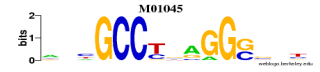
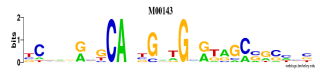
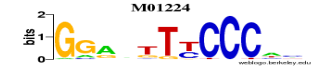
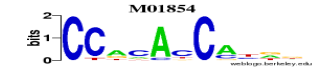
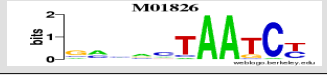
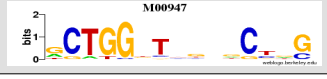
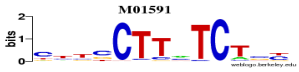
Dataset S7

TRANSFAC MOTIFS

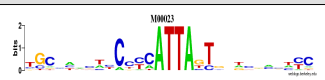
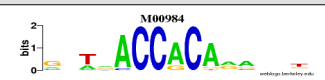
In lower H3K27acetylated sites in R6/1:

Clustered PWMs	Logo	P-Value	ROC AUC
NRSF(M00256), REST(M01256), NRSE(M00325), NRSF(M01028)		1.26e-05	0.55
v-Myb(M00003), c-Myb(M00004), v-Myb(M00227)		3.57e-05	0.55
BEN(M01241), LBP-1(M00644), HEB(M00698)		4.75e-04	0.54
CEBPE(M01868), C/EBP(M00201)		6.48e-04	0.54
MIF-1(M00279)		8.75e-04	0.53
AP-2alphaA(M01045), AP-2(M00800)		1.83e-03	0.53
c-Ets-1(M00743), Elk-1(M01163), Elk-1(M01165), SAP1A(M01983), ERF(M01984), ETV3(M01990)		2.08e-03	0.53
Blimp-1(M01066), IRF-2(M00063), ISGF-3(M00258)		3.45e-03	0.53
SP2(M01783)		3.61e-03	0.53
Gfi1(M01067)		4.39e-03	0.53
TFIIA(M00707)		4.73e-03	0.53
Pax-5(M00143)		4.98e-03	0.53
CREB(M00113), CREB(M00177), ATF-1(M01861), ATF-4(M01864), E4F1(M00694)		6.35e-03	0.53
v-Maf(M00035), TCF11:MafG(M00284)		6.84e-03	0.53
Bach2(M00490), AP-1(M00924)		8.03e-03	0.53
P50:RELA-P65(M01224), NF-kappaB(M00051)		8.10e-03	0.53
CREB(M00801), AP-1(M00173)		8.84e-03	0.52
Max(M00119), c-Myc(M01154), c-Myc:Max(M00118), USF(M00121), MAX(M01830), CLOCK:BMAL(M01116), c-Myc(M01145)		1.03e-02	0.52
MTF-1(M00650)		1.14e-02	0.52
RNF96(M01199), AP-2gamma(M00470)		1.22e-02	0.52
NRF-1(M00652), Zfp206(M01742)		1.26e-02	0.52

Pax-6(M00097), Pax-3(M00327)		1.30e-02	0.52
DEC2(M01843)		1.32e-02	0.52
HTF(M00538)		1.38e-02	0.52
NeuroD(M01288), AP-4(M00175), AP-4(M00176), AREB6(M00414)		1.45e-02	0.52
HEN1(M00058), HEN1(M00068)		1.67e-02	0.52
TCF11(M00285)		1.67e-02	0.52
TGIF(M00418)		1.77e-02	0.52
E2F(M00918)		1.81e-02	0.52
AML2(M01854)		2.04e-02	0.52
COUPTF(M01036)		2.05e-02	0.52
Pax-3(M00360), AhR:Arnt(M00237)		2.05e-02	0.52
CBF(M01080)		2.44e-02	0.52
Lhx4(M01421), Lhx8(M01440)		2.64e-02	0.52
MEF-3(M00319)		2.70e-02	0.52
LXRalpha:RXRalpha(M00647)		2.72e-02	0.52
PITX1(M01826)		2.97e-02	0.52
N-Myc(M00055), Myc(M00799), Ebox(M01034)		3.00e-02	0.52
FXR/RXR-alpha(M00631)		3.01e-02	0.52
TBX22(M01195), TBX15(M01263)		3.16e-02	0.52
Evi-1(M00011)		3.20e-02	0.52
Otx3(M01403), Pitx3(M01343)		3.27e-02	0.52
CP2/LBP-1c/LSF(M00947)		3.47e-02	0.52

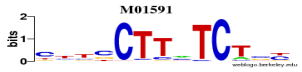
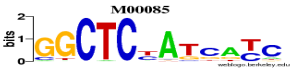
Barbie(M00238)		3.63e-02	0.52
MAZR(M00491)		3.69e-02	0.52
Tal-1(M01591)		4.18e-02	0.52
GAF(M01209)		4.52e-02	0.52
Egr(M00807)		4.56e-02	0.52

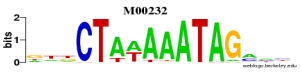
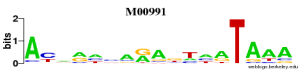
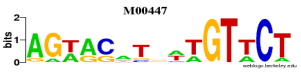
Dataset S7
Regression-based motif analysis.
H3K27acetylated sites near down-regulated genes in R6/1:

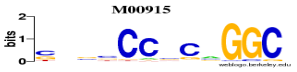
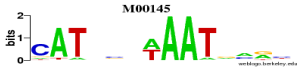
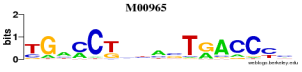
Motif_id	beta	t-stat	pval	FDR	Motif_name	Logo
5	0.0927	7.72	1.21e-14	1.73e-12	Rela Nfkb1 Nfkb2	
42	0.106	7.72	1.24e-14	1.73e-12	Nfia Nfic	
84	0.0911	7.66	1.96e-14	1.73e-12	Ets1 Ets2 Elf2 Elf1 Elk1 Erg Fli1 Elk4	
18	0.0955	7.63	2.44e-14	1.73e-12	Ikzf1 Ikzf2	
138	0.0919	7.62	2.64e-14	1.73e-12	Gtf2i	
4	0.118	7.51	6.48e-14	3.55e-12	Rela Rel	
141	0.0796	7.42	1.24e-13	5.81e-12	x	
108	0.0977	7.39	1.55e-13	6.39e-12	Topors	
2	0.11	7.36	1.91e-13	7e-12	Tfap4	
129	0.146	7.24	4.58e-13	1.3e-11	Maf	
54	0.0981	7.24	4.61e-13	1.3e-11	Egr1 Egr2	
117	0.0955	7.24	4.74e-13	1.3e-11	Arnt	
7	0.119	7.18	7.36e-13	1.86e-11	x	
3	0.0933	7.16	8.67e-13	2.04e-11	Hoxa5	
40	0.0786	7.07	1.6e-12	3.5e-11	Tfap4 Tcf12 Neurod1	
109	0.147	7.04	2.02e-12	4.16e-11	Pitx2	
16	0.134	6.99	2.8e-12	5.14e-11	Zfp87	
9	0.0855	6.99	2.81e-12	5.14e-11	Tcf7l1 Tal1 Tcf7l2 Zbtb18	
219	0.0727	6.97	3.2e-12	5.3e-11	Elf1 Spi1	
176	0.0922	6.97	3.22e-12	5.3e-11	Runx1 Runx2 Cbfb	
171	0.0888	6.94	4e-12	6.26e-11	Tcf7l1 Myod1 Myog Arid5b Tcf12 Tcf7l2 Myf6 Myf5 Tal1 Neurod1	

