Supplementary Material

Table 1: Training genes

Gene	Chromosome	Expression	Reference
Imprinted			
Gatm	2f1	Maternal	(Sandell et al. 2003)
Nnat	2h2	Paternal	(Kagitani et al. 1997)
Gnas	2h3	NA†	(Peters et al. 1999)
Peg10	6a1	Paternal	(Ono et al. 2001)
Calcr	6a1	Maternal	(Hoshiya et al. 2003)
Neurabin	6a1	Maternal	(Ono et al. 2003)
Pon3	6a1	Maternal	(Ono et al. 2003)
Pon2	6a1	Maternal	(Ono et al. 2003)
Asb4	6a1	Maternal	(Mizuno et al. 2002)
Sgce	6a1	Paternal	(Piras et al. 2000)
Copg2	6a3	Maternal	(Lee et al. 2000)
Usp29, Ocat	7a1	Paternal	(Kim et al. 2000)
Zim1	7a1	Maternal	(Kim et al. 1999)
Peg3,Pw1	7a1	Paternal	(Kuroiwa et al. 1996)
Znf264	7a1	Paternal	(Kim et al. 2001)
Magel2	7b5	Paternal	(Boccaccio et al. 1999)
Ndn	7b5	Paternal	(MacDonald and Wevrick 1997)
Snrpn	7b5	Paternal	(Glenn et al. 1993)
Ube3a	7b5	Maternal	(Albrecht et al. 1997)
Peg12, Frat3	7c	Paternal	(Kobayashi et al. 2002)
H19	7f5	Maternal	(Bartolomei et al. 1991)
Igf2	7f5	Paternal	(DeChiara et al. 1991)
Ins2	7f5	Paternal	(Giddings et al. 1994)
Tssc4	7f5	Maternal	(Paulsen et al. 2000)
Ascl2, Mash2	7f5	Maternal	(Guillemot et al. 1994; Alders et al. 1997)
Cdnk1c, p57	7f5	Maternal	(Hatada and Mukai 1995)
Kcnq1	7f5	Maternal	(Gould and Pfeifer 1998)
Slc22a1l, Orctl2	7f5	Maternal	(Dao et al. 1998; Cooper et al. 1998)
Tssc3, Ipl	7f5	Maternal	(Qian et al. 1997)
Rasgrf1, Grf1	9e3.3	Paternal	(Plass et al. 1996)
Plagl1,Zac1, Lot1	10a2	Paternal	(Piras et al. 2000)
Dcn	10c3	Maternal	(Mizuno et al. 2002)
Grb10, Meg1	11a2	Maternal	(Miyoshi et al. 1998; Hitchins et al. 2002)
U2af1-rs1	11a3	Paternal	(Hatada and Mukai 1993; Hayashizaki et al. 1994)
Dio3	12f2	Paternal	(Hernandez et al. 2002)
Dlk1, Peg9	12f2	Paternal	(Schmidt et al. 2000)
Meg3, Gtl2	12f2	Maternal	(Miyoshi et al. 2000)
Htr2a	14d2	Maternal	(Kato et al. 1998)
Slc38a4, ATA3	15f2	Paternal	(Mizuno et al. 2002; Smith et al. 2003)
Slc22a2, Orct2	17a2	Maternal	(Zwart et al. 2001)
Slc22a3, Orct3	17a2	Maternal	(Zwart et al. 2001)
Igf2r	17a2	Maternal	(Barlow et al. 1991)
Impact	18a2	Paternal	(Hagiwara et al. 1997)
Ins1	19d2	Paternal	(Giddings et al. 1994; Deltour et al. 1995)
Non-imprinted			
Mrpl23	2d	Biallelic	(Ishihara et al. 1998; Paulsen et al. 2000)
Ppgb	2h3	Biallelic	(Williamson et al. 1994)
Nipa1	7b5	Biallelic	(Chai et al. 2003)
Nipa2	7b5	Biallelic	(Chai et al. 2003)
P	7b5	Biallelic	(Chai et al. 2003)
Herc2	7b5	Biallelic	(Chai et al. 2003)
Gabrb1	7b5	Biallelic	(Chai et al. 2003)
Gcp5	7b5	Biallelic	(Chai et al. 2003)
Cyfip1	7b5	Biallelic	(Chai et al. 2003)
Ndnl2	7c	Biallelic	(Chibuk et al. 2001)
Stim1	7f1	Biallelic	(Overall et al. 1998)
Hras	7f5	Biallelic	(Goldberg et al. 2003)
Dusp8	7f5	Biallelic	(Goldberg et al. 2003)
Mucdhl	7f5	Biallelic	(Goldberg et al. 2003)
L23mrp	7f5	Biallelic	(Zubair et al. 1997)
Th	7f5	Biallelic	(Reik and Walter 2001)
Phemx, Tssc6	7f5	Biallelic	(Paulsen et al. 2000)
Trpm5	7f5	Biallelic	(Paulsen et al. 2000)
Igfbp3	11a1	Biallelic	(Eggermann et al. 1999; Wakeling et al. 2000)
Igfbp1	11a1	Biallelic	(Eggermann et al. 1999; Wakeling et al. 2000)
Cobl	11a2	Biallelic	(Hitchins et al. 2002)
Ddc	11a2	Biallelic	(Hitchins et al. 2002)
Rpl23	11d	Biallelic	(Greally et al. 1998)
Yy1	12f2	Biallelic	(Yevtodiyenko et al. 2002)
Wars	12f2	Biallelic	(Yevtodiyenko et al. 2002)
Mas1	17a2	Biallelic	(Schweifer et al. 1997)
Tcp1	17a2	Biallelic	(Barlow et al. 1991)
Sod2	17a2	Biallelic	(Barlow et al. 1991)
Plg	17a2	Biallelic	(Barlow et al. 1991)
Lx1,Oct1,Slc22a1	17a2	Biallelic	(Schweifer et al. 1997)

†The Gnas locus encodes multiple oppositely imprinted products and was excluded from the maternal/paternal model.

Table 2: Test genes

Gene	Chromosome	Prediction	Reference
Stochastic monoallelic expression			
Olfr48	2e1	X	Monoallelically expressed (Singh et al. 2003)
Tlr4	4c2	X	Monoallelically expressed (Pereira et al. 2003)
Olfr47	6b2	X	Monoallelically expressed (Singh et al. 2003)
V1rb1	6d2	X	Monoallelically expressed (Singh et al. 2003)
Klrc1	6f3	X	Monoallelically expressed (Vance et al. 2002)
Klra6	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra5	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra23	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra2	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra8	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra4	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Klra9	6f3	X	Monoallelically expressed (Tanamachi et al. 2001; Byun et al. 2003)
Olfr41	7f2	X	Monoallelically expressed (Singh et al. 2003)
Il4	11b1.3	X	Monoallelically expressed (Kelly and Locksley 2000)
Mor28	14c1	X	Monoallelically expressed (Ishii et al. 2001)
Sftpd	14c1	X	Heterogeneous allele-specific expression in extrapulmonary tissues (Lin and Floros 2002)
Olfr19	16b1	X	Monoallelically expressed (Singh et al. 2003)
Pcdha	18b3	X	Monoallelically expressed (Esumi et al. 2005)
Potential parent-of-origin monoallelic expression			
Wt1	2e3	P	Imprinted in human tissues (may be polymorphic in placenta) (Huff et al. 1990; Jinno et al. 1994; Mitsuya et al. 1997; Malik et al. 2000; Dallosso et al. 2004)
Aldh1b1	4b2	M	Demonstrated to be a novel imprinting gene in human (M. P. Lee, http://lpg.nci.nih.gov/LPG/lee/proj2)
Cpa4	6a3	X	Maternal expression in human tissues (Kayashima et al. 2003*b*; Bentley et al. 2003)
Atp10a	7b5	M	Maternal expression in human tissues (Meguro et al. 2001), as well as in mouse tissues (Kashiwagi et al. 2003), although this may be strain-dependent (Kayashima et al. 2003*a*)
Presumed biallelic expression			
Igfbp5	1c3	X	No evidence of imprinting (Piras et al. 2000)
Gpd2	2c2	X	No evidence of imprinting (Piras et al. 2000)
Pax6	2e3	X	Biallelically expressed (van Raamsdonk and Tilghman 2000)
Duox1	2f1	X	No evidence of imprinting (Sandell et al. 2003)
Duox2	2f1	X	No evidence of imprinting (Sandell et al. 2003)
Slc28a2	2f1	X	No evidence of imprinting (Sandell et al. 2003)
Slc30a4	2f1	X	No evidence of imprinting (Sandell et al. 2003)
E2f1	2h2	X	Biallelically expressed (Williamson et al. 1995)
Bc10	2h2	X	Biallelically expressed (John et al. 2001)
Cyp24a1	2h3	X	Biallelically expressed (Williamson et al. 1995)
Kcnb1	2h3	X	Biallelically expressed (Williamson et al. 1995)
Pck1	2h3	X	Biallelically expressed (Williamson et al. 1995)
Plcg1	2h3	X	Biallelically expressed (Williamson et al. 1995)
Th1l	2h3	X	Biallelically expressed (Bonthron et al. 2000)
Tnfrsf5	2h3	X	Biallelically expressed (Williamson et al. 1995)
Bmp7	2h3	X	No evidence of imprinting (Marker et al. 1995)
Cdh4	2h4	X	Biallelically expressed (Williamson et al. 1995)
Edn3	2h4	X	Biallelically expressed (Williamson et al. 1995)
Ntsr	2h4	X	Biallelically expressed (Williamson et al. 1995)
Cd2	3f3	X	Synchronously replicated (Mostoslavsky et al. 2001)
Cdkn2c	4c7	X	Biallelically expressed (Cost et al. 1997)
Msx1	5b2	X	No evidence of imprinting (Blin-Wakkach et al. 2001)
Gapd	5e4	X	Biallelically expressed (Paulsen et al. 1998)
Ache	5g1	X	Synchronously replicated (Kitsberg et al. 1993)
Actb	5g2	X	Biallelically expressed (Zhang et al. 1994)
Col1a2	6a1	X	Biallelically expressed (Mizuno et al. 2002)
Dlx5	6a1	X	Imprinted in human (Okita et al. 2003), but non-imprinted in mouse (Kimura et al. 2004)
Tsga14	6a3	X	Biallelically expressed (Yamada et al. 2002)
Nrf1	6a3	X	Biallelically expressed (Yamada et al. 2003)
Ube2h	6a3	X	Biallelically expressed (Yamada et al. 2003)
Hspc216	6a3	X	Biallelically expressed (Yamada et al. 2003)
Kiaa0265	6a3	X	Biallelically expressed (Yamada et al. 2003)
Flj14803	6a3	X	Biallelically expressed (Yamada et al. 2003)
Mkrn1	6b1	X	No evidence of imprinting (Walter and Paulsen 2003)
Gt(ROSA)26asSor	6e3	X	Biallelically expressed (Singh et al. 2003)
Cd4	6f2	X	Synchronously replicated (Singh et al. 2003)
Cdkn1b	6g1	X	Biallelically expressed (Cost et al. 1997)
Clcn4-2	7a1	X	Biallelically expressed (Buettner et al. 2004)
Apoe	7a2	X	Biallelically expressed (Buettner et al. 2004)
Grik5	7a3	X	Biallelically expressed (Buettner et al. 2004)
Aplp1	7a3	X	Biallelically expressed (Buettner et al. 2004)
Mag	7a3	X	Biallelically expressed (Buettner et al. 2004)
Scn1b	7a3	X	Biallelically expressed (Buettner et al. 2004)
Grin2d	7b2	X	Biallelically expressed (Buettner et al. 2004)

Hrc	7b2	X	Biallelically expressed (Buettner et al. 2004)
Kcna7	7b2	X	Biallelically expressed (Buettner et al. 2004)
Kcnc3	7b2	X	Biallelically expressed (Buettner et al. 2004)
Syt3	7b2	X	Biallelically expressed (Buettner et al. 2004)
Rras	7b2	X	Synchronously replicated (Kitsberg et al. 1993)
Tph1	7b3	X	Biallelically expressed (Buettner et al. 2004)
Gas2	7b4	X	No evidence of imprinting (Piras et al. 2000)
Tyr	7e1	X	Synchronously replicated (Singh et al. 2003)
Rrm1	7f1	X	No evidence of imprinting (Byrne and Smith 1993)
Drd4	7f5	X	No evidence of imprinting (Cichon et al. 1996)
Cd81	7f5	X	Relative paternal preference in early extraembryonic tissues (Dao et al. 1998), but other studies suggest it to be non-imprinted (Maecker et al. 1998; Gabriel et al. 1998)
Tnnt3	7f5	X	Biallelically expressed (Yuan et al. 1996)
Ctsd	7f5	P	Biallelically expressed in human hydatidiform mole, mature teratoma, and normal placenta (Rachmilewitz et al. 1993)
Rnh1	7f5	X	Biallelically expressed (Rachmilewitz et al. 1993)
Cars	7f5	X	Biallelically expressed (Clark et al. 2002)
Cd3d	9b	X	Synchronously replicated (Kitsberg et al. 1993)
Pfkl	10c1	X	Synchronously replicated (Kitsberg et al. 1993)
Egfr	11a3.1	X	Biallelically expressed (Wakeling et al. 1998)
Gabra6	11b1	X	Biallelically expressed (Takahashi and Ko 1993)
Trp53	11b4	X	Synchronously replicated (Kitsberg et al. 1993)
Rl19	11d	X	Biallelically expressed (Piras et al. 2000)
Erbb2	11d	X	Synchronously replicated (Amiel et al. 1999)
Apob	12a1.3	X	Synchronously replicated (Kitsberg et al. 1993)
Rb1	14d1	X	Synchronously replicated (Amiel et al. 1999)
Ghr	15a1	X	Biallelically expressed (Buettner et al. 2004)
Il7r	15a2	X	Biallelically expressed (Buettner et al. 2004)
Q8VI68	15a2	X	Biallelically expressed (Buettner et al. 2004)
Npr3	15a2	X	Biallelically expressed (Buettner et al. 2004)
Osmr	15a2	X	Biallelically expressed (Buettner et al. 2004)
Prlr	15a2	X	Biallelically expressed (Buettner et al. 2004)
Sdc2	15b3.2	X	Biallelically expressed (Buettner et al. 2004)
Sema5a	15b3.2	X	Biallelically expressed (Buettner et al. 2004)
Fzd6	15C	X	Biallelically expressed (Buettner et al. 2004)
Nov	15d2	X	Biallelically expressed (Buettner et al. 2004)
Myc	15d3	X	Synchronously replicated (Chess et al. 1994)
Runx1	16c4	X	Synchronously replicated (Dotan et al. 2000)
Cdkn1a	17b1	X	Biallelically expressed (Cost et al. 1997)
Pygm	19a	X	Synchronously replicated (Kitsberg et al. 1993)

P Imprinted and paternally expressed; M Imprinted and maternally expressed; X Not imprinted

Table 3: Randomly chosen control genes

Ensembl ID	Chromosome
ENSMUSG00000046334	1a2
ENSMUSG00000025940 (1110020A09Rik)	1a3
ENSMUSG00000041859 (Mcmd)	1a5
ENSMUSG00000026069 (Il1rl1)	1b
ENSMUSG00000041303	1c1
ENSMUSG00000041562	1c1
ENSMUSG00000048650	1c2
ENSMUSG00000006576 (Slc4a3)	1c3
ENSMUSG00000033364 (NM_176972)	1c3
ENSMUSG00000026246 (Akp5)	1c5
ENSMUSG00000026288 (Inpp5d)	1c5
ENSMUSG00000048591 (Dnajb3)	1c5
ENSMUSG00000009907 (Vps4b)	1d
ENSMUSG00000026374 (Tsn)	1e2
ENSMUSG00000050687	1e4
ENSMUSG00000014980 (5730449L18Rik)	1g2
ENSMUSG00000026577 (1700030G05Rik)	1h2
ENSMUSG00000043700 (4833414E09Rik)	1h2
ENSMUSG00000050230 (Rgs5)	1h2
ENSMUSG00000038034 (Q8R366)	1h3
ENSMUSG00000043263 (NM_175026)	1h3
ENSMUSG00000016194 (Hsd11b1)	1h6
ENSMUSG00000026736 (4930426L09Rik)	2a2
ENSMUSG00000026743 (Mllt10)	2a2
ENSMUSG00000007476	2b
ENSMUSG00000026853 (Crat)	2b
ENSMUSG00000035295 (1700123D08Rik)	2b
ENSMUSG00000043504	2b
ENSMUSG00000048517 (Ppia)	2c1
ENSMUSG00000051249	2c2
ENSMUSG00000026992	2c3
ENSMUSG00000041751 (Waspip)	2c3
ENSMUSG00000043603	2d
ENSMUSG00000042863 (NM_146584)	2e1
ENSMUSG00000042894 (NM_146981)	2e1
ENSMUSG00000043226 (NM_146572)	2e1
ENSMUSG00000044514 (NM_146589)	2e1
ENSMUSG00000044923 (NM_146588)	2e1
ENSMUSG00000045617 (NM_146973)	2e1
ENSMUSG00000050706 (2610305J24Rik)	2e1
ENSMUSG00000047039 (Q8VFQ8)	2e1
ENSMUSG00000047923 (Q8K076)	2e1
ENSMUSG00000048197 (Q8VFR0)	2e1
ENSMUSG00000048877	2e1
ENSMUSG00000049029 (NM_146767)	2e1
ENSMUSG00000050948 (NM_146917)	2e1
ENSMUSG00000042604 (Kcna4)	2e3
ENSMUSG00000050776 (Q8VF84)	2e4
ENSMUSG00000027305 (Ndufaf1)	2e5
ENSMUSG00000034013 (NM_177294)	2e5
ENSMUSG00000027206 (CSN2_hUMAN)	2f2
ENSMUSG00000014355 (Mcpr)	2f3
ENSMUSG00000032802 (1700127B04Rik)	2h1
ENSMUSG00000027422 (Rrbp1)	2h1
ENSMUSG00000027451 (Cst7)	2h1
ENSMUSG00000033003 (1600031M04Rik)	2h1
ENSMUSG00000043583 (4930470P17Rik)	2h3
ENSMUSG00000038705 (GME2_MOUSE)	2h4
ENSMUSG00000051598	2h4
ENSMUSG00000040329 (Il7)	3a1
ENSMUSG00000027552 (E2f5)	3a2
ENSMUSG00000027615 (Hps3)	3a3
ENSMUSG00000027712 (Anxa5)	3b
ENSMUSG00000044954 (NM_177170)	3b
ENSMUSG00000046965	3b
ENSMUSG00000027751 (P38ip-pending)	3d
ENSMUSG00000045296 (NM_177165)	3d
ENSMUSG00000027774 (Gfm)	3e2
ENSMUSG00000048304	3e3
ENSMUSG00000019710 (6720473G22Rik)	3f1
ENSMUSG00000049684 (NM_177130)	3f1
ENSMUSG00000005629 (3110001I17Rik)	3f2
ENSMUSG00000027942 (4933434E20Rik)	3f2
ENSMUSG00000028141 (Oaz3)	3f2
ENSMUSG00000042031 (2310007F04Rik)	3f2
ENSMUSG00000042520 (NM_153489)	3f2
ENSMUSG00000042572 (2310012M18Rik)	3f2
ENSMUSG00000051128	3f2
ENSMUSG00000051409	3f2
ENSMUSG00000023124 (Chia-pending)	3f3
ENSMUSG00000044165 (Q8K186)	3f3
ENSMUSG00000047772	3f3
ENSMUSG00000033554 (2410012M04Rik)	3g2
ENSMUSG00000039887 (5430428G01Rik)	3g3
ENSMUSG00000027984 (Hadhsc)	3h1
ENSMUSG00000032755 (8430410J10Rik)	3h1
ENSMUSG00000046561 (NM_173451)	3h1
ENSMUSG00000028160	3h2
ENSMUSG00000028188 (4921536I21Rik)	3h3
ENSMUSG00000028255 (Clca3)	3h3
ENSMUSG00000043056	3h3
ENSMUSG00000028034 (D3Ertd330e)	3h4
ENSMUSG00000039047 (3000001O05Rik)	3h4
ENSMUSG00000040016 (Ptger3)	3h4
ENSMUSG00000028232 (2010300G19Rik)	4a1
ENSMUSG00000050418	4a1
ENSMUSG00000048714	4a2
ENSMUSG00000049488	4a2
ENSMUSG00000049833	4a3
ENSMUSG00000028420 (D4Ertd89e)	4b3
ENSMUSG00000028381 (Ugcg)	4c1
ENSMUSG00000028382 (NM_144904)	4c1
ENSMUSG00000045917 (6330416G13Rik)	4c1
ENSMUSG00000028494 (Adfp)	4c3
ENSMUSG00000044181	4c3
ENSMUSG00000028699 (9030418M05Rik)	4c7
ENSMUSG00000042989	4c7
ENSMUSG00000047755	4c7
ENSMUSG00000051366	4c7
ENSMUSG00000028633 (Ctps)	4d1
ENSMUSG00000028869 (NM_145552)	4d1
ENSMUSG00000032897 (Nfyc)	4d1
ENSMUSG00000023120	4d2.3
ENSMUSG00000023232 (NM_172702)	4d2.3
ENSMUSG00000028832 (Stmn1)	4d3
ENSMUSG00000028850 (NM_172876)	4d3
ENSMUSG00000036896 (C1qg)	4d3
ENSMUSG00000037342	4d3
ENSMUSG00000045764 (9130020G10Rik)	4d3
ENSMUSG00000028955 (VAM3_MOUSE)	4e1
ENSMUSG00000037655	4e1
ENSMUSG00000048016	4e1
ENSMUSG00000015653	5a1
ENSMUSG00000040473 (NM_172447)	5a1
ENSMUSG00000001566 (Hlxb9)	5a3
ENSMUSG00000029092 (4930435H24Rik)	5b3
ENSMUSG00000043542 (NM_173181)	5b3
ENSMUSG00000029191 (Recc1)	5c3.3
ENSMUSG00000037685 (Atp8a1)	5d
ENSMUSG00000046808	5d
ENSMUSG00000049907 (1190017B18Rik)	5d
ENSMUSG00000029245 (Epha5)	5e1
ENSMUSG00000044552 (4930529A19Rik)	5e1
ENSMUSG00000029382 (Ccni)	5e3
ENSMUSG00000029417 (Cxcl9)	5e3
ENSMUSG00000025533 (Asl)	5f
ENSMUSG00000029404 (Arl6ip4)	5f
ENSMUSG00000029471 (6330570N16Rik)	5f
ENSMUSG00000037866	5f
ENSMUSG00000038326	5f
ENSMUSG00000047966	5f
ENSMUSG00000005378 (Wbscr22)	5g1
ENSMUSG00000047680	5g1
ENSMUSG00000029606	5g2
ENSMUSG00000049461	5g2
ENSMUSG00000000658	6a2
ENSMUSG00000029866 (Kel)	6b2
ENSMUSG00000029867 (1700034O15Rik)	6b2
ENSMUSG00000047681	6b2
ENSMUSG00000036390 (Gadd45a)	6c1
ENSMUSG00000048353	6c1
ENSMUSG00000048505 (V1rc12)	6c1
ENSMUSG00000023140 (Reg2)	6c3
ENSMUSG00000033456	6d2
ENSMUSG00000049694	6d2
ENSMUSG00000048794	6d2
ENSMUSG00000030274 (AR20_hUMAN)	6e3
ENSMUSG00000030276 (AI450050)	6e3
ENSMUSG00000030278 (Fsp27)	6e3
ENSMUSG00000003153 (Slc2a3)	6f2
ENSMUSG00000030331 (Acrbp)	6f2
ENSMUSG00000030341 (Tnfrsf1a)	6f2
ENSMUSG00000038167 (Q8R0J1)	6f2
ENSMUSG00000030238 (Slc21a1)	6g1
ENSMUSG00000046883	6g1
ENSMUSG00000005649 (Cabp5)	7a2
ENSMUSG00000030413 (Pglyrp)	7a2
ENSMUSG00000040647	7a2
ENSMUSG00000044888	7a2
ENSMUSG00000003759 (Shkbp1)	7a3
ENSMUSG00000036999	7a3
ENSMUSG00000040857 (Erf)	7a3
ENSMUSG00000030423 (1110023P21Rik)	7b1
ENSMUSG00000030492 (Slc7a9)	7b1
ENSMUSG00000003423 (NM_029406)	7b2
ENSMUSG00000006948 (Klk4)	7b2
ENSMUSG00000006599 (Gtf2h1)	7b3
ENSMUSG00000049805	7d3
ENSMUSG00000044952	7e3
ENSMUSG00000032790	7f1
ENSMUSG00000032614	7f1
ENSMUSG00000043914 (NM_146755)	7f1
ENSMUSG00000049797 (NM_146329)	7f1
ENSMUSG00000048544	7f1
ENSMUSG00000030788 (2610110L04Rik)	7f2
ENSMUSG00000036744 (4933433E02Rik)	7f2
ENSMUSG00000043855	7f2
ENSMUSG00000030869 (2610003B19Rik)	7f3
ENSMUSG00000030872 (Gga2)	7f3
ENSMUSG00000044141 (E130201H02Rik)	7f3
ENSMUSG00000049996	7f3
ENSMUSG00000030748 (Il4ra)	7f4
ENSMUSG00000039990	7f4
ENSMUSG00000031443 (F7)	8a2
ENSMUSG00000047302	8a2
ENSMUSG00000031516 (Dctn6)	8a3
ENSMUSG00000031574 (Star)	8a3
ENSMUSG00000031594 (Fgl1)	8b1.2
ENSMUSG00000031595 (Pdgfrl)	8b1.2
ENSMUSG00000031629 (1700029A22Rik)	8b2
ENSMUSG00000038064 (2210404A22Rik)	8b2
ENSMUSG00000031521 (Aga)	8b3.1
ENSMUSG00000031559 (4930555F03Rik)	8b3.1
ENSMUSG00000048666	8b3.2
ENSMUSG00000036437 (Npy1r)	8b3.3
ENSMUSG00000036151 (Q8R1J1)	8c1
ENSMUSG00000047654 (Sstk-pending)	8c1
ENSMUSG00000004994 (4930527D15Rik)	8c3
ENSMUSG00000031718 (Hhip)	8c3
ENSMUSG00000031781 (2810413N20Rik)	8c5
ENSMUSG00000031774 (2310065K24Rik)	8c5
ENSMUSG00000048400	8c5
ENSMUSG00000048511	8c5
ENSMUSG00000048795 (Impdh2)	8d1
ENSMUSG00000031902 (Nfatc3)	8d2
ENSMUSG00000003657 (Calb2)	8d3
ENSMUSG00000031954 (Cfdp)	8d3
ENSMUSG00000033783 (NM_172916)	8d3
ENSMUSG00000043364	8d3
ENSMUSG00000050992	8d3
ENSMUSG00000023336 (Wfdc1)	8e1
ENSMUSG00000031824 (6430548M08Rik)	8e1
ENSMUSG00000046844	8e1
ENSMUSG00000048140 (1110003O08Rik)	8e1
ENSMUSG00000001062 (Q8VDI6)	8e2
ENSMUSG00000001482 (Def8)	8e2
ENSMUSG00000031986	8e2
ENSMUSG00000034053 (Tsnax)	8e2
ENSMUSG00000005800 (Mmp8)	9a1
ENSMUSG00000031997 (Trpc6)	9a1
ENSMUSG00000047004	9a2
ENSMUSG00000031939 (D2Ertd198e)	9a3
ENSMUSG00000043040	9a3
ENSMUSG00000044607 (Olfr24)	9a3
ENSMUSG00000001833 (Sept7)	9a4
ENSMUSG00000008429 (5031400M07Rik)	9a4
ENSMUSG00000034815	9a4
ENSMUSG00000032034 (Kcnj5)	9a5.2
ENSMUSG00000032038 (Siat4c)	9a5.3
ENSMUSG00000032105 (Pdzk2)	9b
ENSMUSG00000043911 (NM_146781)	9b
ENSMUSG00000048299 (NM_146505)	9b
ENSMUSG00000049926 (NM_146782)	9b
ENSMUSG00000050554 (BC003321)	9b
ENSMUSG00000025237 (Q8K0V6)	9c
ENSMUSG00000036244 (1700095K08Rik)	9c
ENSMUSG00000039714 (BC016632)	9c
ENSMUSG00000044820 (NM_145229)	9c
ENSMUSG00000046460	9c
ENSMUSG00000048823 (BC027163)	9d
ENSMUSG00000051459	9d
ENSMUSG00000042761	9e3.2

