

Table S1. Upregulated coding Genes in YAP1 OFF D6 tumors compared to YAP1 ON. Upregulated genes in YAP1 OFF D6/ YAP1 ON tumor RNA-Seq include major urinary proteins (Mups), cytochrome p450 enzymes, and other metabolic liver enzymes. Coding genes with a p-value<0.05 shown.

	Fold Change	
Gene	FC (Mean(YAP1 OFF)+0.01) / (Mean(YAP1 ON)+0.01)	p-value
Mup22	3755.29	0.00
Mup10	3230.00	0.00
Mup9	895.47	0.00
Mup2	585.44	0.02
Mup11	545.53	0.00
Sult3a1	299.86	0.01
Mup1	259.14	0.00
Mup17	179.48	0.00
Mup12	177.24	0.04
Mup15	78.69	0.05
A1bg	58.25	0.01
Sult2a8	57.99	0.01
Cyp3a44	57.47	0.02
Ces3b	30.89	0.02
Rfx4	30.06	0.01
Cyp3a16	21.23	0.01
Cyp2b13	19.54	0.01
Cyp2c69	17.17	0.01
Ces3a	14.19	0.01
Cyp2b9	13.58	0.04
Cpsf4l	13.27	0.01
Cyp3a41b	12.42	0.01
Cyp3a41a	11.65	0.01
Mup3	11.64	0.02
Cyp2c40	11.06	0.01
Cyp17a1	10.94	0.01
Sult2a1	10.60	0.00
Car3	10.33	0.00
Cyp2g1	9.80	0.00
Sult2a2	7.61	0.00

Cyp26b1	6.95	0.00
Oat	6.64	0.01
Cyp26a1	6.56	0.01
Cyp2c54	6.41	0.01
Cyp2c37	6.40	0.01
Ido2	6.38	0.02
Gm21748	6.25	0.00
Slc10a1	6.20	0.02
Lrit2	6.17	0.04
Gm4756	6.10	0.01
Gm21860	5.97	0.00
Lrit1	5.82	0.02
Sult2a5	5.55	0.02
Dio1	5.44	0.01
Orm3	5.29	0.02
Serpina3k	5.27	0.04
Esrrg	5.22	0.05
Aox3	5.16	0.01
Ugt3a1	5.14	0.01
Lin7a	5.09	0.01
Nat8f2	5.07	0.01
P2ry4	5.01	0.03
Acacb	4.97	0.03
Ces1b	4.92	0.01
Slc22a26	4.82	0.02
Rtp3	4.64	0.01
Upp2	4.63	0.02
Sc5d	4.56	0.01
Ces1f	4.55	0.03
Sult2a4	4.50	0.01
Car5a	4.46	0.01
Ugt2b37	4.42	0.01
Rdh9	4.36	0.03
Cyp2d40	4.35	0.00
Stx1b	4.33	0.01
Cyp2c29	4.33	0.01

Acss2	4.28	0.02
F11	4.23	0.03
Slc47a1	4.21	0.02
Apoa2	4.20	0.00
Cyp4a10	4.17	0.05
Cacna1a	4.14	0.05
Hsd3b7	4.14	0.01
Slc27a5	4.06	0.02
Slco1a1	4.06	0.01
Sucnr1	4.02	0.04
Hao	4.02	0.01
Ces1d	4.01	0.01
Pbld2	4.00	0.03
Cyp8b1	3.93	0.02
Mbl2	3.93	0.02
Ces1e	3.86	0.02
Ccl4	3.86	0.01
Agxt	3.84	0.03
Serpina6	3.83	0.02
Rdh16f2	3.83	0.04
Lhpp	3.76	0.01
Urad	3.76	0.03
Adh4	3.75	0.02
Ugt2a3	3.72	0.02
Ccl3	3.71	0.02
Prlr	3.70	0.02
Klkb1	3.66	0.02
Sdr9c7	3.64	0.01
Sult1d1	3.62	0.00
Ang	3.62	0.01
Neb	3.60	0.04
Lipc	3.59	0.01
Cyp2c70	3.58	0.01
Aspdh	3.55	0.01
Sult1c2	3.53	0.02
Nat8f1	3.53	0.01

Phlda1	3.52	0.02
Abca8a	3.51	0.04
Fabp1	3.50	0.03
Csrp3	3.49	0.00
Gm4952	3.42	0.02
Ces2c	3.42	0.01
Scd1	3.36	0.03
Gnmt	3.32	0.01
Cyp1a2	3.30	0.03
Gbp10	3.30	0.02
Gpcpd1	3.26	0.02
Rhbg	3.25	0.04
Psen2	3.23	0.01
Slc16a10	3.18	0.02
Abcb11	3.17	0.03
Slc2a5	3.14	0.02
Slco1b2	3.12	0.01
Cxcl10	3.11	0.02
Cyp2c39	3.06	0.03
Cyp7b1	3.06	0.02
Saa4	3.02	0.04
Gstt3	3.02	0.04
Pde9a	3.02	0.05
Nr0b2	3.00	0.02
Ppm1k	3.00	0.05
Hrg	2.99	0.03
Hgd	2.98	0.02
Bco2	2.98	0.02
Cyp2c68	2.97	0.01
Calr3	2.95	0.03
Ass1	2.95	0.03
Slc17a3	2.95	0.02
Apon	2.95	0.03
Cyp4a32	2.94	0.05
F7	2.93	0.03
Cyp2c67	2.89	0.02

Fn3k	2.88	0.05
Igfals	2.86	0.04
Hpd	2.84	0.03
Adh7	2.83	0.01
Hmgcs1	2.81	0.04
D130043K22Rik	2.81	0.02
Rnf125	2.79	0.04
Keg1	2.79	0.04
Slc6a12	2.77	0.05
Fads2	2.77	0.05
Kyat1	2.77	0.04
Phospho1	2.77	0.04
Acsm1	2.76	0.04
Idi1	2.74	0.02
Otc	2.72	0.03
Tmem254c	2.71	0.01
Paox	2.70	0.02
Slc22a27	2.70	0.05
Tmem254b	2.69	0.01
Cdo1	2.68	0.02
Hopx	2.68	0.01
Prodh2	2.67	0.01
C8g	2.66	0.01
Dpyd	2.66	0.05
Gulo	2.64	0.04
Ube2u	2.64	0.04
Aldh8a1	2.64	0.03
Lrrc14b	2.63	0.02
Cyp2d26	2.63	0.05
Ghr	2.63	0.02
Slc22a1	2.62	0.02
Tmem254a	2.58	0.01
Mapk15	2.58	0.03
Fetub	2.57	0.05
Pglyrp2	2.55	0.04
Sult1b1	2.54	0.01

Pcp4l1	2.54	0.04
Tymp	2.52	0.05
Gm9992	2.51	0.04
Cxcl9	2.51	0.04
Insc	2.51	0.04
Cyp51	2.51	0.04
Gm36028	2.49	0.02
Cyp3a25	2.49	0.02
Nnmt	2.49	0.01
Gcgr	2.49	0.02
Apoc3	2.48	0.00
Fdps	2.48	0.03
Ugt1a2	2.46	0.01
BC024139	2.45	0.04
Pecr	2.45	0.05
Ces2a	2.45	0.04
Inca1	2.43	0.01
Aass	2.42	0.05
Pon1	2.42	0.01
Ndrp2	2.40	0.05
Nudt7	2.39	0.01
Rdh16f1	2.39	0.03
Tm7sf2	2.39	0.04
Rdh16	2.37	0.03
Cmb1	2.36	0.01
Eif4ebp3	2.35	0.05
Spp2	2.35	0.01
Hmgcr	2.34	0.05
Cyp2j5	2.33	0.04
Ugt3a2	2.33	0.03
Ugt2b5	2.32	0.03
Gas1	2.32	0.05
Mup21	2.32	0.03
Asic5	2.30	0.03
A2ml1	2.29	0.04
Gcat	2.29	0.04

Abhd3	2.29	0.05
Igf1	2.27	0.05
Ptgds	2.26	0.03
Mreg	2.25	0.03
Acmsd	2.25	0.02
Adh1	2.25	0.05
Tlcd2	2.24	0.05
Iigp1	2.24	0.05
Clec2d	2.22	0.00
Tuba8	2.22	0.05
Car1	2.21	0.03
Msmo1	2.21	0.03
Chchd10	2.18	0.04
Trim12a	2.17	0.03
Asgr1	2.16	0.03
Slc22a29	2.15	0.01
Bbox1	2.13	0.05
Mlxipl	2.13	0.04
Serpina7	2.13	0.03
Car8	2.13	0.02
Zfand4	2.13	0.02
Cyp27a1	2.12	0.05
Mfsd4b3	2.11	0.04
Mvd	2.10	0.05
Sgk2	2.10	0.04
Dcxr	2.08	0.04
Crp	2.07	0.05
Decr2	2.03	0.05
Rarres2	2.02	0.01
Cyp3a59	1.99	0.05
Bcl6b	1.94	0.03
Ccl5	1.94	0.04
Tstd3	1.94	0.05
Cd2	1.88	0.04
Mmp13	1.86	0.05
Thrsp	1.85	0.05

Cfhr1	1.84	0.05
Cth	1.83	0.04
Ddt	1.82	0.02
Gpx1	1.81	0.01
Cd59b	1.77	0.03
Mpv17l	1.72	0.02
Rnase4	1.72	0.03
Nit2	1.72	0.02
BC025446	1.71	0.04
Endog	1.68	0.04
Tfpi2	1.66	0.04
Akr1c6	1.66	0.04
Tmem205	1.62	0.05
Apoc4	1.38	0.03
Leap2	1.36	0.04
Gm5617	1.32	0.05
Tmem256	1.25	0.02
Ufc1	0.80	0.05
Tmem60	0.75	0.05
2310009B15Rik	0.74	0.05
Med21	0.73	0.02
Tsen15	0.73	0.05
Elof1	0.73	0.05
Churc1	0.73	0.01
Psmg4	0.72	0.02
Cox14	0.72	0.03
Tma7	0.72	0.04
Mrpl28	0.72	0.05
Dbi	0.72	0.04
Supt4a	0.71	0.03
Lamtor5	0.71	0.05
Trnau1ap	0.71	0.04
Npm3	0.71	0.04
Kbtbd3	0.71	0.05
Fam96a	0.70	0.03
Zfp873	0.70	0.03

Orc4	0.70	0.04
Bola2	0.70	0.01
Tmem29	0.69	0.04
Mrpl32	0.69	0.05
Use1	0.69	0.03
Sec61b	0.69	0.02
Sumo1	0.69	0.03
Chchd1	0.69	0.01
Polr2k	0.69	0.04
Rtraf	0.69	0.04
Rpl36al	0.69	0.05
Rps28	0.69	0.01
Tomm5	0.68	0.04
Rwdd1	0.68	0.04
Arl1	0.68	0.05
Yrdc	0.68	0.05
Pts	0.68	0.01
Sf3b6	0.68	0.03
Sugt1	0.68	0.05
Tbca	0.68	0.02
Ndufaf5	0.68	0.04
Elob	0.68	0.05
Eef1akmt1	0.68	0.04
Eif3i	0.68	0.03
Fopnl	0.67	0.02
Serf1	0.67	0.02
Cox7a1	0.67	0.01
Tpt1	0.67	0.04
Rpl37a	0.67	0.01
Tmem128	0.67	0.04
Cox7a2l	0.67	0.02
Gm7334	0.66	0.04
Rpp21	0.66	0.03
Nme2	0.66	0.01
Bbip1	0.66	0.02
Med30	0.66	0.04

Btf3	0.66	0.03
Rap1b	0.66	0.04
Hsbp1	0.66	0.02
Mrpl54	0.66	0.01
Gnb4	0.66	0.03
Naca	0.65	0.02
Nudt2	0.65	0.04
Eif2s2	0.65	0.04
Gm14322	0.65	0.05
Pigx	0.65	0.02
Mrpl50	0.65	0.02
Gm14391	0.65	0.03
Gngt2	0.65	0.05
Mrps28	0.65	0.03
Naa20	0.65	0.02
9130409I23Rik	0.65	0.04
Lage3	0.64	0.02
Dynlt1c	0.64	0.04
Gm2026	0.64	0.03
Glmn	0.64	0.05
Rpl10-ps3	0.64	0.02
Nhp2	0.64	0.03
Ostc	0.64	0.01
Rpl30	0.64	0.04
Lsm7	0.64	0.04
Pfdn1	0.64	0.02
Gm32687	0.64	0.02
Ggps1	0.64	0.05
Rpl27-ps3	0.64	0.00
Rpl41	0.63	0.00
Cops4	0.63	0.03
Sptssa	0.63	0.02
Ran	0.63	0.02
Dhps	0.63	0.04
1810037I17Rik	0.63	0.01
Glrx3	0.63	0.01

Nbdy	0.63	0.05
Jmjd7	0.63	0.05
Nup37	0.63	0.05
Ppp2r3c	0.63	0.03
Tmem37	0.63	0.05
Eif3m	0.63	0.01
Aimp1	0.62	0.02
Fau	0.62	0.01
Anapc10	0.62	0.02
Commd8	0.62	0.04
Pole3	0.62	0.05
Ssr4	0.62	0.01
S100a10	0.62	0.01
Polr2e	0.62	0.05
Rpl27	0.62	0.00
Setmar	0.62	0.05
43345	0.62	0.05
Magohb	0.62	0.03
Magoh	0.62	0.02
Gm14434	0.62	0.01
Gm9843	0.62	0.01
Gm14326	0.61	0.01
Mzt1	0.61	0.02
Coq6	0.61	0.04
Gm10073	0.61	0.03
Hspb11	0.61	0.01
Snrpd2	0.61	0.03
Eef1akmt2	0.61	0.05
Gm3055	0.61	0.03
Cetn3	0.61	0.02
Tceanc	0.61	0.02
Zfp950	0.61	0.05
Ccdc125	0.61	0.05
Gng11	0.61	0.01
Zfp960	0.61	0.01
Clk1	0.61	0.04

Ten1	0.61	0.03
Rbp1	0.61	0.03
Phpt1	0.61	0.02
Chrac1	0.61	0.02
Selenof	0.61	0.01
Slc51b	0.61	0.04
Zfp958	0.61	0.02
Stard3nl	0.61	0.01
Sec22a	0.61	0.03
Eif3h	0.61	0.01
Rpl37	0.60	0.00
Batf	0.60	0.03
Mcrip1	0.60	0.04
Fkbp7	0.60	0.04
Rpl27a	0.60	0.00
Dclre1a	0.60	0.05
Fancc	0.60	0.03
Hist1h4i	0.60	0.03
Fundc2	0.60	0.01
Sec61g	0.60	0.00
1110059E24Rik	0.60	0.01
Rpl18	0.60	0.03
Rps29	0.60	0.02
Rpl23a	0.60	0.02
Zfp97	0.60	0.01
Fancl	0.60	0.02
Pycard	0.60	0.04
Eef1e1	0.60	0.01
Cyba	0.60	0.02
Hbb-bs	0.60	0.02
Myl6	0.60	0.04
Hist1h4c	0.59	0.01
Gm14325	0.59	0.02
Fastkd3	0.59	0.01
Setd4	0.59	0.04
Gm14295	0.59	0.03