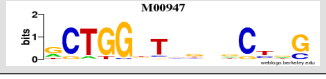
170	0.079	6.89	5.94e-12	8.88e-11	Etv4 Spi1 Ets1 Ets2 Elf1 Elk1 Erg Fli1 Gabpa Gabpb1 Elf2 Elk3 Elk4 Spib Elf5	
157	0.0824	6.88	6.34e-12	9.07e-11	Egr1 Egr2	
142	0.104	6.87	6.77e-12	9.28e-11	Zfp148	
139	0.0802	6.84	8.52e-12	1.1e-10	Gtf2a2	
294	0.0635	6.83	8.71e-12	1.1e-10	Ltf	
65	0.135	6.81	1.05e-11	1.27e-10	Mafg Nfe2l1 Nrf1	
175	0.0892	6.78	1.23e-11	1.45e-10	Nfe2l2 Bach1 Bach2 Maf Mafb Mafg Mafk Nfe2 Nfe2l1 Nrf1 Fosl1	
97	0.154	6.74	1.7e-11	1.9e-10	x	
122	0.0976	6.73	1.79e-11	1.9e-10	Foxm1	
58	0.0914	6.73	1.79e-11	1.9e-10	Ebf1	
86	0.412	6.7	2.12e-11	2.18e-10	Pax3	
32	0.149	6.68	2.41e-11	2.34e-10	Ahr	
29	0.0962	6.68	2.45e-11	2.34e-10	Max Usf1 Myc Usf2 Srebf1 Arnt Bhlhe40	
41	0.102	6.68	2.49e-11	2.34e-10	Nr3c1	
238	0.0685	6.65	3.11e-11	2.85e-10	Ctcf	
315	0.0784	6.61	3.92e-11	3.49e-10	Bhlhe40 Bhlhe41	
87	0.114	6.6	4.29e-11	3.71e-10	Pax4	
124	0.356	6.55	6.14e-11	5.18e-10	Gata4	
39	0.0743	6.54	6.47e-11	5.32e-10	Fos Jun Atf1 Atf2 Atf3 Atf4 Atf5 Creb1 Crem	
11	0.14	6.53	6.74e-11	5.4e-10	Yy1	
281	0.137	6.51	7.56e-11	5.92e-10	Tgif1 Tgif2 Pknox2 Meis1 Pknox1 Meis2	

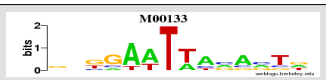
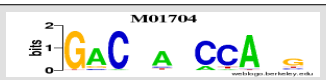
143	0.0716	6.49	9.04e-11	6.47e-10	Foxd3 Foxa1 Foxj1 Foxf1 Foxf2 Foxh1 Foxa2	
106	0.0898	6.49	9.06e-11	6.47e-10	Foxf2 Foxo1 Foxo4	
179	0.0705	6.48	9.18e-11	6.47e-10	Foxp3	
154	0.0885	6.48	9.46e-11	6.47e-10	Hif1a	
189	0.0604	6.48	9.55e-11	6.47e-10	Myod1 Usf1 Usf2 Myc Max Mitf Tfe3 Tfeb Arid5b Bhlhe40 Bhlhe41 Tcf7l1 Nhlh1 Tcf12 Tcf7l2 Myf6 Myf5 Myog Mycn Tal1	
103	0.108	6.48	9.63e-11	6.47e-10	Pou3f2	
55	0.34	6.48	9.63e-11	6.47e-10	Cebpa	
151	0.109	6.47	1.04e-10	6.8e-10	Nr2f1 Nr2f2 Hnf4a Hnf4g Ppara Ppard Pparg	
74	0.0723	6.46	1.05e-10	6.8e-10	x	
49	0.0857	6.43	1.35e-10	8.53e-10	Stat1 Stat3	
149	0.106	6.41	1.51e-10	9.4e-10	Srebf1	
153	0.0798	6.4	1.56e-10	9.48e-10	Pou2f1 Pou2af1 Pou2f2 Pou5f1 Slc22a3 Pou3f1 Pou3f2 Pou4f1	
282	0.067	6.4	1.58e-10	9.48e-10	Zfp263	
47	0.103	6.4	1.61e-10	9.48e-10	Srebf1	
113	0.0767	6.39	1.71e-10	9.88e-10	Nfe2 Bach2 Bach1 Fos Jun Fosb Fosl1 Junb Jund Fosl2 Mafk	
63	0.082	6.36	2.1e-10	1.19e-09	Rfx1	
127	0.0658	6.35	2.18e-10	1.21e-09	Tfcp2 Ubp1	
239	0.0718	6.35	2.21e-10	1.21e-09	Foxa1	
92	0.151	6.31	2.81e-10	1.52e-09	Foxj2	