ENSMUSG00000032409 (Atr)	9e4
ENSMUSG00000032803 (Cdv3)	9f1
ENSMUSG00000032547 (Ryk)	9f1
ENSMUSG00000035032 (NM_172461)	9f1
ENSMUSG00000050397 (NM_012020)	9f1
ENSMUSG00000025650 (Col7a1)	9f2
ENSMUSG00000041528	9f2
ENSMUSG00000038233	9f4
ENSMUSG00000042262 (Ccr8)	9f4
ENSMUSG00000040006 (NM_145418)	10a1
ENSMUSG00000040034 (2610529I12Rik)	10a1
ENSMUSG00000045023	10a3
ENSMUSG00000038407	10b1
ENSMUSG00000043433	10b1
ENSMUSG00000044914	10b1
ENSMUSG00000047160	10b1
ENSMUSG00000044770 (NM_172938)	10b2
ENSMUSG00000049814	10b2
ENSMUSG00000038624 (5730521E12Rik)	10b3
ENSMUSG00000036917	10b4
ENSMUSG00000043906	10b5.2
ENSMUSG00000020230 (Hrmt1l1)	10b5.3
ENSMUSG00000020231	10b5.3
ENSMUSG00000033444 (NM_153406)	10b5.3
ENSMUSG00000004929 (Thop1)	10c1
ENSMUSG00000020203	10c1
ENSMUSG00000035206	10c1
ENSMUSG00000035890 (2610010O19Rik)	10c1
ENSMUSG00000043121	10c1
ENSMUSG00000004356 (3830408P06Rik)	10c2
ENSMUSG00000019961 (Tmpo)	10c2
ENSMUSG00000047855	10d1
ENSMUSG00000025405 (Inhbc)	10d3
ENSMUSG00000025407 (Gli)	10d3
ENSMUSG00000025422	10d3
ENSMUSG00000039914	10d3
ENSMUSG00000040415 (Dtx3)	10d3
ENSMUSG00000047247 (1200014O24Rik)	10d3
ENSMUSG00000020393 (Kremen)	11a1
ENSMUSG00000019368 (AI256582)	11a1
ENSMUSG00000020454 (Eif4enif1)	11a1
ENSMUSG00000041175	11a1
ENSMUSG00000048807 (AI414849)	11a1
ENSMUSG00000050283	11a1
ENSMUSG00000020287 (Mpg)	11a5
ENSMUSG00000044949	11a5
ENSMUSG00000051558	11a5
ENSMUSG00000041231	11b1.1
ENSMUSG00000046879 (Ifi1)	11b1.2
ENSMUSG00000020368 (Canx)	11b1.3
ENSMUSG00000020333 (NM_144823)	11b1.3
ENSMUSG00000046998 (Q8K541)	11b1.3
ENSMUSG00000049772 (NM_146911)	11b1.3
ENSMUSG00000049427	11b1.3
ENSMUSG00000049588	11b1.3
ENSMUSG00000018415 (4933439F18Rik)	11b2
ENSMUSG00000018599	11b2
ENSMUSG00000019373 (Cops3)	11b2
ENSMUSG00000047331	11b2
ENSMUSG00000047941 (Trim17)	11b2
ENSMUSG00000045717	11b3
ENSMUSG00000005209 (Tnfsf12)	11b4
ENSMUSG00000014606 (Slc25a11)	11b4
ENSMUSG00000018476 (Q8K0Z1)	11b4
ENSMUSG00000020850 (Prpf8)	11b4
ENSMUSG00000038224 (Serpinf2)	11b4
ENSMUSG00000046257	11b4
ENSMUSG00000046811 (C730027E14Rik)	11b4
ENSMUSG00000051318	11b4
ENSMUSG00000018925	11b5
ENSMUSG00000020840 (Blmh)	11b5
ENSMUSG00000037750 (NM_145430)	11b5
ENSMUSG00000048419	11b5
ENSMUSG00000034121	11c
ENSMUSG00000039078 (NM_153807)	11c
ENSMUSG00000044355	11c
ENSMUSG00000049818 (Q8VF58)	11c
ENSMUSG00000020877 (NM_146027)	11d
ENSMUSG00000038020	11d
ENSMUSG00000046095 (Krt1-2)	11d
ENSMUSG00000046495 (Q61877)	11d
ENSMUSG00000051275 (4733401H21Rik)	11d
ENSMUSG00000001901	11e1
ENSMUSG00000041695 (Kcnj2)	11e1
ENSMUSG00000045065 (NM_177179)	11e1
ENSMUSG00000037546 (1700013G20Rik)	12a1.3
ENSMUSG00000020591 (Ntsr2)	12a3
ENSMUSG00000020601 (NM_144551)	12a3
ENSMUSG00000046346	12a3
ENSMUSG00000020545 (1700108M19Rik)	12b2
ENSMUSG00000020562 (4930504H06Rik)	12b2
ENSMUSG00000045186	12c2
ENSMUSG00000020948 (2810440N09Rik)	12c3
ENSMUSG00000020949 (Fkbp3)	12c3
ENSMUSG00000021096 (Ppm1a)	12c3
ENSMUSG00000043156	12c3
ENSMUSG00000046649 (Q9CUQ2)	12c3
ENSMUSG00000048141	12c3
ENSMUSG00000032829	12d2
ENSMUSG00000045064 (NM_172414)	12d3
ENSMUSG00000049675	12f1
ENSMUSG00000021213 (Akr1c13)	13a1
ENSMUSG00000033520 (NM_177197)	13a1
ENSMUSG00000021337 (Scgn)	13a3.2
ENSMUSG00000021346 (Prlpc3)	13a3.3
ENSMUSG00000037816	13b1
ENSMUSG00000038132	13b1
ENSMUSG00000021496 (2700061N24Rik)	13b2
ENSMUSG00000034675 (Dbn1)	13b2
ENSMUSG00000045767 (Q922W8)	13b2
ENSMUSG00000046706 (Caml)	13b2
ENSMUSG00000048904 (Neurog1)	13b2
ENSMUSG00000021445 (1600000I23Rik)	13b3
ENSMUSG00000045293	13c3
ENSMUSG00000045676	13c3
ENSMUSG00000041632	13d1
ENSMUSG00000021725 (D13Ertd275e)	13d2.3
ENSMUSG00000021733	14a2
ENSMUSG00000015970 (NM_172264)	14b
ENSMUSG00000021894 (4933409E02Rik)	14b
ENSMUSG00000021900 (Btd)	14b
ENSMUSG00000041471	14b
ENSMUSG00000010376 (Nedd8)	14c1
ENSMUSG00000021791 (4933428D01Rik)	14c1
ENSMUSG00000021934 (4930548G07Rik)	14c1
ENSMUSG00000022198 (Pabpn1)	14c1
ENSMUSG00000035953	14c1
ENSMUSG00000037544 (Hurp-pending)	14c1
ENSMUSG00000040293 (Gzmd)	14c1
ENSMUSG00000046273	14c1
ENSMUSG00000047172	14c1
ENSMUSG00000047975	14c1
ENSMUSG00000021952 (Xpo4)	14c2
ENSMUSG00000035469	14c2
ENSMUSG00000044547	14c2
ENSMUSG00000035184	14c3
ENSMUSG00000022040 (Ephx2)	14d1
ENSMUSG00000034463 (C130058N24Rik)	14d1
ENSMUSG00000044447 (Q91YL4)	14d1
ENSMUSG00000034731	14d3
ENSMUSG00000034689 (4921530L21Rik)	14e2.1
ENSMUSG00000022060 (Klf12)	14e2.2
ENSMUSG00000048059	14e3
ENSMUSG00000050764	14e4
ENSMUSG00000032925 (B930011D01Rik)	14e5
ENSMUSG00000022250 (NM_177123)	15a2
ENSMUSG00000025370	15a2
ENSMUSG00000045187	15a2
ENSMUSG00000022324 (Matn2)	15b3.3
ENSMUSG00000046648	15b3.3
ENSMUSG00000038616 (Ext1)	15d1
ENSMUSG00000022588 (2010109I03Rik)	15e1
ENSMUSG00000022570 (Tsta3)	15e1
ENSMUSG00000033576 (2310076O14Rik)	15e1
ENSMUSG00000044742	15e1
ENSMUSG00000049844	15e1
ENSMUSG00000051472	15e1
ENSMUSG00000014372 (Cyp2d11)	15e2
ENSMUSG00000022440 (NM_028331)	15e2
ENSMUSG00000022452 (1500032L24Rik)	15e2
ENSMUSG00000042048	15e2
ENSMUSG00000051518	15e2
ENSMUSG00000015377 (1700027J05Rik)	15e3
ENSMUSG00000022435 (Upk3)	15e3
ENSMUSG00000044530 (Q8R329)	15e3
ENSMUSG00000051176 (Zfp42)	15f1
ENSMUSG00000023030 (Slc11a2)	15f3
ENSMUSG00000036139 (Hoxc9)	15f3
ENSMUSG00000039427 (NM_145362)	16a2
ENSMUSG00000022706 (Mrpl40)	16b1
ENSMUSG00000022885 (Siat1)	16b1
ENSMUSG00000033821	16b1
ENSMUSG00000043811 (Rtn4r)	16b1
ENSMUSG00000049118	16b1
ENSMUSG00000050821 (2900046G09Rik)	16b1
ENSMUSG00000009337 (Rpl35a)	16b3
ENSMUSG00000022825 (Q9CVA9)	16b3
ENSMUSG00000049808	16b3
ENSMUSG00000002844 (Adprh)	16b4
ENSMUSG00000043204	16b5
ENSMUSG00000047530	16b5
ENSMUSG00000043317 (NM_146397)	16c1.1
ENSMUSG00000050543	16c1.1
ENSMUSG00000049851 (NM_146998)	16c1.2
ENSMUSG00000022891 (NM_023844)	16c3.3
ENSMUSG00000039851 (4932438H23Rik)	16c3.3
ENSMUSG00000050239	16c3.3
ENSMUSG00000000157 (Itgb2l)	16c4
ENSMUSG00000022914 (Wdr9)	16c4
ENSMUSG00000039411 (Sim2)	16c4
ENSMUSG00000023843	17a3.1
ENSMUSG00000036157	17a3.1
ENSMUSG00000036691	17a3.1
ENSMUSG00000049778	17a3.1
ENSMUSG00000048645	17a3.1
ENSMUSG00000002271 (Msln)	17a3.3
ENSMUSG00000024125 (Sbp)	17a3.3
ENSMUSG00000025738	17a3.3
ENSMUSG00000045744 (NM_175682)	17a3.3
ENSMUSG00000015575 (NM_025272)	17b1
ENSMUSG00000024200 (Bak1)	17b1
ENSMUSG00000024213 (Nudt3)	17b1
ENSMUSG00000041059 (Hmga1)	17b1
ENSMUSG00000024319 (Q9QWT6)	17b2
ENSMUSG00000036185 (NM_023893)	17b2
ENSMUSG00000001528 (Flot1)	17b3
ENSMUSG00000003200 (Sh3gl1)	17d
ENSMUSG00000003206 (Ebi3)	17d
ENSMUSG00000003208 (2900016D05Rik)	17d
ENSMUSG00000011492	17d
ENSMUSG00000044279 (Q8QZT4)	17d
ENSMUSG00000046071 (Q9D2B8)	17d
ENSMUSG00000024227 (2610034M16Rik)	17e1.1
ENSMUSG00000024096 (Ralbp1)	17e1.2
ENSMUSG00000034553 (2900001A12Rik)	17e1.2
ENSMUSG00000051060	17e1.3
ENSMUSG00000038493	17e3
ENSMUSG00000051588	17e4
ENSMUSG00000042905 (2900055J20Rik)	18b3
ENSMUSG00000045062 (Pcdhb7)	18b3
ENSMUSG00000045712	18b3
ENSMUSG00000051696	18b3
ENSMUSG00000035420	18c
ENSMUSG00000038059 (NM_134133)	18d2
ENSMUSG00000049239 (6330411I15Rik)	18d2
ENSMUSG00000024622 (2510002C16Rik)	18d3
ENSMUSG00000050595 (NM_176986)	18d3
ENSMUSG00000049165	18e2
ENSMUSG00000024571 (D18Wsu98e)	18e3
ENSMUSG00000024644 (Cn2-pending)	18e3
ENSMUSG00000025429 (Pstpip2)	18e3
ENSMUSG00000043772	18e4
ENSMUSG00000003673 (G2an)	19a
ENSMUSG00000006456 (Rbm14)	19a
ENSMUSG00000024799 (3110041O18Rik)	19a
ENSMUSG00000024847 (Aip)	19a
ENSMUSG00000047733	19a
ENSMUSG00000043407	19b
ENSMUSG00000024898	19c1
ENSMUSG00000024815 (4931412G03Rik)	19c2
ENSMUSG00000024935 (Slc1a1)	19c2
ENSMUSG00000025000	19c3
ENSMUSG00000037372 (2310051D19Rik)	19c3
ENSMUSG00000025201 (2410089B13Rik)	19d1
ENSMUSG00000025227 (NM_029186)	19d1
ENSMUSG00000042401 (Crtac1)	19d1
ENSMUSG00000047509	19d1
ENSMUSG00000049046	19d1