Lyrn4	0.59	0.02
Znhit3	0.59	0.00
Cd84	0.59	0.05
Ppia	0.59	0.01
Zfp810	0.59	0.05
Wdr89	0.59	0.02
Zfp712	0.59	0.05
Gtf2a2	0.59	0.00
Tiparp	0.59	0.04
43350	0.59	0.05
Rpl11	0.59	0.01
Rps21	0.59	0.00
Fabp4	0.59	0.03
Hprt	0.59	0.01
Fcgr4	0.59	0.03
Cd300a	0.59	0.05
Rps17	0.59	0.00
Med6	0.59	0.01
Zfp458	0.59	0.05
Hscb	0.59	0.00
Cd52	0.59	0.01
Cyb5r1	0.59	0.05
Rsl24d1	0.59	0.04
D030056L22Rik	0.59	0.03
Gm14305	0.58	0.02
Nsmce1	0.58	0.01
4921524J17Rik	0.58	0.03
Pfdn5	0.58	0.00
Cenpl	0.58	0.04
Aif1	0.58	0.05
Pigf	0.58	0.01
Tceal8	0.58	0.05
Nudt14	0.58	0.03
Sergef	0.58	0.04
Rps26	0.58	0.01
Haus3	0.58	0.04

Zfp433	0.58	0.03
Rplp1	0.58	0.02
Zfp277	0.58	0.03
Tmem159	0.58	0.04
Rplp2	0.58	0.02
Cd86	0.58	0.02
Gm527	0.58	0.03
Rpl8	0.58	0.01
H2afv	0.58	0.01
Ccdc107	0.58	0.00
Cd48	0.58	0.03
Dut	0.58	0.02
Rpl36a	0.58	0.02
Mageh1	0.58	0.05
Tpd52l2	0.58	0.04
Cep57	0.57	0.05
Lpxn	0.57	0.05
Glt8d1	0.57	0.05
Psm8	0.57	0.05
Thoc7	0.57	0.00
Bcl10	0.57	0.04
Aim2	0.57	0.02
Spata24	0.57	0.04
Rpl35a	0.57	0.01
Rpl24	0.57	0.04
Orc2	0.57	0.04
Fkbp14	0.57	0.05
Pnrc2	0.57	0.03
Polr2h	0.57	0.01
Rpsa	0.57	0.01
Nudt19	0.57	0.03
Gyg	0.57	0.05
Slamf9	0.57	0.05
Rpl7	0.57	0.01
Scai	0.57	0.03
Zfp991	0.57	0.04

Rplp0	0.57	0.01
3110009E18Rik	0.57	0.00
Cuedc2	0.57	0.02
Inmt	0.56	0.05
Cdkn2aipnl	0.56	0.03
Rpl19	0.56	0.00
Rpa3	0.56	0.00
Rps27rt	0.56	0.00
Zfp867	0.56	0.01
Mrpl33	0.56	0.01
Rpl36	0.56	0.00
Vbp1	0.56	0.01
Chchd6	0.56	0.01
Snx7	0.56	0.04
Gtf3a	0.56	0.02
Rpl7a	0.56	0.01
Rps23	0.56	0.00
Gm2004	0.56	0.05
Erich1	0.56	0.04
Pdcd10	0.56	0.01
2410002F23Rik	0.56	0.05
Hmgn1	0.56	0.03
Ccdc126	0.56	0.01
Mthfd2	0.56	0.05
Hist1h1e	0.56	0.05
B9d2	0.56	0.01
AU041133	0.56	0.05
Commd2	0.56	0.01
Fhit	0.56	0.05
Prpf38a	0.56	0.02
Fam111a	0.56	0.04
Rfc5	0.56	0.04
Gm10131	0.56	0.00
Fkbp3	0.56	0.01
Tfec	0.56	0.03
Birc2	0.56	0.05

Rps27	0.56	0.00
Fcer1g	0.56	0.05
Gm10036	0.55	0.01
Gm14308	0.55	0.00
Cby1	0.55	0.04
Rps5	0.55	0.01
Snrnp25	0.55	0.02
Atpif1	0.55	0.01
Clec4a3	0.55	0.03
Rpl26	0.55	0.00
Srsf7	0.55	0.03
Rps3a1	0.55	0.00
Fis1	0.55	0.01
Pfdn4	0.55	0.01
Calm2	0.55	0.05
Rps15	0.55	0.00
Cd9	0.55	0.04
Rpl38	0.55	0.00
Cep78	0.55	0.04
Rpl13	0.55	0.01
Prdx2	0.55	0.01
Nap111	0.55	0.05
Rab39	0.54	0.01
Nudcd2	0.54	0.00
Pla2g4a	0.54	0.03
Med11	0.54	0.00
Gm10260	0.54	0.00
Adgre4	0.54	0.04
C330021F23Rik	0.54	0.01
Zfp951	0.54	0.04
Hey1	0.54	0.02
Sap30	0.54	0.05
Mri1	0.54	0.04
Guca1a	0.54	0.01
Zfp52	0.54	0.02
Snrpd1	0.54	0.01

2200002D01Rik	0.54	0.03
Faap24	0.54	0.03
Fam49b	0.54	0.05
Ints6l	0.54	0.04
Zfp189	0.54	0.05
Ecscr	0.54	0.03
Cmss1	0.54	0.02
Ada	0.54	0.04
Tomm20	0.54	0.00
Rpl13a	0.54	0.00
Gm8186	0.54	0.00
Snx5	0.54	0.02
Gimd1	0.53	0.01
Slfn2	0.53	0.01
Cks2	0.53	0.00
Txndc12	0.53	0.05
Trim13	0.53	0.03
Aoah	0.53	0.03
Pop4	0.53	0.04
Cdc16	0.53	0.04
Lamtor3	0.53	0.01
Gm6133	0.53	0.00
Nabp1	0.53	0.05
Pms1	0.53	0.04
Gm29394	0.53	0.03
Tmem165	0.53	0.05
Plp1	0.53	0.02
Mfsd10	0.53	0.05
Gm14419	0.53	0.03
Cd80	0.53	0.05
1810011H11Rik	0.53	0.03
Epsti1	0.53	0.02
Rps4x	0.53	0.01
Ncf4	0.53	0.05
Rps3	0.53	0.00
Mal2	0.53	0.02

Slc25a14	0.53	0.00
Hist1h4h	0.53	0.02
Nipsnap2	0.53	0.02
Rps13	0.53	0.00
Rps20	0.53	0.01
Tlr13	0.53	0.04
Il1b	0.53	0.02
Dnajc9	0.53	0.03
Tra2a	0.52	0.04
Tes	0.52	0.05
Cfap69	0.52	0.03
Gng10	0.52	0.00
Ikbip	0.52	0.03
Nup43	0.52	0.02
Fgf21	0.52	0.03
Cdk7	0.52	0.01
Golt1b	0.52	0.02
Rps6	0.52	0.00
Ppih	0.52	0.00
Clic1	0.52	0.04
Btbd3	0.52	0.05
Med31	0.52	0.00
Tpm4	0.52	0.04
Rps11	0.52	0.00
Mctp1	0.52	0.02
Rpl5	0.52	0.00
Rps9	0.52	0.00
Srsf3	0.52	0.01
Rpl36a-ps1	0.52	0.00
Hist1h1c	0.52	0.03
Gm12355	0.52	0.02
C1qa	0.51	0.05
Snrpg	0.51	0.00
Wfdc17	0.51	0.01
Ifi27l2a	0.51	0.00
Ccdc80	0.51	0.03

Bcl2a1b	0.51	0.04
Erh	0.51	0.00
Lpcat4	0.51	0.05
Rps14	0.51	0.00
Plac8	0.51	0.05
Zfp658	0.51	0.03
Rpl34	0.51	0.00
Pot1b	0.51	0.04
Reep5	0.51	0.03
Ifrd1	0.51	0.02
Tspan4	0.51	0.04
Klhl23	0.51	0.02
Mdm1	0.51	0.04
Camk1	0.51	0.03
Lym9	0.51	0.03
Dtymk	0.51	0.01
Rpl6	0.51	0.00
Pim3	0.50	0.05
Slc35g2	0.50	0.01
Rpl10a	0.50	0.00
Zfp566	0.50	0.03
Gm11361	0.50	0.00
Cryl1	0.50	0.03
Lsm5	0.50	0.00
Rpl17	0.50	0.00
Rps10	0.50	0.01
Anxa1	0.50	0.03
Zfp9	0.50	0.01
Arrdc1	0.50	0.05
Mybl1	0.50	0.01
Cd14	0.50	0.05
Igsf6	0.50	0.01
Lat2	0.50	0.04
Cdca4	0.50	0.02
Lsm3	0.50	0.01
Kitl	0.50	0.05

Pik3c2a	0.50	0.04
Fam118a	0.50	0.01
Dck	0.50	0.03
Rpl14	0.50	0.00
Nlrp3	0.50	0.05
C1qb	0.50	0.04
Rps16	0.49	0.00
Rbl1	0.49	0.03
Tmem237	0.49	0.03
Lins1	0.49	0.03
Sass6	0.49	0.05
Bst1	0.49	0.03
Cenpc1	0.49	0.04
I830077J02Rik	0.49	0.03
Pcna	0.49	0.01
Prdx5	0.49	0.01
Qpct	0.49	0.04
Lsm4	0.49	0.01
Gemin7	0.49	0.01
C1qc	0.49	0.05
Twf2	0.49	0.05
Rab2b	0.49	0.02
Npm1	0.49	0.01
Apex2	0.49	0.04
Lyz1	0.49	0.01
Tdrp	0.49	0.04
Exoc6	0.49	0.03
Tipin	0.49	0.03
Rps27a	0.49	0.00
Cd207	0.49	0.01
Pcna-ps2	0.49	0.01
Snx20	0.49	0.05
Tmem17	0.49	0.00
Mnat1	0.49	0.02
Tctex1d2	0.49	0.03
Rps15a	0.49	0.00

Fam105a	0.48	0.01
Rps18	0.48	0.00
Oxct1	0.48	0.04
Tsc22d3	0.48	0.03
Mllt11	0.48	0.05
Zfp322a	0.48	0.01
Hist3h2a	0.48	0.01
Rdm1	0.48	0.01
Eri2	0.48	0.02
BC147527	0.48	0.01
Eef1b2	0.48	0.00
Gmnn	0.48	0.00
Nt5c3b	0.48	0.01
Sgcb	0.48	0.04
Ggh	0.48	0.00
Zfp449	0.48	0.03
Topbp1	0.48	0.04
Rhobtb3	0.48	0.05
Derl3	0.48	0.03
Zfp40	0.48	0.01
Snrpe	0.48	0.00
Lyz2	0.48	0.01
Rpl9	0.48	0.00
1810032O08Rik	0.48	0.00
Rpl31	0.48	0.00
Spa17	0.48	0.05
Dynlt1a	0.48	0.00
43160	0.48	0.04
Ctss	0.48	0.03
Ubtd2	0.48	0.04
Klh6	0.48	0.04
Gpx8	0.48	0.00
Tk1	0.48	0.03
Crip1	0.47	0.01
Miip	0.47	0.04
Zfp808	0.47	0.02

Hyls1	0.47	0.01
Plek2	0.47	0.03
Cav1	0.47	0.05
Acot1	0.47	0.03
Tusc3	0.47	0.02
Clec4n	0.47	0.02
Rpl15	0.47	0.00
Mgat4a	0.47	0.05
Bag2	0.47	0.02
Bzw2	0.47	0.03
Zfp934	0.47	0.01
Arl6	0.47	0.04
Gm9493	0.47	0.00
Apold1	0.47	0.04
Prmt1	0.47	0.05
Tyrobp	0.47	0.00
Haus1	0.47	0.00
Bcl2a1d	0.47	0.01
Nme4	0.47	0.01
Lrmp	0.47	0.05
Gm33543	0.47	0.03
Wsb1	0.47	0.02
Rpl3	0.47	0.00
Rpl9-ps6	0.47	0.00
Tax1bp3	0.47	0.02
Nenf	0.47	0.00
Hgf	0.47	0.05
Mis18a	0.47	0.02
Rpl35	0.47	0.00
Rbbp8	0.47	0.03
Ankrd49	0.47	0.01
Tuba1a	0.47	0.04
Rps24	0.47	0.00
Gnb1l	0.47	0.04
Platr25	0.47	0.01
Rps7	0.46	0.00

Npl	0.46	0.03
Siva1	0.46	0.01
Rpl39	0.46	0.00
Ndc1	0.46	0.05
Hddc2	0.46	0.01
Bambi	0.46	0.02
Aoc2	0.46	0.04
Ifngr1	0.46	0.04
Gdpd3	0.46	0.03
Fam171b	0.46	0.03
Taf1d	0.46	0.00
Hspbap1	0.46	0.03
Gm2000	0.46	0.00
Aph1c	0.46	0.02
Hat1	0.46	0.01
Ncf2	0.46	0.04
Naip5	0.46	0.03
Tuba1b	0.46	0.04
Sgce	0.46	0.03
Arhgap15	0.46	0.01
Ncoa7	0.46	0.03
Gins1	0.46	0.02
Rfc3	0.46	0.00
Atad5	0.46	0.04
Cd300c2	0.46	0.01
Rps8	0.46	0.00
Emb	0.46	0.05
Unc119	0.46	0.04
Gen1	0.46	0.02
Spire1	0.46	0.05
Tspan3	0.46	0.05
Naip6	0.45	0.03
Panx1	0.45	0.05
Rpl32	0.45	0.00
Hamp	0.45	0.03
P2ry12	0.45	0.01

Zc2hc1c	0.45	0.05
Ell3	0.45	0.01
Gm11007	0.45	0.02
Rpp38	0.45	0.00
1500011B03Rik	0.45	0.00
AB124611	0.45	0.01
Pak1	0.45	0.05
Psph	0.45	0.01
Tnfaip8	0.45	0.01
Ear2	0.45	0.02
Gmfg	0.45	0.00
Rgs2	0.45	0.01
Vsig10l	0.45	0.04
Zfp90	0.45	0.03
Cd300lf	0.45	0.05
Zfp821	0.45	0.04
Gm10269	0.45	0.00
Ngf	0.45	0.03
Fam216a	0.45	0.01
Tlr8	0.45	0.04
Rnaseh2b	0.45	0.01
Cytip	0.45	0.01
Tyms	0.45	0.02
Ccdc77	0.45	0.02
Klh13	0.45	0.05
Gm5141	0.45	0.05
Odc1	0.44	0.01
Lair1	0.44	0.01
Acot9	0.44	0.00
Ptpn18	0.44	0.01
Rcan1	0.44	0.03
E2f2	0.44	0.05
Fpr1	0.44	0.02
Jazf1	0.44	0.04
Ltc4s	0.44	0.02
Ezh2	0.44	0.05

Brip1	0.44	0.05
Mrps6	0.44	0.00
Nemp2	0.44	0.05
Msh5	0.44	0.01
Sectm1a	0.44	0.03
Adgb	0.44	0.03
Ulbp1	0.44	0.05
Micu3	0.44	0.02
Trim7	0.44	0.05
Myl12b	0.44	0.04
Dok3	0.44	0.03
H3f3a	0.44	0.02
Skp2	0.44	0.02
Sparc	0.44	0.05
Ppic	0.44	0.00
Adgrl3	0.44	0.05
Ccdc102a	0.44	0.05
Sh3bgrl3	0.44	0.05
Eci2	0.44	0.01
Fam72a	0.44	0.01
Htra2	0.44	0.04
Cklf	0.44	0.00
Tceal9	0.44	0.00
Ctnnbip1	0.44	0.04
Cpt1c	0.44	0.04
Stx1a	0.44	0.05
BC028528	0.44	0.00
Trpc1	0.43	0.03
Ift43	0.43	0.04
Smim6	0.43	0.01
Dok2	0.43	0.02
Tmem191c	0.43	0.05
H2-Q1	0.43	0.04
Gm28285	0.43	0.00
Rnaseh2a	0.43	0.02
Mindy4	0.43	0.04