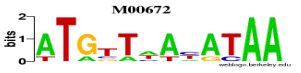
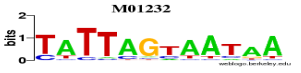
91	0.112	6.31	2.87e-10	1.53e-09	Hoxa9 Meis1	
162	0.171	6.3	3e-10	1.57e-09	Tcf7l1 Myf6 Myod1 Myog	
284	0.0599	6.29	3.27e-10	1.68e-09	Tal1	
14	0.0918	6.28	3.59e-10	1.81e-09	Mecom	
93	0.135	6.27	3.65e-10	1.82e-09	E2f1 E2f3	
102	0.217	6.25	4.17e-10	2.04e-09	Stat5a	
161	0.113	6.25	4.22e-10	2.04e-09	Srf	
115	0.0876	6.25	4.3e-10	2.05e-09	Ppara Pparg	
172	0.0762	6.24	4.63e-10	2.18e-09	Rfx1 Rfx2 Rfx4 Rfxank Rfxap	
1	0.0755	6.23	4.81e-10	2.23e-09	Myb	
327	0.0532	6.23	4.92e-10	2.25e-09	Lef1 Tcf7	
96	0.17	6.22	5.09e-10	2.29e-09	Vdr Ppara Rxra	
80	0.425	6.2	5.7e-10	2.54e-09	Pax6 Pax3	
243	0.0578	6.16	7.55e-10	3.31e-09	Atf5	
22	0.0887	6.15	8.11e-10	3.51e-09	Cux1	
318	0.0528	6.14	8.61e-10	3.68e-09	Cebpg	
155	0.178	6.09	1.17e-09	4.92e-09	Pou1f1	
15	0.106	6.06	1.36e-09	5.66e-09	Zfp87	
123	0.106	6.06	1.42e-09	5.83e-09	Nr1h4	
68	0.0651	6.01	1.88e-09	7.63e-09	Foxi1 Foxf1 Foxp3	
17	0.083	6	2.06e-09	8.25e-09	Zbtb6	
264	0.139	5.99	2.17e-09	8.61e-09	Duxbl2	

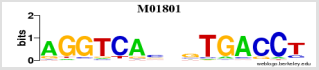
70	0.137	5.97	2.37e-09	9.3e-09	x	
107	0.0725	5.97	2.42e-09	9.35e-09	Cdc5l	
6	2.56	5.96	2.62e-09	1e-08	Nfia Nfib Nfic	
23	0.345	5.95	2.78e-09	1.05e-08	Cux1	
37	0.51	5.94	2.85e-09	1.06e-08	Nr2f2	
206	0.0663	5.94	2.86e-09	1.06e-08	Rbpj	
51	0.0648	5.94	2.92e-09	1.07e-08	Mef2a	
76	0.187	5.93	3.09e-09	1.12e-08	x	
178	0.19	5.93	3.12e-09	1.12e-08	Cdx1 Cdx2	
85	0.0736	5.92	3.29e-09	1.14e-08	Gata1 Gata2 Gata3	
94	0.145	5.92	3.3e-09	1.14e-08	Nkx2-1	
56	0.0787	5.92	3.3e-09	1.14e-08	Tbp	
134	0.0855	5.91	3.53e-09	1.21e-08	x	
147	0.0737	5.9	3.61e-09	1.22e-08	Pou1f1	
99	0.0886	5.9	3.76e-09	1.26e-08	Cyp19a1	
48	0.13	5.88	4.27e-09	1.42e-08	Tcf7l1	
158	0.81	5.87	4.34e-09	1.43e-08	Pax1 Pax2 Pax3 Pax4 Pax5 Pax8 Pax6	
64	0.0846	5.87	4.38e-09	1.43e-08	Rfx1	
25	0.0743	5.86	4.87e-09	1.57e-08	Cebpb Cebpa Cebpd Cebpe	
150	0.134	5.85	5.06e-09	1.62e-08	Hmga2 Hmga1 Irf4	
126	0.0678	5.84	5.25e-09	1.66e-08	Onecut1 Onecut2	

272	0.0615	5.83	5.6e-09	1.75e-08	Alx1 Hoxb5 Hoxc8 Gsx2 Hoxa3 Hoxd3 Hoxa6 Vax1 Hoxa2 Pdhx Dlx1 Bsx Meox1 Hoxa5 Irf6 Hoxb6 Hoxa1	
19	0.169	5.83	5.64e-09	1.75e-08	Cux1	
159	0.0821	5.82	6.19e-09	1.9e-08	Tfap2a Tfap2b Tfap2c	
135	0.0881	5.81	6.23e-09	1.9e-08	x	
253	0.106	5.8	6.92e-09	2.09e-08	Pou3f3	
160	0.0871	5.79	7.11e-09	2.13e-08	Creb1 Atf2 Jun Atf3 Atf4 Crem Atf1 Atf5	
27	0.197	5.78	7.46e-09	2.21e-08	Creb1	
144	0.0622	5.77	7.97e-09	2.34e-08	Usf1 Usf2	
35	0.0746	5.76	8.51e-09	2.48e-08	Pou3f2	
128	0.183	5.76	8.83e-09	2.55e-08	Hnf1b	
44	0.0825	5.75	9.28e-09	2.65e-08	x	
283	0.0673	5.74	9.85e-09	2.79e-08	Klf4 Klf1	
168	0.6	5.73	1.01e-08	2.84e-08	Nr2f1 Nr2f2 Nr1h3 Nr1h2 Rara Nr1i2 Rxra Rxrb	
185	0.0536	5.71	1.16e-08	3.24e-08	Tbx5	
52	0.118	5.71	1.18e-08	3.27e-08	Ahr Arnt	
104	0.0592	5.7	1.24e-08	3.41e-08	Pou6f1	
90	0.0703	5.68	1.38e-08	3.75e-08	Meis1	
120	0.186	5.68	1.4e-08	3.79e-08	Cebpg	
60	0.0646	5.67	1.43e-08	3.82e-08	Trp53	
66	0.0851	5.63	1.82e-08	4.83e-08	Nfe2l1 Nrf1	

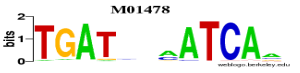
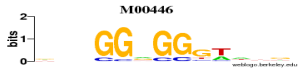
101	0.0652	5.62	1.92e-08	5.05e-08	Arid5b	
316	0.0569	5.62	1.95e-08	5.08e-08	Tfap2b	
34	0.929	5.59	2.27e-08	5.89e-08	Pax5	
163	0.0699	5.55	2.83e-08	7.27e-08	Sp1 Sp3 Zbtb7b Sp4 Zfp148 Klf11	
174	0.335	5.55	2.95e-08	7.53e-08	Pax6	
132	0.162	5.55	2.99e-08	7.56e-08	Sp3	
111	0.355	5.5	3.79e-08	9.53e-08	Pparg	
215	0.0471	5.49	4.2e-08	1.05e-07	Nkx2-5 Vsx2 Hoxa4 Bglap2 Arid3a	
289	0.0519	5.48	4.28e-08	1.06e-07	Trp53	
21	0.0608	5.46	4.72e-08	1.15e-07	Cux1	
262	0.15	5.46	4.73e-08	1.15e-07	Rhox11	
100	0.0647	5.45	5.18e-08	1.25e-07	Nkx3-1	
199	0.0498	5.42	5.98e-08	1.44e-07	Zbtb16	
209	0.058	5.42	6.2e-08	1.48e-07	Pou5f1 Slc22a3	
222	0.0627	5.41	6.38e-08	1.51e-07	Bcl6	
169	0.508	5.4	6.63e-08	1.56e-07	Nr1i2 Rxra Vdr	
211	0.0503	5.4	6.85e-08	1.6e-07	Nr5a1 Nr4a1 Nr4a2 Nr6a1	
191	0.0543	5.36	8.5e-08	1.97e-07	Nr2f1 Nr2f2	
217	0.0987	5.36	8.6e-08	1.98e-07	Ikzf1	
166	0.222	5.34	9.23e-08	2.11e-07	Tfcp2	
165	0.0569	5.34	9.52e-08	2.16e-07	Mef2c Mef2d Mef2a	
145	0.149	5.3	1.19e-07	2.68e-07	Smad4	