Table 4: Relevant features for imprinting prediction

Feature	Weight	Mean (Standard deviation) All Genes		Mean (Standard deviation) Imprinted		P
downstream 10:100 SINE_Alu$\pm^1$	16.01	-0.09	(2.03)	1.00	(2.76)	6.3×10^{-3}
upstream 4:3 ATF^1	14.26	0.39	(0.72)	0.52	(0.85)	1.6×10^{-1}
downstream 10:100 B2$\pm^2$	14.11	50.68	(116.81)	111.41	(149.08)	4.9×10^{-3}
downstream 10:100 LTR_ERV1^1	13.85	1.55	(2.33)	2.73	(3.95)	2.7×10^{-2}
upstream 6:5 ICP4^1	13.37	0.06	(0.24)	0.14	(0.35)	6.6×10^{-2}
upstream 5:4 ICP4^3	13.05	0.05	(0.22)	0.09	(0.29)	1.9×10^{-1}
upstream 5:4 ICP4^1	12.38	0.05	(0.25)	0.09	(0.29)	2.0×10^{-1}
downstream 10:100 L1$\pm^1$	-12.23	0.02	(2.55)	-0.93	(4.52)	8.8×10^{-2}
upstream 7:6 AP2^3	11.7	0.21	(0.41)	0.41	(0.50)	5.7×10^{-3}
upstream 7:6 AP2^1	11.67	0.27	(0.63)	0.48	(0.63)	1.7×10^{-2}
downstream 10:100 L1ME^2	11.53	0.20	(0.37)	0.32	(0.47)	4.4×10^{-2}
intron LTR_ERV1$\pm^1$	-11.43	0.04	(0.57)	-0.19	(1.46)	1.4×10^{-1}
upstream 100:10 L1MC^2	11.39	0.24	(0.42)	0.33	(0.57)	1.7×10^{-1}
downstream 5:10 L1^1	-11.28	0.35	(0.84)	0.30	(0.82)	3.2×10^{-1}
upstream 100:10 L1ME$\pm^2$	11.2	132.60	(281.00)	318.42	(525.83)	1.2×10^{-2}
upstream 1:0 SRF^1	-10.95	0.01	(0.11)	0.00	(0.00)	0
upstream 10:5 L1MA^1	10.87	0.06	(0.32)	0.25	(0.87)	7.2×10^{-2}
downstream 10:100 B2$\pm^1$	10.81	0.02	(2.30)	0.82	(1.81)	2.8×10^{-3}
upstream 100:10 B2$\pm^2$	10.78	49.30	(116.55)	92.50	(149.40)	3.1×10^{-2}
upstream 100:10 L1MD^2	10.68	0.08	(0.26)	0.20	(0.36)	2.4×10^{-2}
upstream 5:0 Lx^1 $\times$ upstream 8:7 Oct1^3	-10.63	0.21	(0.70)	0.00	(0.00)	0
downstream 5:10 LTR_ERVL$\pm^1$	10.57	0.00	(0.35)	0.07	(0.50)	1.7×10^{-1}
upstream 4:3 ATF^3	10.42	0.30	(0.46)	0.32	(0.47)	3.9×10^{-1}
downstream 0:5 LTR_MaLR$\pm^2$ $\times$ upstream 2:0 Pit1^3	-10.3	71.29	(215.05)	0.04	(0.21)	0
downstream 10:100 LTR_MaLR$\pm^2$	10.17	78.38	(407.71)	153.91	(530.96)	1.8×10^{-1}
upstream 100:10 LTR_MaLR$\pm^2$	-10.14	72.18	(395.37)	2.37	(1.55)	0
upstream 7:6 GATA1^1	10.12	0.70	(0.90)	0.95	(1.20)	8.6×10^{-2}
upstream 10:9 SRF^1	10.08	0.01	(0.12)	0.07	(0.25)	8.4×10^{-2}
upstream 2:1 AP2^3 $\times$ upstream 2:1 Pit1^3	-10.05	0.08	(0.27)	0.00	(0.00)	0
upstream 5:0 LINE_L1^1 $\times$ upstream 8:7 Oct1^3	-9.77	0.47	(1.14)	0.05	(0.21)	0
upstream 10:5 Lx$\pm^2$	-9.43	141.70	(413.75)	48.86	(145.64)	6.4×10^{-5}
downstream 0:5 LTR_ERVL$\pm^1$	9.35	0.00	(0.32)	0.11	(0.75)	1.5×10^{-1}
upstream 5:0 MIR$\pm^1$	-9.33	0.01	(0.47)	-0.07	(0.40)	1.0×10^{-1}
intron L1$\pm^1$	-9.27	-0.16	(1.14)	-0.69	(1.51)	1.3×10^{-2}
intron SINE_B4$\pm^2$	9.22	45.00	(131.22)	69.15	(178.13)	1.9×10^{-1}
upstream 3:2 Sp1^1	9.21	0.20	(0.70)	0.45	(1.07)	5.7×10^{-2}
upstream 2:1 SIF^3	9.18	0.08	(0.28)	0.25	(0.44)	7.6×10^{-3}
intron CpGi^2	9.03	19.38	(58.10)	58.80	(149.17)	4.3×10^{-2}
upstream 100:10 LTR_ERVK^2	9.02	2.01	(2.96)	2.93	(4.72)	1.0×10^{-1}
upstream 100:10 SINE_B2$\pm^1$	8.93	0.21	(2.35)	0.92	(3.19)	7.5×10^{-2}
upstream 5:0 LINE_CR1^1	8.82	0.02	(0.13)	0.07	(0.25)	8.7×10^{-2}
upstream 100:10 L1MC^1	8.76	1.24	(1.78)	1.41	(2.20)	3.0×10^{-1}
upstream 10:5 L1MA$\pm^2$	8.71	12.56	(84.97)	32.91	(118.66)	1.3×10^{-1}
upstream 10:5 LINE_L1$\pm^1$	-8.7	0.01	(1.62)	-0.45	(2.25)	8.7×10^{-2}
downstream 0:1 B2$\pm^1$	-8.68	0.00	(0.24)	-0.05	(0.30)	1.5×10^{-1}
downstream 5:10 L1^2	-8.56	4.44	(13.58)	1.83	(6.24)	4.2×10^{-3}
downstream 0:5 LTR_MaLR$\pm^2$ $\times$ upstream 2:1 Pit1^3	-8.49	51.88	(186.83)	0.04	(0.21)	0
upstream 7:6 NFuE1^3	-8.45	0.08	(0.27)	0.02	(0.15)	1.0×10^{-2}
I^7	8.32	0.26	(0.44)	0.41	(0.50)	3.0×10^{-2}
upstream 2:1 ETFA^3	8.3	0.05	(0.22)	0.16	(0.37)	2.7×10^{-2}
exon CpGi^2	8.29	140.78	(161.42)	218.23	(187.98)	4.6×10^{-3}
upstream 9:8 AP2^1	8.21	0.27	(0.60)	0.32	(0.80)	3.4×10^{-1}
upstream 100:10 PB$\pm^1$	8.04	0.20	(1.92)	0.48	(2.82)	2.6×10^{-1}
intron LTR_ERV1$\pm^2$	8.03	19.79	(235.39)	113.02	(603.13)	1.6×10^{-1}
upstream 100:10 DNA_Tip100$\pm^2$	7.99	3.01	(19.51)	7.73	(29.46)	1.5×10^{-1}
upstream 8:7 E4TF1^3	7.98	0.09	(0.28)	0.11	(0.32)	2.8×10^{-1}
downstream 0:5 SINE_B4^2	7.97	2.62	(3.61)	3.67	(4.81)	7.8×10^{-2}
Motif$^9_7$	-7.96	0.00	(0.21)	-0.02	(0.26)	2.7×10^{-1}
intron L1$\pm^2$	7.94	143.67	(733.84)	439.09	(1181.94)	5.2×10^{-2}
upstream 4:3 NFuE5^3	7.9	0.17	(0.37)	0.25	(0.44)	1.1×10^{-1}
upstream 2:1 AP2^1 $\times$ upstream 2:1 Pit1^3	-7.88	0.09	(0.34)	0.00	(0.00)	0
upstream 10:9 GATA1^1	-7.84	0.71	(0.92)	0.75	(0.87)	3.9×10^{-1}
downstream 10:100 L1ME$\pm^1$	-7.83	-0.02	(1.58)	-0.05	(2.11)	4.7×10^{-1}
downstream 0:5 Lx$\pm^1$	7.81	-0.02	(0.91)	0.18	(0.84)	6.3×10^{-2}
upstream 10:9 Oct1^1 $\times$ upstream 10:0 IgPE2^3	-7.78	0.11	(0.43)	0.00	(0.00)	0
upstream 2:0 L1ME$\pm^1$	-7.77	0.00	(0.15)	-0.02	(0.15)	1.6×10^{-1}
upstream 7:6 NFuE1^1	-7.72	0.08	(0.29)	0.02	(0.15)	6.8×10^{-3}
upstream 10:5 LTR_ERVL^1	7.71	0.07	(0.34)	0.07	(0.25)	4.8×10^{-1}
upstream 5:0 ATF^1	7.68	2.19	(1.93)	2.89	(2.05)	1.4×10^{-2}
upstream 10:9 NFuE1^3	7.65	0.08	(0.28)	0.20	(0.41)	2.7×10^{-2}
intron Lintron E_CR1$\pm^1$	7.64	0.00	(0.34)	0.09	(0.36)	5.9×10^{-2}
upstream 10:5 SINE_MIR$\pm^1$	-7.6	0.01	(0.48)	-0.14	(0.67)	7.2×10^{-2}
upstream 6:5 BPVE2^3	7.57	0.34	(0.47)	0.48	(0.51)	4.1×10^{-2}
downstream 5:10 LINE_L1^2	-7.56	7.70	(16.17)	4.83	(7.17)	5.6×10^{-3}
upstream 10:5 LINE_L1$\pm^2$	-7.55	229.73	(517.82)	151.76	(237.51)	1.8×10^{-2}
downstream 0:2 B2$\pm^1$	-7.48	0.01	(0.35)	-0.05	(0.37)	1.8×10^{-1}
upstream 4:3 E4F1^3	7.44	0.16	(0.37)	0.16	(0.37)	4.9×10^{-1}
downstream 5:10 LTR_ERVL^1	7.38	0.07	(0.36)	0.18	(0.58)	1.1×10^{-1}

downstream 10:100 SINE_MIR± [2]	7.37	57.11	(112.35)	82.70	(127.15)	9.5×10^{-2}
upstream 1:0 PU1 [1]	−7.35	0.85	(1.06)	0.70	(0.88)	1.3×10^{-1}
downstream 10:100 B1± [1]	7.26	−0.04	(2.24)	0.95	(3.40)	3.0×10^{-2}
downstream 10:100 L1M [2]	7.22	0.34	(0.58)	0.65	(0.96)	1.9×10^{-2}
upstream 10:9 GT2B [3]	7.2	0.34	(0.47)	0.48	(0.51)	4.1×10^{-2}
upstream 10:5 SINE_MIR [1]	7.18	0.20	(0.52)	0.41	(0.69)	2.7×10^{-2}
downstream 0:2 Lx± [1]	7.16	−0.01	(0.47)	0.07	(0.45)	1.4×10^{-1}
upstream 9:8 GT2B [1]	7.14	0.45	(0.74)	0.73	(1.74)	1.5×10^{-1}
upstream 5:4 NFkB [3]	7.12	0.07	(0.25)	0.07	(0.25)	4.7×10^{-1}
upstream 100:10 SINE_B4± [1]	7.11	0.25	(2.37)	−0.06	(2.74)	2.3×10^{-1}
upstream 2:1 AP1 [1]	7.1	1.57	(1.44)	1.84	(1.58)	1.3×10^{-1}
downstream 0:5 LTR± [1]	−7.09	0.00	(0.49)	−0.09	(0.47)	1.1×10^{-1}
upstream 2:1 SIF [1]	7.03	0.09	(0.33)	0.30	(0.55)	9.5×10^{-3}
upstream 2:1 AP2 [3]	−7.01	0.22	(0.41)	0.16	(0.37)	1.4×10^{-1}
upstream 5:0 LINE_CR1± [1]	7	0.00	(0.13)	0.02	(0.26)	2.9×10^{-1}
upstream 7:6 GATA1 [3]	6.99	0.48	(0.50)	0.55	(0.50)	2.0×10^{-1}
upstream 10:5 LINE_L1 [2]	−6.98	4.12	(7.28)	2.88	(5.58)	7.4×10^{-2}
downstream 10:100 L1M [1]	6.94	1.55	(2.17)	2.70	(3.70)	2.3×10^{-2}
upstream 5:0 LINE_L1 [1] × upstream 8:7 Oct1 [1]	−6.93	0.66	(1.85)	0.05	(0.21)	0
downstream 10:100 SINE_B4± [2]	−6.91	24.21	(125.30)	22.56	(132.59)	4.7×10^{-1}
upstream 1:0 GTIIC [1]	6.89	0.26	(0.53)	0.43	(0.70)	5.0×10^{-2}
downstream 10:100 DNA_MER1_type± [2]	6.88	104.58	(182.75)	145.99	(212.34)	1.0×10^{-1}
upstream 100:10 HAL1± [1]	6.86	0.01	(0.47)	0.14	(0.51)	4.9×10^{-2}
upstream 5:4 NFkB [1]	6.85	0.07	(0.27)	0.07	(0.25)	4.9×10^{-1}
upstream 10:9 ATF [3] × upstream 9:8 GTIIC [3]	−6.83	0.09	(0.28)	0.00	(0.00)	0
upstream 10:5 L1MB [2]	−6.82	0.15	(0.90)	0.19	(0.95)	3.9×10^{-1}
upstream 1:0 AP2 [3]	6.81	0.27	(0.45)	0.43	(0.50)	2.1×10^{-2}
upstream 10:5 L1ME± [1]	−6.8	0.00	(0.32)	0.00	(0.30)	4.8×10^{-1}
downstream 0:2 DNA_MER1_type± [1]	6.78	0.00	(0.25)	0.02	(0.26)	2.8×10^{-1}
upstream 4:3 MLTF [1] × upstream 5:4 GTIIC [3]	−6.77	0.22	(0.65)	0.00	(0.00)	0
intron LTR_ERV1 [1]	6.76	0.20	(0.84)	0.68	(1.94)	5.2×10^{-2}
intron LTR_ERV1 [2]	6.74	5.36	(36.66)	19.51	(68.39)	8.9×10^{-2}
upstream 10:9 E4TF1 [3]	6.72	0.09	(0.28)	0.14	(0.35)	1.8×10^{-1}
downstream 10:100 Lx [1]	−6.71	8.60	(8.82)	8.50	(8.54)	4.7×10^{-1}
upstream 100:10 PB± [2]	−6.7	7.36	(64.41)	2.23	(2.08)	0
upstream 5:0 LTR_ERVK± [1]	6.69	0.02	(0.72)	0.20	(1.36)	1.8×10^{-1}
upstream 5:0 LINE_L2 [1]	6.68	0.14	(0.44)	0.18	(0.50)	2.9×10^{-1}
upstream 9:8 NFIII [1]	6.65	1.96	(1.65)	2.48	(1.55)	1.6×10^{-2}
upstream 100:10 LTR_ERVK± [2]	−6.64	466.58	(1242.77)	370.34	(1375.39)	3.2×10^{-1}
upstream 10:5 L1MA± [1]	−6.61	0.00	(0.32)	−0.07	(0.90)	3.1×10^{-1}
downstream 10:100 B1± [2]	6.58	27.06	(107.80)	95.17	(266.56)	4.9×10^{-2}
intron PB± [2]	−6.57	37.70	(135.00)	22.32	(86.05)	1.2×10^{-1}
upstream 10:5 MIR± [1]	−6.55	0.01	(0.45)	−0.14	(0.63)	6.3×10^{-2}
upstream 8:7 MLTF [1]	6.54	0.79	(1.01)	0.84	(0.83)	3.4×10^{-1}
upstream 100:10 LTR± [2]	−6.53	267.12	(443.67)	223.19	(378.58)	2.2×10^{-1}
upstream 6:5 NFuE1 [1]	−6.52	0.08	(0.29)	0.07	(0.25)	3.7×10^{-1}
upstream 5:4 TFIID [1] × upstream 2:1 NFuE5 [3]	−6.48	0.13	(0.49)	0.00	(0.00)	0
upstream 1:0 Lx [2]	−6.47	1.44	(8.05)	0.00	(0.00)	0
upstream 10:0 IgPE2 [1] × upstream 9:8 TFIID [3]	−6.46	0.12	(0.36)	0.00	(0.00)	0
upstream 10:9 NFuE1 [1]	6.44	0.09	(0.30)	0.27	(0.69)	4.2×10^{-2}
upstream 6:5 NFuE5 [3]	6.42	0.16	(0.37)	0.30	(0.46)	3.2×10^{-2}
upstream 2:1 ICSBP [1]	6.4	1.26	(1.20)	1.18	(1.37)	3.6×10^{-1}
upstream 5:0 LTR_MaLR [1] × upstream 10:9 ATF [3]	−6.37	0.23	(0.75)	0.00	(0.00)	0
upstream 10:5 CpGi [1]	6.35	1.35	(1.42)	1.50	(1.52)	2.6×10^{-1}
downstream 10:100 MIR3± [2] × upstream 9:8 Pit1 [3]	−6.34	13.64	(44.81)	0.00	(0.00)	0
upstream 7:6 PU1 [1] × upstream 10:0 IgPE2 [3]	−6.33	0.19	(0.64)	0.00	(0.00)	0
upstream 7:6 PU1 [3] × upstream 10:0 IgPE2 [3]	−6.32	0.11	(0.32)	0.00	(0.00)	0
upstream 5:4 GTIIC [1] × upstream 4:3 MLTF [1]	−6.3	0.26	(0.84)	0.00	(0.00)	0
upstream 10:5 MIR3 [2]	6.29	0.02	(0.17)	0.05	(0.27)	2.2×10^{-1}
upstream 2:0 NF1 [1] × upstream 6:5 TFIID [3]	−6.27	0.12	(0.39)	0.00	(0.00)	0
upstream 10:9 ATF [3] × upstream 2:1 BPVE2 [3]	−6.26	0.11	(0.31)	0.00	(0.00)	0
downstream 10:100 LINE_L1 [2]	−6.25	10.12	(11.01)	10.05	(8.16)	4.8×10^{-1}
upstream 5:0 LINE_CR1 [2]	6.24	0.04	(0.37)	0.13	(0.56)	1.3×10^{-1}
upstream 100:10 L1M± [2]	6.23	194.51	(397.75)	333.23	(588.59)	6.3×10^{-2}
downstream 10:100 LTR [1]	−6.22	2.82	(2.78)	2.09	(2.48)	2.8×10^{-2}
upstream 10:9 NFuE5 [3] × upstream 1:0 PU1 [3]	−6.2	0.09	(0.28)	0.00	(0.00)	0
I [5]	6.18	0.41	(0.49)	0.48	(0.51)	2.0×10^{-1}
upstream 1:0 E4TF1 [1]	6.17	0.11	(0.35)	0.18	(0.50)	1.8×10^{-1}
upstream 9:8 NFuE5 [3]	6.16	0.17	(0.37)	0.32	(0.47)	1.9×10^{-2}
upstream 4:3 Pit1 [1]	−6.15	0.73	(1.14)	0.73	(1.55)	4.9×10^{-1}
downstream 10:100 LTR_ERV1 [2]	6.14	0.52	(1.28)	0.80	(1.68)	1.3×10^{-1}
upstream 8:7 Oct1 [3] × upstream 2:1 NFuE5 [3]	−6.13	0.07	(0.25)	0.00	(0.00)	0
downstream 10:100 DNA_Tip100± [2]	6.1	3.04	(19.31)	2.23	(14.77)	3.6×10^{-1}
upstream 5:0 CpGi [2] × upstream 2:1 Pit1 [3]	−6.09	14.76	(36.78)	1.00	(4.66)	0
upstream 9:8 PU1 [3] × upstream 7:6 Sp1 [3]	−6.08	0.08	(0.27)	0.00	(0.00)	0
upstream 2:0 SRF [1]	−6.07	0.03	(0.16)	0.00	(0.00)	0
upstream 100:10 L1MD [1]	6.06	0.42	(1.11)	0.70	(1.13)	5.0×10^{-2}
upstream 9:8 BPVE2 [3] × upstream 2:0 NFuE5 [3]	−6.05	0.10	(0.30)	0.00	(0.00)	0
upstream 10:0 IgPE2 [1] × upstream 10:9 Oct1 [3]	−6.04	0.09	(0.32)	0.00	(0.00)	0
intron SINE_Alu± [2]	−6.03	30.67	(99.26)	18.97	(87.19)	1.9×10^{-1}
downstream 10:100 DNA_MER2_type± [2]	6	78.08	(153.32)	108.08	(163.95)	1.2×10^{-1}
upstream 10:9 NFuE5 [3] × upstream 2:0 Oct1 [3]	−5.99	0.09	(0.29)	0.00	(0.00)	0
downstream 10:100 L1ME± [2]	5.97	134.36	(283.89)	255.87	(401.42)	2.6×10^{-2}