Rps19	0.43	0.00
Rhebl1	0.43	0.04
Nop58	0.43	0.05
Tmsb15l	0.43	0.00
Abcc5	0.43	0.04
Sccpdh	0.43	0.01
Pld4	0.43	0.05
Plin4	0.43	0.05
Clec10a	0.43	0.01
Serpina3i	0.43	0.04
Dynll1	0.43	0.02
Pla2g12a	0.43	0.03
Dse	0.43	0.02
Cep128	0.42	0.05
Dynlt1f	0.42	0.00
Ii18rap	0.42	0.03
Ms4a6d	0.42	0.00
Nrep	0.42	0.01
Myc	0.42	0.04
Ctsk	0.42	0.02
Flywch2	0.42	0.00
Slc25a43	0.42	0.05
C1qtnf12	0.42	0.00
B9d1	0.42	0.01
Ube2s	0.42	0.01
Zfp697	0.42	0.02
Ly6d	0.42	0.02
Prim1	0.42	0.00
Tm4sf4	0.42	0.01
Ntpcr	0.42	0.01
Mtbp	0.42	0.01
Klhdc8b	0.42	0.05
Pdgfc	0.42	0.05
Sertad1	0.42	0.01
Fam102b	0.42	0.04
Fabp7	0.41	0.01

Ccdc68	0.41	0.01
Mcm7	0.41	0.03
Tagap	0.41	0.03
Dusp4	0.41	0.05
Hist1h4m	0.41	0.00
Tspan17	0.41	0.05
Cysltr1	0.41	0.01
Rack1	0.41	0.00
Nmb	0.41	0.02
Rnf180	0.41	0.04
Cr2	0.41	0.02
Ly86	0.41	0.01
Maged2	0.41	0.02
Klf10	0.41	0.02
Rgs10	0.41	0.00
Trem2	0.41	0.01
Il33	0.41	0.03
Mycn	0.41	0.03
Mcm8	0.41	0.01
Sfxn1	0.41	0.03
Cebpd	0.41	0.01
Ap1s2	0.41	0.01
Pthr1	0.41	0.02
Fcgr1	0.41	0.03
Fam60a	0.40	0.01
Rps25	0.40	0.05
1810062G17Rik	0.40	0.00
Smarcd3	0.40	0.05
Cdkn2d	0.40	0.01
Cpeb1	0.40	0.04
Ccdc14	0.40	0.05
Lrrc75a	0.40	0.03
Orc6	0.40	0.00
Rgs1	0.40	0.01
Cav2	0.40	0.00
Card9	0.40	0.04

Rapgef1l	0.40	0.03
Raet1e	0.40	0.03
Pcolce2	0.40	0.04
Tmsb4x	0.40	0.00
Tef	0.40	0.03
Rras2	0.40	0.03
Ptpro	0.40	0.03
Vrk1	0.40	0.02
Smc4	0.40	0.02
Prim2	0.40	0.02
Sla	0.40	0.01
Zdhhc2	0.40	0.02
Rpl12	0.39	0.00
Sirpb1b	0.39	0.00
Moap1	0.39	0.02
Fhl2	0.39	0.05
Rps12-ps3	0.39	0.00
Cd63	0.39	0.02
B3glct	0.39	0.04
Fgd2	0.39	0.02
Smo	0.39	0.05
Rfc4	0.39	0.00
Tmem229a	0.39	0.05
Slc22a17	0.39	0.02
Cep72	0.39	0.04
Sgk1	0.39	0.01
Rrp1b	0.39	0.03
Lpcat2	0.39	0.02
Edn1	0.39	0.04
Arl11	0.39	0.02
Rps12	0.39	0.00
Il1r1	0.39	0.02
Nrip2	0.38	0.03
Dab1	0.38	0.04
Rab34	0.38	0.02
Xlr	0.38	0.00

Rem1	0.38	0.04
Cavin2	0.38	0.03
Abca9	0.38	0.04
Adamts12	0.38	0.04
Tube1	0.38	0.03
Ncf1	0.38	0.05
Gpx7	0.38	0.01
Nradd	0.38	0.04
D130040H23Rik	0.38	0.01
Atad2	0.38	0.02
P2rx5	0.38	0.03
Galk1	0.38	0.01
Camk2b	0.38	0.05
Lum	0.38	0.05
Hmgn2	0.38	0.01
Bcl2a1a	0.38	0.00
Fkbp10	0.38	0.04
Ms4a6b	0.38	0.00
Tnfrsf12a	0.38	0.00
Spry1	0.38	0.04
Hist2h4	0.37	0.00
Myo7a	0.37	0.04
Lhx6	0.37	0.05
Ccl2	0.37	0.04
Mcf2l	0.37	0.04
Clec4a2	0.37	0.00
Rundc3b	0.37	0.01
Zfr2	0.37	0.04
Per3	0.37	0.03
BC016579	0.37	0.01
Pkn3	0.37	0.04
Ms4a4c	0.37	0.01
Rrm1	0.37	0.04
Clca3a1	0.37	0.01
Txnip	0.37	0.03
Serpnb6b	0.37	0.02

Preld2	0.37	0.00
Nrg1	0.37	0.04
H2afz	0.37	0.00
43349	0.37	0.04
Tmem41a	0.37	0.02
Klra2	0.37	0.00
Gfra2	0.37	0.03
Cdc25b	0.37	0.05
Pdk3	0.37	0.02
Rab31	0.37	0.02
Rpl22l1	0.37	0.00
Pck2	0.37	0.04
Wdhd1	0.37	0.01
Ctla2b	0.36	0.00
Papss1	0.36	0.04
Hist3h2ba	0.36	0.03
Gpsm1	0.36	0.03
Cdkn1a	0.36	0.05
Mcub	0.36	0.04
Pdlim2	0.36	0.01
Peg3	0.36	0.03
Tmsb10	0.36	0.00
Bcl2	0.36	0.03
Pole2	0.36	0.00
Dbf4	0.36	0.01
Gcnt1	0.36	0.02
Nlrc4	0.35	0.01
Vps37d	0.35	0.04
Mms22l	0.35	0.01
Impa2	0.35	0.02
Serpnb6a	0.35	0.00
Csf2rb	0.35	0.04
Angptl4	0.35	0.02
Kdelr3	0.35	0.02
Itgae	0.35	0.02
Fstl1	0.35	0.04

Atp6v0e2	0.35	0.02
Mcm4	0.35	0.05
Zc2hc1a	0.35	0.01
Tm6sf1	0.35	0.03
Gm9780	0.35	0.00
Pla2g7	0.35	0.00
Gm5148	0.35	0.02
Hist2h2ab	0.35	0.00
Gm5150	0.34	0.00
Corin	0.34	0.04
Tmem136	0.34	0.04
Plac9b	0.34	0.01
Myzap	0.34	0.02
F3	0.34	0.04
Xrcc2	0.34	0.01
Sirpb1c	0.34	0.02
Phlda3	0.34	0.04
Tstd1	0.34	0.00
Mfsd2a	0.34	0.05
Prmt2	0.34	0.03
Fen1	0.34	0.03
Pafah1b3	0.34	0.00
Plscr2	0.34	0.00
Gm10282	0.34	0.00
Ms4a6c	0.34	0.00
Grb10	0.34	0.05
Mpped2	0.34	0.02
Grhl2	0.34	0.02
Sdsl	0.34	0.04
Specc1	0.34	0.04
Arhgap22	0.34	0.04
Vgll3	0.34	0.05
Gm20503	0.34	0.03
Palb2	0.34	0.01
Pdlim4	0.34	0.02
Cenpq	0.33	0.00

Veph1	0.33	0.04
Lrrc1	0.33	0.01
Mbd4	0.33	0.01
Lmnb1	0.33	0.04
Cd33	0.33	0.01
Tead2	0.33	0.05
Rin1	0.33	0.01
Bhlhb9	0.33	0.03
Tnfaip8l2	0.33	0.00
Cenpw	0.33	0.00
Dync2li1	0.33	0.03
Bmp4	0.33	0.03
Lgals4	0.33	0.00
Cd209a	0.33	0.01
Hist2h2ac	0.33	0.00
Kcne3	0.33	0.00
Sifn9	0.33	0.03
Dbp	0.33	0.03
Fancb	0.33	0.01
Hist1h4j	0.33	0.00
B4galt6	0.33	0.04
Gm609	0.33	0.05
P3h4	0.33	0.01
Eps8	0.33	0.02
Mturn	0.33	0.02
Mcm2	0.33	0.04
Kif24	0.33	0.01
Alox5ap	0.32	0.01
Map3k6	0.32	0.05
Acot2	0.32	0.02
Ms4a4a	0.32	0.02
Poc1a	0.32	0.01
Wdr62	0.32	0.02
Plat	0.32	0.02
Smim3	0.32	0.00
Chek2	0.32	0.00

Schip1	0.32	0.03
Arhgap19	0.32	0.01
Hells	0.32	0.01
E2f1	0.32	0.05
Slc25a24	0.32	0.05
Lgals1	0.32	0.00
Slc25a4	0.32	0.01
Hist1h4k	0.32	0.01
Pkmyt1	0.31	0.02
Wfdc2	0.31	0.01
Gm9844	0.31	0.00
Hilpda	0.31	0.00
Sh2d1b1	0.31	0.01
Ifnlr1	0.31	0.05
Cfap43	0.31	0.04
Enah	0.31	0.03
Dzip1l	0.31	0.04
Gm9922	0.31	0.01
Tagln	0.31	0.00
Ccdc158	0.31	0.00
Cdc45	0.31	0.01
Tamm41	0.31	0.01
Hsd17b13	0.31	0.01
Plac9a	0.31	0.00
Susd3	0.31	0.01
Rcan3	0.31	0.02
Ccl6	0.31	0.00
Fkbp1b	0.31	0.02
Nrtn	0.31	0.00
Selenoh	0.31	0.00
Ahnak	0.31	0.05
Phldb1	0.30	0.04
Pmp22	0.30	0.03
Pld6	0.30	0.02
Kazn	0.30	0.01
Tspan6	0.30	0.00

Selenbp2	0.30	0.03
Fam174b	0.30	0.03
Slc7a6	0.30	0.02
Pkhd1	0.30	0.05
Rnf32	0.30	0.01
Hacd4	0.30	0.00
9530077C05Rik	0.30	0.04
Gm2007	0.30	0.01
Slc30a3	0.30	0.02
Nucb2	0.30	0.04
Epdr1	0.29	0.01
Myl12a	0.29	0.01
Mapk13	0.29	0.01
Tmem119	0.29	0.05
Anxa3	0.29	0.00
Col4a4	0.29	0.05
43351	0.29	0.05
Agpat4	0.29	0.02
Ccdc18	0.29	0.01
P4ha2	0.29	0.03
Fry	0.29	0.04
Fcgr3	0.29	0.00
Yap1	0.29	0.05
Cenpk	0.29	0.00
Ms4a8a	0.29	0.00
BC034090	0.29	0.04
Eps8l1	0.29	0.01
H2afx	0.29	0.01
Mcm6	0.29	0.02
Anxa2	0.29	0.02
Wfdc3	0.29	0.00
Nrg4	0.29	0.02
Zgrf1	0.29	0.01
Fbxo5	0.29	0.00
Tmsb15b1	0.29	0.00
Krt23	0.29	0.02

Pdzk1ip1	0.29	0.01
Dapp1	0.28	0.01
Syt15	0.28	0.05
S100a4	0.28	0.00
Kcnh7	0.28	0.03
Tmem150b	0.28	0.02
Vldlr	0.28	0.02
Asns	0.28	0.01
Gnai1	0.28	0.02
Rad18	0.28	0.00
Ssbp2	0.28	0.00
Ccr2	0.28	0.00
Lmcd1	0.28	0.03
6720489N17Rik	0.28	0.00
Gm6169	0.28	0.03
Tcte2	0.28	0.02
Syng1	0.28	0.00
Amotl2	0.28	0.01
Tgfb2	0.28	0.04
Krt80	0.28	0.05
Hist1h3e	0.28	0.00
Shisa4	0.28	0.05
Hist1h4b	0.27	0.00
Hist1h4n	0.27	0.00
Chaf1b	0.27	0.02
Fam81a	0.27	0.03
Ncapg2	0.27	0.01
Relt	0.27	0.03
Pdgfrl	0.27	0.04
Fkbp11	0.27	0.00
Ihh	0.27	0.02
Prrg4	0.27	0.04
Tmem221	0.27	0.03
Them6	0.27	0.01
Wisp2	0.27	0.04
Tmem246	0.27	0.02

Haspin	0.27	0.02
Cep112	0.27	0.00
Dab2	0.27	0.03
Plp2	0.27	0.03
Trpv4	0.27	0.05
Cdca7l	0.27	0.02
Zfp57	0.27	0.01
Stk17b	0.27	0.00
Cit	0.27	0.05
Cep295nl	0.26	0.01
Ddit4	0.26	0.02
Hist1h2ba	0.26	0.00
Tcf19	0.26	0.03
Tuft1	0.26	0.02
Htra3	0.26	0.02
Zfp850	0.26	0.04
Trim34b	0.26	0.00
Il1rl2	0.26	0.01
Enc1	0.26	0.04
Vill	0.26	0.03
Rasd1	0.26	0.01
Adcy1	0.26	0.03
Ajuba	0.25	0.02
Milr1	0.25	0.00
S100a6	0.25	0.00
Cox6b2	0.25	0.00
Lig1	0.25	0.04
E2f7	0.25	0.04
2610524H06Rik	0.25	0.00
Pycr1	0.25	0.02
Hmgb2	0.25	0.00
Ccnf	0.25	0.02
Ptgr1	0.25	0.01
Tesmin	0.25	0.02
Eda2r	0.25	0.05
Ciart	0.25	0.05

Id1	0.25	0.01
Syce2	0.25	0.00
Nrm	0.25	0.02
Ccdc34	0.25	0.01
Tgif2	0.25	0.00
Plk4	0.25	0.00
Col23a1	0.25	0.03
Afp	0.25	0.01
Spint1	0.25	0.03
Mthfd1l	0.24	0.00
Hist1h2br	0.24	0.03
Crym	0.24	0.02
Smc2	0.24	0.01
Jdp2	0.24	0.01
Hist1h2ac	0.24	0.00
Rbm3	0.24	0.00
Ccne1	0.24	0.01
Ikzf4	0.24	0.03
Cks1b	0.24	0.00
L3mbtl1	0.24	0.01
Zfp651	0.23	0.03
4930579G24Rik	0.23	0.00
Usp2	0.23	0.02
Ypel1	0.23	0.01
Gadd45b	0.23	0.01
Pkia	0.23	0.00
Ranbp17	0.23	0.03
Hist1h2bg	0.23	0.00
Ddah2	0.23	0.02
Ncapd2	0.23	0.01
Syt9	0.23	0.03
Tet1	0.23	0.00
Igdcc4	0.23	0.04
Cenpa	0.23	0.00
Pole	0.23	0.03
Lamc3	0.23	0.05

Chn1	0.23	0.04
Nipal2	0.23	0.05
Hspb2	0.23	0.00
Klc3	0.23	0.03
Mapk8ip1	0.23	0.02
Eif3j2	0.23	0.03
Vcan	0.23	0.04
Ranbp3l	0.22	0.00
Prune2	0.22	0.02
Tead4	0.22	0.03
Hspa12a	0.22	0.03
Acta2	0.22	0.03
Bicc1	0.22	0.04
P4htm	0.22	0.03
Olfm2	0.22	0.03
Chaf1a	0.22	0.04
Trip13	0.22	0.00
Glipr2	0.22	0.01
Sgpp2	0.22	0.04
Incenp	0.22	0.02
Cenpn	0.22	0.01
Per1	0.22	0.02
BC055324	0.22	0.01
Fxyd3	0.22	0.00
Arhgap11a	0.22	0.01
Dsn1	0.22	0.01
Bdh2	0.22	0.00
Ctps	0.22	0.01
Timp2	0.21	0.04
Ogn	0.21	0.02
Tnfaip6	0.21	0.00
Ctxn1	0.21	0.03
Mybl2	0.21	0.04
Hist1h4a	0.21	0.00
Hist1h1d	0.21	0.00
Timp1	0.21	0.01