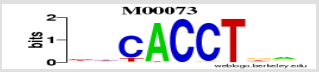
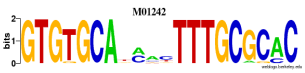
137	0.0495	5.29	1.21e-07	2.71e-07	Tead1	
89	0.0633	5.29	1.25e-07	2.79e-07	Mef2a	
274	0.123	5.26	1.44e-07	3.17e-07	Cdx2 Hoxa9 Cdx1 Hoxd10 Hoxc9 Hoxb9 Hoxd11 Hoxb8 Hoxa10	
248	0.0528	5.25	1.51e-07	3.31e-07	Zfp217	
266	0.146	5.25	1.57e-07	3.41e-07	Hoxd13	
265	0.0582	5.24	1.62e-07	3.5e-07	Dlx3 Dlx2 Dlx4	
301	0.0538	5.24	1.66e-07	3.56e-07	Nr1h3 Nr1h2 Rorb Thra	
20	0.164	5.24	1.66e-07	3.56e-07	Pbx1	
112	0.0759	5.22	1.81e-07	3.83e-07	E2f1 Tfdp1 E2f3 E2f7	
302	0.0494	5.2	2.01e-07	4.24e-07	x	
121	0.211	5.19	2.08e-07	4.36e-07	Rfx1	
254	0.151	5.19	2.11e-07	4.4e-07	Hoxc11 Hoxc10 Hoxc12	
329	0.0546	5.19	2.13e-07	4.41e-07	Pbx1	
236	0.0783	5.19	2.14e-07	4.41e-07	Pdhx Hoxd9	
59	0.0742	5.16	2.48e-07	5.08e-07	Zfp143	
31	0.154	5.16	2.56e-07	5.2e-07	Pou3f1	
257	0.44	5.14	2.81e-07	5.66e-07	Nkx2-1 Nkx2-6 Nkx2-4 Nkx2-2 Nkx2-5 Nkx3-2	
38	0.0645	5.14	2.82e-07	5.66e-07	Pou2f1	
218	0.0491	5.11	3.27e-07	6.53e-07	Bcl6	
297	0.0441	5.1	3.37e-07	6.65e-07	Gli1 Gli2 Gli3	
194	0.0501	5.1	3.38e-07	6.65e-07	Tfap2a Tfap2b Tfap2c	
309	0.0471	5.1	3.45e-07	6.75e-07	Gata5	

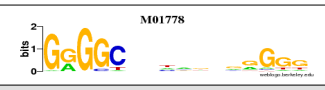
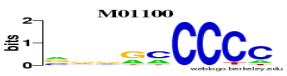
267	0.0998	5.1	3.48e-07	6.77e-07	Hmx2 Hmx3	
33	0.397	5.07	3.93e-07	7.6e-07	Pax5	
279	0.0523	5.07	4.06e-07	7.82e-07	Pou6f1	
311	0.0485	5.04	4.78e-07	9.14e-07	Runx3	
252	0.14	5.04	4.82e-07	9.18e-07	Hoxc13 Hoxa13	
249	0.259	5	5.85e-07	1.11e-06	Sox5 Sry Sox9 Sox2 Sox4	
207	0.0515	5	5.93e-07	1.11e-06	Zbtb33	
205	0.0414	4.98	6.34e-07	1.18e-06	x	
328	0.0405	4.98	6.34e-07	1.18e-06	Mef2c Mef2d	
110	0.105	4.97	6.82e-07	1.26e-06	Glis3	
133	0.0498	4.94	7.74e-07	1.42e-06	Tef	
280	0.112	4.93	8.15e-07	1.49e-06	Irx3 Irx6 Irx2 Irx4 Irx5	
197	0.048	4.91	9.18e-07	1.67e-06	Maf	
255	0.071	4.9	9.8e-07	1.77e-06	Prrx2 Nkx6-1 Barhl1 Msx3 En1 Barhl2 Hmx1	
228	0.0494	4.89	9.97e-07	1.79e-06	Satb1	
130	0.126	4.88	1.05e-06	1.88e-06	Mtf1	
321	0.0439	4.87	1.15e-06	2.04e-06	Smad3 Smad1 Smad2 Smad4	
30	0.0791	4.87	1.15e-06	2.04e-06	Gata1 Gata2 Gata3 Lmo2	
286	0.044	4.83	1.35e-06	2.38e-06	Sox5 Sox2 Sox10 Sox13 Sox15 Sox18 Sox4 Sox6 Sox9 Sry Nanog Smad1 Tcf7l1 Nr2e3	
259	0.0884	4.83	1.39e-06	2.43e-06	Nkx6-2 Pou2f1 Dbx2 Pax6 Hlx Pou4f3 Shox2 Nkx6-1 Nkx6-3	