downstream 10:100 MIR$\pm^{2}$	5.94	59.42	(113.05)	84.20	(129.85)	1.1×10^{-1}
upstream 5:4 IgPE2^{1}	5.93	0.02	(0.15)	0.05	(0.21)	2.3×10^{-1}
upstream 5:4 TFIID$^{3}\times$upstream 2:1 NFuE5^{3}	-5.92	0.08	(0.28)	0.00	(0.00)	0
upstream 2:0 ICSBP^{1}	5.91	2.32	(1.73)	2.39	(2.04)	4.1×10^{-1}
downstream 5:10 L1MA$\pm^{1}$	5.89	0.00	(0.33)	0.07	(0.50)	1.8×10^{-1}
downstream 10:100 LINE_L1$\pm^{1}$	-5.88	-0.18	(3.51)	-0.61	(3.54)	2.1×10^{-1}
downstream 10:100 LINE_CR1^{1}	5.87	0.27	(0.61)	0.25	(0.49)	3.9×10^{-1}
intron LTR_ERVL$\pm^{1}$	-5.86	-0.07	(0.64)	-0.08	(0.90)	4.7×10^{-1}
downstream 10:100 LTR_ERV1$\pm^{1}$	5.85	0.45	(1.86)	0.65	(2.92)	3.3×10^{-1}
upstream 5:4 GTIIC$^{1}\times$upstream 4:3 MLTF^{3}	-5.84	0.17	(0.45)	0.00	(0.00)	0
upstream 10:5 L1^{1}	-5.83	0.25	(0.68)	0.14	(0.41)	3.6×10^{-2}
upstream 10:5 L1MA^{2}	5.82	0.13	(0.86)	0.33	(1.19)	1.3×10^{-1}
upstream 100:90 CpGi^{2,10}	5.79	0.12	(0.29)	0.16	(0.32)	2.1×10^{-1}
upstream 100:10 SINE_Alu$\pm^{1}$	-5.78	0.22	(2.02)	0.08	(2.33)	3.4×10^{-1}
upstream 9:8 NFkB^{3}	5.77	0.07	(0.25)	0.07	(0.25)	5.0×10^{-1}
upstream 5:4 AP1$^{3}\times$upstream 2:1 E4TF1^{3}	-5.76	0.07	(0.25)	0.00	(0.00)	0
upstream 5:0 NFkB$^{1}\times$upstream 70:60 CpGi^{1,11}	-5.74	0.27	(0.94)	0.00	(0.00)	0
upstream 100:10 L1dif$\pm^{2}$	5.73	271.87	(869.58)	569.70	(1212.34)	5.5×10^{-2}
downstream 10:100 LTR$\pm^{2}$	-5.72	257.37	(421.63)	116.15	(224.12)	7.2×10^{-5}
downstream 0:1 L1$\pm^{1}$	5.71	0.00	(0.18)	0.00	(0.00)	8.5×10^{-2}
upstream 2:1 AP2^{1}	-5.69	0.28	(0.59)	0.18	(0.45)	8.4×10^{-2}
upstream 5:0 NFkB$^{3}\times$upstream 70:60 CpGi^{1,11}	-5.67	0.22	(0.68)	0.00	(0.00)	0
downstream 5:10 B2$\pm^{2}\times$upstream 2:1 Pit1^{3}	-5.66	10.50	(39.00)	0.01	(0.09)	0
$I^{7} \times I^{8}$	5.65	0.20	(0.40)	0.30	(0.46)	8.0×10^{-2}
upstream 3:2 NFuE3^{3}	5.64	0.14	(0.34)	0.16	(0.37)	3.4×10^{-1}
downstream 10:100 DNA_AcHobo$\pm^{2}$	-5.62	18.73	(84.49)	2.93	(19.45)	1.6×10^{-6}
upstream 6:5 BPVE2^{1}	5.61	0.44	(0.69)	0.55	(0.63)	1.3×10^{-1}
upstream 6:5 ICSBP^{3}	5.6	0.70	(0.46)	0.80	(0.41)	7.4×10^{-2}
upstream 5:0 CEBP^{1}	5.59	0.15	(0.39)	0.27	(0.59)	9.2×10^{-2}
upstream 10:5 L1$\pm^{1}$	-5.58	0.01	(0.63)	-0.14	(0.41)	9.7×10^{-3}
upstream 2:1 E4TF1$^{1}\times$upstream 5:4 AP1^{3}	-5.57	0.07	(0.28)	0.00	(0.00)	0
upstream 10:5 SINE_MIR^{2}	5.56	0.23	(0.61)	0.41	(0.69)	4.2×10^{-2}
upstream 5:4 TFIID$^{1}\times$upstream 2:1 NFuE5^{1}	-5.55	0.15	(0.59)	0.00	(0.00)	0
upstream 1:0 Pit1^{1}	-5.54	0.49	(0.96)	0.23	(0.48)	3.4×10^{-4}
downstream 0:1 LINE_L1$\pm^{1}$	5.53	-0.01	(0.41)	0.05	(0.30)	1.2×10^{-1}
upstream 2:0 Pit1^{1}	-5.52	1.17	(1.59)	0.61	(0.92)	1.1×10^{-4}
downstream 0:5 L1^{1}	-5.51	0.28	(0.74)	0.16	(0.43)	2.9×10^{-2}
upstream 10:0 ICP4^{1}	5.49	0.56	(0.79)	0.75	(0.97)	1.0×10^{-1}
upstream 5:0 LINE_L1^{2}	-5.48	6.55	(11.90)	5.62	(10.98)	2.9×10^{-1}
upstream 5:0 DNA_MER1_type$\pm^{1}$	-5.47	0.01	(0.44)	-0.05	(0.30)	1.3×10^{-1}
upstream 5:0 LINE_L1^{1}	-5.46	0.98	(1.47)	0.68	(1.58)	1.1×10^{-1}
downstream 5:10 Lx^{1}	5.44	0.48	(1.03)	0.59	(1.04)	2.5×10^{-1}
upstream 10:0 dinucleotide repeats^{1}	-5.43	65.69	(74.17)	60.84	(68.72)	3.2×10^{-1}
upstream 1:0 SIF^{1}	-5.42	0.16	(0.46)	0.20	(0.46)	2.8×10^{-1}
upstream 9:8 ICSBP^{1}	5.41	1.31	(1.18)	1.59	(1.33)	8.2×10^{-2}
upstream 3:2 NFuE3^{1}	5.4	0.15	(0.40)	0.18	(0.45)	3.3×10^{-1}
downstream 10:100 DNA_AcHobo$^{1}\times$upstream 10:0 ATF^{3}	-5.39	0.12	(0.45)	0.00	(0.00)	0
intron LTR_MaLR$\pm^{2}$	-5.37	133.12	(385.40)	27.96	(102.52)	1.3×10^{-8}
upstream 1:0 DNA_MER1_type$\pm^{2}$	-5.36	3.33	(23.88)	0.00	(0.00)	0
downstream 0:5 LTR_MaLR^{2}	-5.35	3.61	(6.74)	2.70	(5.33)	1.3×10^{-1}
upstream 5:0 CpGi$^{2}\times$upstream 2:1 Pit1^{1}	-5.34	21.90	(62.55)	1.00	(4.66)	0
upstream 10:5 LTR_MaLR$\pm^{1}$	-5.33	-0.02	(1.31)	-0.27	(1.74)	1.7×10^{-1}
upstream 2:0 LINE_L1$^{1}\times$upstream 9:8 Oct1^{3}	-5.32	0.15	(0.52)	0.00	(0.00)	0
upstream 10:0 IgPE2$^{1}\times$upstream 7:6 PU1^{3}	-5.31	0.13	(0.37)	0.00	(0.00)	0
upstream 2:1 GTIIC$^{3}\times$upstream 2:0 NFuE5^{3}	-5.3	0.07	(0.26)	0.00	(0.00)	0
downstream 0:1 DNA_MER1_type^{1}	-5.29	0.03	(0.17)	0.02	(0.15)	4.5×10^{-1}
upstream 2:0 DNA_MER1_type^{1}	-5.28	0.06	(0.26)	0.02	(0.15)	6.2×10^{-2}
upstream 2:0 NF1$^{3}\times$ Motif$_{3}^{3}\times$ Motif$_{11}^{3}$	-5.27	0.08	(0.27)	0.00	(0.00)	0
upstream 1:0 TFIID^{3}	5.26	0.40	(0.49)	0.55	(0.50)	3.3×10^{-2}
upstream 1:0 SIF^{3}	-5.24	0.14	(0.34)	0.18	(0.39)	2.3×10^{-1}
upstream 5:0 Pit1^{1}	-5.23	3.35	(2.89)	2.80	(2.45)	7.0×10^{-2}
downstream 0:5 DNA_MER2_type^{1}	-5.21	0.03	(0.21)	0.00	(0.00)	0
upstream 100:90 CpGi^{1,10}	5.18	0.23	(0.61)	0.34	(0.71)	1.6×10^{-1}
exon L1ME^{1}	5.17	0.00	(0.04)	0.02	(0.15)	1.7×10^{-1}
upstream 5:0 L1^{1}	-5.15	0.21	(0.61)	0.07	(0.25)	2.9×10^{-4}
upstream 10:9 AP2^{3}	5.14	0.21	(0.41)	0.25	(0.44)	3.0×10^{-1}
I^{8}	5.12	0.51	(0.50)	0.64	(0.49)	5.2×10^{-2}
downstream 0:5 L1MB^{2}	5.11	0.20	(1.47)	0.82	(5.47)	2.3×10^{-1}
downstream 0:5 DNA_MER2_type^{2}	-5.1	0.10	(0.74)	0.00	(0.00)	0
upstream 7:6 SRF^{1}	5.09	0.01	(0.12)	0.07	(0.25)	8.1×10^{-2}
upstream 5:0 Lx^{2}	-5.07	3.22	(8.34)	2.96	(6.23)	3.9×10^{-1}
exon LINE_L2^{1}	5.05	0.01	(0.08)	0.02	(0.15)	2.3×10^{-1}
upstream 10:0 tetranucl. repeats$^{1}\times$downstream 10:100 LTR$\pm^{2}$	-5.04	10456.21	(25473.71)	1758.18	(4071.34)	0
$I^{6}\times$upstream 4:3 E4TF1^{3}	-5.02	0.08	(0.27)	0.00	(0.00)	0
upstream 10:5 L1M$\pm^{1}$	-5.01	0.00	(0.43)	-0.11	(0.65)	1.3×10^{-1}
upstream 5:0 NFkB^{3}	5	0.29	(0.45)	0.25	(0.44)	3.0×10^{-1}
upstream 6:5 AP2^{3}	4.99	0.21	(0.41)	0.23	(0.42)	4.0×10^{-1}
upstream 2:0 LTR$\pm^{1}$	4.98	0.00	(0.26)	0.02	(0.15)	1.8×10^{-1}
upstream 2:1 NFuE5$^{1}\times$upstream 8:7 Oct1^{3}	-4.97	0.08	(0.30)	0.00	(0.00)	0
upstream 100:10 LTR^{2}	4.96	0.88	(0.87)	0.92	(0.96)	3.9×10^{-1}
downstream 5:10 ID$\pm^{2}$	4.95	12.83	(32.56)	22.30	(42.28)	7.2×10^{-2}
Motif$_{3}^{3}$	-4.94	0.52	(0.50)	0.30	(0.46)	1.2×10^{-3}
upstream 5:4 AP1$^{3}\times$upstream 4:3 E4TF1^{3}	-4.93	0.07	(0.25)	0.00	(0.00)	0

upstream 4:3 MLTF^{1} ×upstream 70:0 CpGi^{2,10}	−4.92	0.17	(0.36)	0.03	(0.07)	0
downstream 0:2 LTR_ERVL±^{1}	4.9	0.00	(0.17)	0.02	(0.15)	1.3×10^{-1}
intron L1MB±^{1}	4.89	−0.14	(0.98)	−0.17	(1.33)	4.4×10^{-1}
upstream 10:5 MIR3±^{1}	−4.88	0.00	(0.15)	0.00	(0.22)	5.0×10^{-1}
upstream 5:0 ATF^{3}	4.87	0.80	(0.40)	0.93	(0.25)	5.1×10^{-4}
upstream 2:0 MIR^{1}	4.86	0.08	(0.30)	0.11	(0.32)	2.5×10^{-1}
upstream 2:0 SINE_Alu±^{2}	4.85	54.18	(91.59)	25.13	(55.63)	6.2×10^{-4}
downstream 0:1 L1ME^{1}	−4.84	0.01	(0.08)	0.00	(0.00)	0
downstream 10:100 LTR_ERVK^{2}	4.83	1.91	(2.90)	3.24	(5.39)	5.4×10^{-2}
upstream 8:7 COUP^{1}	−4.81	1.94	(1.53)	1.57	(1.58)	6.1×10^{-2}
downstream 5:10 CpGi^{1} ×downstream 10:100 LTR±^{2}	−4.8	266.31	(773.77)	24.19	(88.44)	0
upstream 4:3 E4TF1^{1} ×upstream 9:8 COUP^{3}	−4.79	0.08	(0.28)	0.00	(0.00)	0
downstream 5:10 LTR^{2}	4.78	0.50	(1.67)	0.54	(1.91)	4.5×10^{-1}
upstream 8:7 NFuE3^{3} × Motif$_{3}^{3}$	−4.77	0.08	(0.27)	0.00	(0.00)	0
upstream 5:0 DNA_AcHobo^{1}	−4.76	0.01	(0.10)	0.00	(0.00)	0
upstream 1:0 LINE_L1±^{2}	−4.75	29.56	(115.92)	11.84	(78.54)	7.1×10^{-2}
upstream 1:0 LTR_ERVK^{1}	−4.74	0.03	(0.24)	0.00	(0.00)	0
upstream 10:9 Pit1^{1}	−4.73	0.73	(1.16)	0.75	(1.01)	4.6×10^{-1}
intron DNA_MER2_type±^{2}	−4.72	23.50	(90.10)	9.41	(35.53)	6.1×10^{-3}
upstream 2:0 DNA_MER1_type±^{2}	−4.71	8.22	(39.42)	1.80	(11.91)	4.7×10^{-4}
upstream 5:0 B2^{2}	4.7	0.75	(1.49)	0.53	(1.72)	2.0×10^{-1}
upstream 2:0 TFIID^{1}	4.69	1.45	(1.60)	1.86	(1.88)	7.8×10^{-2}
downstream 10:100 DNA_AcHobo^{1}	−4.66	0.13	(0.46)	0.02	(0.15)	1.5×10^{-5}
upstream 8:7 ATF^{1}	−4.65	0.41	(0.72)	0.30	(0.46)	6.1×10^{-2}
downstream 5:10 ID±^{1}	−4.64	0.01	(0.53)	−0.05	(0.57)	2.7×10^{-1}
upstream 7:6 AP1^{1} ×upstream 10:9 Sp1^{3}	−4.63	0.21	(0.77)	0.00	(0.00)	0
intron Lx±^{1}	−4.62	−0.43	(1.62)	−0.32	(1.84)	3.4×10^{-1}
downstream 10:100 LINE_L2±^{1}	4.6	0.12	(1.92)	0.19	(1.48)	3.7×10^{-1}
upstream 5:4 Pit1^{1}	−4.59	0.72	(1.15)	0.73	(0.87)	4.9×10^{-1}
downstream 0:5 LTR_MaLR^{1}	−4.58	0.72	(1.19)	0.64	(1.37)	3.4×10^{-1}
upstream 10:5 Lx^{2}	−4.57	2.02	(5.08)	1.44	(3.76)	1.6×10^{-1}
upstream 2:0 ATF^{1}	4.56	1.01	(1.26)	1.23	(1.51)	1.8×10^{-1}
upstream 1:0 L1M±^{1}	−4.55	0.00	(0.11)	−0.07	(0.45)	1.6×10^{-1}
upstream 2:0 NFuE5^{1} ×upstream 9:8 BPVE2^{3}	−4.54	0.12	(0.40)	0.00	(0.00)	0
upstream 8:7 NFuE3^{1} × Motif$_{3}^{3}$	−4.53	0.09	(0.31)	0.00	(0.00)	0
intron LTR_ERVK^{1}	−4.52	0.58	(2.26)	0.30	(0.98)	2.9×10^{-2}
upstream 4:3 E4TF1^{1} ×upstream 5:4 AP1^{3}	−4.51	0.07	(0.27)	0.00	(0.00)	0
upstream 5:0 LINE_L1±^{2}	−4.5	190.24	(432.26)	145.51	(300.84)	1.7×10^{-1}
upstream 10:9 GTIIC^{3}	4.49	0.27	(0.45)	0.32	(0.47)	2.7×10^{-1}
upstream 4:3 AP2^{1}	4.48	0.27	(0.61)	0.30	(0.67)	4.1×10^{-1}
upstream 1:0 LTR_MaLR±^{2}	4.46	15.59	(69.34)	23.07	(87.01)	2.9×10^{-1}
upstream 10:0 IgPE2^{1} ×upstream 2:0 GT2B^{3}	−4.45	0.11	(0.36)	0.00	(0.00)	0
upstream 8:7 TFIID^{1}	4.44	0.86	(1.09)	1.14	(1.47)	1.1×10^{-1}
downstream 0:2 LTR_ERVK^{2}	−4.43	1.68	(9.79)	0.00	(0.00)	0
intron MIR±^{2}	−4.42	29.33	(74.42)	23.19	(69.20)	2.8×10^{-1}
upstream 5:0 NFuE3^{1}	4.41	0.68	(0.92)	0.61	(0.97)	3.3×10^{-1}
upstream 10:0 IgPE2^{3}	−4.4	0.18	(0.39)	0.11	(0.32)	8.2×10^{-2}
upstream 1:0 L1M^{1}	4.39	0.01	(0.11)	0.07	(0.45)	2.0×10^{-1}
downstream 0:1 MIR±^{1}	−4.38	0.00	(0.17)	−0.02	(0.15)	1.8×10^{-1}
upstream 10:9 APF^{3} ×upstream 10:9 Sp1^{3}	−4.37	0.10	(0.29)	0.00	(0.00)	0
upstream 10:5 LINE_L1^{2} ×upstream 5:0 E4TF1^{3}	−4.36	1.33	(4.44)	0.04	(0.18)	0
upstream 4:3 MLTF^{3} ×upstream 10:0 IgPE2^{3}	−4.35	0.10	(0.29)	0.00	(0.00)	0
upstream 2:1 NF1^{3}	4.32	0.11	(0.31)	0.09	(0.29)	3.7×10^{-1}
downstream 0:2 L1±^{1}	−4.31	0.00	(0.32)	−0.02	(0.26)	3.0×10^{-1}
upstream 4:3 MLTF^{1} ×upstream 60:0 CpGi^{2,10}	−4.3	0.17	(0.36)	0.02	(0.06)	0
upstream 10:0 Sp1^{3}	4.29	0.72	(0.45)	0.84	(0.37)	1.6×10^{-2}
upstream 4:3 CEBP^{1}	4.28	0.03	(0.18)	0.05	(0.21)	3.4×10^{-1}
downstream 10:100 LINE_L1±^{2}	4.27	84.49	(505.75)	113.53	(441.66)	3.3×10^{-1}
upstream 2:1 NFuE5^{3} × Motif$_{3}^{3}$	−4.26	0.08	(0.28)	0.00	(0.00)	0
upstream 9:8 TFIID^{1} ×upstream 10:0 IgPE2^{3}	−4.25	0.18	(0.61)	0.00	(0.00)	0
upstream 3:2 IgPE2^{1}	4.23	0.02	(0.14)	0.07	(0.33)	1.7×10^{-1}
upstream 2:0 AP1^{1}	4.22	2.81	(2.09)	2.89	(1.94)	3.9×10^{-1}
upstream 5:0 B1±^{1}	−4.21	0.05	(1.36)	−0.11	(0.84)	9.7×10^{-2}
upstream 100:10 MIR3±^{2}	4.2	31.53	(64.70)	27.51	(54.79)	3.1×10^{-1}
upstream 5:0 LINE_L2±^{2}	4.19	17.77	(70.86)	21.55	(73.27)	3.7×10^{-1}
I^{4} ×upstream 6:5 BPVE2^{3}	−4.18	0.09	(0.28)	0.00	(0.00)	0
downstream 10:100 LINE_L2^{1}	−4.17	2.23	(2.32)	1.43	(1.45)	3.5×10^{-4}
downstream 5:10 B2±^{2}	−4.16	27.87	(60.02)	17.40	(45.29)	6.7×10^{-2}
upstream 5:4 COUP^{1}	4.15	1.94	(1.52)	2.11	(1.35)	2.0×10^{-1}
upstream 2:0 NFkB^{1} ×upstream 5:4 TFIID^{3}	−4.14	0.07	(0.29)	0.00	(0.00)	0
downstream 10:100 L1MA±^{1}	4.13	−0.04	(1.60)	0.22	(1.46)	1.2×10^{-1}
upstream 10:9 PU1^{3} ×upstream 2:1 PEA1^{3}	−4.12	0.06	(0.25)	0.00	(0.00)	0
upstream 5:0 ICSBP^{1}	4.1	6.19	(3.03)	6.52	(3.48)	2.6×10^{-1}
upstream 5:0 LTR^{2}	−4.09	0.95	(3.20)	0.38	(1.96)	3.1×10^{-2}
upstream 3:2 ICP4^{1}	−4.08	0.06	(0.24)	0.09	(0.29)	2.2×10^{-1}
downstream 10:100 SINE_B2±^{2}	4.07	26.27	(129.70)	49.79	(176.94)	1.9×10^{-1}
upstream 10:5 LINE_L1^{2} ×upstream 5:0 E4TF1^{1}	−4.06	1.66	(5.87)	0.06	(0.26)	0
downstream 0:5 LTR_ERVK^{2}	−4.05	2.21	(9.81)	0.77	(3.11)	1.9×10^{-3}
downstream 0:5 LINE_L1^{2}	−4.04	10.89	(23.50)	6.41	(10.75)	4.3×10^{-3}
upstream 8:7 NFuE1^{1}	−4.03	0.08	(0.29)	0.07	(0.25)	3.8×10^{-1}
upstream 100:10 LTR_ERVL±^{2}	−4.02	265.04	(844.28)	133.48	(247.24)	5.4×10^{-4}
I^{5} ×upstream 8:7 E4F1^{3}	−4.01	0.06	(0.24)	0.00	(0.00)	0
downstream 5:10 LTR_MaLR±^{2} ×upstream 5:0 E4TF1^{3}	−4	50.93	(190.13)	0.12	(0.49)	0