C1qtnf6	0.21	0.02
Ror1	0.21	0.02
Ska2	0.21	0.00
Nfe2l3	0.21	0.05
Ltk	0.20	0.05
Arhgap33	0.20	0.01
Slc15a2	0.20	0.01
Ankrd29	0.20	0.00
Ccne2	0.20	0.00
Ager	0.20	0.03
Cd163	0.20	0.04
Ddias	0.20	0.00
Fcrls	0.20	0.00
Gstm5	0.20	0.00
Ankrd37	0.20	0.00
Hist1h4f	0.20	0.00
Ppp1r3g	0.20	0.01
Dio3	0.20	0.02
AA986860	0.20	0.02
Hist1h3f	0.20	0.00
Efna4	0.19	0.03
Ube2t	0.19	0.00
Bora	0.19	0.01
Rims2	0.19	0.04
Depdc1b	0.19	0.00
Krt7	0.19	0.05
Asf1b	0.19	0.01
Gtse1	0.19	0.01
Trim59	0.19	0.00
Fcgbp	0.19	0.02
Mad2l1	0.19	0.00
Hist2h3c2	0.19	0.01
Tppp3	0.19	0.01
Kif18a	0.18	0.00
Nsl1	0.18	0.01
Fgd3	0.18	0.03

Sema3c	0.18	0.01
S100a11	0.18	0.01
Cnksr1	0.18	0.02
Hist1h2ak	0.18	0.00
Cyp4f18	0.18	0.01
Rasl10a	0.18	0.01
Spc25	0.18	0.01
Nmnat2	0.18	0.04
Mgl2	0.18	0.01
Chek1	0.18	0.00
Ticrr	0.18	0.01
Tmem151a	0.18	0.02
Kif20b	0.18	0.00
Hebp2	0.17	0.00
Olfml2b	0.17	0.03
Chtf18	0.17	0.01
Hist1h3i	0.17	0.00
Calml4	0.17	0.00
Rab3b	0.17	0.01
Fbp2	0.17	0.00
Prph	0.17	0.02
Chrb1	0.17	0.02
Bard1	0.17	0.01
Hist2h3b	0.17	0.00
Spdl1	0.17	0.01
Hist1h2bf	0.17	0.00
1810010D01Rik	0.17	0.02
A430105I19Rik	0.17	0.01
Spr1a	0.17	0.01
Slc35f2	0.17	0.02
Gpr141	0.17	0.00
Hist1h3h	0.17	0.00
Tedc1	0.17	0.01
Rgs11	0.17	0.01
Scube3	0.16	0.04
Adamdec1	0.16	0.00

Cgref1	0.16	0.00
Ptgfr	0.16	0.01
Klf5	0.16	0.05
Rrm2	0.16	0.01
Actg2	0.16	0.05
Cbr3	0.16	0.00
Pde6c	0.16	0.00
Polq	0.16	0.04
Dtna	0.16	0.01
Hist1h3d	0.16	0.00
Fads3	0.16	0.02
Gins2	0.16	0.00
Tacc3	0.16	0.00
C330027C09Rik	0.16	0.00
1810010H24Rik	0.16	0.03
Mis18bp1	0.15	0.00
Klhdc7a	0.15	0.02
Mcm5	0.15	0.01
Ncaph	0.15	0.01
Apoa4	0.15	0.01
Adam33	0.15	0.02
2310007B03Rik	0.15	0.02
Cdca8	0.15	0.01
Ccr1	0.15	0.00
Hist1h3g	0.15	0.00
Mgat4c	0.15	0.00
Hist4h4	0.15	0.00
Rad51	0.15	0.00
Omd	0.15	0.00
Clspn	0.15	0.00
Ankrd1	0.15	0.03
Ercc6l	0.14	0.00
Ctgf	0.14	0.01
Chrdl1	0.14	0.04
Hist1h2bh	0.14	0.00
B4galt2	0.14	0.00

Pclaf	0.14	0.00
Stmn1	0.14	0.00
Uhrf1	0.14	0.02
Figl1	0.14	0.00
Rad54l	0.14	0.01
Fstl3	0.14	0.03
Zwilch	0.14	0.00
Kifc5b	0.14	0.01
Cbr2	0.14	0.02
Kif14	0.14	0.01
Hist1h3b	0.13	0.00
Sult2b1	0.13	0.01
Hist1h2ab	0.13	0.00
Hist1h2bn	0.13	0.00
Cenpe	0.13	0.02
Traip	0.13	0.00
Bub1b	0.13	0.01
Aurka	0.13	0.00
Efemp1	0.13	0.02
Glis2	0.13	0.02
Espl1	0.13	0.01
Nkain1	0.13	0.01
Kif23	0.13	0.01
Tbx1	0.13	0.05
Fam83b	0.13	0.01
Hist1h2bl	0.13	0.00
Rad54b	0.13	0.00
Dtl	0.13	0.00
Hist1h3a	0.13	0.00
Hist1h2ae	0.13	0.00
Slc4a3	0.13	0.02
Rad51ap1	0.13	0.00
Hist1h2bp	0.13	0.00
Cidec	0.13	0.01
Gprc5a	0.13	0.04
Tinag	0.13	0.00

Hist1h2bk	0.12	0.00
Oip5	0.12	0.00
Hist1h2ag	0.12	0.00
Lamc2	0.12	0.03
Lce6a	0.12	0.00
Hist1h2ai	0.12	0.00
Cenps	0.12	0.00
Ccnd1	0.12	0.01
Hist1h2ad	0.12	0.00
Hist1h2ao	0.12	0.00
Hist1h2ap	0.12	0.00
Arhgef39	0.12	0.00
2810408A11Rik	0.12	0.00
Hist1h2bj	0.12	0.00
Hist1h2ah	0.12	0.00
Ttll10	0.12	0.01
Fam13c	0.12	0.01
Hist1h2bb	0.12	0.00
Neurl1b	0.12	0.02
Ect2	0.12	0.00
Fancd2	0.11	0.00
Pcolce	0.11	0.02
Phgdh	0.11	0.01
Kcne4	0.11	0.05
Stil	0.11	0.00
Fam46b	0.11	0.02
Ttc22	0.11	0.01
Prc1	0.11	0.01
Actr3b	0.11	0.00
Cdca5	0.11	0.00
Ppp2r2b	0.11	0.03
Arnt2	0.11	0.05
1700011H14Rik	0.11	0.00
Kif15	0.11	0.00
Cryab	0.11	0.01
Hist1h2af	0.11	0.00

Hist2h2bb	0.10	0.00
Hist1h2an	0.10	0.00
Spag5	0.10	0.00
Slit2	0.10	0.02
Hist1h3c	0.10	0.00
Racgap1	0.10	0.00
Sftpd	0.10	0.01
Hist1h1a	0.10	0.00
Cdca2	0.10	0.00
Sgo2a	0.10	0.00
Adamts17	0.10	0.00
Pak3	0.10	0.01
Ankle1	0.10	0.00
Mmp7	0.10	0.05
Hist1h2bm	0.10	0.00
Psat1	0.10	0.00
Kif22	0.10	0.00
Hist1h1b	0.10	0.00
Kn11	0.10	0.00
Epn3	0.10	0.02
Exo1	0.10	0.02
Arxes2	0.10	0.01
Cfap44	0.10	0.00
Fa2h	0.10	0.01
Kif4	0.10	0.00
Spp1	0.10	0.01
Nusap1	0.09	0.00
Diaph3	0.09	0.01
Mki67	0.09	0.02
Top2a	0.09	0.01
Ncapg	0.09	0.00
Aurkb	0.09	0.00
Cdk1	0.09	0.00
Kntc1	0.09	0.01
Neil3	0.09	0.00
Parm1	0.09	0.03

Gsta1	0.09	0.01
Cep55	0.09	0.00
H1fx	0.08	0.04
Klrg2	0.08	0.02
Prr11	0.08	0.01
Klra17	0.08	0.00
Kifc1	0.08	0.01
Sgo1	0.08	0.00
Cenpp	0.08	0.00
Esco2	0.08	0.00
Apela	0.08	0.01
Anln	0.08	0.00
Bub1	0.08	0.00
Scn7a	0.08	0.01
Stc2	0.08	0.01
Ube2c	0.08	0.00
Ccl17	0.08	0.00
Aspm	0.08	0.01
Wnt6	0.08	0.02
Fanca	0.08	0.01
Cenpu	0.08	0.00
Zfp185	0.08	0.01
Mxd3	0.08	0.00
Bex1	0.07	0.00
Cdkn3	0.07	0.00
Csrnp3	0.07	0.00
Pimreg	0.07	0.00
Tpx2	0.07	0.01
Parpbp	0.07	0.00
Ccnb1	0.07	0.00
Dlgap5	0.07	0.00
Capn11	0.07	0.02
Mastl	0.07	0.01
Gpc3	0.07	0.02
Pla2g5	0.07	0.01
Knstrn	0.07	0.00

Ndc80	0.07	0.00
Kif18b	0.07	0.01
Ccna2	0.07	0.00
Tmem130	0.07	0.03
Foxm1	0.07	0.01
Fam83d	0.07	0.00
Plk1	0.06	0.01
Psrc1	0.06	0.00
Hist1h2be	0.06	0.05
Nuf2	0.06	0.00
Cdca3	0.06	0.00
Gm3776	0.06	0.01
Pif1	0.06	0.00
Kif20a	0.06	0.00
Ckap2l	0.06	0.01
Iqgap3	0.06	0.01
Cenph	0.06	0.00
Mrgprb3	0.06	0.00
Birc5	0.05	0.00
Chst9	0.05	0.00
Cdc20	0.05	0.00
Fanci	0.05	0.00
Cenpf	0.05	0.01
Kif2c	0.05	0.00
Shcbp1	0.05	0.00
2900011O08Rik	0.05	0.01
Fgfbp1	0.05	0.00
Ifitm7	0.04	0.00
Ckap2	0.04	0.00
Pbk	0.04	0.00
Paqr6	0.04	0.01
Ska1	0.04	0.00
Tceal5	0.04	0.02
Ppp2r3d	0.04	0.05
Fam107a	0.04	0.01
Mrgprb2	0.04	0.00
Hmmr	0.04	0.00
Cdc25c	0.04	0.01
Ccnb2	0.04	0.00

Melk	0.03	0.00
Klk1b22	0.03	0.00
Hs3st2	0.03	0.01
Troap	0.03	0.01
Krt4	0.03	0.03
Ska3	0.03	0.00
Ttk	0.03	0.00
Cenpi	0.03	0.00
Depdc1a	0.03	0.00
Muc13	0.03	0.01
Asb15	0.03	0.02
Gli2	0.03	0.04
Rbp7	0.02	0.00
Dlk2	0.02	0.02
Meig1	0.01	0.00
Spink1	0.01	0.00
Gal3st2	0.01	0.00
Igf2bp1	0.01	0.01
Psca	0.00	0.00

Table S2. DNA Footprinting reveals increased occupancy of TEAD and FOS-JUN in YAP1 ON tumors compared to D33 hbHeps. Motifs with a z-score <-1 shown, Factor motif occupancy increased in YAP1 ON tumors compared to YAP1 OFF D33 hbHeps

Motif	Num	TC_YAPon	TC_YAPoff	Z_score
MA0080.4.SPI1	5007	0.778149	0.538991	-3.62052
MA0081.1.SPIB	6272	0.755879	0.600586	-3.03093
MA0645.1.ETV6	2693	0.924492	0.693585	-3.00384
MA0700.1.LHX2	25	0.683405	0.574311	-2.36181
MA1130.1.FOSL2::JUN	3888	0.750448	0.576744	-2.02294
MA1141.1.FOS::JUND	3339	0.752609	0.591832	-2.02104
MA0050.2.IRF1	11047	0.725148	0.63215	-2.00134
MA0635.1.BARHL2	529	0.679539	0.661234	-1.98751
MA0528.1.ZNF263	26793	0.961864	0.8601	-1.97823
MA0902.1.HOXB2	14	0.618762	0.457821	-1.96636
MA1134.1.FOS::JUNB	4283	0.733577	0.561284	-1.96465
MA0841.1.NFE2	3661	0.735318	0.578604	-1.92478
MA0099.3.FOS::JUN	4495	0.744406	0.578429	-1.90219
MA0640.1.ELF3	3248	0.967451	0.822858	-1.89177
MA1121.1.TEAD2	2909	0.792292	0.644182	-1.88482
MA1135.1.FOSB::JUNB	4721	0.731667	0.564872	-1.87261
MA0489.1.JUN(var.2)	4242	0.716737	0.568	-1.85442
MA0655.1.JDP2	4008	0.710884	0.548633	-1.84141
MA0808.1.TEAD3	2901	0.780134	0.618662	-1.81452
MA0149.1.EWSR1-FLI1	13626	0.898555	0.808222	-1.8074
MA0136.2.ELF5	4654	0.915554	0.757198	-1.80655
MA0090.2.TEAD1	2946	0.748555	0.600178	-1.79365
MA0471.1.E2F6	6216	1.001446	0.910616	-1.75167
MA0490.1.JUNB	4958	0.728213	0.577619	-1.74798
MA0486.2.HSF1	293	0.703584	0.634885	-1.686
MA0809.1.TEAD4	647	0.696452	0.571292	-1.64175
MA0687.1.SPIC	1986	0.70014	0.626577	-1.62383
MA1128.1.FOSL1::JUN	429	0.768187	0.666081	-1.53249
MA0827.1.OLIG3	44	0.51697	0.564302	-1.52551
MA1418.1.IRF3	2970	0.762067	0.678593	-1.51175
MA1137.1.FOSL1::JUNB	2233	0.723122	0.598112	-1.43477
MA0598.2.EHF	3268	1.00357	0.862099	-1.42871
MA0073.1.RREB1	16124	0.891048	0.796752	-1.41162

MA0818.1.BHLHE22	38	0.568836	0.474767	-1.40013
MA0057.1.MZF1(var.2)	4652	0.938087	0.854863	-1.36519
MA0778.1.NFKB2	2314	0.862555	0.74159	-1.34449
MA1138.1.FOSL2::JUNB	179	0.595233	0.484966	-1.33929
MA0517.1.STAT1::STAT2	6348	0.717002	0.626025	-1.3261
MA0694.1.ZBTB7B	385	1.058201	0.979285	-1.32292
MA0741.1.KLF16	6177	1.214019	1.132158	-1.29843
MA0491.1.JUND	689	0.682824	0.571315	-1.29697
MA1101.1.BACH2	4131	0.698715	0.612523	-1.29594
MA0062.2.Gabpa	3856	1.38778	1.277995	-1.26133
MA0641.1.ELF4	801	1.06468	0.957842	-1.25495
MA0076.2.ELK4	4828	1.178598	1.074044	-1.24491
MA0462.1.BATF::JUN	3723	0.690766	0.595798	-1.21229
MA0476.1.FOS	2537	0.691186	0.593478	-1.21043
MA0493.1.Klf1	8860	1.209899	1.127992	-1.1817
MA0098.3.ETS1	573	0.706173	0.584575	-1.17598
MA0163.1.PLAG1	5413	1.110323	1.027596	-1.15754
MA1153.1.Smad4	2638	0.730578	0.656664	-1.12025
MA0750.2.ZBTB7A	4768	1.217727	1.113749	-1.11617
MA0753.1.ZNF740	12500	1.027477	0.937335	-1.11131
MA0079.3.SP1	14445	1.338151	1.27327	-1.08826
MA0139.1.CTCF	8289	0.894397	0.831166	-1.08377
MA0516.1.SP2	19313	1.465544	1.402844	-1.08314
MA0525.2.TP63	341	0.957683	0.944956	-1.06602
MA0116.1.Znf423	2834	0.926574	0.851325	-1.0471
MA0865.1.E2F8	1633	0.875143	0.830128	-1.04313
MA0815.1.TFAP2C(var.3)	606	1.403677	1.282608	-1.03202
MA0150.2.Nfe2l2	2691	0.68869	0.631014	-1.02888
MA0657.1.KLF13	2124	1.24792	1.199901	-1.02637
MA0751.1.ZIC4	1009	1.184411	1.122232	-1.00912
MA1125.1.ZNF384	20604	0.674298	0.64212	-1.00197
MA0747.1.SP8	13194	1.284385	1.214146	-1.00064