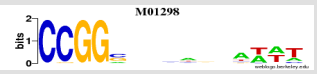
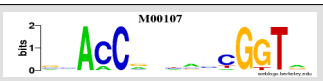
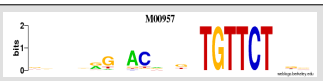
271	0.1	4.81	1.53e-06	2.67e-06	Isl2 Barx1 Mnx1 Dlx5 Hoxa7 Hoxb7 Msx1 Barx2 Hoxd8	
310	0.0442	4.81	1.55e-06	2.69e-06	Esr1	
299	0.0435	4.8	1.63e-06	2.8e-06	Ikzf2 Nfatc2 Nfatc1 Nr2c2 Nfatc3	
273	0.082	4.8	1.63e-06	2.8e-06	Lhx2 Vax2 Isx Gbx1 Gbx2 Rax Msx2 Lbx2 Nkx1-2 Rhox6 Bglap2 En2	
26	0.0902	4.79	1.65e-06	2.81e-06	Creb1	
77	0.0655	4.78	1.78e-06	3.02e-06	x	
275	0.126	4.78	1.8e-06	3.04e-06	Gsc Pitx1	
250	0.136	4.75	2.03e-06	3.41e-06	Six1 Six6 Six3 Six4 Six2	
69	0.0972	4.75	2.05e-06	3.42e-06	Nfatc2 Nfatc3 Nfatc4	
8	0.0677	4.74	2.16e-06	3.58e-06	Irf1	
256	0.0493	4.73	2.24e-06	3.71e-06	Cux1	
312	0.0426	4.71	2.49e-06	4.09e-06	Tead1	
270	0.12	4.71	2.5e-06	4.09e-06	Homez	
183	0.0454	4.69	2.73e-06	4.44e-06	Hnf1a Hnf1b	
277	0.127	4.67	2.98e-06	4.82e-06	Pdhx Evx2 Lhx4 Lhx8 Hoxd1 Emx2 Evx1	
220	0.0501	4.66	3.19e-06	5.14e-06	Srebf1 Srebf2	
269	0.0448	4.66	3.24e-06	5.2e-06	Hnf1a Hnf1b Hmbox1	
62	0.161	4.65	3.3e-06	5.26e-06	Tcf7l1 Lmo2 Zeb1 Atoh1	
88	0.0748	4.62	3.9e-06	6.19e-06	Mef2a	
268	0.0733	4.62	3.95e-06	6.24e-06	Otp Vsx1 Hoxa7 Lhx5 Phox2b Lmx1b Lhx9 Hoxc4 Hoxa4 Hoxc6 Lmx1a Alx4 Tlx2 Hoxc5 Uncx Lhx3 Pou3f2 Nkx6-1	

148	0.0538	4.58	4.68e-06	7.36e-06	Nkx2-5 Irf1	
230	0.0972	4.55	5.5e-06	8.61e-06	Gtf2ird1	
164	0.101	4.54	5.58e-06	8.69e-06	E2f1	
226	0.0377	4.51	6.5e-06	1.01e-05	Foxo4 Foxo3 Foxo1	
295	0.0428	4.46	8.17e-06	1.26e-05	Yy2 Zfp42	
234	0.0517	4.44	9.27e-06	1.42e-05	Zeb1	
247	0.0494	4.39	1.12e-05	1.71e-05	Myod1 Myf5 Myog Myf6	
291	0.0504	4.39	1.15e-05	1.75e-05	Tbp Cdx2	
263	0.0643	4.37	1.23e-05	1.87e-05	Otx1 Otx2 Dmbx1 Crx Pitx2	
251	0.082	4.37	1.26e-05	1.91e-05	Lhx3 Pou3f1 Pou1f1 Pou3f4	
78	0.0542	4.35	1.37e-05	2.06e-05	Mycn Myc Max Hes1	
260	0.0502	4.32	1.57e-05	2.34e-05	Pou2f1 Pou2f2 Pou3f2 Pou2f3	
290	0.0366	4.32	1.58e-05	2.36e-05	Runx1 Runx2	
293	0.0388	4.32	1.59e-05	2.36e-05	Irf8	
223	0.0466	4.3	1.72e-05	2.54e-05	Cyp19a1	
146	0.0587	4.3	1.75e-05	2.57e-05	Zfp384	
233	0.0438	4.28	1.89e-05	2.76e-05	Rora Nr5a2 Nr0b1 Esrrb Nr2c2 Esrra	
28	0.0725	4.24	2.22e-05	3.24e-05	Myc Max	
187	0.0489	4.23	2.38e-05	3.45e-05	Hsf1 Hsf2	
287	0.0466	4.22	2.51e-05	3.62e-05	Maz Wt1	
13	0.0332	4.21	2.58e-05	3.71e-05	Mecom	
298	0.0493	4.19	2.84e-05	4.06e-05	Klf15	

190	0.0468	4.18	2.87e-05	4.09e-05	Yy1 Zfp42	
214	0.035	4.18	2.88e-05	4.09e-05	Dmrt1 Dmrtc2	
136	0.0479	4.18	2.95e-05	4.17e-05	Tead2	
261	0.118	4.09	4.28e-05	6.01e-05	Nkx2-2 Nkx2-9 Nkx3-1 Nkx2-3	
140	0.092	4.08	4.61e-05	6.46e-05	x	
276	0.0681	4.07	4.78e-05	6.67e-05	Lhx6 Pax7 Prrx1 Alx3 Alx1 Prrx2 Pax4 Uba2 Phox2a Esx1	
125	0.0761	4.05	5.17e-05	7.18e-05	Gcm1 Gcm2	
188	0.039	4.04	5.36e-05	7.41e-05	Hnf4a Nr2f1 Nr2f6	
292	0.0377	3.96	7.66e-05	0.000105	Hbp1	
324	0.0379	3.94	8.04e-05	0.00011	Elk1 Ets1 Elf3 Ehf Elf1 Elf4 Elf5 Etv6 Spic	
118	0.057	3.92	8.87e-05	0.000121	Zfhx3	
213	0.0329	3.89	9.96e-05	0.000135	Dmrt2 Dmrt3 Dmrta1 Dmrta2	
131	0.105	3.88	0.000105	0.000142	x	
216	0.0387	3.87	0.000109	0.000147	Elk1	
72	0.094	3.83	0.000129	0.000174	x	
67	0.101	3.82	0.000135	0.00018	Nfya Nfyb Nfyc	
278	0.101	3.79	0.000152	0.000202	Cphx1	
50	0.0737	3.78	0.000157	0.000208	Atf2 Nfil3 Tef Hlf	
98	0.0736	3.77	0.000162	0.000215	Spz1	
208	0.0924	3.71	0.000204	0.000269	Nanog	
242	0.0291	3.71	0.000206	0.00027	Hoxa13	
288	0.035	3.7	0.000215	0.000281	Zbed6	