intron LTR_ERVK^{2}	-3.99	24.13	(111.92)	14.76	(56.39)	1.4×10^{-1}
downstream 0:5 LINE_L1$\pm^{1}$	3.98	-0.01	(1.48)	0.02	(1.15)	4.2×10^{-1}
downstream 5:10 B2$\pm^{1}$	3.97	0.01	(0.62)	0.07	(0.40)	1.8×10^{-1}
intron HAL1^{1}	3.96	0.04	(0.26)	0.11	(0.62)	2.1×10^{-1}
upstream 6:5 NF1^{3}	-3.95	0.12	(0.32)	0.05	(0.21)	1.5×10^{-2}
upstream 2:0 CP1^{3}	3.94	0.12	(0.32)	0.23	(0.42)	4.5×10^{-2}
upstream 5:0 L1$\pm^{2}$	-3.93	70.89	(260.87)	48.82	(245.21)	2.8×10^{-1}
downstream 10:100 L1MB^{1}	3.92	1.22	(1.85)	1.39	(2.39)	3.2×10^{-1}
downstream 5:10 LINE_L1$\pm^{2}$	-3.91	425.02	(1198.44)	323.57	(637.53)	1.5×10^{-1}
downstream 10:100 LTR$\pm^{2}$ $\times$ upstream 100:0 CpGi^{2,10}	-3.9	56.76	(137.55)	10.27	(27.92)	1.3×10^{-14}
upstream 5:0 LINE_L2^{2}	3.89	0.40	(1.54)	0.43	(1.47)	4.4×10^{-1}
upstream 8:7 GT2B^{3}	3.88	0.34	(0.47)	0.41	(0.50)	1.8×10^{-1}
upstream 2:0 L1M^{1}	3.87	0.02	(0.19)	0.09	(0.47)	1.8×10^{-1}
downstream 0:2 LTR_ERVK^{1}	-3.86	0.09	(0.45)	0.00	(0.00)	0
upstream 100:10 LTR$\pm^{2}$ $\times$ upstream 5:0 E4TF1^{3}	-3.85	94.44	(291.57)	3.33	(20.48)	0
upstream 8:7 SRF^{1}	3.84	0.01	(0.12)	0.05	(0.21)	1.7×10^{-1}
intron L1ME$\pm^{1}$	3.83	-0.09	(0.81)	-0.02	(0.73)	2.7×10^{-1}
upstream 5:0 CEBP^{3}	3.82	0.14	(0.35)	0.23	(0.42)	9.3×10^{-2}
intron Lintron E_L1$\pm^{2}$	3.81	149.85	(651.01)	157.12	(591.05)	4.7×10^{-1}
downstream 10:100 SINE_MIR^{1} $\times$ upstream 70:60 CpGi^{1,11}	-3.8	3.01	(7.21)	0.48	(1.17)	0
upstream 10:9 Sp1^{3} $\times$ upstream 6:5 PU1^{3}	-3.79	0.07	(0.26)	0.00	(0.00)	0
upstream 2:0 Lx$\pm^{2}$	-3.78	36.40	(152.37)	20.89	(94.59)	1.4×10^{-1}
upstream 9:8 E4F1^{1}	3.76	0.20	(0.48)	0.20	(0.46)	4.5×10^{-1}
upstream 20:10 CpGi^{1,11}	3.74	0.75	(1.11)	0.82	(1.23)	3.6×10^{-1}
upstream 10:5 SINE_B4^{1}	3.73	1.16	(1.46)	0.91	(1.07)	6.8×10^{-2}
downstream 0:2 LTR_ERVL^{2}	-3.72	0.26	(3.09)	0.15	(1.00)	2.4×10^{-1}
intron MIR3$\pm^{1}$	-3.71	0.01	(0.42)	0.00	(0.48)	4.2×10^{-1}
downstream 0:1 LTR_ERVL^{2}	-3.7	0.19	(2.97)	0.00	(0.00)	0
upstream 6:5 PU1^{1}	3.69	1.00	(1.14)	1.00	(1.12)	5.0×10^{-1}
downstream 5:10 SINE_B4^{1}	3.68	1.07	(1.38)	1.09	(1.49)	4.6×10^{-1}
upstream 2:1 NFkB^{3}	3.67	0.06	(0.24)	0.11	(0.32)	1.5×10^{-1}
upstream 7:6 MLTF^{3}	-3.66	0.51	(0.50)	0.48	(0.51)	3.6×10^{-1}
downstream 0:1 MIR3^{2}	3.65	0.05	(0.77)	0.45	(3.02)	1.9×10^{-1}
upstream 10:0 NFuE5^{1}	3.63	1.83	(1.64)	2.11	(1.53)	1.1×10^{-1}
upstream 100:10 LTR_ERVL^{1}	3.62	1.22	(1.74)	2.32	(4.38)	5.2×10^{-2}
upstream 2:1 CP1^{1}	3.61	0.06	(0.25)	0.14	(0.35)	6.7×10^{-2}
upstream 10:9 GATA1^{3} $\times$ upstream 80:70 CpGi^{2,10}	-3.6	0.06	(0.21)	0.00	(0.00)	0
upstream 5:0 MIR^{2}	-3.59	0.43	(1.15)	0.29	(0.71)	9.5×10^{-2}
upstream 100:10 HAL1$\pm^{2}$	-3.58	23.23	(92.79)	14.41	(57.53)	1.6×10^{-1}
upstream 10:0 E2F^{1}	-3.57	0.12	(0.37)	0.05	(0.21)	1.0×10^{-2}
upstream 2:0 TFIID^{3}	3.56	0.65	(0.48)	0.77	(0.42)	3.5×10^{-2}
intron Lx^{2}	-3.55	73.59	(309.06)	72.32	(172.32)	4.8×10^{-1}
upstream 5:4 BPVE2^{3}	-3.54	0.34	(0.47)	0.34	(0.48)	4.9×10^{-1}
downstream 5:10 B1^{2}	3.53	1.41	(1.88)	1.07	(1.73)	9.9×10^{-2}
I^{8} $\times$ upstream 60:50 CpGi^{1,10}	-3.52	0.15	(0.51)	0.00	(0.00)	0
upstream 10:5 LINE_CR1^{2}	-3.51	0.02	(0.20)	0.00	(0.00)	0
upstream 2:1 MLTF^{3} $\times$ upstream 2:1 NFuE5^{3}	-3.5	0.09	(0.28)	0.00	(0.00)	0
upstream 10:5 B2^{2}	3.49	0.40	(0.78)	0.47	(1.05)	3.2×10^{-1}
upstream 2:0 LTR_ERV1$\pm^{2}$	3.48	3.98	(47.69)	7.39	(49.00)	3.2×10^{-1}
upstream 2:1 NFuE3^{3}	3.47	0.12	(0.32)	0.11	(0.32)	4.6×10^{-1}
upstream 4:3 MLTF^{3} $\times$ upstream 90:0 CpGi^{2,10}	-3.46	0.11	(0.19)	0.02	(0.06)	5.2×10^{-13}
upstream 9:8 E4TF1^{3}	-3.45	0.09	(0.28)	0.07	(0.25)	3.3×10^{-1}
upstream 10:9 APF^{3}	3.44	0.83	(0.38)	0.86	(0.35)	2.5×10^{-1}
upstream 10:0 NFuE3^{1}	3.43	1.46	(1.45)	1.39	(1.48)	3.7×10^{-1}
upstream 1:0 PEA2^{1}	-3.42	0.03	(0.19)	0.02	(0.15)	3.6×10^{-1}
upstream 10:9 Sp1^{1} $\times$ upstream 10:9 APF^{3}	-3.41	0.13	(0.53)	0.00	(0.00)	0
upstream 7:6 NF1^{3}	3.4	0.11	(0.32)	0.11	(0.32)	4.9×10^{-1}
downstream 5:10 SINE_B4^{2}	3.39	1.39	(1.85)	1.53	(2.30)	3.5×10^{-1}
upstream 9:8 CEBP^{1}	3.38	0.03	(0.19)	0.05	(0.21)	3.6×10^{-1}
downstream 5:10 DNA_MER2_type^{1}	-3.37	0.03	(0.22)	0.00	(0.00)	0
downstream 0:1 Lx^{2}	3.35	2.06	(11.10)	1.61	(10.66)	3.9×10^{-1}
upstream 2:0 NFuE3^{3}	3.34	0.18	(0.39)	0.14	(0.35)	1.9×10^{-1}
upstream 100:10 L1MD$\pm^{2}$	3.33	72.98	(231.85)	139.79	(280.32)	6.1×10^{-2}
upstream 100:10 MIR^{1} $\times$ downstream 10:100 MIR^{2}	-3.32	1.78	(3.73)	0.46	(0.84)	9.2×10^{-14}
upstream 100:10 LTR_MaLR^{2} $\times$ upstream 100:10 Lx$\pm^{2}$	-3.31	950.25	(3613.89)	89.11	(307.15)	0
upstream 6:5 NFuE4^{1}	-3.3	0.05	(0.22)	0.05	(0.21)	4.8×10^{-1}
intron LTR$\pm^{1}$	3.29	-0.05	(0.86)	-0.05	(0.57)	4.6×10^{-1}
downstream 0:1 LTR_ERVL^{1}	-3.28	0.01	(0.10)	0.00	(0.00)	0
downstream 10:100 SINE_B2$\pm^{1}$	-3.27	-0.06	(2.37)	-0.30	(2.87)	2.9×10^{-1}
upstream 6:5 NFuE1^{3}	-3.26	0.08	(0.27)	0.07	(0.25)	4.1×10^{-1}
upstream 100:10 LTR$\pm^{2}$ $\times$ upstream 5:0 E4TF1^{1}	-3.25	121.71	(410.71)	6.54	(40.97)	0
upstream 2:1 GTIIC^{1}	-3.24	0.31	(0.58)	0.32	(0.56)	4.8×10^{-1}
upstream 100:10 SINE_MIR$\pm^{2}$	-3.23	54.65	(110.17)	52.96	(125.68)	4.6×10^{-1}
upstream 100:10 CpGi^{3} $\times$ downstream 10:100 LTR$\pm^{2}$	-3.22	112.41	(305.86)	9.17	(56.80)	5.6×10^{-16}
upstream 5:0 ICSBP^{3} $\times$ upstream 10:0 GT2B^{3}	3.21	0.92	(0.27)	1.00	(0.00)	0
I^{8} $\times$ upstream 60:50 CpGi^{2,10}	-3.2	0.07	(0.24)	0.00	(0.00)	0
upstream 100:10 MIR^{1}	-3.19	3.30	(3.55)	1.91	(2.34)	1.6×10^{-4}
upstream 100:10 LTR_MaLR^{2}	-3.18	3.78	(2.21)	4.21	(2.64)	1.4×10^{-1}
downstream 10:100 L1MC^{2}	-3.17	0.24	(0.42)	0.29	(0.61)	2.8×10^{-1}
downstream 10:100 LTR_ERV^{1}	3.16	0.01	(0.13)	0.05	(0.21)	1.7×10^{-1}
downstream 10:100 L1MD$\pm^{2}$	-3.15	71.67	(233.62)	27.16	(66.40)	3.3×10^{-5}
upstream 5:4 GTIIC^{3} $\times$ upstream 2:0 NFuE5^{3}	-3.14	0.07	(0.26)	0.00	(0.00)	0
upstream 2:1 NFuE5^{1} $\times$ upstream 2:1 MLTF^{3}	-3.12	0.10	(0.34)	0.00	(0.00)	0

downstream 5:10 L1MC^{2}	-3.11	0.12	(0.76)	0.04	(0.26)	2.8×10^{-2}
upstream 7:6 SIF^{3}	3.1	0.08	(0.27)	0.09	(0.29)	4.0×10^{-1}
upstream 7:6 CP1^{1}	-3.09	0.06	(0.26)	0.02	(0.15)	6.9×10^{-2}
upstream 9:8 CP1^{1}	-3.08	0.06	(0.26)	0.09	(0.29)	2.3×10^{-1}
upstream 100:10 MIR^{2} $\times$downstream 10:100 MIR^{1}	-3.07	1.80	(3.79)	0.45	(0.78)	4.2×10^{-15}
upstream 4:3 ICSBP^{1}	3.06	1.29	(1.19)	1.23	(1.12)	3.5×10^{-1}
downstream 0:1 SINE_B4^{2}	3.05	2.32	(6.52)	4.37	(9.95)	8.9×10^{-2}
downstream 0:1 SINE_MIR$\pm^{1}$	-3.04	0.00	(0.18)	0.00	(0.22)	4.8×10^{-1}
intron MIR3$\pm^{2}$	-3.03	9.64	(37.69)	5.96	(27.79)	1.9×10^{-1}
upstream 9:8 Oct1^{3}	3.02	0.43	(0.49)	0.48	(0.51)	2.5×10^{-1}
upstream 2:0 SINE_MIR^{2}	3.01	0.49	(1.82)	0.54	(1.61)	4.2×10^{-1}
upstream 1:0 Pit1^{3}	-3	0.31	(0.46)	0.20	(0.41)	4.8×10^{-2}
upstream 5:0 LTR^{1}	-2.99	0.16	(0.52)	0.07	(0.33)	3.4×10^{-2}
upstream 10:5 LINE_L2$\pm^{1}$	2.98	0.00	(0.43)	-0.02	(0.40)	3.6×10^{-1}
upstream 10:9 Sp1^{3} $\times$upstream 8:7 MLTF^{3}	-2.97	0.07	(0.25)	0.00	(0.00)	0
upstream 100:10 Lx$\pm^{2}$ $\times$upstream 6:5 APF^{1}	-2.96	559.98	(2452.06)	19.65	(88.96)	0
upstream 5:4 NF1^{1} $\times$upstream 10:0 E4TF1^{3}	-2.95	0.08	(0.30)	0.00	(0.00)	0
downstream 0:2 LTR_MaLR^{1}	-2.94	0.25	(0.62)	0.07	(0.25)	1.3×10^{-5}
upstream 5:0 Sp1^{3}	2.93	0.58	(0.49)	0.70	(0.46)	4.4×10^{-2}
upstream 10:5 ID^{1} $\times$ Motif$_{3}^{3}$	-2.92	0.13	(0.43)	0.00	(0.00)	0
upstream 2:0 GT2B^{3} $\times$upstream 60:50 CpGi^{2,10}	-2.91	0.07	(0.23)	0.00	(0.00)	0
upstream 5:0 DNA^{1}	2.9	0.00	(0.07)	0.02	(0.15)	2.1×10^{-1}
downstream 0:1 LINE_L2^{1}	2.89	0.01	(0.12)	0.02	(0.15)	3.6×10^{-1}
upstream 2:0 PU1^{3}	-2.88	0.77	(0.42)	0.73	(0.45)	2.8×10^{-1}
downstream 0:2 PB^{1}	2.87	1.02	(1.43)	0.80	(1.19)	1.1×10^{-1}
upstream 100:10 SINE_B2^{2} $\times$upstream 2:0 Pit1^{1}	-2.86	3.48	(6.15)	0.77	(1.31)	0
upstream 5:0 PB^{2}	2.85	7.80	(7.64)	5.21	(6.84)	8.0×10^{-3}
upstream 6:5 AP1^{1} $\times$upstream 50:40 CpGi^{2,10}	-2.84	0.23	(0.72)	0.00	(0.00)	0
downstream 10:100 LTR$\pm^{2}$ $\times$downstream 10:100 PB^{2}	-2.83	1751.57	(3584.60)	403.86	(890.29)	3.2×10^{-13}
downstream 0:2 SINE_B2^{1} $\times$upstream 40:0 CpGi^{2,10}	-2.82	0.08	(0.27)	0.00	(0.02)	0
upstream 10:5 SINE_Alu^{1}	2.81	2.16	(2.37)	1.59	(1.83)	2.3×10^{-2}
upstream 4:3 SIF^{3} $\times$upstream 2:0 ICSBP^{3}	-2.8	0.07	(0.25)	0.00	(0.00)	0
upstream 10:9 PU1^{3} $\times$upstream 80:70 CpGi^{2,10}	-2.79	0.07	(0.24)	0.00	(0.00)	0
upstream 9:8 GTIIC^{3}	2.78	0.27	(0.45)	0.39	(0.49)	6.9×10^{-2}
downstream 10:100 L1MD^{1}	-2.77	0.41	(1.09)	0.23	(0.57)	2.1×10^{-2}
upstream 5:4 PU1^{3}	-2.76	0.59	(0.49)	0.57	(0.50)	4.0×10^{-1}
intron L1M^{2}	2.75	8.44	(35.48)	25.80	(86.37)	9.5×10^{-2}
exon CpGi^{1} $\times$upstream 60:50 CpGi^{1,10}	-2.74	0.32	(1.23)	0.00	(0.00)	0
upstream 4:3 APF^{1}	-2.73	2.29	(1.85)	2.20	(1.82)	3.8×10^{-1}
upstream 10:0 Pit1^{3}	2.72	0.95	(0.22)	1.00	(0.00)	0
upstream 2:1 ATF^{1} $\times$upstream 10:9 ATF^{3}	-2.71	0.14	(0.47)	0.00	(0.00)	0
downstream 0:2 SINE_B4$\pm^{2}$	2.7	40.21	(85.61)	63.42	(126.25)	1.1×10^{-1}
downstream 0:5 DNA_AcHobo^{1}	2.69	0.01	(0.09)	0.07	(0.45)	1.8×10^{-1}
upstream 2:0 CpGi^{1}	2.68	0.58	(0.69)	0.66	(0.71)	2.3×10^{-1}
upstream 4:3 AP1^{3} $\times$upstream 60:50 CpGi^{2,10}	-2.67	0.10	(0.27)	0.00	(0.00)	0
upstream 10:5 SINE_ID^{1} $\times$upstream 7:6 MLTF^{1}	-2.66	0.19	(0.75)	0.00	(0.00)	0
exon DNA_MER1_type$\pm^{1}$	-2.65	0.00	(0.09)	0.02	(0.15)	1.7×10^{-1}
upstream 8:7 GTIIC^{3} $\times$upstream 5:0 E4TF1^{3}	-2.64	0.10	(0.30)	0.00	(0.00)	0
upstream 2:0 AP1^{3}	2.63	0.86	(0.35)	0.91	(0.29)	1.3×10^{-1}
upstream 1:0 MIR$\pm^{1}$	-2.62	0.00	(0.20)	-0.02	(0.26)	3.1×10^{-1}
upstream 8:7 E4F1^{1}	-2.61	0.20	(0.50)	0.14	(0.46)	1.8×10^{-1}
upstream 10:5 MIR$\pm^{2}$	2.6	16.78	(48.62)	26.66	(55.68)	1.2×10^{-1}
upstream 2:1 BPVE2^{1}	-2.59	0.43	(0.68)	0.36	(0.57)	2.4×10^{-1}
upstream 100:10 SINE_B4^{1} $\times$intron LTR_MaLR$\pm^{2}$	-2.58	2978.83	(9905.14)	252.72	(893.10)	0
upstream 1:0 PB^{2} $\times$upstream 9:8 TFIID^{3}	-2.57	2.54	(7.50)	0.00	(0.00)	0
upstream 10:9 NFuE5^{1} $\times$ Motif$_{3}^{3}$	-2.56	0.10	(0.34)	0.00	(0.00)	0
downstream 10:100 LINE_L2^{1} $\times$downstream 10:100 SINE_B2^{2}	-2.55	7.91	(10.63)	2.48	(3.49)	1.5×10^{-13}
upstream 5:0 B1^{1} $\times$upstream 3:2 NFIII^{3}	-2.54	0.93	(1.44)	0.23	(0.52)	1.3×10^{-11}
upstream 2:0 LINE_L2^{2}	-2.53	0.38	(2.18)	0.10	(0.64)	3.0×10^{-3}
upstream 100:10 LTR_MaLR^{2} $\times$upstream 60:50 CpGi^{1,10}	-2.52	0.89	(2.63)	0.03	(0.18)	0
upstream 2:0 Pit1^{3} $\times$upstream 60:50 CpGi^{1,10}	-2.51	0.12	(0.45)	0.00	(0.00)	0
upstream 5:0 AP2^{3} $\times$upstream 80:70 CpGi^{2,10}	-2.5	0.09	(0.26)	0.00	(0.00)	0
downstream 0:5 B1^{2} $\times$upstream 5:4 MLTF^{1}	-2.49	2.11	(5.49)	0.19	(0.93)	0
intron DNA_AcHobo$\pm^{1}$	2.48	0.00	(0.19)	0.02	(0.15)	1.5×10^{-1}
upstream 5:4 MLTF^{3}	2.47	0.50	(0.50)	0.52	(0.51)	3.8×10^{-1}
upstream 100:10 Lx$\pm^{2}$ $\times$upstream 8:7 ICSBP^{3}	-2.46	178.11	(669.94)	9.89	(51.75)	0
downstream 0:1 DNA_MER1_type$\pm^{1}$	-2.45	0.00	(0.17)	-0.02	(0.15)	1.6×10^{-1}
upstream 6:5 NFIII^{3} $\times$upstream 60:50 CpGi^{2,10}	-2.44	0.10	(0.27)	0.00	(0.00)	0
upstream 6:5 AP1^{1} $\times$upstream 50:40 CpGi^{1,10}	-2.43	0.44	(1.49)	0.00	(0.00)	0
upstream 6:5 ICSBP^{1} $\times$upstream 60:50 CpGi^{2,10}	-2.42	0.16	(0.55)	0.00	(0.00)	0
downstream 0:2 SINE_MIR^{1}	-2.41	0.07	(0.27)	0.05	(0.21)	2.7×10^{-1}
upstream 9:8 ICP4^{1}	-2.4	0.05	(0.24)	0.07	(0.33)	3.9×10^{-1}
upstream 4:3 SIF^{1} $\times$upstream 5:0 PU1^{3}	-2.39	0.08	(0.31)	0.00	(0.00)	0
upstream 9:8 TFIID^{3}	-2.38	0.52	(0.50)	0.41	(0.50)	7.0×10^{-2}
upstream 1:0 PB^{1} $\times$upstream 1:0 GATA1^{3}	-2.37	0.15	(0.51)	0.00	(0.00)	0
downstream 5:10 Lx$\pm^{1}$	2.36	0.00	(0.97)	0.02	(1.07)	4.4×10^{-1}
upstream 8:7 AP2^{1}	-2.35	0.27	(0.63)	0.20	(0.46)	1.6×10^{-1}
upstream 8:7 NF1^{3}	-2.34	0.12	(0.32)	0.16	(0.37)	2.3×10^{-1}
upstream 50:40 CpGi^{1,10}	-2.33	0.25	(0.63)	0.09	(0.36)	2.6×10^{-3}
upstream 5:0 LTR_ERVK^{1}	2.32	0.20	(0.74)	0.20	(1.36)	5.0×10^{-1}
upstream 100:10 SINE_MIR^{1}	-2.31	3.75	(4.01)	2.30	(2.66)	3.9×10^{-4}
upstream 2:1 BPVE2^{3}	-2.3	0.33	(0.47)	0.32	(0.47)	4.1×10^{-1}
upstream 4:3 AR^{3}	2.29	0.95	(0.22)	1.00	(0.00)	0