Table S3. DNA Footprinting reveals increased occupancy in D33 hbHeps of canonical liver differentiation factors compared to YAP1 ON tumors. Motifs with a z-score>1 shown, Factor motif occupancy increased in YAP1 OFF D33 hbHeps compared to YAP1 ON

Motif	Num	TC_YAPon	TC_YAPoff	Z_score
MA0699.1.LBX2	12	0.32653967	0.52311015	5.924942502
MA0153.2.HNF1B	3826	0.80248743	1.0193863	4.415248951
MA0502.1.NFYB	1965	1.0852838	1.3233035	4.009027299
MA0060.3.NFYA	2274	0.997634	1.2149532	3.86143795
MA0046.2.HNF1A	3752	0.7699377	0.95962375	3.564307538
MA0755.1.CUX2	590	0.6183872	0.8066129	3.180869541
MA0679.1.ONECUT1	1000	0.6086101	0.7874461	3.121112524
MA0836.1.CEBPD	90	0.50474006	0.7128465	3.001319336
MA0754.1.CUX1	94	0.70393884	0.8852368	2.943199104
MA0611.1.Dux	2116	0.76220053	0.93064123	2.80685777
MA0837.1.CEBPE	332	0.6501896	0.8423744	2.62255491
MA0628.1.POU6F1	411	0.6863035	0.76014477	2.417984064
MA0910.1.Hoxd8	1949	0.610785	0.7277515	2.300017373
MA0897.1.Hmx2	145	0.6376049	0.82093495	2.298592894
MA0790.1.POU4F1	2261	0.6019612	0.7082293	2.209166145
MA0791.1.POU4F3	770	0.60553205	0.7336625	2.134941679
MA0757.1.ONECUT3	577	0.57527816	0.6667662	1.943141712
MA0780.1.PAX3	1268	0.52953994	0.6535507	1.909255033
MA0102.3.CEBPA	3341	0.61856204	0.7617427	1.907801839
MA0851.1.Foxj3	3709	0.5940336	0.69034183	1.782839857
MA0033.2.FOXL1	2503	0.7034454	0.7881816	1.780195203
MA0464.2.BHLHE40	86	0.70498097	0.85164917	1.73417386
MA0888.1.EVX2	72	0.5732519	0.65915495	1.69652474
MA0833.1.ATF4	1820	0.69059515	0.8065345	1.690420572
MA0602.1.Arid5a	1245	0.63892263	0.74046844	1.680034965
MA0115.1.NR1H2::RXRA	2978	0.61687076	0.79525775	1.664114558
MA0614.1.Foxj2	2968	0.63072777	0.71427464	1.61301998
MA0677.1.Nr2f6	1065	0.65457076	0.7937308	1.525219188
MA0846.1.FOXC2	5487	0.5905316	0.686183	1.518921543
MA0113.3.NR3C1	238	0.6162055	0.636031	1.516346913
MA1148.1.PPARA::RXRA	2981	0.6738655	0.8230723	1.511865996
MA0032.2.FOXC1	1404	0.5819075	0.6707976	1.479346836

MA0070.1.PBX1	1659	0.6675985	0.74833727	1.445946909
MA0043.2.HLF	311	0.62558126	0.7058281	1.429897282
MA0683.1.POU4F2	1771	0.675564	0.7543555	1.419908514
MA0148.3.FOXA1	4493	0.6352972	0.72453487	1.3642404
MA0831.2.TFE3	2401	0.8025362	0.8722045	1.361560911
MA0030.1.FOXF2	2474	0.65011775	0.7373259	1.309496832
MA0692.1.TFEB	2203	0.7947739	0.8445178	1.305278473
MA0713.1.PHOX2A	573	0.5099098	0.59086764	1.302812233
MA0604.1.Atf1	879	1.15482	1.2484417	1.29083315
MA0884.1.DUXA	1419	0.61196584	0.68826574	1.287731872
MA0723.1.VAX2	547	0.6083474	0.6636892	1.282320643
MA0707.1.MNX1	375	0.55833846	0.63539284	1.251303163
MA0838.1.CEBPG	1779	0.7832952	0.8846953	1.245730467
MA0603.1.Arntl	1927	0.92505246	1.0177896	1.235440893
MA1103.1.FOXB2	3425	0.65566	0.7317576	1.234158109
MA1112.1.NR4A1	1630	0.6442691	0.7784775	1.229674603
MA0114.3.Hnf4a	2872	0.6970709	0.9137632	1.224271023
MA0871.1.TFEC	768	0.7860029	0.8455651	1.213781852
MA0718.1.RAX	537	0.5957651	0.66168207	1.203849103
MA0847.1.FOXD2	2277	0.58222157	0.6544616	1.197576878
MA0135.1.Lhx3	2132	0.57173127	0.62766415	1.168965383
MA0466.2.CEBPB	11	0.75908935	0.89144915	1.150355013
MA0845.1.FOXB1	3573	0.586207	0.65885204	1.139548441
MA0468.1.DUX4	1519	0.62060034	0.6825238	1.126263037
MA1111.1.NR2F2	2646	0.6167436	0.7510032	1.125901033
MA0680.1.PAX7	169	0.5033955	0.5923587	1.116796798
MA0512.2.Rxra	3838	0.6730063	0.86270976	1.10981685
MA0675.1.NKX6-2	1272	0.5704339	0.6222491	1.102415025
MA0674.1.NKX6-1	244	0.5868199	0.66955346	1.090921281
MA0624.1.NFATC1	185	0.52410656	0.5987333	1.078537003
MA0706.1.MEOX2	134	0.5946885	0.6775434	1.063421218
MA0879.1.Dlx1	141	0.43387082	0.48311076	1.058160863
MA0093.2.USF1	3586	0.787873	0.8413811	1.04067287
MA0644.1.ESX1	42	0.47383732	0.5170309	1.039818465
MA0843.1.TEF	199	0.5475359	0.59046316	1.025762684
MA0065.2.Pparg::Rxra	6448	0.77363634	0.86374295	1.009155929

MA1099.1.Hes1	1890	1.2928712	1.3484945	1.00415519
MA0862.1.GMEB2	549	0.93862605	0.9989083	0.994277989
MA0047.2.Foxa2	4857	0.63744664	0.71984005	0.991057142

Table S4. Top 50 IPA Analysis *Upstream Regulator* Signatures in hbHeps D114+, YAP1 OFF D6, and YAP1 ON tumors. Score is log(p-value) for specific IPA signature, generated from gene expression data for YAP1 ON tumors , YAP1 OFF D6 tumors, hbHeps D114+, and WT Fah^{-/-} liver.

Upstream Regulators	WT-FAH	HbHep	YAP1 Off	YAP1 On
HNF4A	151.4	126.5	129.4	108.0
1,2-dithiol-3-thione	75.1	73.3	68.0	57.9
methylprednisolone	58.1	56.1	74.1	68.0
RICTOR	55.5	57.9	62.2	59.4
TP53	37.6	50.4	55.9	62.7
pirinixic acid	44.5	51.6	51.2	52.4
NFE2L2	45.1	53.5	51.8	45.3
PPARA	36.0	38.4	46.6	47.3
metribolone	33.2	38.8	40.1	42.2
methapyrilene	28.6	40.1	38.9	37.8
MYC	22.4	33.9	38.9	52.5
ciprofibrate	28.9	37.2	41.1	34.3
ESR1	19.1	31.8	38.1	41.5
TO-901317	31.4	32.4	35.0	33.3
ACOX1	24.4	32.9	40.7	33.8
arsenic trioxide	25.2	31.1	30.8	33.2
MYCN	24.4	28.4	30.0	34.6
ST1926	27.3	29.1	29.7	28.5
uranyl nitrate	30.7	28.1	30.0	26.6
mono-(2-ethylhexyl)phthalate	28.0	27.5	28.1	31.8
CLPP	26.3	32.3	32.2	23.1
MAPT	22.2	27.2	29.4	34.2
nitrofurantoin	18.3	30.7	29.7	35.2
5-fluorouracil	21.0	28.5	26.6	37.0
CD 437	23.6	28.2	27.3	30.2
TLE3	27.9	29.2	30.3	21.6
HNF1A	27.5	24.8	27.6	26.4
POR	25.0	26.1	28.1	22.3
dexamethasone	14.2	18.6	35.0	40.2
gentamicin	22.6	26.4	25.6	22.6
APP	12.3	21.5	31.8	35.8
ONECUT1	24.9	22.7	24.1	21.6

imatinib	17.6	21.5	25.8	30.1
XBP1	22.7	22.8	22.1	23.0
PTEN	17.8	23.9	25.4	25.4
fenofibrate	16.4	23.9	23.7	21.6
NR1I2	20.5	22.7	22.6	21.5
Insulin	16.1	20.4	23.8	28.2
MAP4K4	22.4	24.7	18.9	17.3
LONP1	21.2	22.3	21.2	19.3
sirolimus	12.3	21.0	23.0	28.8
GnRH analog	17.3	20.3	22.0	20.5
dihydrotestosterone	15.3	17.2	21.8	27.5
lipopolysaccharide	6.7	13.7	32.8	32.3
torin1	18.4	21.3	16.2	17.4
valproic acid	14.4	18.4	19.3	21.3
INSR	14.5	17.7	21.6	21.6
beta-estradiol	9.7	15.7	22.6	30.0
tunicamycin	14.9	19.6	18.9	19.6
NR3C1	13.6	14.6	22.7	24.5
TGFB1	7.2	14.7	22.7	32.1

Table S5. Top 50 IPA Analysis *Disease and Function* signatures in hbHeps, YAP1 OFF D6, and YAP1 ON tumors. Score is log(p-value) for specific IPA signature, generated from gene expression data for YAP1 ON tumors , YAP1 OFF D6 tumors, hbHeps D114+, and WT Fah^{-/-} liver.

Disease and Function, Tox Functions	WT-FAH	HbHep	YAP1 Off	YAP1 On
Liver cancer	31.9	39.5	47.6	52.3
Liver tumor	32.1	40.5	44.7	49.4
Liver carcinoma	29.3	36.7	43.7	49.2
Hepatic steatosis	25.1	27.3	32.4	29.9
Cell death of liver	16.6	22.2	29.9	28.0
Necrosis of liver	16.2	21.7	29.4	27.5
Cell death of kidney cells	16.1	20.2	23.1	25.6
Necrosis of liver parenchyma	14.6	17.6	22.6	22.0
Cell death of liver cells	13.6	17.5	22.4	22.3
Cell death of kidney cell lines	14.8	17.9	18.8	20.8
Cell death of hepatocytes	14.0	17.5	21.9	21.3
Hepatomegaly	13.9	15.6	19.3	19.7
Hepatocellular carcinoma	11.2	14.9	20.8	22.7
Apoptosis of liver	12.8	15.6	20.4	19.7
Apoptosis of liver cells	12.1	14.8	19.6	18.9
Apoptosis of hepatocytes	11.9	14.1	19.2	18.2
Hepatitis B virus-related hepatocellular carcinoma	12.4	16.3	16.2	15.8
Proliferation of hepatocytes	9.7	13.6	17.2	19.4
Proliferation of liver cells	8.8	11.9	17.2	18.9
Cell death of heart cells	10.1	11.8	13.6	16.6
Cell death of cardiomyocytes	10.0	11.7	13.5	16.6
Hepatitis B surface antigen-negative hepatitis C virus negative hepatocellular carcinoma	12.5	13.0	12.9	13.4
Liver Damage	8.4	11.8	16.9	15.3
Apoptosis of kidney cell lines	10.1	12.6	12.5	15.4
Cell death of heart	9.1	11.4	12.4	15.7
Apoptosis of heart	8.9	10.4	13.6	16.1
Apoptosis of cardiomyocytes	8.8	10.3	13.4	15.9
Apoptosis of heart cells	8.6	10.1	13.2	15.6
Intrahepatic cholestasis	12.1	11.4	12.0	10.6
Cell proliferation of kidney cell lines	7.2	10.5	12.4	15.7
Cholestasis	11.2	11.4	10.7	10.5

Nephrotoxicity	7.9	11.4	12.6	13.6
Nephromegaly	8.5	11.2	11.1	13.5
Proximal tubular toxicity	8.1	10.6	12.4	13.3
Progressive intrahepatic cholestasis	11.5	10.6	10.5	8.9
Progressive familial intrahepatic cholestasis type 1	11.1	10.1	10.1	8.6
Development of liver tumor	6.3	9.6	10.9	13.1
Enlargement of heart	6.4	9.0	10.9	12.3
Inflammation of liver	5.7	9.0	11.6	10.6
Hepatic injury	6.6	8.2	11.2	10.9
Microvesicular hepatic steatosis	8.2	8.6	8.5	10.1
Development of hepatocellular carcinoma	5.3	8.7	8.6	10.5
Hepatitis C virus-related hepatocellular carcinoma	7.6	8.0	7.9	7.3
Liver Regeneration	5.8	6.9	9.0	9.1
Liver Hypoplasia	4.5	7.4	8.1	8.6
Fibrosis of liver	4.6	6.9	7.9	8.5
Benign neoplasm of liver	5.1	7.6	6.1	6.5
Hepatic adenocarcinoma	3.9	6.7	7.2	9.0
Liver cholangiocarcinoma	4.3	6.7	7.2	8.4
Hepatocellular adenoma	4.9	6.7	5.9	6.3
Glomerulosclerosis	4.6	5.6	7.1	8.9

Table S6. Top 50 IPA Analysis *Canonical Pathways* signatures in hbHeps, YAP1 OFF D6, and YAP1 ON tumors. Score is log(p-value) for specific IPA signature, generated from gene expression data for YAP1 ON tumors , YAP1 OFF D6 tumors, hbHeps D114+, and WT Fah^{-/-} liver.

