	0	0	140	N/A	9	32	3.2
Control 3	Citrullinemia	11	0.6	0	127	23	85	83	3.5
Control 4	Citrullinemia	16	0.1	0	301	27	103	52	3.6
Control 5	Joubert syndrome	124	7.1	12.9	1149	1074	351	298	3.5
Control 6	Steatosis	Adult	0.6	N/A	61	N/A	44	46	N/A
Cholestatic 1	Biliary atresia	8	6.5	4.2	890	614	101	142	3.4
Cholestatic 2	Biliary atresia	7	14.2	8	883	379	169	234	3.1
Cholestatic 3	Biliary atresia	25	8.9	4.8	882	364	336	334	3.8
Cholestatic 4	Biliary atresia	10	13.9	5.9	1015	194	225	343	3.3
Cholestatic 5	Primary sclerosing cholangitis	137	21.3	5.6	511	55	366	1856	3.2
Cholestatic 6	Primary sclerosing cholangitis	41	7.5	5.5	612	121	120	240	2.7
Cholestatic 7	Primary sclerosing cholangitis	Adult	15.7	14	33	86	55	116	N/A
Cholestatic 8	Primary sclerosing cholangitis	Adult	1.1	0.7	769	318	71	52	N/A

Supplementary Methods

Glutathione Assay. Snap-frozen mouse liver (100 mg) was homogenized in 0.5 mL of 5% sulfosalicylic acid (SSA) using a Kontes glass homogenizer (2mL). After centrifugation at 13000 rpm for 10 min, the supernatant was transferred to a new tube and used for glutathione analysis. Total glutathione and oxidized GSSG content was determined using Bioxytech GSH/GSSG-412 kit (Oxis International, Inc.).

Analysis of Overrepresented Functional Categories. The Database for Annotation, Visualization and Integrated Discovery 2007, a bioinformatics tool provided by the National Center for Biotechnology Information (NCBI: <http://david.abcc.ncifcrf.gov/>), was utilized to determine functional biological categories in the set of 484 Foxa2 target genes. DAVID 2007 utilizes several annotation systems, including Gene Ontology categories, PIR, SwissProt keywords, and pathway maps to summarize the functional information in a large dataset. Functional categories are ranked based on co-occurrence probability, also known as the EASE-score, a metric detecting functional categories over-represented in the target list compared to all the genes represented on the array platform used.