upstream 100:10 CpGi^{3} ×upstream 5:0 B1^{2}	−2.28	1.95	(3.68)	0.23	(0.91)	2.2×10^{-16}
upstream 7:6 ICP4^{3}	2.27	0.05	(0.22)	0.09	(0.29)	1.8×10^{-1}
upstream 7:6 GTIIC^{3}	2.26	0.27	(0.45)	0.30	(0.46)	3.8×10^{-1}
downstream 10:100 LTR±^{2} ×downstream 10:100 SINE_Alu^{1}	−2.25	8839.77	(19397.95)	1920.64	(5298.05)	2.6×10^{-11}
upstream 10:0 ETFA^{1}	−2.24	0.56	(0.80)	0.50	(0.76)	3.0×10^{-1}
upstream 1:0 ATF^{1}	2.23	0.61	(0.97)	0.61	(0.89)	4.9×10^{-1}
downstream 10:100 LTR_MaLR^{1} ×upstream 60:50 CpGi^{1,10}	−2.22	3.54	(10.29)	0.18	(1.21)	0
downstream 0:5 B1^{1} ×upstream 5:4 MLTF^{1}	−2.21	0.82	(2.14)	0.07	(0.33)	0
upstream 5:0 B2±^{2} ×upstream 10:0 NFkB^{3}	−2.2	14.06	(44.17)	0.02	(0.15)	0
upstream 1:0 PB^{2} ×downstream 10:100 LTR^{1}	−2.19	14.84	(42.66)	1.42	(6.20)	0
upstream 10:5 PB±^{1}	−2.18	0.11	(2.36)	−0.94	(2.23)	1.5×10^{-3}
upstream 100:10 Lx±^{2} ×upstream 8:7 COUP^{1}	−2.17	511.59	(1886.44)	27.56	(155.49)	0
downstream 0:5 MIR^{2}	2.16	0.32	(0.99)	0.31	(0.87)	4.8×10^{-1}
downstream 10:100 MIR^{1} ×downstream 10:100 SINE_B2^{2}	−2.15	11.74	(15.67)	3.90	(4.02)	1.1×10^{-16}
upstream 2:1 IgPE2^{1}	−2.14	0.02	(0.14)	0.00	(0.00)	0
upstream 5:4 CP1^{1}	−2.13	0.06	(0.26)	0.05	(0.21)	3.3×10^{-1}
downstream 0:5 CpGi^{2}	2.12	22.81	(46.86)	18.75	(49.28)	2.9×10^{-1}
upstream 10:9 E4F1^{3}	−2.11	0.17	(0.37)	0.14	(0.35)	2.9×10^{-1}
downstream 0:1 LINE_L1^{1}	−2.1	0.13	(0.41)	0.05	(0.30)	3.7×10^{-2}
upstream 6:5 GATA1^{1}	−2.09	0.70	(0.91)	0.68	(1.12)	4.5×10^{-1}
upstream 10:5 LTR_ERVL±^{1}	−2.08	0.00	(0.34)	−0.02	(0.26)	2.8×10^{-1}
Motif$_{7}^{3}$	2.07	0.05	(0.21)	0.07	(0.25)	2.8×10^{-1}
upstream 100:10 LINE_L2^{2} ×upstream 5:0 B1^{1}	−2.06	0.40	(0.92)	0.06	(0.16)	0
downstream 5:10 SINE_B4±^{2} ×upstream 10:5 SINE_B2^{2}	−2.05	183.63	(511.40)	13.56	(47.67)	0
downstream 0:2 B2±^{2}	2.04	11.45	(37.56)	11.68	(35.01)	4.8×10^{-1}
downstream 5:10 PB^{2}	2.03	3.78	(3.85)	3.45	(4.22)	3.0×10^{-1}
upstream 10:5 DNA_MER2_type^{1}	−2.02	0.03	(0.22)	0.00	(0.00)	0
upstream 10:0 NF1^{3}	−2.01	0.67	(0.47)	0.59	(0.50)	1.5×10^{-1}
downstream 10:100 MIR3^{1} ×downstream 0:5 B1^{1}	−2	0.50	(1.68)	0.02	(0.15)	0
downstream 10:100 DNA_MER1_type^{1} ×upstream 60:50 CpGi^{1,10}	−1.99	0.72	(2.32)	0.02	(0.15)	0
indownstream 10:100 CpGi^{1} ×upstream 7:6 E4F1^{3}	−1.98	0.07	(0.25)	0.00	(0.00)	0
downstream 0:1 ID^{2}	1.97	0.27	(1.48)	0.17	(1.13)	2.8×10^{-1}
dsenh1×downstream 0:1 SINE_B2±^{2}	−1.96	23.65	(67.66)	0.00	(0.00)	0
upstream 6:5 GT2B^{1}	1.95	0.45	(0.74)	0.45	(0.63)	4.6×10^{-1}
upstream 1:0 SINE_B4^{2}	−1.94	1.93	(5.67)	0.92	(3.67)	3.7×10^{-2}
upstream 1:0 PB^{2} ×upstream 2:0 GATA1^{1}	−1.93	5.62	(16.41)	0.36	(2.41)	0
downstream 0:5 SINE_ID±^{2} ×upstream 100:0 CpGi^{2,10}	−1.92	2.94	(9.62)	0.02	(0.12)	0
downstream 0:2 LINE_L2^{2}	1.91	0.23	(1.73)	0.08	(0.54)	3.9×10^{-2}
upstream 10:5 B1^{2}	1.9	1.55	(1.99)	0.94	(1.56)	6.5×10^{-3}
indownstream 10:100 CpGi^{1} ×upstream 7:6 ATF^{1}	−1.89	0.19	(0.54)	0.00	(0.00)	0
upstream 100:10 CpGi^{1}	1.88	10.06	(7.54)	7.73	(5.23)	2.5×10^{-3}
upstream 6:5 ATF^{1}	1.87	0.39	(0.70)	0.41	(0.69)	4.4×10^{-1}
upstream 5:0 B2±^{2} ×upstream 10:0 NFkB^{1}	−1.86	20.68	(76.72)	0.07	(0.44)	0
downstream 0:2 LTR_ERVK±^{1}	−1.85	0.02	(0.44)	0.00	(0.00)	1.5×10^{-11}
downstream 0:5 B2^{2}	1.84	0.65	(1.38)	0.53	(1.32)	2.8×10^{-1}
upstream 100:10 CpGi^{2}	1.83	21.75	(18.51)	16.82	(11.91)	4.4×10^{-3}
upstream 100:10 LINE_L1^{1}	1.82	21.50	(15.53)	29.09	(16.32)	1.8×10^{-3}
upstream 2:0 Oct1^{3}	1.81	0.57	(0.49)	0.61	(0.49)	2.9×10^{-1}
downstream 10:100 MIR^{2}	−1.8	0.37	(0.40)	0.23	(0.19)	9.5×10^{-6}
upstream 100:10 SINE_MIR^{1} ×upstream 5:0 B1±^{2}	−1.79	265.89	(692.10)	35.18	(115.96)	0
upstream 100:10 SINE_Alu^{2} ×downstream 10:100 LTR±^{2}	−1.78	1040.13	(2312.73)	191.80	(416.86)	0
upstream 7:6 AR^{3}	1.77	0.96	(0.21)	1.00	(0.00)	0
upstream 30:20 CpGi^{1,10}	1.76	0.25	(0.64)	0.20	(0.46)	2.4×10^{-1}
upstream 10:0 CpGi^{1,10}	1.75	0.25	(0.64)	0.30	(0.59)	3.0×10^{-1}
downstream 0:5 B1^{2} ×upstream 30:20 CpGi^{1,10}	−1.74	0.86	(3.69)	0.00	(0.00)	0
downstream 10:100 B2^{2} ×downstream 10:100 SINE_MIR^{2}	−1.73	0.31	(0.48)	0.09	(0.11)	0
downstream 0:1 SINE_B2^{1} ×upstream 1:0 NFIII^{3}	−1.72	0.12	(0.40)	0.00	(0.00)	0
upstream 2:0 PB^{2} ×upstream 10:9 ATF^{3}	−1.71	2.20	(6.15)	0.14	(0.93)	0
upstream 10:0 AP1^{3}	1.7	0.96	(0.20)	1.00	(0.00)	0
downstream 0:2 SINE_Alu^{2}	1.69	4.12	(6.28)	2.61	(4.83)	2.2×10^{-2}
upstream 9:8 GATA1^{1}	1.68	0.71	(0.91)	0.77	(0.91)	3.2×10^{-1}
downstream 0:5 LINE_CR1^{2}	−1.67	0.03	(0.32)	0.00	(0.00)	0
downstream 0:1 SINE_Alu^{2}	1.66	3.93	(7.79)	2.89	(6.98)	1.6×10^{-1}
intron LTR_MaLR±^{1}	1.65	−0.76	(2.05)	−0.61	(1.11)	1.9×10^{-1}
upstream 10:5 LINE_L2^{2}	−1.64	0.20	(0.84)	0.17	(0.74)	3.8×10^{-1}
upstream 3:2 NFIII^{3}	1.63	0.78	(0.42)	0.80	(0.41)	3.9×10^{-1}
downstream 5:10 SINE_B2^{2}	1.62	1.86	(2.45)	1.69	(2.68)	3.4×10^{-1}
downstream 0:2 L1MA^{1}	−1.61	0.01	(0.14)	0.00	(0.00)	0
upstream 100:10 CpGi^{3}	1.6	0.44	(0.50)	0.30	(0.46)	1.9×10^{-2}
upstream 4:3 E4F1^{1}	1.59	0.19	(0.48)	0.18	(0.45)	4.4×10^{-1}
upstream 10:0 NFuE5^{3}	1.58	0.79	(0.41)	0.82	(0.39)	2.9×10^{-1}
upstream 6:5 CP1^{1}	−1.57	0.06	(0.25)	0.02	(0.15)	5.2×10^{-2}
downstream 5:10 CpGi^{1} ×upstream 10:5 SINE_B4^{1}	−1.56	1.51	(3.48)	0.25	(0.65)	1.1×10^{-16}
downstream 10:100 Alu±^{1}	1.55	0.00	(0.17)	0.02	(0.15)	1.7×10^{-1}
upstream 100:10 LINE_L2±^{2}	1.54	100.18	(202.92)	85.28	(270.89)	3.6×10^{-1}
upstream 10:0 PEA2^{1}	−1.53	0.18	(0.45)	0.16	(0.43)	3.8×10^{-1}
upstream 2:0 B2±^{2} ×upstream 10:0 E4F1^{3}	−1.52	10.46	(36.22)	0.00	(0.00)	0
upstream 5:0 SINE_B4^{2} ×upstream 4:3 AP2^{1}	−1.51	0.86	(3.37)	0.02	(0.16)	0
upstream 100:10 B2^{2} ×downstream 10:100 DNA_MER1_type^{2}	−1.5	0.30	(0.40)	0.09	(0.12)	1.3×10^{-14}
intron L1MB^{1}	1.49	0.34	(1.20)	0.73	(1.91)	9.4×10^{-2}
upstream 9:8 GATA1^{3}	1.48	0.48	(0.50)	0.52	(0.51)	2.9×10^{-1}
upstream 5:0 SINE_B2^{2} ×upstream 10:9 ATF^{1}	−1.47	1.74	(5.32)	0.10	(0.63)	0
upstream 10:9 NFkB^{1}	1.46	0.07	(0.26)	0.07	(0.25)	5.0×10^{-1}

upstream 100:10 L1±^{2}	−1.45	421.57	(1415.32)	298.50	(720.02)	1.3×10^{-1}
upstream 10:0 NFuE1^{3}	1.44	0.52	(0.50)	0.59	(0.50)	1.9×10^{-1}
downstream 5:10 CpGi^{1} × downstream 0:5 SINE_Alu^{2}	−1.43	5.47	(11.19)	0.80	(2.77)	1.0×10^{-14}
upstream 2:0 IgPE2^{1}	−1.42	0.04	(0.19)	0.00	(0.00)	0
upstream 5:0 PEA2^{1}	−1.41	0.10	(0.33)	0.11	(0.39)	3.8×10^{-1}
downstream 0:5 CpGi^{1} ×downstream 0:5 SINE_Alu^{2}	−1.4	2.52	(6.26)	0.24	(1.43)	5.8×10^{-14}
downstream 0:1 B2^{1}	1.39	0.05	(0.24)	0.09	(0.29)	2.1×10^{-1}
upstream 5:0 SINE_B2^{2} ×upstream 30:20 CpGi^{1,11}	−1.38	3.51	(9.01)	0.25	(1.00)	0
upstream 5:0 NFIII^{1} ×upstream 60:50 CpGi^{1,10}	−1.37	1.91	(5.54)	0.11	(0.75)	0
upstream 100:10 DNA_MER1_type^{2} ×upstream 60:50 CpGi^{1,10}	−1.36	0.11	(0.37)	0.00	(0.00)	0
downstream 0:5 B1^{2} ×upstream 10:9 ATF^{1}	−1.35	1.18	(3.73)	0.00	(0.00)	0
upstream 2:0 SINE_B2±^{2} ×upstream 4:3 MLTF^{3}	−1.34	24.66	(73.94)	0.00	(0.00)	0
downstream 0:5 SINE_MIR^{1}	1.33	0.17	(0.47)	0.16	(0.37)	4.0×10^{-1}
upstream 100:10 SINE_ID^{1} ×upstream 9:8 TFIID^{3}	−1.32	2.00	(3.42)	0.59	(1.09)	2.9×10^{-11}
upstream 100:10 SINE_B2^{2} ×upstream 70:0 CpGi^{2,10}	−1.31	0.78	(0.99)	0.22	(0.32)	4.9×10^{-15}
downstream 0:1 LTR^{2}	−1.3	0.55	(4.85)	0.00	(0.00)	0
upstream 10:5 B1^{1}	1.29	1.21	(1.56)	0.73	(1.21)	5.8×10^{-3}
upstream 1:0 CpGi^{1} ×upstream 2:0 B1^{1}	−1.28	0.24	(0.69)	0.00	(0.00)	0
upstream 6:5 AR^{1} ×upstream 7:6 E4TF1^{3}	−1.27	1.24	(4.32)	0.00	(0.00)	0
upstream 10:9 AR^{1}	1.26	13.85	(5.78)	13.77	(4.08)	4.5×10^{-1}
downstream 0:5 ID^{1} ×upstream 10:0 NFkB^{3}	−1.25	0.10	(0.37)	0.00	(0.00)	0
downstream 10:100 SINE_B4±^{1}	−1.24	−0.12	(2.38)	−0.13	(2.81)	4.9×10^{-1}
upstream 100:10 CpGi^{1} ×downstream 10:100 SINE_B2^{1}	−1.23	264.49	(320.91)	89.77	(101.10)	4.8×10^{-15}
downstream 0:2 SINE_B2±^{2} ×upstream 100:0 CpGi^{2,10}	−1.22	11.19	(30.67)	0.50	(2.35)	0
downstream 5:10 GC^{2} ×upstream 1:0 PB±^{2}	−1.21	1895.13	(3981.01)	271.08	(1048.45)	1.6×10^{-13}
upstream 100:10 MIR^{1} ×upstream 100:10 SINE_ID^{2}	−1.2	1.14	(2.06)	0.28	(0.45)	1.1×10^{-16}
upstream 2:0 B1^{1} ×upstream 2:1 GATA1^{3}	−1.19	0.18	(0.54)	0.00	(0.00)	0
upstream 10:5 CpGi^{2} ×upstream 1:0 PB±^{2}	−1.18	1236.37	(4150.07)	58.57	(278.59)	0
upstream 3:2 MLTF^{3} ×upstream 60:50 CpGi^{1,10}	−1.17	0.13	(0.47)	0.00	(0.00)	0
upstream 10:0 GATA1^{3}	1.16	0.95	(0.21)	0.98	(0.15)	1.6×10^{-1}
upstream 100:10 SINE_B2^{2} ×upstream 60:50 CpGi^{1,10}	−1.15	1.04	(3.15)	0.02	(0.15)	0
upstream 10:0 NF1^{1} ×upstream 60:50 CpGi^{2,10}	−1.14	0.16	(0.57)	0.00	(0.00)	0
upstream 1:0 SINE_Alu^{1}	1.13	0.32	(0.65)	0.09	(0.36)	5.2×10^{-5}
exon GC^{2} ×upstream 7:6 E4TF1^{3}	−1.12	4.40	(14.39)	0.00	(0.00)	0
I^{6} ×upstream 7:6 E4TF1^{3}	−1.11	0.08	(0.27)	0.00	(0.00)	0
downstream 0:2 GC^{2} ×upstream 7:6 E4TF1^{3}	−1.1	3.88	(12.72)	0.00	(0.00)	0
upstream 5:4 E4TF1^{1} ×upstream 4:3 APF^{3}	−1.09	0.08	(0.29)	0.00	(0.00)	0
upstream 100:10 PB^{1} ×upstream 70:0 CpGi^{2,10}	−1.08	12.02	(14.93)	3.78	(5.26)	1.2×10^{-13}
downstream 10:100 LINE_L1^{1} ×downstream 0:5 SINE_ID±^{2}	−1.07	193.78	(601.61)	13.72	(89.22)	0
upstream 100:10 CpGi^{2} ×upstream 1:0 PB^{1}	−1.06	10.95	(28.16)	0.95	(3.94)	0
upstream 100:10 MIR^{1} ×upstream 100:10 SINE_B2^{2}	−1.05	11.88	(15.85)	4.21	(5.76)	1.6×10^{-11}
downstream 0:5 ID±^{2} ×upstream 4:3 AP1^{3}	−1.04	9.58	(27.43)	0.02	(0.16)	0
downstream 10:100 B2^{1} ×upstream 70:0 CpGi^{2,10}	−1.03	1.35	(1.98)	0.42	(0.70)	1.3×10^{-11}
downstream 5:10 CpGi^{1} ×upstream 100:10 B2^{1}	−1.02	8.28	(14.88)	1.55	(3.38)	0
upstream 5:0 AR^{1}	1.01	64.02	(20.89)	63.55	(17.07)	4.3×10^{-1}
upstream 100:10 Alu^{1}	−1	0.03	(0.17)	0.00	(0.00)	0
downstream 0:2 L1MB^{2}	−0.99	0.19	(2.01)	0.00	(0.00)	0
upstream 100:10 B1^{2} ×upstream 9:8 TFIID^{1}	−0.98	1.92	(3.54)	0.53	(0.91)	2.3×10^{-13}
upstream 10:0 AR^{1} ×upstream 1:0 NFkB^{3}	−0.97	10.36	(37.01)	0.00	(0.00)	0
upstream 100:10 SINE_Alu^{2} ×upstream 90:0 CpGi^{2,10}	−0.96	0.97	(1.20)	0.24	(0.33)	0
upstream 2:0 MLTF^{1}	−0.95	1.68	(1.63)	1.93	(2.10)	2.1×10^{-1}
downstream 5:10 SINE_MIR±^{2}	0.94	17.33	(48.58)	9.16	(30.96)	4.4×10^{-2}
upstream 5:0 PB^{2} ×upstream 50:40 CpGi^{2,10}	−0.93	1.19	(3.75)	0.12	(0.45)	0
upstream 4:3 Sp1^{1}	0.92	0.19	(0.68)	0.18	(0.54)	4.8×10^{-1}
upstream 6:5 NFIII^{3}	0.91	0.80	(0.40)	0.91	(0.29)	7.1×10^{-3}
upstream 100:10 B2^{1} ×downstream 10:100 LTR±^{2}	−0.9	1504.83	(3533.04)	304.49	(775.04)	1.5×10^{-13}
upstream 100:10 SINE_B2^{2} ×upstream 100:10 SINE_MIR^{1}	−0.89	13.51	(17.79)	4.81	(6.28)	5.0×10^{-12}
upstream 5:0 SINE_B2^{1} ×downstream 10:100 DNA_MER1_type^{1}	−0.88	3.51	(6.12)	0.77	(1.49)	5.6×10^{-16}
downstream 5:10 CpGi^{1} ×upstream 100:10 SINE_Alu^{1}	−0.87	50.30	(86.85)	10.77	(24.93)	7.6×10^{-14}
upstream 1:0 PB±^{2} ×upstream 5:4 GATA1^{3}	−0.86	19.15	(61.70)	0.00	(0.00)	0
downstream 10:100 SINE_B2^{2} ×upstream 90:0 CpGi^{2,10}	−0.85	0.79	(0.98)	0.22	(0.33)	4.8×10^{-15}
upstream 2:0 SINE_B2^{2} ×upstream 10:0 E4TF1^{1}	−0.84	2.96	(8.91)	0.06	(0.41)	0
upstream 5:0 SINE_B2^{1} ×upstream 4:3 MLTF^{1}	−0.83	0.92	(2.21)	0.11	(0.32)	0
downstream 0:5 SINE_ID^{1} ×upstream 3:2 PU1^{3}	−0.82	0.12	(0.41)	0.00	(0.00)	0
upstream 2:0 SINE_B4±^{2}	−0.81	40.48	(83.49)	27.21	(66.08)	9.5×10^{-2}
upstream 1:0 PB^{2}	−0.8	5.19	(10.10)	1.34	(5.06)	4.5×10^{-6}
upstream 2:0 SINE_Alu^{1} ×upstream 5:0 BPVE2^{1}	0.79	1.67	(3.28)	0.36	(0.94)	4.9×10^{-12}
downstream 0:5 ID^{1} ×upstream 10:0 CpGi^{1,11}	−0.78	0.26	(0.95)	0.00	(0.00)	0
upstream 100:10 SINE_Alu^{1} ×upstream 90:80 CpGi^{2,10}	−0.77	5.44	(15.74)	0.35	(1.52)	0
downstream 5:10 MIR^{1}	0.76	0.17	(0.46)	0.09	(0.29)	4.0×10^{-2}
downstream 10:100 L1dif^{1}	−0.75	0.40	(0.96)	0.41	(0.90)	4.7×10^{-1}
upstream 5:0 SINE_B4^{1} ×upstream 50:40 CpGi^{1,10}	−0.74	0.34	(1.32)	0.00	(0.00)	0
upstream 100:10 CpGi^{3} ×upstream 5:0 SINE_B2±^{2}	−0.73	48.36	(123.28)	2.25	(14.01)	0
downstream 10:100 SINE_B2^{2} ×upstream 60:0 CpGi^{2,10}	−0.72	0.76	(1.06)	0.22	(0.38)	2.5×10^{-12}
upstream 2:0 SINE_B2^{2} ×downstream 10:100 LTR_ERVK^{2}	−0.71	5.42	(21.06)	0.08	(0.37)	0
downstream 10:100 L1MC^{1}	−0.7	1.22	(1.75)	1.23	(1.89)	4.9×10^{-1}
downstream 0:1 GC^{2} ×upstream 100:10 ID^{1}	−0.69	189.48	(202.82)	85.00	(75.05)	4.3×10^{-12}
downstream 10:100 LTR_ERVK^{1}	−0.68	4.36	(5.41)	5.25	(8.17)	2.4×10^{-1}
downstream 5:10 L1MB^{2}	−0.67	0.13	(0.86)	0.09	(0.51)	3.0×10^{-1}
upstream 100:10 B1^{1} ×upstream 60:0 CpGi^{2,10}	−0.66	4.35	(6.32)	1.05	(1.73)	1.1×10^{-16}
upstream 2:0 CpGi^{2} ×upstream 2:0 B1±^{2}	−0.65	3107.15	(9780.42)	0.00	(0.00)	0
upstream 10:5 PB^{2} ×downstream 10:100 B2^{2}	0.64	3.72	(5.84)	1.10	(1.80)	1.0×10^{-12}
upstream 100:10 B2^{1} ×downstream 10:100 SINE_B4^{2}	0.63	20.43	(26.60)	7.00	(8.89)	3.6×10^{-13}