Canonical Pathways	WT-FAH	HbHep	YAP1 Off	YAP1 On
Sirtuin Signaling Pathway	39.5	41.5	41.2	35.2
Mitochondrial Dysfunction	38.2	39.4	36.4	36.8
EIF2 Signaling	32.8	35.0	32.6	35.7
Oxidative Phosphorylation	29.2	30.6	27.4	25.1
Protein Ubiquitination Pathway	26.6	30.7	26.2	25.6
Regulation of eIF4 and p70S6K Signaling	24.9	25.7	25.5	25.0
NRF2-mediated Oxidative Stress Response	21.8	25.5	22.0	21.2
Acute Phase Response Signaling	18.9	19.2	25.5	24.6
mTOR Signaling	15.7	18.8	20.3	19.7
FXR/RXR Activation	15.8	13.8	18.2	17.4
PPAR α /RXR α Activation	13.7	14.5	19.9	15.2
PI3K/AKT Signaling	11.0	14.1	18.4	20.6
Iron homeostasis signaling pathway	14.1	15.2	14.5	13.3
Senescence Pathway	12.6	13.6	17.4	15.1
RAR Activation	12.2	13.4	16.9	11.7
Molecular Mechanisms of Cancer	7.2	11.6	16.7	18.1
Xenobiotic Metabolism Signaling	12.4	14.7	13.3	10.6
Hypoxia Signaling in the Cardiovascular System	11.4	12.1	14.4	12.8
LPS/IL-1 Mediated Inhibition of RXR Function	13.1	12.2	13.4	11.3
Unfolded protein response	11.0	12.5	11.6	12.3
PTEN Signaling	8.1	9.9	16.8	16.7
Integrin Signaling	8.7	11.8	12.5	16.9
Clathrin-mediated Endocytosis Signaling	10.0	12.0	12.3	14.1
LXR/RXR Activation	12.2	9.8	13.1	12.9
Prostate Cancer Signaling	11.0	9.9	11.7	13.9
Epithelial Adherens Junction Signaling	8.1	11.8	14.4	11.8
PXR/RXR Activation	11.5	11.4	13.0	8.5
IGF-1 Signaling	8.9	9.2	13.9	12.3
Insulin Receptor Signaling	9.9	9.4	11.8	11.2
HIPPO signaling	8.9	9.6	10.7	12.9
ERK/MAPK Signaling	8.0	9.0	10.5	13.1

Super pathway of Cholesterol Biosynthesis	10.2	10.6	10.6	8.8
B Cell Receptor Signaling	7.2	7.8	12.8	11.7
Mouse Embryonic Stem Cell Pluripotency	7.6	9.4	11.0	10.7
Phagosome Maturation	8.7	10.1	10.4	10.5
Ephrin Receptor Signaling	6.5	9.7	10.9	11.6
Breast Cancer Regulation by Stathmin1	4.6	9.6	11.6	12.9
Aryl Hydrocarbon Receptor Signaling	7.4	11.1	9.0	11.0
AMPK Signaling	9.9	8.7	10.1	10.1
p70S6K Signaling	7.1	8.8	11.2	10.1
NGF Signaling	8.9	9.2	9.1	8.9
Acute Myeloid Leukemia Signaling	7.4	8.6	10.9	10.5
Apoptosis Signaling	7.9	9.2	10.8	10.5
Chronic Myeloid Leukemia Signaling	8.1	8.3	10.4	10.7
Estrogen-Dependent Breast Cancer Signaling	7.0	8.7	10.6	10.6
VEGF Signaling	7.9	8.6	10.2	9.9
JAK/Stat Signaling	6.2	8.4	10.8	11.6
Production of Nitric Oxide and Reactive Oxygen Species in Macrophages	7.6	8.5	10.9	10.3
Germ Cell-Sertoli Cell Junction Signaling	6.2	9.4	10.2	10.8
Huntington's Disease Signaling	9.1	7.7	9.4	10.2
Remodeling of Epithelial Adherens Junctions	6.1	9.1	10.4	11.1

Methods Supplemental Tables

Table S7. Primer Sequences

Primer	Description	Sequence, 5' to 3'
P1	Human YAP1 qPCR_F	TAGCCCTGCGTAGCCAGTTA
P2	Human YAP1 qPCR_R	TCATGCTTAGTCCACTGTCTGT
P3	Mouse Gapdh qPCR_F	AGGTCGGTGTGAACGGATTTG
P4	Mouse Gapdh qPCR_R	TGTAGACCATGTAGTTGAGGTCA
P5	Mouse Afp qPCR_F	TGCTGCAAATTACCCATGAT
P6	Mouse Afp qPCR_R	CCAAAAACTGGCTTGGATTT
P7	Mouse Gpc3_qPCR_F	TCGACAGCCTCTTTCCAGTCA
P8	Mouse Gpc3_qPCR_R	GGTCACGTCTTGCTCCTCG
P9	Mouse Ctgf_qPCR_F	GGGCCTCTTCTGCGATTTTC
P10	Mouse Ctgf_qPCR_R	ATCCAGGCAAGTGCATTGGTA
P11	Human CYP3A5_qPCR_F	GGTGGTGATTCCAACCTTATGCT
P12	Human CYP3A5_qPCR_R	GCGTGTCTAATTTCAAGGGGA
P13	Human CES3_qPCR_F	CAACACCCGTCTTGACCAGTC
P14	Human CES3_qPCR_R	CTGGAACGCCTGGCATTTC
P15	Human OAT_qPCR_F	GTGGGGCTATACCGTGAAGG
P16	Human OAT_qPCR_R	TGGTCCAAAACCATCGTAACTG
P17	Human ApoA2_qPCR_F	CTGTGCTACTCCTCACCATCT
P18	Human ApoA2_qPCR_R	CTCTCCACACATGGCTCCTTT
P19	Human CYP2A6_qPCR_F	TCATGAAGATCAGTGAGCGCT
P21	Human CYP2A6_qPCR_R	TCATGTCCACACAGCACCA
P22	Human CYP2E1_qPCR_F	ATGTCTGCCCTCGGAGTCA
P23	Human CYP2E1_qPCR_R	CGATGATGGGAAGCGGGAAA
P24	sgRNA_human_YAP1	TGCCCCAGACCGTGCCCATG
P25	sgRNA_Non_target	GCGAGGTATTTCGGCTCCGCG

Table S8. IHC Antibodies

Antibody	Dilution	Secondary	Company	Catalog #
YAP D8H1X	1:100	Rabbit	Cell Signaling Technology	14074
GFP D5.1	1:200	Rabbit	Cell Signaling Technology	2956
FAH	1:400	Rabbit	Abcam	Ab83770
Cleaved Caspase 3	1:100	Rabbit	Cell Signaling Technology	9661
FoxA2/Hnf-3 β	1:200	Rabbit	Cell Signaling Technology	8186
Ki67 (SP6)	1:100	Rabbit	Thermo Fischer	MA5-14520
Myc-tag	1:100	Rabbit	Maine Medical	Vli01
RFP	1:400	Rabbit	Rockland	600-401-379
Hnf4 α	1:200	Goat	Santa Cruz	Sc-6556

Extended Methods

Plasmid Vectors

Addgene Plasmids:

H430, pT2/C-Luc//PGK-SB13, Addgene # 20207 (1)

H65, pT3-N90-Beta Catenin, Addgene #31785 (2)

Donated Plasmids:

H73, pT3-TREt- YAP1^{S127A}- IRES-GFP was a gift from the Scott Lowe lab (3). H66, pT2-SB10 was a gift from the Hao Yin Lab.

Generated Plasmids

H550, pT2_TreT_YAP^{S127A}_IRES_GFP_PGK_mcherry

H549, pT2_TreT_YAP^{S127A}_IRES_GFP_PGK_FAH

H592, pT2_PGK_rtTA

H468, LentiV2_sg_YAP1

Lentiv2_sg_non-target

H550, H549 and H592 were generated using the New England Biolabs Gibson protocol and master mix kit per the manufacturer's instructions (Cat # E5510S). LentiCRISPR sgRNA cloning was performed according to Zhang Lab protocol as previously described (4).

Animal Studies Extended

Hydrodynamic Injection

All plasmids used for in vivo injection were purified using the Qiagen Maxi-Prep Endotoxin-free Kit (Qiagen, 12362) according to the manufacturer's instructions. 4-15 ug per plasmid per mouse were mixed together in 0.9% sterile saline at room temperature. Mice were weighed prior to injection and dosed with 10% body weight of the saline mixture. Plasmids were then delivered to mice by hydrodynamic tail vein injection. Specifically, within 5-7 seconds plasmids were continuously and smoothly injected (28). Mice were then warmed by heat lamp or heat pad for a minimum of 30 min to recover from injection shock.

TET-ON Studies

To establish doxycycline-inducible tumors, mice were treated with doxycycline chow (625 mg/kg) (TD.01306, Envigo) for up to 8 weeks following hydrodynamic injection. Doxycycline treated chow was refreshed weekly. Tumors were established in transgenic-rtTA (Tg-rtTA) mice and all downstream analyses were performed in Tg-rtTA mice unless otherwise noted in respective figure legends. The study endpoint for YAP1 ON tumor mice was 2+ signs of distress.

FAH Mouse Studies

Tumor was established in Fah^{-/-} mice as described above. Following tumor formation, doxycycline was withdrawn as previously described, and tumor regression monitored. During this time Fah^{-/-} mice were continuously treated with nitisionone treated water NTBC (5 mg/ml) to prevent liver damage. Following tumor regression, NTBC was withdrawn and mouse weights monitored >2+ times weekly. Mice were continuously cycled onto NTBC following 10% body weight loss until weight restored. Once weight restored, NTBC was removed and mouse weights monitored.

Cell culture

293fs and HCT116 were gifts from Dr. Tyler Jacks. Cells were cultured in Dulbecco's Modification of Eagle's Medium (DMEM) (Corning 10-013CV), 10% serum (vol/vol) and 1% penicillin/streptomycin (vol/vol) under standard conditions, 37C in 5% CO₂ tissue culture incubator.

RNA Extraction, cDNA synthesis, Quantitative PCR

RNA was extracted from in vitro cell lines using the RNAeasy Qiagen RNA Isolation Kit (Catalog #74104) per the manufacturer's instructions. RNA was extracted from mouse liver tissue using TRIzol RNA Isolation Reagent (15596026) followed by a chloroform extraction. cDNA was synthesized using the High-Capacity cDNA Reverse Transcription Kit (4368814) and 1.5 ug RNA template. Quantitative PCR was performed using the SSoFast EvaGreen Supermix (1725200) and Real-Time PCR Detection System CFX96 by BioRad. Primers sequences are in **Supplementary Table 7**.

Histology and Immunohistochemistry

Mouse liver tissue was fixed with 4% formalin overnight and dehydrated in 70% ethanol. The UMassMed Morphology Core embedded tissues as 4µm paraffin sections and performed H&E staining. For immunohistochemistry staining, briefly tumor sections were deparaffinized with xylene, dehydrated with serial ethanol dilutions, and boiled for 9 minutes with 1 mM citrate buffer (pH6.0) for antigen retrieval. 3% hydrogen peroxide was used to inactivate endogenous peroxidase activities for 10 mins at room temperature. Samples with mouse primary antibodies were treated with M.O.M. Mouse on Mouse Blocking Reagent (Vector Labs, MKB-2213) per the manufacturer's instructions prior to blocking. Tissues were blocked with 5% normal horse serum from ImmPRESS™ HRP Anti-Rabbit IgG (Peroxidase) Polymer Detection Kit (Vector labs, MP-7401-50) for 1 hour at room temperature, incubated with primary antibody 4C overnight (**Supplemental Table 8**), secondary HRP antibody (Vector labs, MP-7401-50) incubation for 1 hour at room temperature, and diaminobenzidine (DAB) substrate/chromogen for development (Fisher Scientific, TA-125-QHDX). Slides were counterstained with hematoxylin, dehydrated in ethanol, xylene washed and sealed with a coverslip for long-term storage. H&E or IHC images were captured using a Leica DMI8 microscope. IHC slides were quantified by selection of four random fields per paraffin embedded section, and positive hepatocytes per 20X field counted.

Immunoblot

Whole cell extracts or mouse liver were lysed in RIPA buffer treated with 1:100 Halt phosphatase cocktail inhibitor (Thermo Fisher 78420) and 1:50 Roche Complete protease inhibitor (11836145001). Lysates were boiled for 5 minutes at 95C with Nupage 4X Sample buffer (Invitrogen NP0007). Protein concentration was measured using Pierce BCA Protein Assay Kit (Catalog #23225). Equal amounts of mouse liver protein were separated on a 4-12% Bis Tris gel and transferred to a nitrocellulose membrane and blocked with Odyssey Blocking buffer. Blots were probed with primary antibodies Gapdh 1:1000 (EMD MAB274), and GFP 1:2000 (CST 2956) overnight at 4C. Blots were then incubated with a fluorescent secondary antibody (LICOR) and imaged on the Odyssey Imaging Platform.

Immunofluorescence

Immunofluorescence was performed on paraffin embedded slides of mouse liver prepared by the UMassMed Morphology Core as described above. Briefly, slides were deparaffinized in xylene, dehydrated in serial ethanol dilutions, boiled for 9 minutes with 1 mM citrate buffer (pH6.0) for antigen retrieval, blocked for one hour at room temperature in Perkin Elmer PNB Buffer 0.5% weight/volume (Catalog #FP1012), and incubated with primary antibody O/N at 4C. Secondary antibody was diluted in PNB block and slides were incubated for one hour at room temperature and counterstained with DAPI (1 ug/ml) and mounted with Prolong Gold Antifade Mounting Media (Thermo Fisher, #P36934). Primary antibody used: MUP 1:200 Cedar Lane Labs, #GAM/MUP, Secondary AlexaFluor Goat 568, 1:200.

RNA Sequencing YAP1 ON, YAP1 OFF D6 Tumors

RNA-Sequencing Library Preparation and Analysis

RNA-Sequencing (RNA-seq) libraries for YAP1 ON and YAP1 OFF D6 were prepared as previously described (5, 6). RNA sequencing was performed in YAP1 ON and OFF tumors without luciferase (n=4 tumors). Library quantification was performed using the KAPA Library Quantification Kit. Libraries were sequenced using the Illumina NextSeq 500 system. RNA-seq reads from each sample (n=4 tumors per group) were aligned to the reference genome using STAR (version 2.5.2b). RSEM (v1.2.31), GENCODE V19 gene annotation were used to quantify gene expression, and htSeq, DESeq2 (1.22.0) for identification of differentially expressed genes (7-10).

Ingenuity Analysis

Functional analyses were generated through the use of IPA (Qiagen, Inc).

IVIS Bioluminescent imaging

At the indicated time post injection, mice were given 200 µl luciferin (15 mg/ml) intraperitoneally. Signal was allowed to stabilize for 10 min, and mice were then anesthetized with 3-5 minutes of 1-3% isoflurane. Mice were

loaded into the Perkin Elmer IVIS machine for capture of luminescent signal (1-minute standard exposure, scale 5e4 to 5e5 radiance).

Microarray Data Accession

Microarray data used in the IPA pathway analysis was accessed through ArrayExpress (<http://www.ebi.ac.uk/microarray-as/ae/>) under the accession numbers E-MEXP-1851 (HB transcriptome), E-MEXP-1852 (HB aCGH), and E-MEXP-1853 (mouse liver) (Cairo et al, 2008).

Statistical Analysis

All statistical analyses were performed using GraphPad Prism 8.

TCGA and Microarray Analysis

For gene correlation analyses, correlation data from the TCGA HCC (n=348) data set was obtained from cBioPortal. E-MEXP-1851 (HB transcriptome) was obtained from ArrayExpress (n=25). Briefly, gene expression data were analyzed using Spearman's correlation analysis.

RNA-Sequencing Library Preparation and Analysis in hbHeps

RNA was extracted from hbHep FAH mice (n=3 mice), and control FAH^{-/-} treated with NTBC (n=3 mice) in duplicate. Extracted RNA was prepared into sequencing libraries, and sequenced by GENEWIZ, LLC. (South Plainfield, NJ, USA). Libraries were prepared using paired end-reads, and >15 million reads per sample. Samples were first quantified using the Qubit 2.0, and Agilent Tape Station. Libraries were sequenced using Illumina Hi-seq .