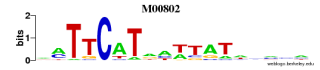
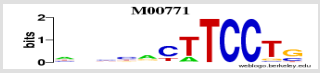
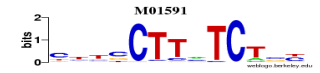
192	0.0368	3.68	0.000238	0.000309	Gli1 Gli2 Gli3 Glis1	
186	0.056	3.64	0.000272	0.000352	Tcf7l2 Lef1 Tcf7 Sox9	
116	0.0636	3.63	0.000279	0.00036	Xbp1	
12	0.0704	3.53	0.000409	0.000526	Zeb1	
325	0.0354	3.5	0.000468	0.000599	Ets1 Gabpa Gabpb1 Elk4 Elf2 Elk1 Elk3 Erf Erg Etv1 Etv2 Ets2 Etv3 Etv4 Etv5 Fev Fli1 Spdef	
210	0.0432	3.47	0.000526	0.00067	Isl1	
53	0.129	3.45	0.000564	0.000716	x	
193	0.0295	3.41	0.000643	0.000814	Nkx2-5	
152	0.0842	3.41	0.000657	0.000828	Nr1h4 Rxra	
237	0.0357	3.39	0.000692	0.000868	Rest	
195	0.0766	3.37	0.000752	0.000941	Gata1 Gfi1 Gfi1b	
200	0.0317	3.36	0.000788	0.000982	Runx1	
305	0.0379	3.35	0.000819	0.00102	Pou2f1	
184	0.0717	3.27	0.00107	0.00132	Foxa2 Foxc1 Foxj2 Foxa3 Foxa1	
308	0.0454	3.25	0.00117	0.00144	Brf1 Bdp1 Polr3a	
196	1.53	3.19	0.00145	0.00177	Gzf1	
307	0.32	3.06	0.00223	0.00272	Pparg	
204	0.0617	3.04	0.0024	0.00292	Hoxa7	
156	0.0336	3.04	0.0024	0.00292	E2f1 Tfdp1 E2f3	
43	0.387	2.94	0.00332	0.00401	x	
231	0.0473	2.88	0.00398	0.00479	Mtf1	

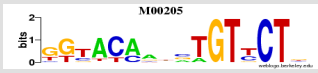
306	0.0426	2.81	0.00502	0.00603	Plag1	
323	0.0212	2.77	0.00561	0.00672	Foxo1	
202	0.0355	2.76	0.00578	0.00689	Zbtb7a	
235	0.0238	2.57	0.0101	0.0119	Cnot3	
225	0.0314	2.55	0.0108	0.0128	Elk1 Fli1	
203	0.123	2.51	0.0121	0.0143	x	
313	0.0595	2.31	0.0208	0.0245	Stat1 Stat3 Stat4 Stat5a Stat5b Stat6	
227	0.0972	2.3	0.0215	0.0251	Stat3	
114	0.0474	2.24	0.0248	0.029	Nr6a1	
245	0.0331	2.23	0.0261	0.0303	Mecp2	
177	0.0173	2.2	0.0277	0.032	Foxp1	
314	0.0352	2.02	0.0429	0.0496	Crx Rax Otx1 Otx2 Gtf2ird1 Pitx3 Pitx1	
246	0.0395	1.94	0.0527	0.0606	Hmga2	
317	0.0341	1.92	0.0549	0.0629	Creb1 Atf1 Crem	
182	0.0313	1.88	0.0602	0.0688	Hes1	
212	0.0362	1.83	0.0678	0.0772	Rora	
258	0.0259	1.79	0.0742	0.0841	Pbx1 Pbx2 Pbx3	
71	0.279	1.67	0.0951	0.107	x	
173	0.0305	1.66	0.0968	0.109	Ahr Ahrr Arnt Hif1a Epas1	
320	0.0468	1.64	0.1	0.113	Irf7 Irf8 Irf1 Irf2 Irf3 Irf5 Irf4 Irf9 Prdm1	
319	0.0364	1.54	0.124	0.139	Ebf1 Ebf3	
201	-0.108	-1.51	0.132	0.147	Zfp628	

82	0.0583	1.44	0.149	0.166	Ahr	
83	0.0526	1.44	0.151	0.167	x	
300	0.0435	1.42	0.154	0.17	Satb1	
45	0.26	1.18	0.24	0.264	x	
326	0.426	1.17	0.243	0.266	Mecom	
221	0.068	1.13	0.258	0.282	Hinfp	
198	-0.085	-1.13	0.26	0.284	Hic1	
244	0.0486	1.07	0.283	0.307	Mecp2	
81	0.126	1.01	0.313	0.339	x	
105	1.55	0.935	0.35	0.377	Zfp423	
10	0.0519	0.915	0.36	0.387	Nhlh1	
95	0.109	0.899	0.368	0.395	Hmx3	
61	0.131	0.884	0.377	0.402	x	
322	0.016	0.869	0.385	0.41	Stat5b Stat1 Stat3 Stat4 Stat5a Stat6 Parp1	
75	0.0264	0.786	0.432	0.458	x	
24	0.0927	0.78	0.436	0.461	x	
57	0.204	0.74	0.46	0.484	Rreb1	
180	0.0233	0.738	0.46	0.484	Aire	
285	0.0187	0.726	0.468	0.49	Zfx	
73	0.0924	0.692	0.489	0.511	x	
304	0.014	0.607	0.544	0.566	x	
167	-0.355	-0.569	0.569	0.591	Cyp19a1	

296	0.0355	0.522	0.602	0.623	Zfp42	
224	-0.0325	-0.327	0.744	0.767	Vdr Rxra	
119	-0.0808	-0.221	0.825	0.848	Alx4	
232	-0.0111	-0.191	0.848	0.869	Mterf	
36	-0.0355	-0.174	0.862	0.881	T	
303	-0.00263	-0.0991	0.921	0.938	Nrf1	
181	-0.000856	0.0525	0.958	0.973	nse5	
46	0.00305	0.0316	0.975	0.987	x	
79	-Inf	NaN	NaN	NaN	Pax1	
229	-Inf	NaN	NaN	NaN	Terf1	
240	-Inf	NaN	NaN	NaN	Tbx22 Tbx18 Tbx15	
241	-Inf	NaN	NaN	NaN	Tbx15	

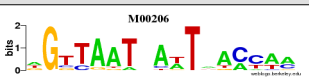
Dataset S7
TRANSFAC MOTIFS
In lower H3K27acetylated sites in CHL2:

Clustered PWMs	Logo	P-Value	ROC AUC
Octamer(M01324)		1.08e-04	0.54
HSF2(M01244)		3.91e-03	0.53
c-ets-1(M01986), Pet-1(M02037), Fli-1(M02038), GABPalpha(M02039), ER81(M01987), ERG(M01985), ER71(M01988), Ets2(M01989), Erm(M01992)		5.13e-03	0.53
Oct-2(M01761), Oct-1(M00136)		5.47e-03	0.53
POU3F2(M00464), OCT-x(M00210), Oct-1(M00161), Oct-2(M01368), POU2F3(M01476)		6.42e-03	0.53
c-Myc:Max(M00123)		6.79e-03	0.53
RFX(M00975)		9.21e-03	0.52
AP-1(M00517), Bach1(M00495)		1.01e-02	0.52
TBX22(M01195)		1.06e-02	0.52
Pit-1(M00802)		1.08e-02	0.52
PTF1-beta(M00657)		1.27e-02	0.52
AP-1(M00199), FRA1(M01267), AP-1(M00174), AP-1(M00173)		1.44e-02	0.52
Ets(M00771), c-Ets-1(M00339), c-Ets-2(M00340)		1.47e-02	0.52
C/EBPdelta(M00621)		1.59e-02	0.52
RSRFC4(M00026), MEF-2(M00232), RSRFC4(M00407)		1.67e-02	0.52
Tal-1(M01591)		1.71e-02	0.52
PU.1(M00658)		1.77e-02	0.52
Oct-1(M00138)		1.80e-02	0.52
MEF-2(M00006)		2.16e-02	0.52
FOXP3(M00992)		2.26e-02	0.52

ZABC1(M01306)		2.64e-02	0.52
Staf(M00262)		2.81e-02	0.52
HOXA10(M01464), Cdx-1(M01373)		3.22e-02	0.52
ICSBP(M00699)		3.38e-02	0.52
c-Maf(M01070)		3.64e-02	0.52
NRSE(M00325)		3.65e-02	0.52
Poly(M00211)		3.83e-02	0.52
Meis2(M01488), Meis1(M01419)		4.10e-02	0.52
v-Myb(M00003)		4.13e-02	0.52
GR(M00205)		4.40e-02	0.52
C/EBPgamma(M00622)		4.46e-02	0.52
MEF-2D(M02026)		4.55e-02	0.52
Evi-1(M00078)		4.62e-02	0.52
MyoD(M00184)		4.75e-02	0.52
E2F6(M01252)		4.93e-02	0.52
IRF-1(M00747)		4.99e-02	0.52

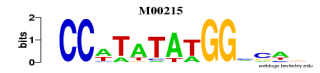
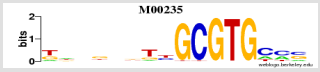
Dataset S7
TRANSFAC MOTIFS
In higher H3K27acetylated sites in R6/1:

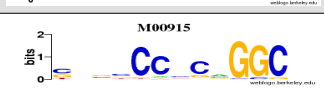
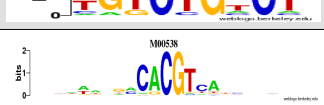
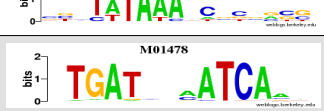
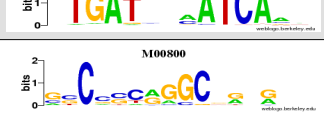
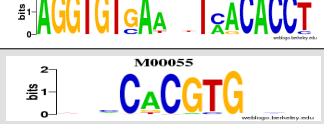
Clustered PWMs	Logo	P-Value	ROC AUC
Oct-1(M00162), Oct-1(M00195), Oct-1(M00930)		1.25e-05	0.55
TCF11(M00285), REX1(M01695)		7.36e-05	0.54
ATF-4(M01864), v-Jun(M00036), ATF2:c-Jun(M00041), E4F1(M00694), ATF-2(M01862), ATF-3(M01863), CREB(M00916), CREB,(M00981)		1.09e-04	0.54
Oct-1(M00161), Oct-1(M00135), OCT-x(M00210), Oct-1(M00248), Oct-1(M00342)		1.17e-04	0.54
CEBPE(M01868), C/EBP(M00201)		3.83e-04	0.54
Nrf-2(M00821)		4.76e-04	0.54
v-Myb(M00003), v-Myb(M00227)		5.02e-04	0.54
CREB(M00801), FRA1(M01267), AP-1(M00174)		8.24e-04	0.53
Hdx(M01333), CDP(M01344)		1.14e-03	0.53
HB9(M01349), Vax-2(M01327), HOXB3(M01330), HOXB7(M01396), Evx-1(M01475)		1.65e-03	0.53
Cart-1(M00416), HoxB5(M01319), GSH2(M01326), HOXA3(M01337), HOXD3(M01338), Barx1(M01340), dlx5(M01388), HOXA6(M01392), Vax-1(M01397), dlx3(M01400), HoxA2(M01402), ipf1(M01438), Dlx-1(M01439), Mox1(M01443), HOXD1(M01448), HOXA5(M01452), HOXB6(M01460), Dlx-2(M01468), Dlx7(M01486), HOXA1(M01487)		2.11e-03	0.53
NeuroD(M01288)		2.13e-03	0.53
LEF1(M01022), TCF-4(M00671)		2.19e-03	0.53
APOLYA(M00310)		2.22e-03	0.53
TGIF1(M01346), MRG2(M01395), TGIF2(M01407), Meis1(M01419), PREP1(M01459), TGIF(M00418)		2.51e-03	0.53
Evi-1(M00079), Evi-1(M02002)		3.57e-03	0.53
Pbx(M01967)		3.84e-03	0.53
IPF1(M01234), IPF1(M01233), IPF1(M01235), ISL1(M01127)		4.82e-03	0.53

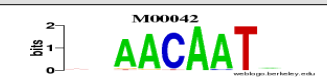
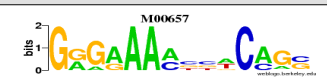
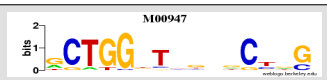
Oct-1(M00136)		5.66e-03	0.53
C/EBPgamma(M01869)		8.23e-03	0.53
KAISO(M01119)		9.38e-03	0.52
FOXJ2(M00423)		1.03e-02	0.52
Octamer(M01324)		1.09e-02	0.52
alpha-CP1(M00687)		1.14e-02	0.52
FOXP3(M00992)		1.17e-02	0.52
TCF-4(M02033)		1.28e-02	0.52
Barx-2(M01431)		1.51e-02	0.52
Lhx4(M01421)		1.76e-02	0.52
TCF11:MafG(M00284), v-Maf(M00035), c-Maf(M01070)		1.91e-02	0.52
HLF(M00260)		2.03e-02	0.52
RORalpha2(M00157), RORalpha(M01138)		2.10e-02	0.52
Rhox11(M01384)		2.40e-02	0.52
GZF1(M01069)		2.47e-02	0.52
C/EBPgamma(M00622)		2.56e-02	0.52
SOX(M01014)		2.65e-02	0.52
HMGA2(M01300)		2.66e-02	0.52
IPF1(M01013)		2.67e-02	0.52
HOXA7(M01336), HOXC5(M01454)		2.68e-02	0.52
HNF1(M00206)		3.07e-02	0.52
CHX10(M00437)		3.11e-02	0.52