downstream 0:5 SINE_ID$\pm^2$ $\times$ upstream 5:0 PU1^1	-0.62	58.29	(170.65)	3.48	(22.31)	0
upstream 2:0 B1^1 $\times$ upstream 9:8 PU1^3	-0.61	0.25	(0.62)	0.00	(0.00)	0
upstream 100:10 B2^2 $\times$ upstream 5:0 NFkB^1	-0.6	0.25	(0.62)	0.04	(0.11)	1.1×10^{-16}
exon SINE_B4$\pm^1$	-0.59	0.01	(0.19)	0.02	(0.15)	2.2×10^{-1}
upstream 100:10 B1^2 $\times$ upstream 90:0 CpGi^{2,10}	-0.58	0.58	(0.75)	0.14	(0.20)	0
upstream 1:0 SINE_Alu$\pm^2$ $\times$ upstream 4:3 Pit1^3	-0.57	12.26	(42.91)	0.01	(0.08)	0
I^5 $\times$ upstream 1:0 SINE_Alu^1	-0.56	0.12	(0.43)	0.00	(0.00)	0
upstream 10:5 B1^2 $\times$ upstream 10:5 SINE_B2^2	-0.55	5.68	(12.81)	0.75	(2.16)	0
upstream 100:10 DNA_Tip100$\pm^1$	-0.54	0.00	(0.18)	0.02	(0.26)	2.8×10^{-1}
downstream 5:10 LINE_L2$\pm^2$	0.53	14.68	(65.03)	6.02	(28.84)	2.7×10^{-2}
upstream 1:0 B1^2 $\times$ upstream 9:8 PU1^3	-0.52	1.24	(4.35)	0.00	(0.00)	0
downstream 10:100 L1MB$\pm^1$	-0.51	-0.03	(1.80)	0.10	(2.47)	3.6×10^{-1}
upstream 1:0 B1$\pm^2$ $\times$ upstream 5:0 PU1^1	-0.5	84.61	(265.80)	0.02	(0.15)	0
upstream 1:0 SINE_Alu$\pm^2$ $\times$ upstream 6:5 APF^1	-0.49	66.22	(182.88)	2.08	(13.41)	0
upstream 4:3 SIF^3	0.48	0.08	(0.27)	0.02	(0.15)	1.2×10^{-2}
downstream 0:1 GC^2 $\times$ upstream 1:0 B1$\pm^2$	-0.47	872.00	(2363.64)	0.45	(3.00)	0
intron Lintron E_CR1^1	-0.46	0.09	(0.41)	0.09	(0.36)	4.7×10^{-1}
upstream 100:10 CpGi^1 $\times$ upstream 100:10 B2^2	-0.45	1.74	(2.74)	0.50	(0.86)	1.4×10^{-12}
upstream 1:0 B1$\pm^2$ $\times$ upstream 10:0 NFuE5^3	-0.44	15.86	(47.42)	0.01	(0.08)	0
upstream 1:0 B1$\pm^2$ $\times$ upstream 5:0 BPVE2^3	-0.43	16.08	(47.63)	0.00	(0.00)	0
upstream 100:10 B2^2 $\times$ upstream 100:10 PB^2	0.42	7.02	(9.16)	2.30	(3.26)	1.3×10^{-12}
upstream 9:8 PEA2^1	-0.41	0.02	(0.14)	0.00	(0.00)	0
upstream 2:0 SINE_Alu^2 $\times$ upstream 30:20 CpGi^{2,10}	-0.4	0.68	(2.71)	0.00	(0.00)	0
upstream 1:0 SINE_Alu^2 $\times$ upstream 3:2 NFIII^1	-0.39	6.41	(17.38)	0.20	(1.34)	0
downstream 0:2 CpGi^1 $\times$ upstream 100:10 B2^1	-0.38	1.57	(4.67)	0.14	(0.55)	0
upstream 100:10 CpGi^1 $\times$ upstream 100:10 PB^1	-0.37	131.51	(187.12)	49.20	(63.23)	2.9×10^{-11}
upstream 1:0 B1^2 $\times$ upstream 5:0 BPVE2^3	-0.36	1.78	(5.21)	0.00	(0.00)	0
upstream 1:0 B1$\pm^2$ $\times$ upstream 10:0 ATF^1	-0.35	83.61	(268.46)	0.02	(0.15)	0
upstream 1:0 PB^1 $\times$ upstream 10:0 NFuE3^1	-0.34	0.82	(2.29)	0.07	(0.33)	0
upstream 100:10 SINE_Alu^1 $\times$ downstream 10:100 B2^2	-0.33	33.54	(46.38)	8.26	(13.77)	5.6×10^{-16}
upstream 1:0 B1$\pm^2$ $\times$ upstream 9:8 NFIII^1	-0.32	35.27	(124.83)	0.01	(0.08)	0
upstream 1:0 SINE_Alu^2 $\times$ upstream 3:2 PU1^1	-0.31	3.36	(11.18)	0.20	(1.34)	0
upstream 1:0 SINE_Alu$\pm^2$ $\times$ upstream 10:0 Pit1^1	-0.3	193.24	(494.57)	17.08	(78.88)	0
upstream 1:0 B1$\pm^2$ $\times$ upstream 10:0 APF^1	-0.29	411.81	(1177.01)	0.30	(2.00)	0
upstream 1:0 SINE_Alu$\pm^2$ $\times$ upstream 10:0 NFuE3^3	-0.28	23.02	(57.54)	2.03	(13.42)	1.1×10^{-13}
upstream 100:10 SINE_Alu^2 $\times$ downstream 10:100 SINE_ID^1	-0.27	22.97	(35.16)	5.94	(9.60)	1.9×10^{-15}
downstream 5:10 SINE_Alu^1 $\times$ downstream 10:100 ID^1	-0.26	11.42	(20.60)	2.52	(4.10)	0
upstream 100:10 CpGi^1 $\times$ upstream 100:10 B1^1	-0.25	53.77	(84.34)	15.98	(28.38)	1.5×10^{-11}
upstream 1:0 CpGi^2	-0.24	131.37	(184.16)	160.00	(221.57)	2.0×10^{-1}
upstream 2:0 SINE_B2^1 $\times$ downstream 10:100 SINE_B2^2	-0.23	1.90	(4.58)	0.25	(0.93)	1.8×10^{-15}
upstream 100:10 B2^1 $\times$ downstream 10:100 SINE_B2^1	-0.22	173.36	(233.38)	37.64	(55.92)	0
upstream 100:10 B1^1 $\times$ downstream 10:100 SINE_B4^2	0.21	65.34	(82.51)	22.04	(28.38)	2.7×10^{-13}
upstream 2:0 B1^1 $\times$ upstream 6:5 ICSBP^3	0.2	0.31	(0.69)	0.02	(0.15)	1.1×10^{-16}
upstream 100:10 SINE_Alu^1 $\times$ downstream 10:100 SINE_B4^2	0.19	121.21	(148.02)	42.05	(46.92)	1.1×10^{-14}
downstream 10:100 B1^1 $\times$ downstream 10:100 SINE_ID^2	-0.18	7.67	(11.56)	2.11	(3.32)	1.3×10^{-14}
downstream 10:100 B2^2 $\times$ downstream 10:100 SINE_ID^1	-0.17	4.11	(7.08)	1.05	(1.62)	1.1×10^{-16}
upstream 2:0 B1$\pm^2$ $\times$ downstream 10:100 PB$\pm^2$	0.16	148.06	(2732.90)	7.97	(36.82)	7.9×10^{-15}
upstream 5:0 SIF^3	-0.15	0.36	(0.48)	0.43	(0.50)	1.7×10^{-1}
upstream 100:10 SINE_Alu^1 $\times$ downstream 10:100 SINE_Alu^1	0.14	1838.75	(2443.93)	447.48	(732.18)	2.2×10^{-16}
upstream 1:0 SINE_B2^2 $\times$ upstream 2:0 NFIII^1	-0.13	7.94	(28.61)	0.00	(0.00)	0
upstream 1:0 SINE_Alu$\pm^2$ $\times$ upstream 1:0 AR^1	-0.12	328.94	(840.03)	33.80	(159.04)	2.2×10^{-16}
downstream 0:1 GC^2 $\times$ upstream 1:0 SINE_B2$\pm^2$	-0.11	956.93	(2862.94)	0.00	(0.00)	0
upstream 1:0 GC^2 $\times$ upstream 1:0 SINE_B2$\pm^2$	-0.1	955.21	(2827.05)	0.00	(0.00)	0
upstream 100:10 B2^1 $\times$ downstream 10:100 PB^2	0.09	55.96	(71.33)	14.88	(18.81)	0
downstream 10:100 FAM^1	-0.08	0.03	(0.18)	0.00	(0.00)	0
upstream 100:10 PB^2 $\times$ downstream 10:100 SINE_B2^1	-0.07	198.75	(234.97)	65.81	(92.06)	1.5×10^{-12}
upstream 1:0 B1^1 $\times$ upstream 80:0 CpGi^{2,10}	-0.06	0.04	(0.13)	0.00	(0.00)	0
upstream 1:0 SINE_B2$\pm^2$ $\times$ upstream 5:0 ICSBP^1	-0.05	133.62	(436.81)	0.00	(0.00)	0
upstream 1:0 SINE_B2$\pm^2$ $\times$ upstream 10:0 COUP^1	-0.04	428.52	(1351.94)	0.00	(0.00)	0
upstream 1:0 SINE_B2^1 $\times$ upstream 1:0 APF^1	-0.03	0.32	(1.26)	0.00	(0.00)	0
downstream 10:100 CpGi^1 $\times$ upstream 10:5 PB^1	0.02	7.24	(13.80)	1.55	(3.54)	4.6×10^{-14}
upstream 2:0 SINE_Alu^2 $\times$ upstream 60:0 CpGi^{2,10}	0.01	0.98	(2.16)	0.11	(0.35)	0
upstream 100:10 B2^2 $\times$ downstream 10:100 ID^2	0.01	0.27	(0.46)	0.07	(0.12)	5.9×10^{-14}

Unit is kilobases and it refers to the beginning of the first or the end of the last exon, respectively.
For example, `downstream 10:100` refers to the 90 kb window from 10 kb to 100 kb downstream of the last exon.
[1] Number of this feature within the sequence window.
$\pm^1$ denotes the ratio of repeated elements in $+$ versus $-$ orientation with respect to the gene.
It is the negative inverse if there are more elements in $-$ orientation than in $+$.
[2] Percentage of the sequence window covered by this feature.
$\pm^2$ Ratio of the percentage of the sequence window covered by repeated elements in $\pm$ orientation.
[3] Indicator for presence of this feature within the sequence window.
[4] Indicator for presence of upstream CTCF consensus-binding site.
[5] Indicator for presence of TGTTTGCAG consensus site.
[7] Indicator for presence of CpG island overlapping the last exon.
[8] Indicator for presence of CpG island overlapping the first exon.
[9] Orientation of motif relative to gene.
[10] Methylation prone.
[11] Methylation resistant.
L1dif denotes L1P5, L1PB4, L1R2_RN, L1VL2 and LLME
$\times$ indicates pairwise interaction between two variables.

Table 5: Relevant features for prediction of parental preference

Feature	Weight	Mean (Standard deviation) Maternally expressed		Paternally expressed		P
upstream 100:10 Line_L1$\pm^1$ $\times$ downstream 10:100 Line_L1ME$\pm^1$	-26.03	-1.69	(2.51)	1.62	(2.69)	8.6×10^{-5}
I^6 $\times$ upstream 5:4 PU1^3	-23.32	0.04	(0.21)	0.60	(0.50)	5.2×10^{-5}
upstream 5:4 Oct1^3 $\times$ upstream 5:4 PU1^3	-21.44	0.04	(0.21)	0.60	(0.50)	5.2×10^{-5}
I^4	-21.22	0.00	(0.00)	0.30	(0.47)	5.1×10^{-3}
upstream 5:4 Oct1^1 $\times$ upstream 5:4 PU1^3	-19.53	0.04	(0.21)	0.85	(0.81)	1.5×10^{-4}
upstream 5:0 CEBP^3	-18.83	0.09	(0.29)	0.40	(0.50)	1.0×10^{-2}
downstream 10:100 MIR$\pm^2$	-18.75	26.62	(62.98)	154.64	(154.78)	1.0×10^{-3}
upstream 4:3 CEBP^1	-18.62	0.00	(0.00)	0.10	(0.31)	8.1×10^{-2}
upstream 10:0 CEBP^1	-18.03	0.22	(0.42)	0.85	(1.04)	8.8×10^{-3}
upstream 9:8 SIF^1	17.92	0.17	(0.39)	0.00	(0.00)	2.1×10^{-2}
I^6 $\times$ upstream 5:4 Oct1^3	-17.71	0.17	(0.39)	0.75	(0.44)	3.1×10^{-5}
downstream 10:100 L1ME$\pm^1$	-17.47	-0.57	(1.83)	0.55	(2.35)	4.7×10^{-2}
upstream 5:0 CEBP^1	-16.92	0.09	(0.29)	0.50	(0.76)	1.6×10^{-2}
upstream 4:3 NFkB^1	-16.7	0.00	(0.00)	0.05	(0.22)	1.6×10^{-1}
upstream 100:10 PB$\pm^1$	-16.6	-0.21	(2.79)	1.23	(2.79)	5.0×10^{-2}
upstream 10:5 LTR_ERVL^1	16.57	0.13	(0.34)	0.00	(0.00)	4.1×10^{-2}
upstream 9:8 ICSBP^3 $\times$ upstream 5:0 E4F1^3	-16.26	0.22	(0.42)	0.75	(0.44)	1.3×10^{-4}
upstream 100:10 LTR_MaLR^2 $\times$ upstream 100:10 LTR_MaLR$\pm^1$	-16.07	-3.52	(8.09)	5.89	(6.80)	8.5×10^{-5}
upstream 100:10 LTR_MaLR^1 $\times$ upstream 100:10 LTR_MaLR$\pm^1$	-15.89	-13.30	(30.32)	22.41	(26.87)	9.7×10^{-5}
upstream 7:6 Sp1^3	-15.22	0.00	(0.00)	0.20	(0.41)	2.1×10^{-2}
downstream 10:100 L1dif$\pm^2$	-14.9	50.61	(242.71)	689.95	(1091.62)	9.1×10^{-3}
downstream 5:10 Lx$\pm^1$	-14.85	-0.30	(1.22)	0.35	(0.75)	1.9×10^{-2}
upstream 7:6 Sp1^1	-14.76	0.00	(0.00)	0.30	(0.73)	4.1×10^{-2}
upstream 9:8 ICSBP^3 $\times$ upstream 7:6 GATA1^3	-14.75	0.22	(0.42)	0.75	(0.44)	1.3×10^{-4}
intron PB$\pm^1$	14.69	0.60	(2.08)	-0.75	(2.14)	2.2×10^{-2}
intron SINE_B4$\pm^2$	14.68	120.39	(231.93)	13.68	(53.41)	2.1×10^{-2}
upstream 5:4 PU1^1	-14.47	0.52	(0.73)	1.70	(1.89)	7.6×10^{-3}
upstream 80:70 CpGi^{2,10}	-14.34	0.00	(0.00)	0.09	(0.23)	4.3×10^{-2}
upstream 100:10 MIR3$\pm^1$	14.28	0.17	(0.58)	-0.20	(0.62)	2.4×10^{-2}
upstream 10:0 CEBP^3	-14.07	0.22	(0.42)	0.50	(0.51)	2.9×10^{-2}

Unit is kilobases and it refers to the beginning of the first or the end of the last exon, respectively.
For example, `downstream 10:100` refers to the 90 kb window from 10 kb to 100 kb downstream of the last exon.
^{1} Number of this feature within the sequence window.
$\pm^1$ denotes the ratio of repeated elements in $+$ versus $-$ orientation with respect to the gene.
It is the negative inverse if there are more elements in $-$ orientation than in $+$.
^{2} Percentage of the sequence window covered by this feature.
$\pm^2$ Ratio of the percentage of the sequence window covered by repeated elements in $\pm$ orientation.
^{3} Indicator for presence of this feature within the sequence window.
^{4} Indicator for presence of upstream CTCF consensus-binding site.
^{6} Indicator for presence of TGTCTGCAG consensus site.
^{10} Methylation prone.
$\times$ indicates pairwise interaction between two variables.

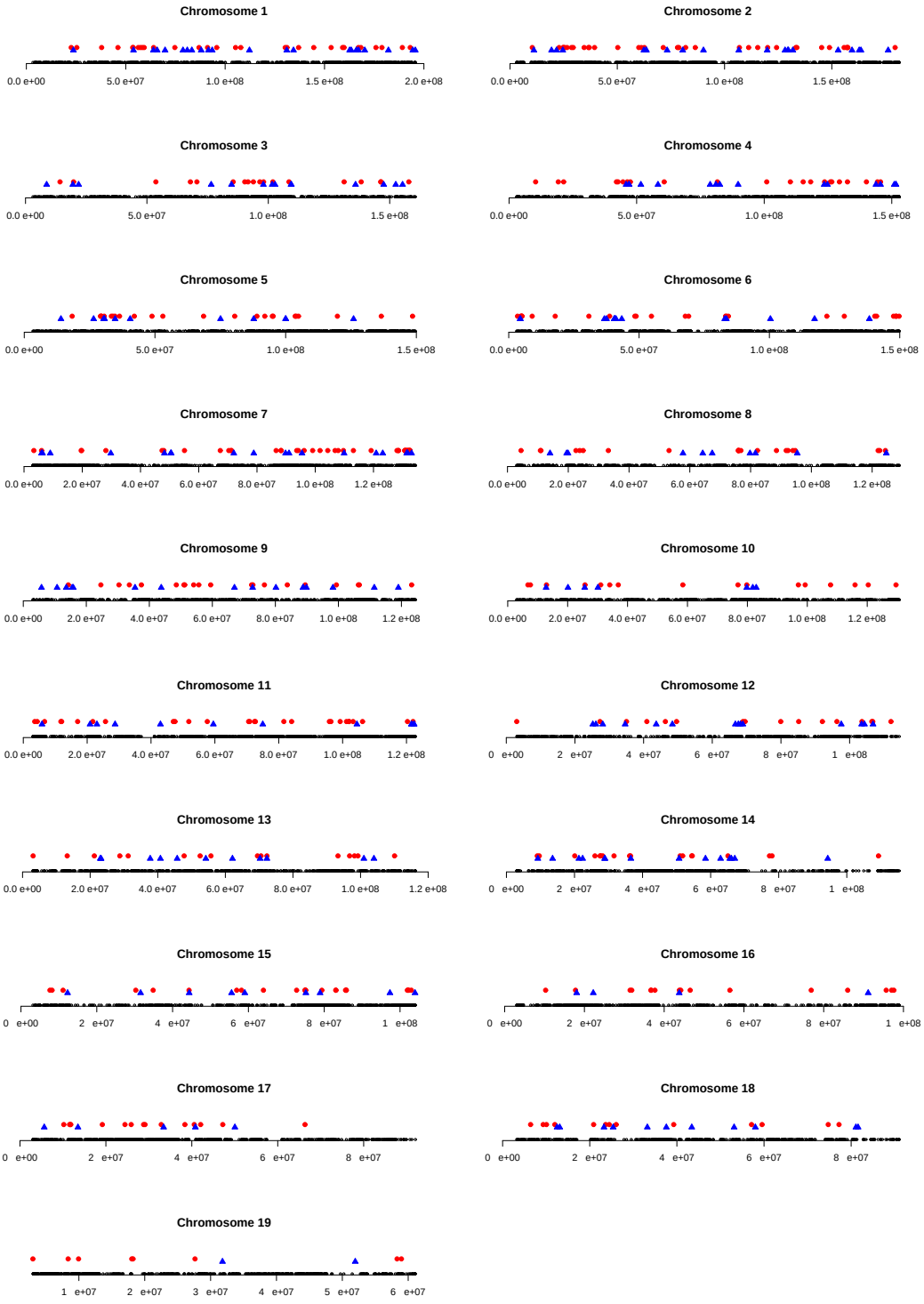

Figure 1: Plots showing the distribution of imprinted gene candidates. Red circles, blue triangles, and black dots define genes predicted to be maternally, paternally, or biallelically expressed, respectively.