RNAseq Analysis in hbHeps

Transcript quantification was performed using kallisto according to Bray et al. (<https://doi.org/10.1038/nbt.3519>) Paired-end FASTQ files were pseudoaligned (100 bootstraps setting, -b 100) to an index built with an Ensembl FASTA (all cDNA; GRCm38.p6). Gene-level transcript aggregation and statistical comparison between genes (scaled-reads-per-base) were done using sleuth. (<https://doi.org/10.1038/nmeth.4324>).

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Author names in bold designate shared co-first authorship

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Supplemental Figure Legends

Figure S1. Establishment of YAP1 ON conditional HB model

(A-B) Representative immunohistochemistry in YAP1 OFF D3, D6 and D14 tumors, 100 μm . (C-D) H&E scale bars 25 μm , Representative immunohistochemistry in YAP1 OFF D3, and D14 tumors, 100 μm (E) in vivo immunoblot of liver lysates

Figure S2. YAP1 withdrawal promotes reduced proliferation and a mild increase in cleaved caspase-3 (CC3) in vivo.

(A-B) Representative immunohistochemistry in YAP1 ON and YAP1 OFF D6 tumors, CC3 and Ki67 respectively, n=3, Scale bars 25 μm .

Figure S3. YAP1 withdrawal promotes long term survival in mice.

(A) Representative histology and immunohistochemistry in YAP1 ON and YAP1 OFF tumors D14, D70, scale bars 25 μm H&E, scale bars 100 μm IHC. (B) Quantification of long term off relative luciferase signal, n=2, SB-rtTA mice.

Figure S4. Reactivation of YAP1 promotes tumor proliferation.

(A) Quantification of luminescent radiance, mice were treated with doxycycline for 8 weeks prior to withdrawal and monitored for 18+ weeks, n=2 SB-rtTA plasmid, n=3 Tg-rtTA not shown (B) Representative luminescent imaging in one SB-rtTA plasmid mouse. (C) Representative IHC Ki67 in SB-rtTA, (n=4 mice), Scale Bars 100 μm .

Figure S5. YAP1 OFF induces markers of hepatocyte differentiation.

(A-B) GSEA Analysis in YAP1 OFF D6 vs YAP1 ON tumors. (C-D) Fold change of gene expression in YAP1 ON vs. YAP1 OFF D6 tumors, n=4 tumors, p<0.05, Fold change>2. (E) in vivo immunoblot in Huh6 cells (F) Relative expression of liver differentiation markers in sgNT and sgYAP1 Huh6

Figure S6. Lineage Tracing of hbHeps

(A) Lineage Tracing Schematic (B) Representative in vivo luminescent imaging in one SB-rtTA plasmid mouse 8 weeks post-doxycycline withdrawal, validating lineage tracing model. The mouse was treated with doxycycline for 8 weeks prior to withdrawal. (C) H&E and immunohistochemistry from SB-rtTA mouse in (B), validating lineage tracing construct, scale bars 100 μm (D) Enhancer peak intersects shared with WT liver in YAP1 ON, YAP1 OFF D14 regressing tumor, and hbHeps YAP1 OFF D33 and D64. (E-G) Total ATAC peak intersects between hbHep cells, WT liver peaks, and YAP1 ON tumors. Not to scale.

Figure S7. Decreased enhancer occupancy in YAP1 OFF D14 compared to YAP1 ON

(A) Enhancer occupancy plots for ENCODE enhancers postnatal D0, embryonic D11.5 and mouse transcription start sites in YAP1 ON, YAP1 OFF D14 and WT liver, scale bigwig peak signal (B) Biological replicate

Figure S8. Transient increase in enhancer occupancy in hbHeps D33

(A) Enhancer occupancy plots for ENCODE enhancers postnatal embryonic D11.5 and mouse transcriptions in YAP1 ON, YAP1 OFF D14, hbHeps D33, hbHeps D64, and WT liver. YAP1 ON, YAP1 OFF D14 and WT representative sequencing data, scale bigwig peak signal

Figure S9. Decreased Tead and Fos-Jun occupancy in hbHeps D33 compared to YAP1 ON Tumors.

(A-D) ATAC-seq DNA footprints shows decreased occupancy at Tead and Fos-Jun motifs in YAP1 OFF D33 hbHeps compared to YAP1 ON

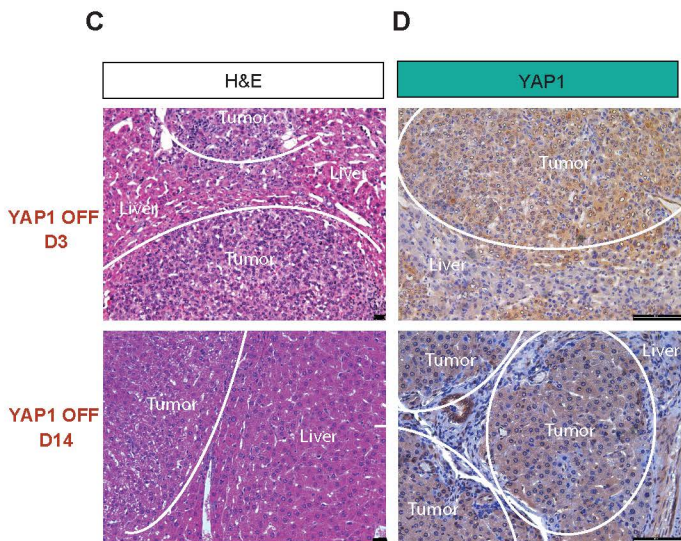
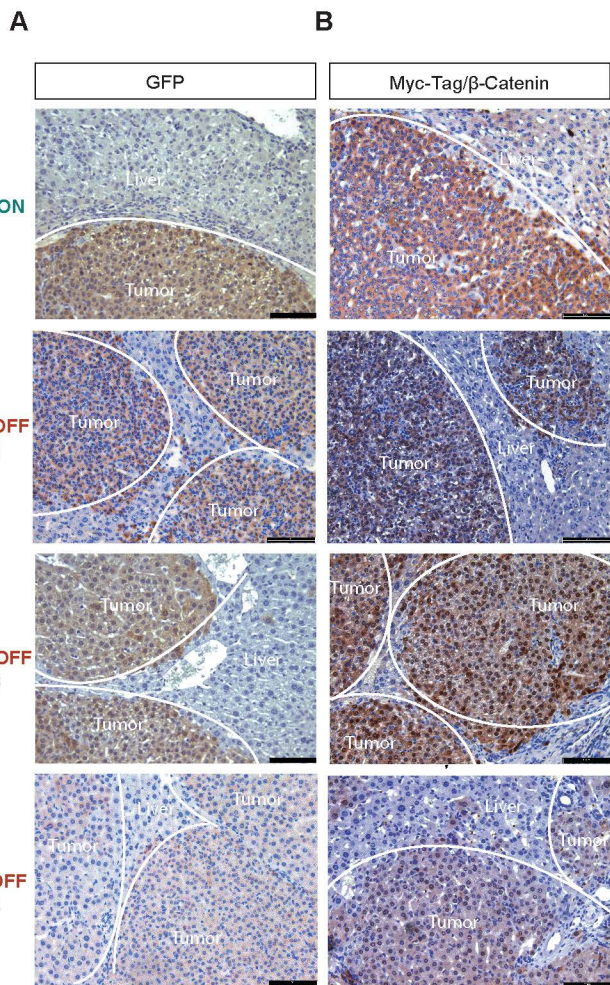
Figure S10. hbHeps D33 show increased occupancy of canonical liver differentiation transcription factors compared to YAP1 ON.

(A-D) ATAC-seq DNA footprints comparing YAP1 ON Tumor to YAP1 OFF D33 hbHeps

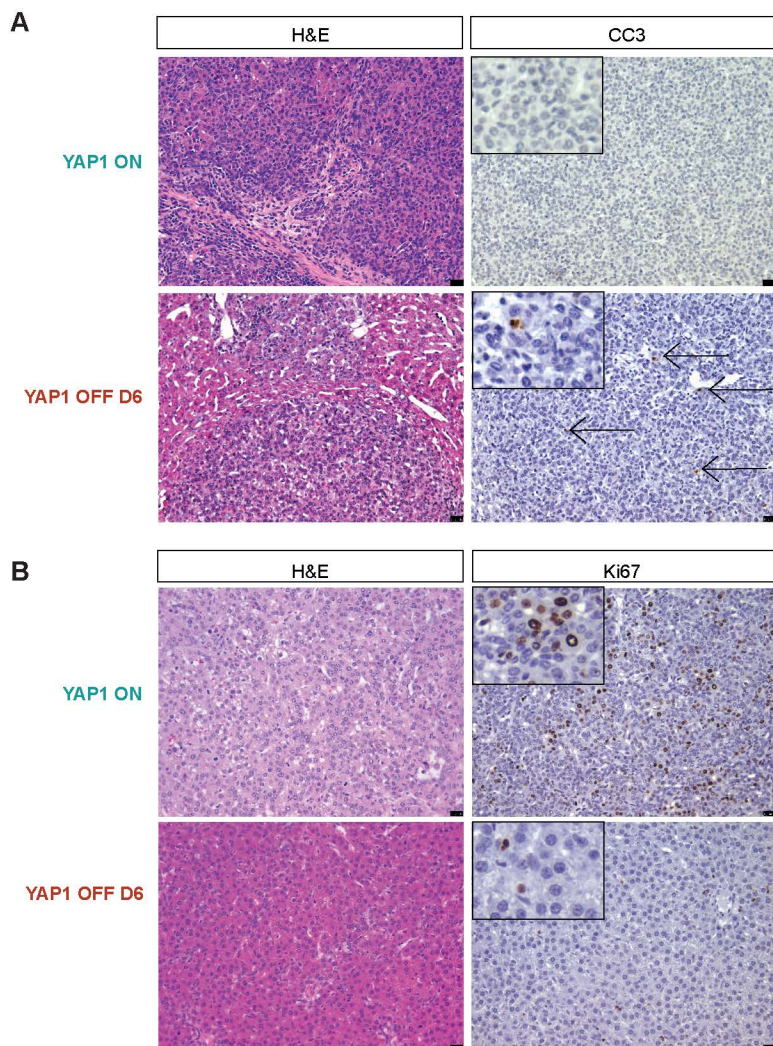
Figure S11. hbHeps partially recover hepatocyte gene expression.

(A) IPA Ingenuity analysis *Disease and Function* signatures, curated, gene expression data from YAP1 ON, YAP1 OFF D6 tumors (n=4 tumors), hbHeps D114+ (n=3 mice), WT *Fah*^{-/-} mice +NTBC (n=3 mice), scale log(p-value) for pathway signatures **(B)** Volcano plot differentially expressed genes, hbHep D114+ *Fah*⁺ mice vs WT *Fah*^{-/-} mice +NTBC (n=3 mice), P<0.05 **(C)** Hooks 4-gene signature shown for gene expression data from YAP1 ON, YAP1 OFF D6 tumors (n=4 tumors), hbHeps D114+ (n=3 mice), WT *Fah*^{-/-} mice +NTBC (n=3 mice) **(D)** Top 10 downregulated genes in hbHep D114+ *Fah*⁺ mice vs WT *Fah*^{-/-} mice +NTBC (n=3 mice) **(E)** Top 10 upregulated genes in hbHep D114+ *Fah*⁺ mice vs WT *Fah*^{-/-} mice +NTBC (n=3 mice) **(F-G)** Normalized reads (scaled bases per read) for select genes in YAP1 ON, YAP1 OFF D6 tumors (n=4 tumors), hbHeps D114+ (n=3 mice), WT *Fah*^{-/-} mice +NTBC (n=3 mice)

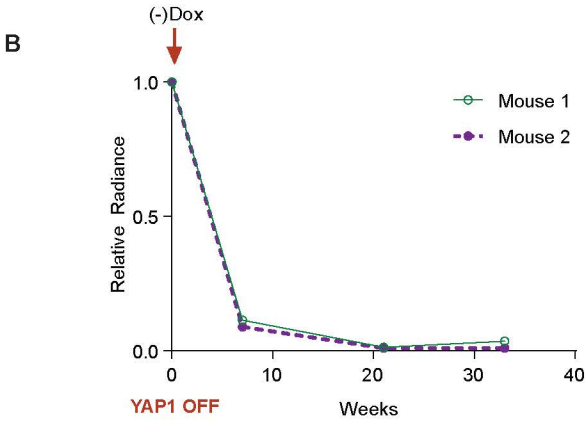
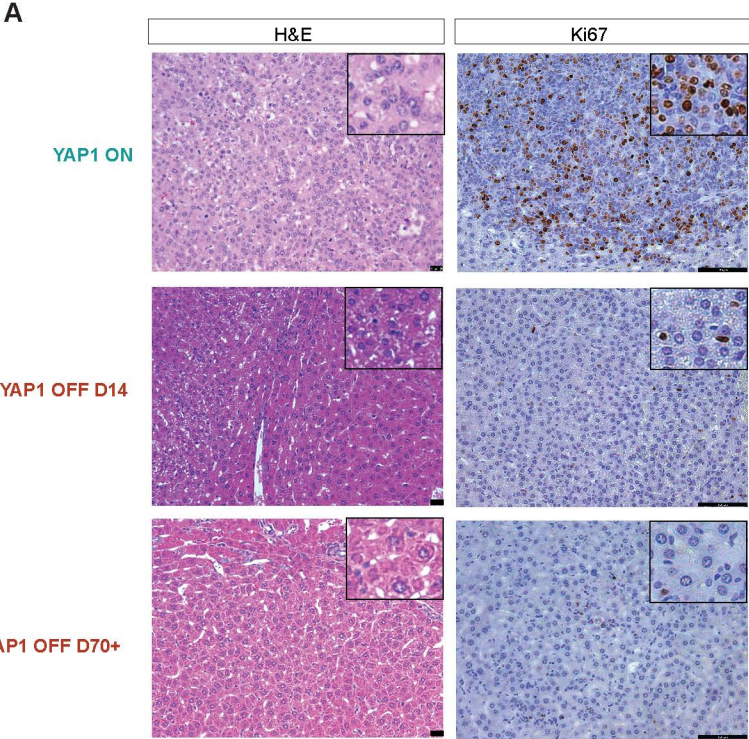
Supplemental Figure 1



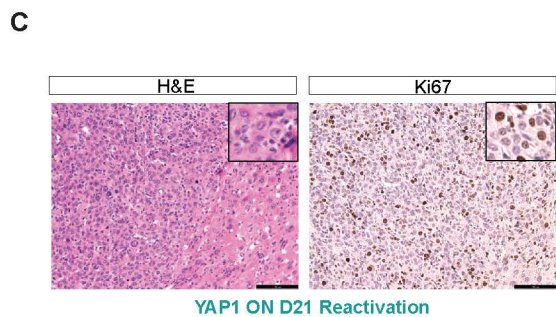
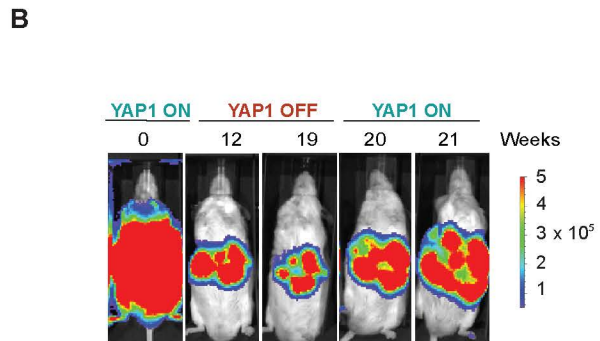
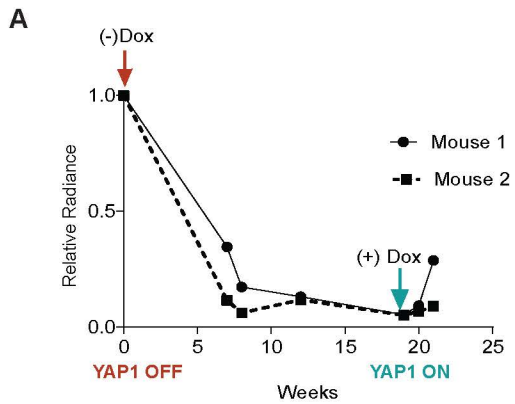
Supplemental Figure 2