Zec(M01081)		3.17e-02	0.52
NF-AT2(M01718)		3.19e-02	0.52
NFAT3(M01734)		3.42e-02	0.52
Pbx1(M01357)		3.61e-02	0.52
DEC(M00997)		3.67e-02	0.52
Hmbox1(M01456)		3.74e-02	0.52
PPAR(M00528)		3.76e-02	0.52
PEA3(M00655)		4.29e-02	0.52
IRF-2(M00063)		4.44e-02	0.52
TBX15(M01264)		4.49e-02	0.52
Gfi1(M01067)		4.55e-02	0.52
mTERF(M01245)		4.69e-02	0.52
MEF-3(M00319)		4.73e-02	0.52

Dataset S7
TRANSFAC MOTIFS
In higher H3K27acetylated sites in CHL2:

Clustered PWMs	Logo	P-Value	ROC AUC
TCF-4(M02033), LEF-1(M02019)		7.09e-05	0.54
Barbie(M00238)		8.91e-05	0.54
HB9(M01349), Vax-2(M01327), Gbx2(M01382), Msx-2(M01393), HOXA7(M01394), HOXB7(M01396), Msx-1(M01412), Nkx1-1(M01334), Evx-1(M01475)		3.48e-04	0.54
dlx5(M01388), Barx1(M01340), HoxB5(M01319), HOXC-8(M01321), GSH2(M01326), HOXA3(M01337), HOXD3(M01338), HOXA6(M01392), Vax-1(M01397), HoxA2(M01402), ipf1(M01438), Bsx(M01442), Mox1(M01443), HOXD1(M01448), HOXA5(M01452)		7.55e-04	0.54
C/EBPdelta(M00621), C/EBPbeta(M00109), C/EBP(M00201), CEBPE(M01868)		8.56e-04	0.53
REST(M01256), NRSF(M00256), NRSE(M00325)		2.21e-03	0.53
Oct-1(M00161), OCT-x(M00210)		2.78e-03	0.53
SRF(M00215), SRF(M00186)		2.91e-03	0.53
HNF-1A(M02013), HP1(M00725), HNF1(M01011)		3.52e-03	0.53
Brachyury(M00150)		4.35e-03	0.53
AhR:Arnt(M00235), AhR:Arnt(M00237)		6.13e-03	0.53
EAR2(M01728)		6.23e-03	0.53
Alx-4(M00619)		7.36e-03	0.53
NERF1a(M00531), c-Ets-1(M00339), c-Ets-2(M00340), Ets(M00771)		8.25e-03	0.53
NF-1(M00193), NF-1(M00806)		8.67e-03	0.53
RFX(M00975)		8.85e-03	0.53
Gfi1(M01067), Gfi-1(M00250)		9.15e-03	0.52
HIF1(M00797)		9.46e-03	0.52
Bach1(M00495), AP-1(M00517), AP-1(M00924)		9.82e-03	0.52

GABP-beta(M01876), ELF1(M01266), Tel-2(M00678)		1.06e-02	0.52
AREB6(M00415), E2F6(M01252)		1.23e-02	0.52
UF1H3BETA(M01068), Zfp281(M01597)		1.27e-02	0.52
USF(M00187)		1.29e-02	0.52
TGIF1(M01346)		1.30e-02	0.52
Pax-1(M00326)		1.39e-02	0.52
AP-2(M00915), RNF96(M01199)		1.48e-02	0.52
Barx-2(M01431)		1.51e-02	0.52
AP-1(M00199), FRA1(M01267), AP-1(M00174), CREB(M00801)		1.63e-02	0.52
HES1(M01009)		1.74e-02	0.52
E2F(M00024)		1.79e-02	0.52
SMAD3(M00701), SMAD4(M00733)		1.95e-02	0.52
HTF(M00538)		2.13e-02	0.52
Obox2(M01364), Otx1(M01366), Obox3(M01466), Pitx1(M01484)		2.27e-02	0.52
Muscle(M00320)		2.41e-02	0.52
Cphx(M01478)		2.45e-02	0.52
AP-2(M00800)		2.51e-02	0.52
HMX1(M01481)		2.64e-02	0.52
CHX10(M00437)		2.66e-02	0.52
E2F(M00425)		2.78e-02	0.52
TBX15(M01263)		2.84e-02	0.52
N-Myc(M00055)		2.86e-02	0.52

PPAR(M00528), PPARalpha:RXRalpha(M00242)		2.88e-02	0.52
Ikaros(M01169)		2.98e-02	0.52
Nanog(M01123), REX1(M01695)		3.01e-02	0.52
MEF-3(M00319)		3.03e-02	0.52
MTF-1(M00650)		3.03e-02	0.52
Pax-9(M00329)		3.18e-02	0.52
AhR(M00139)		3.64e-02	0.52
TEF-1(M00704)		3.76e-02	0.52
ZABC1(M01306)		3.93e-02	0.52
Dax1(M01248)		4.00e-02	0.52
CAC-binding(M00720)		4.01e-02	0.52
MEIS1B:HOXA9(M00421)		4.01e-02	0.52
CACCC-binding(M00721), Muscle(M00321)		4.03e-02	0.52
ATF2:c-Jun(M00041)		4.03e-02	0.52
CNOT3(M01253)		4.22e-02	0.52
Evx2(M01386)		4.23e-02	0.52
E2F-1(M00938)		4.36e-02	0.52
D-Type(M00334)		4.48e-02	0.52
SOX5(M00042)		4.54e-02	0.52
FOXO1(M01968)		4.62e-02	0.52
PTF1-beta(M00657)		4.63e-02	0.52
CP2/LBP-1c/LSF(M00947)		4.87e-02	0.52

Dataset S7

Enriched motifs in the promoters of genes that are differentially-expressed in the striatum of 4-week old R6/1 mice:

MotifID	*Motif_genes*	*pval*	*Logo*
M00644	Ubp1	3.91e-05	
M00131	Foxa2	7.91e-05	
M04595	Sall2	8.14e-05	
M02836	Zic2	0.000141	
M00720	CAC-BP	0.000154	
M01973	Plag1	0.000209	
M01224	NFKB1 Rela	0.00036	
M01028	Rest	0.000494	
M01202	Vdr Rxra	0.000605	
M02023	Maz	0.000801	
M02737	Ascl2	0.000842	
M04142	Tead1	0.000847	
M00008	Sp1	0.000857