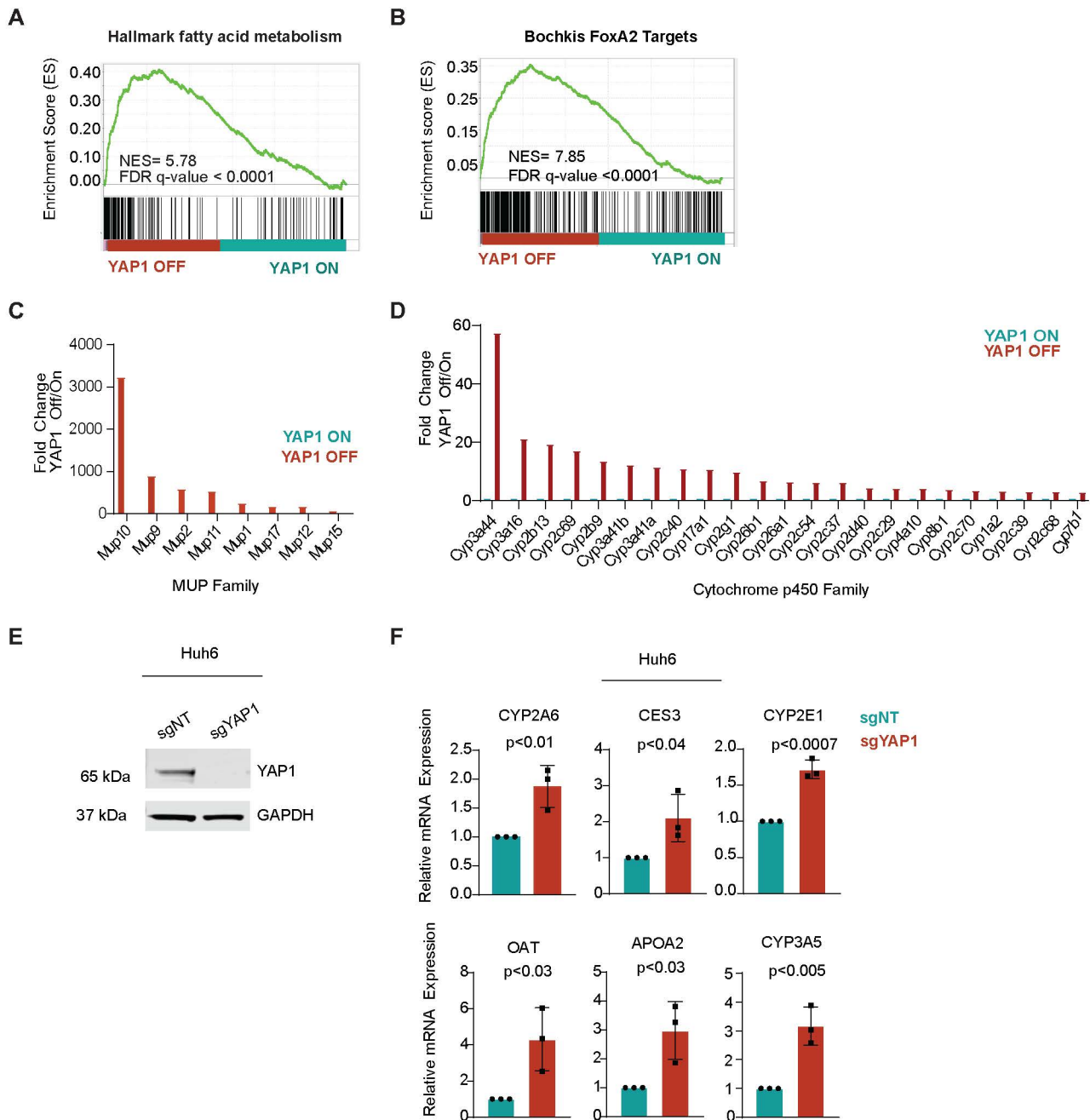
Supplemental Figure 3



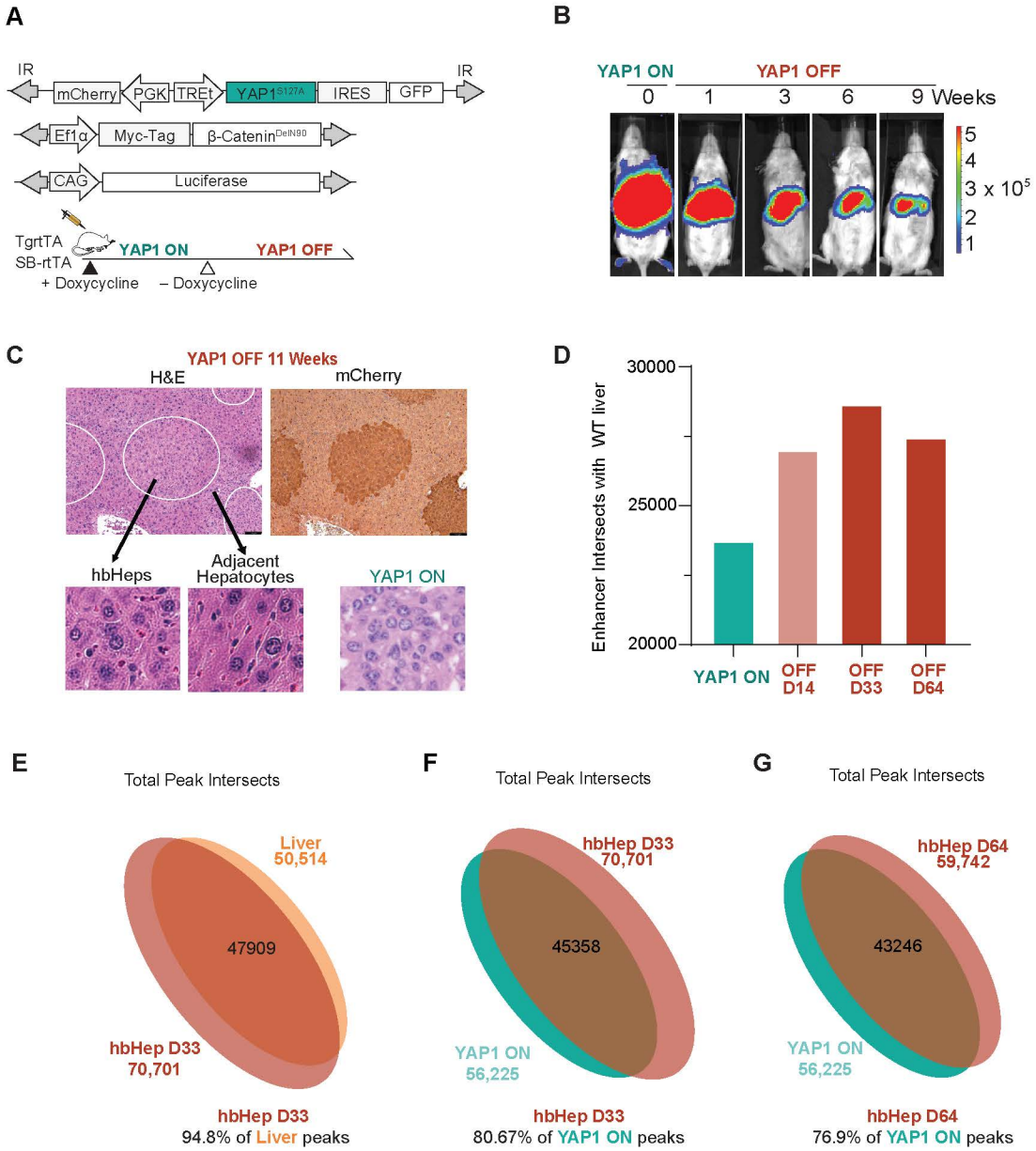
Supplemental Figure 4



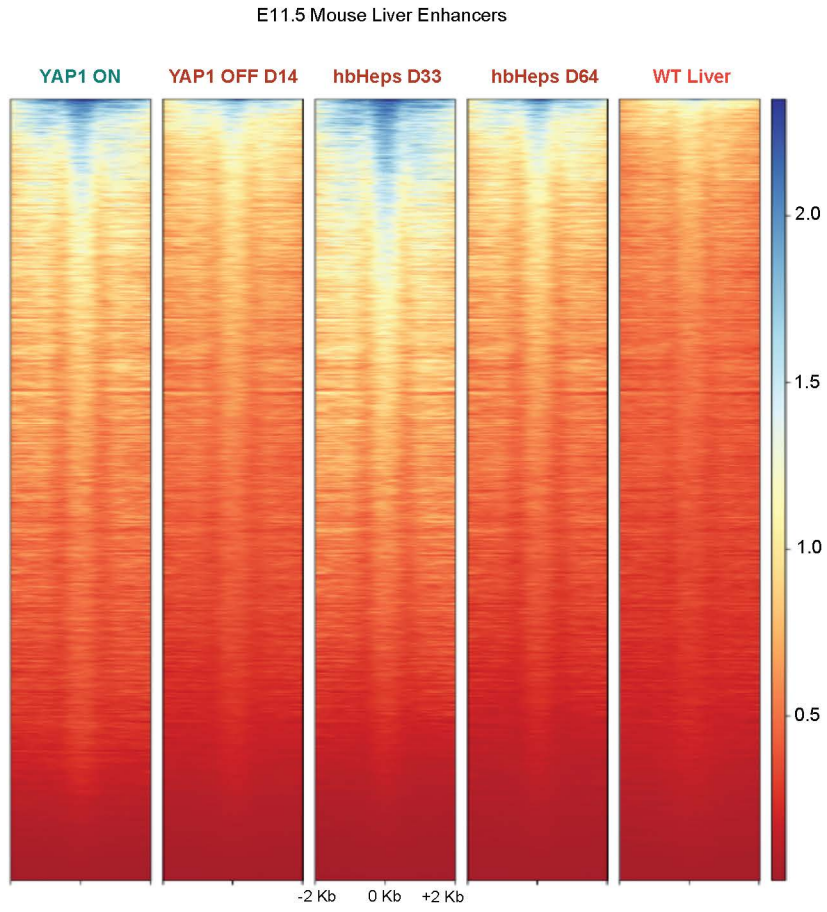
Supplemental Figure 5



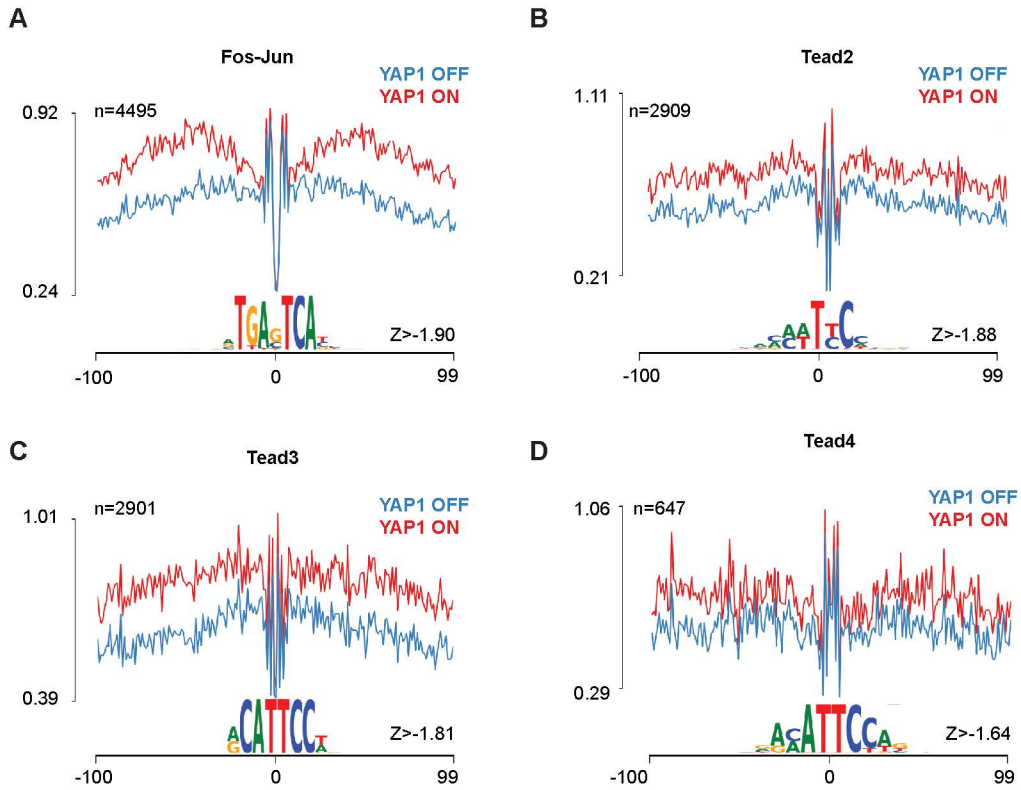
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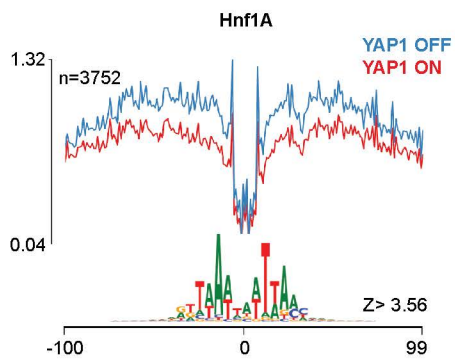
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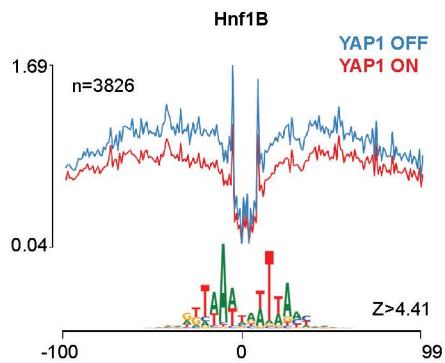
Supplemental Figure 9



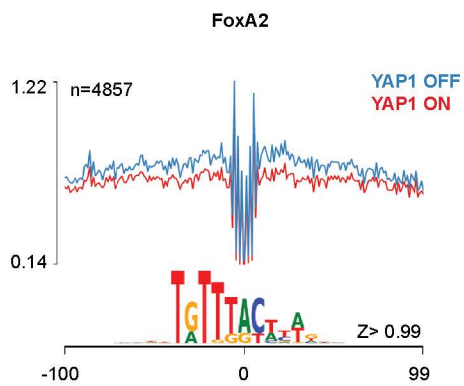
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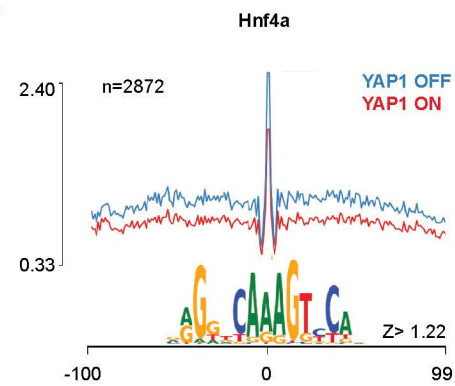
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C



D



Supplemental Figure 11