Table 6: Genes predicted to be potentially imprinted

Ensembl ID	Chrom.	Expr.	Ensembl ID	Chrom.	Expr.	Ensembl ID	Chrom.	Expr.
ENSMUSG00000027859 (Ngfb)	3f3	P	ENSMUSG00000015016 (BC021611)	8e2	M	ENSMUSG00000032056 (Btg4)	9b	M
ENSMUSG00000040957 (Cables)	18a2	M	ENSMUSG00000031618	8c2	M	ENSMUSG00000000621	5e2	M
ENSMUSG00000045040	17b1	M	ENSMUSG00000024240 (Epc1)	18a1	M	ENSMUSG00000051085	7f3	M
ENSMUSG00000040490 (Lrfn2)	17c	M	ENSMUSG00000037959 (Muc5ac)	7f5	M	ENSMUSG00000025144 (Stra13)	11e2	P
ENSMUSG00000049586	13d1	M	ENSMUSG00000037170	8c2	M	ENSMUSG00000048279 (NM_172809)	14c3	M
ENSMUSG00000026099 (1700019A02Rik)	1c1	M	ENSMUSG00000036136 (9030611O19Rik)	12b1	P	ENSMUSG00000041986	9c	M
ENSMUSG00000022489 (Pde1b)	15f3	P	ENSMUSG00000051267	16c4	M	ENSMUSG00000047250 (Ptgs1)	2b	M
ENSMUSG00000024732 (Q9JJ89)	19b	M	ENSMUSG00000044327 (2900056P18Rik)	2h4	M	ENSMUSG00000043460	15e2	P
ENSMUSG00000000001 (Gnai3)	3f3	M	ENSMUSG00000046533 (NM_172147)	5b1	M	ENSMUSG00000024269	18b1	P
ENSMUSG00000034435	12d1	P	ENSMUSG00000023367 (0610011I04Rik)	6b3	M	ENSMUSG00000026892 (KCH7_MOUSE)	2c3	P
ENSMUSG00000044912 (NM_172804)	12d1	P	ENSMUSG00000047736	11b1.3	M	ENSMUSG00000031616 (Ednra)	8c2	M
ENSMUSG00000042587 (NM_176926)	2d	M	ENSMUSG00000049404	3e2	M	ENSMUSG00000049697 (Wwp1-pending)	2a3	M
ENSMUSG00000026110	1b	M	ENSMUSG00000050088 (1600012H06Rik)	17a2	P	ENSMUSG00000037180 (Nr3c2)	8c2	M
ENSMUSG00000036760	15e3	M	ENSMUSG00000030108 (Gabt3)	6f1	M	ENSMUSG00000036181 (Hist1h1c)	13a3.2	P
ENSMUSG00000047105	5g1	M	ENSMUSG00000046404	1e4	P	ENSMUSG00000038305 (2810022L02Rik)	1c2	M
ENSMUSG00000022770 (Dlgh1)	16b2	M	ENSMUSG00000042138 (BC024479)	9b	M	ENSMUSG00000031712 (Il15)	8c3	P
ENSMUSG00000033161 (Atp1a1)	3f3	M	ENSMUSG00000030304 (1200009B18Rik)	6g3	M	ENSMUSG00000037186 (Nr3c2)	8c2	M
ENSMUSG00000024566 (Atp9b)	18e3	P	ENSMUSG00000005078 (1200003C05Rik)	12c3	P	ENSMUSG00000038771 (Serpinb2)	1e1	M
ENSMUSG00000032012 (Pvrl1)	9b	P	ENSMUSG00000042973 (Q99JT4)	6g1	M	ENSMUSG00000047122	11a3.2	M
ENSMUSG00000042852	4c5	P	ENSMUSG00000047859 (Q8R407)	12d3	M	ENSMUSG00000025143	7f5	M
ENSMUSG00000044456	12f1	M	ENSMUSG00000037406	8a3	M	ENSMUSG00000035172 (NM_146030)	11d	M
ENSMUSG00000035050 (Tank)	2c3	P	ENSMUSG00000050963 (Kcns2)	15b3.3	M	ENSMUSG00000032423 (Nsap1-pending)	9e3.2	P
ENSMUSG00000033533 (Bucs1)	7f3	M	ENSMUSG00000019990 (Pde7b)	10a3	P	ENSMUSG00000045496 (Cbx3)	1c2	M
ENSMUSG00000025324 (Atp10a)	7b5	M	ENSMUSG00000046091	1h1	M	ENSMUSG00000007891 (Ctsd)	7f5	P
ENSMUSG00000047005 (Muc5ac)	7f5	M	ENSMUSG00000023041 (Krt2-6a)	15f3	M	ENSMUSG00000024534 (Sncaip)	18d1	P
ENSMUSG00000034402 (NM_172805)	12d1	M	ENSMUSG00000000296 (Tpd52l1)	10a4	M	ENSMUSG00000037604	12f2	P
ENSMUSG00000043972	17c	P	ENSMUSG00000040554 (Aipl1)	11b4	M	ENSMUSG00000040836	1h2	P
ENSMUSG00000034306 (Hes6)	1c5	P	ENSMUSG00000044769	4b3	P	ENSMUSG00000034898	9e02	P
ENSMUSG00000030994 (4933400E14Rik)	7f4	P	ENSMUSG00000029128 (2700023P08Rik)	5b2	P	ENSMUSG00000041791 (Cappa3)	6g1	M
ENSMUSG00000050692	11a1	M	ENSMUSG00000047569	11a4	P	ENSMUSG00000039257 (AB030198)	7b2	P
ENSMUSG00000022197 (A930022H17Rik)	15a2	P	ENSMUSG00000021576 (Pdcd6)	13c1	M	ENSMUSG00000029338 (2310046B19Rik)	5e3	M
ENSMUSG00000021470 (0610007P08Rik)	13b3	P	ENSMUSG00000028830 (AU040320)	4d2.1	P	ENSMUSG00000037016 (NM_172862)	3d	M
ENSMUSG00000033569 (Bai3)	1a5	M	ENSMUSG00000047845	18b1	M	ENSMUSG00000038736	15d1	M
ENSMUSG00000041670	1a5	M	ENSMUSG00000020950 (Foxg1)	12c1	P	ENSMUSG00000048482 (Bdnf)	2e3	M
ENSMUSG00000026966 (1110003H09Rik)	2a3	M	ENSMUSG00000040596	1h2	M	ENSMUSG00000018654 (Znfn1a1)	11a2	M
ENSMUSG00000048001 (Hes5)	4e2	P	ENSMUSG00000024286 (5730405I09Rik)	18a1	M	ENSMUSG00000037764 (Ptgdr)	14c1	M
ENSMUSG00000037994	3h2	P	ENSMUSG00000038118 (4930473A06Rik)	4c3	P	ENSMUSG00000049863	2f3	M
ENSMUSG00000015807 (NM_172811)	14d1	P	ENSMUSG00000050461	3f3	P	ENSMUSG00000036594 (H2-Aa)	17b2	M
ENSMUSG00000022696 (Q8R397)	16b5	M	ENSMUSG00000046369	13a3.1	M	ENSMUSG00000040133	2e5	P
ENSMUSG00000027912 (Sprrl10)	3f2	M	ENSMUSG00000049705	8a3	M	ENSMUSG00000029285 (Igj)	5e2	P
ENSMUSG00000036553 (Q8R1A5)	5b1	M	ENSMUSG00000038596 (4930553F24Rik)	5b1	M	ENSMUSG00000021775 (Nr1d2)	14a3	P
ENSMUSG00000044858 (SM32_HUMAN)	2d	M	ENSMUSG00000044378 (Q8R300)	6g1	P	ENSMUSG00000032456 (4933408N02Rik)	9.e4	P
ENSMUSG00000048952	2d	M	ENSMUSG00000039722	10a4	P	ENSMUSG00000036152 (KV5J_MOUSE)	6c2	M
ENSMUSG00000050700	2h3	P	ENSMUSG00000040710 (Siat8d)	1d	M	ENSMUSG00000050407	18e3	P
ENSMUSG00000046885	9d	M	ENSMUSG00000037492 (NM_177086)	8a3	M	ENSMUSG00000038070 (Q8R2F0)	4c3	P
ENSMUSG00000010797 (Wnt2)	6a2	M	ENSMUSG00000022002 (4930564B18Rik)	14d2	P	ENSMUSG00000047469	7c	M
ENSMUSG00000039238	11e2	P	ENSMUSG00000027605 (Acas2)	2h2	M	ENSMUSG00000000694 (Dok1)	6d1	P
ENSMUSG00000035033 (Tbr1)	2c3	M	ENSMUSG00000049245 (H2A4_MOUSE)	13a3.2	P	ENSMUSG00000043723	14b	M
ENSMUSG00000049478	3a2	M	ENSMUSG00000049155 (1700040F17Rik)	15d2	P	ENSMUSG00000049569	3a3	P
ENSMUSG00000041309	7f5	M	ENSMUSG00000023052 (Npff)	15f3	M	ENSMUSG00000048417	12b3	M
ENSMUSG00000021986 (2600011E07Rik)	14c3	M	ENSMUSG00000039090 (R27A_MOUSE)	9e3.1	M	ENSMUSG00000043795	7f5	M
ENSMUSG00000028208 (2610301B20Rik)	4a2	M	ENSMUSG00000044978	8c3	M	ENSMUSG00000022382 (Wnt7b)	15e3	M
ENSMUSG00000035513 (Ntng2)	2a3	M	ENSMUSG00000050716 (6330408A02Rik)	7a2	P	ENSMUSG00000043051 (NM_174853)	8e2	P
ENSMUSG00000024952 (Rps6ka4)	19a	M	ENSMUSG00000030603 (Psmc4)	7a3	M	ENSMUSG00000045905	16c4	M
ENSMUSG00000043854	11e1	M	ENSMUSG00000044579 (Pth)	7f2	M	ENSMUSG00000025090 (1700011F14Rik)	19d3	M
ENSMUSG00000029232 (Kdr)	5e1	P	ENSMUSG00000005611 (Mrvi1)	7f2	M	ENSMUSG00000023495 (Pcbp4)	9f1	M
ENSMUSG00000035456	5e3	M	ENSMUSG00000048286	18a2	P	ENSMUSG00000048036	12d1	M
ENSMUSG00000020399 (Havcr2)	11b1.2	M	ENSMUSG00000047985	9f1	M	ENSMUSG00000047962 (NM_146775)	7f2	M
ENSMUSG00000039601 (Dscr1l1)	17c	M	ENSMUSG00000051236 (NM_177092)	10d3	M	ENSMUSG00000029467 (Atp2a2)	5f	M
ENSMUSG00000043864 (NM_145464)	14e4	M	ENSMUSG00000044754	14c3	P	ENSMUSG00000042256	17c	M
ENSMUSG00000020466 (Camk2b)	11a1	P	ENSMUSG00000047794	7f1	M	ENSMUSG00000000693 (Loxl3)	6d1	M
ENSMUSG00000006270 (Vax1)	19d3	M	ENSMUSG00000044857 (NM_146075)	17b1	M	ENSMUSG00000032101 (Ddx25)	9a5.3	P
ENSMUSG00000021604 (Irx4)	13c1	M	ENSMUSG00000040640	14b	P	ENSMUSG00000027834 (Serpini1)	3e3	P
ENSMUSG00000039740 (NM_019998)	4b2	M	ENSMUSG00000046919	11a3.1	M	ENSMUSG00000020945 (1700023H08Rik)	11d	P
ENSMUSG00000026041	1c1	M	ENSMUSG00000017167 (Cntnap1)	11d	M	ENSMUSG00000027404 (Snrpb)	2f3	P
ENSMUSG00000025236 (2610017G09Rik)	9c	M	ENSMUSG00000030306	6g3	M	ENSMUSG00000030607 (Agc1)	7d2	M
ENSMUSG00000043899	14b	M	ENSMUSG00000039782 (NM_175937)	5b3	M	ENSMUSG00000035270 (NM_174876)	16c1.1	M
ENSMUSG00000021592 (4833414G15Rik)	13c1	M	ENSMUSG00000032353 (1200002G13Rik)	9e3.2	M	ENSMUSG00000033051	14a2	P
ENSMUSG00000049298	1h4	P	ENSMUSG00000041707	14b	M	ENSMUSG00000049934	18e3	M
ENSMUSG00000044146 (NM_147027)	14a2	M	ENSMUSG00000043975	4c1	P	ENSMUSG00000026527 (Rgs7)	1h3	M
ENSMUSG00000025950 (Idh1)	1c3	P	ENSMUSG00000022338 (Q9JIX0)	15d1	P	ENSMUSG00000005973 (Rcn)	2e3	M
ENSMUSG00000033879	12f1	M	ENSMUSG00000015943 (1810037G04Rik)	3f2	M	ENSMUSG00000039797	4b2	P

ENSMUSG00000048134	14e2.2	P
ENSMUSG00000032318 (Isl2)	9c	M
ENSMUSG00000051398	14d1	P
ENSMUSG00000030850 (Ate1)	7f4	M
ENSMUSG00000022656 (Pvrl3)	16b5	M
ENSMUSG00000046695 (NM_147063)	7f1	M
ENSMUSG00000049420	10a4	P
ENSMUSG00000049210 (Ftl2)	4d2.1	P
ENSMUSG00000021830 (5730420B22Rik)	14c1	M
ENSMUSG00000020811	11b4	M
ENSMUSG00000001985 (Grik3)	4d2.1	M
ENSMUSG00000043784	15e3	M
ENSMUSG00000029135 (Fosl2)	5b1	P
ENSMUSG00000013539 (D16H22S680E)	16b1	M
ENSMUSG00000016458 (Wt1)	2e3	P
ENSMUSG00000050034 (RL3P_MOUSE)	3e3	M
ENSMUSG00000046818 (NM_030143)	3h2	M
ENSMUSG00000040118 (Cacna2d1)	5a2	P
ENSMUSG00000028634 (Krc)	4d1	M
ENSMUSG00000016481 (Crry)	1h6	P
ENSMUSG00000029150	5b1	M
ENSMUSG00000026158 (Q8VE52)	1a5	P
ENSMUSG00000034634 (Ly6d)	15e1	M
ENSMUSG00000035799 (Twist1)	12b2	P
ENSMUSG00000051453 (Q9CU42)	14c1	P
ENSMUSG00000028195 (Cyr61)	3h3	M
ENSMUSG00000026417 (Pigr)	1e4	M
ENSMUSG00000040639	4e1	M
ENSMUSG00000039272	1c3	M
ENSMUSG00000041134 (Cyyr1)	16c3.3	M
ENSMUSG00000023927 (Satb1)	17c	P
ENSMUSG00000022704 (Q8VD23)	16b4	P
ENSMUSG00000026981 (Il1rn)	2a3	P
ENSMUSG00000029126 (Nsg1)	5b2	M
ENSMUSG00000013858 (Q99K29)	10c1	M
ENSMUSG00000032632 (Mtx1)	3f2	M
ENSMUSG00000043632	4e1	M
ENSMUSG00000050299 (Fau)	16c3.1	M
ENSMUSG00000048494	15d2	M
ENSMUSG00000047493	8b3.3	P
ENSMUSG00000049449	4c3	M
ENSMUSG00000043301 (Kcnj6)	16c4	M
ENSMUSG00000041992 (NM_175930)	12f2	M
ENSMUSG00000038641 (NM_145364)	6b1	P
ENSMUSG00000032058	9b	M
ENSMUSG00000045344 (NM_146896)	2e1	P
ENSMUSG00000029381 (shrm)	5e3	M
ENSMUSG00000022861 (Dgkg)	16b1	P
ENSMUSG00000031737 (Irx5)	8c5	M
ENSMUSG00000024323 (Ttr)	18a2	M
ENSMUSG00000028341 (Nr4a3)	4b2	P
ENSMUSG00000048759	17a3.2	M
ENSMUSG00000039563 (2210406O10Rik)	5b2	M
ENSMUSG00000043947	6b2	P
ENSMUSG00000028677 (4931406I20Rik)	4c7	M
ENSMUSG00000026763 (NM_172663)	2c1	M
ENSMUSG00000044685	14b	M
ENSMUSG00000047566 (Park2)	17a2	M
ENSMUSG00000043271	8c3	P
ENSMUSG00000038349	1c1	M
ENSMUSG00000041132 (AI428195)	5g3	M
ENSMUSG00000035547 (Capn5)	7e3	M
ENSMUSG00000051415	1f	M
ENSMUSG00000044269 (NM_175284)	5f	P
ENSMUSG00000009549 (Srp14)	2e5	M
ENSMUSG00000035561 (Aldh1b1)	4b2	M
ENSMUSG00000020831 (0610010K14Rik)	11b4	M
ENSMUSG00000044272	7f5	M
ENSMUSG00000021924	14b	M
ENSMUSG00000033767 (D930015E06Rik)	3f1	P
ENSMUSG00000036684	8c4	M
ENSMUSG00000043806	9a2	P
ENSMUSG00000045509	13c1	P
ENSMUSG00000027987	3h1	M
ENSMUSG00000037375 (2810432O22Rik)	1h6	M
ENSMUSG00000044054	5b1	P
ENSMUSG00000049592	7f3	M
ENSMUSG00000024302 (Dtna)	18b1	M
ENSMUSG00000037990 (NM_172788)	10b3	M
ENSMUSG00000044143 (Q8VFY1)	11b4	P
ENSMUSG00000028088 (Fmo5)	3f2	P
ENSMUSG00000042293 (Q91VN2)	9b	M
ENSMUSG00000048056	9d	M
ENSMUSG00000035413 (6530411B15Rik)	11b5	M
ENSMUSG00000004113 (Cacna1b)	2a3	M
ENSMUSG00000021469 (Msx2)	13b2	M
ENSMUSG00000045044	18d2	M
ENSMUSG00000000420 (Galnt1)	18b1	M
ENSMUSG00000032985 (5730522E02Rik)	11a3.3	M
ENSMUSG00000043068 (Q8R3X3)	8e2	M
ENSMUSG00000034685	11d	M
ENSMUSG00000015755 (Map3k7ip2)	10a1	M
ENSMUSG00000047641	15f3	M
ENSMUSG00000049440	2d	P
ENSMUSG00000037306 (Q8K2N2)	4d3	M
ENSMUSG00000047645	19c1	M
ENSMUSG00000021365 (Nedd9)	13a5	P
ENSMUSG00000024043 (NM_172964)	17e1.3	M
ENSMUSG00000045716	10d1	M
ENSMUSG00000032360 (OX2R_MOUSE)	9e1	M
ENSMUSG00000038341	2h2	M
ENSMUSG00000020524 (Gria1)	11b2	M
ENSMUSG00000020564 (2810423G08Rik)	12b2	M
ENSMUSG00000051425 (1810013P09Rik)	7b1	M
ENSMUSG00000022021 (Diap3)	14d3	M
ENSMUSG00000028199 (Cryz)	3h4	P
ENSMUSG00000027359 (Slc27a2)	2f2	P
ENSMUSG00000026928	2a3	M
ENSMUSG00000046178 (Nxph1)	6a1	M
ENSMUSG00000028813	4d2.2	M
ENSMUSG00000043230 (NM_173425)	1c5	P
ENSMUSG00000049539 (Hist1h1a)	13a3.2	P
ENSMUSG00000050968	19a	M
ENSMUSG00000031792 (AA960436)	8c5	M
ENSMUSG00000030862 (Cpxm2)	7f4	P
ENSMUSG00000050636 (Sp5)	2c3	M
ENSMUSG00000034368	4c7	M
ENSMUSG00000039775 (Defb3)	8a3	P
ENSMUSG00000026683 (2410003C07Rik)	1h2	P
ENSMUSG00000050052	8a2	P
ENSMUSG00000046119 (1110008E08Rik)	16c3.3	P
ENSMUSG00000044477 (Tex27)	17b1	M
ENSMUSG00000024893 (2700046G09Rik)	19c3	P
ENSMUSG00000050208	8c5	P
ENSMUSG00000048414	2a3	M
ENSMUSG00000031467 (D8Ertd319e)	8a3	P
ENSMUSG00000038894 (IRS2_MOUSE)	8a2	M
ENSMUSG00000032422 (NM_172926)	9e3.2	P
ENSMUSG00000002409 (Dyrk1b)	7a3	M
ENSMUSG00000026097 (C730042F17Rik)	1c1	P
ENSMUSG00000037532	12a1.1	M
ENSMUSG00000004872 (Pax3)	1c4	P
ENSMUSG00000019811 (Q91VK6)	10a2	M
ENSMUSG00000042581	1e4	M
ENSMUSG00000035067 (NM_173393)	14c3	M
ENSMUSG00000050820	1h5	M
ENSMUSG00000025517 (Q9WVG0)	7f5	M
ENSMUSG00000021047 (Nova1)	12c1	M
ENSMUSG00000042306 (S100a14)	3f2	M
ENSMUSG00000047918 (NM_173433)	9a3	M
ENSMUSG00000046002 (NM_177015)	1c5	P
ENSMUSG00000024595	18d2	P
ENSMUSG00000043637	9a3	P
ENSMUSG00000049655 (1700013J13Rik)	18a2	P
ENSMUSG00000035127	11b5	M
ENSMUSG00000043083	15d3	M
ENSMUSG00000034638 (Sox7)	14c3	M
ENSMUSG00000020435 (Osbp2)	11a1	M
ENSMUSG00000025145 (NM_153545)	11e2	P
ENSMUSG00000025169 (1110031I02Rik)	11e2	M
ENSMUSG00000039004 (Bmp6)	13a5	P
ENSMUSG00000001435 (Col18a1)	10b5.3	M
ENSMUSG00000007653 (GAB2_MOUSE)	11b1.1	P
ENSMUSG00000051158	1c2	M
ENSMUSG00000046653	6g3	M
ENSMUSG00000045967 (NM_175706)	2a3	P
ENSMUSG00000036862	7f1	M
ENSMUSG00000046463 (NM_177177)	10b1	M
ENSMUSG00000014956 (PP1B_HUMAN)	5b1	P
ENSMUSG00000046298 (HMG1_MOUSE)	2e4	M
ENSMUSG00000034397	1c5	M
ENSMUSG00000039098 (C030003D03Rik)	10a4	M
ENSMUSG00000022144 (Gdnf)	15a2	M
ENSMUSG00000032619	1g2	M
ENSMUSG00000043591	7f3	P
ENSMUSG00000022835 (6330407A06Rik)	16b4	M
ENSMUSG00000040818 (NM_145969)	14b	P
ENSMUSG00000035134 (Insl5)	4c6	M
ENSMUSG00000033029 (1700088E04Rik)	15e2	M
ENSMUSG00000000628 (Hk2)	6d1	M
ENSMUSG00000021998 (Lcp1)	14d2	P
ENSMUSG00000031097 (Tnni2)	7f5	P
ENSMUSG00000021624 (Ly78)	13d1	M
ENSMUSG00000032551 (1110059G10Rik)	9f4	M
ENSMUSG00000031965 (Tbx20)	9a4	M
ENSMUSG00000021801 (1700012P13Rik)	14b	M
ENSMUSG00000036192 (Rorb)	19b	M
ENSMUSG00000039065 (A930016P21Rik)	15b3.2	P
ENSMUSG00000038037 (Socs1)	16b1	M
ENSMUSG00000007216 (NM_173429)	6b3	M
ENSMUSG00000036983 (Tfb1m)	17a1	P
ENSMUSG00000035954 (NM_172803)	12b3	P
ENSMUSG00000035239 (Neu3)	7f1	M
ENSMUSG00000033820	13a1	M
ENSMUSG00000044010	4e1	M
ENSMUSG00000050677 (4921513E08Rik)	5b2	P
ENSMUSG00000051597	14a2	M
ENSMUSG00000006191 (NM_144536)	13a3.3	M
ENSMUSG00000029735 (Tpk1)	6b2	P
ENSMUSG00000038065 (2410066E13Rik)	6b3	M
ENSMUSG00000051079 (Rgs13)	1f	M
ENSMUSG00000020255 (C430041I18Rik)	10c1	P
ENSMUSG00000039230 (2310057L06Rik)	11e2	P
ENSMUSG00000040092	1h6	P
ENSMUSG00000022703	16b4	M
ENSMUSG00000025965 (4930431J08Rik)	1c2	P
ENSMUSG00000039485 (NM_133745)	10b1	M
ENSMUSG00000029877 (TVB7_MOUSE)	6b2	P
ENSMUSG00000030351 (1110014F12Rik)	6f3	M
ENSMUSG00000035394 (4933415I03Rik)	18e2	M
ENSMUSG00000046934 (1700007H16Rik)	10c3	M
ENSMUSG00000027630 (8030499H02Rik)	3a3	P
ENSMUSG00000049157	14b	P
ENSMUSG00000038208 (Q8K2Q4)	11d	M
ENSMUSG00000051638 (4921515J06Rik)	3f3	P
ENSMUSG00000024290 (Rock1)	18a2	M
ENSMUSG00000040874 (Rnp24-pending)	9a5.3	M
ENSMUSG00000030043 (Tacr1)	6d1	P
ENSMUSG00000021481 (Zfp346)	13b2	P
ENSMUSG00000026787 (Gad2)	2a3	M
ENSMUSG00000047181 (BC034054)	11c	M
ENSMUSG00000046624	4d2.2	M
ENSMUSG00000044508	6b2	P
ENSMUSG00000051270	1c3	P
ENSMUSG00000028348 (2310039E09Rik)	4b2	M
ENSMUSG00000036356 (4732435N03Rik)	8c1	P

ENSMUSG00000034389	12e	M
ENSMUSG00000027380 (1200014P05Rik)	2f3	P
ENSMUSG00000022362 (9130401M01Rik)	15d2	M
ENSMUSG00000004665 (Cnn2)	10c1	P
ENSMUSG00000034158 (NM_177093)	16b4	M
ENSMUSG00000041417 (Pik3r1)	13d1	M
ENSMUSG00000037541	7f5	P
ENSMUSG00000029090 (Q8VE71)	5c1	M
ENSMUSG00000024727 (NM_153417)	19b	M
ENSMUSG00000041058 (NM_177327)	4a3	M
ENSMUSG00000027434 (Nkx2-2)	2h1	M
ENSMUSG00000043903	8e1	M
ENSMUSG00000051239	12c1	P
ENSMUSG00000021572 (4933440J22Rik)	13c1	P
ENSMUSG00000041062	17a3.3	M
ENSMUSG00000037001 (Zfp39)	11b2	P
ENSMUSG00000043410	5e5	M
ENSMUSG00000022587 (Ly6e)	15e1	P
ENSMUSG00000027067 (Ssrp1)	2e1	M
ENSMUSG00000041852 (Tcf20)	15e2	M
ENSMUSG00000027340 (Slc23a2)	2f3	M
ENSMUSG00000048085 (Q8K2G2)	7d2	M
ENSMUSG00000047819	3f1	M
ENSMUSG00000021209 (8430415E04Rik)	12f1	P
ENSMUSG00000022598 (Psca)	15e1	M
ENSMUSG00000029325 (Mapk10)	5e4	P
ENSMUSG00000034384	5e5	M
ENSMUSG00000043925 (NM_020289)	7f1	P
ENSMUSG00000037602 (Q8R1N3)	4e1	P
ENSMUSG00000026894 (1700010A17Rik)	2b	M
ENSMUSG00000004085 (Zak-pending)	2c3	P
ENSMUSG00000026991	2c3	M
ENSMUSG00000047142 (1700012H05Rik)	7f2	P
ENSMUSG00000020154 (3230402H02Rik)	10d2	M
ENSMUSG00000039165 (NM_025765)	4c1	M
ENSMUSG00000026698 (3110030E07Rik)	1h1	P
ENSMUSG00000027418 (Pcsk2)	2g3	M
ENSMUSG00000026751 (Nr5a1)	2b	M
ENSMUSG00000020242	10c1	P
ENSMUSG00000048857	13d1	P
ENSMUSG00000048337 (Ppyr1)	14b	P
ENSMUSG00000043885 (NM_172289)	9a3	P
ENSMUSG00000043817 (NM_146729)	10d3	M
ENSMUSG00000049571 (NM_177212)	7f5	M
ENSMUSG00000029052 (3200001K10Rik)	5a3	P
ENSMUSG00000002997	12b1	P
ENSMUSG00000040478	4a3	M
ENSMUSG00000020354 (Sgcd)	11b1.2	M
ENSMUSG00000048132	4d3	M
ENSMUSG00000040623 (Stk19)	17b2	P
ENSMUSG00000032656 (NM_177115)	18d2	M
ENSMUSG00000040037 (NM_177274)	3h4	M
ENSMUSG00000016541 (Sca10)	15e3	M
ENSMUSG00000001552 (Jup)	11d	M
ENSMUSG00000034596	15e1	M
ENSMUSG00000039156	5c2	M
ENSMUSG00000038882	4c3	P
ENSMUSG00000025105 (Bnc)	7d2	M
ENSMUSG00000046719 (Nxph3)	11c	M
ENSMUSG00000022019 (NM_172605)	14d3	M
ENSMUSG00000050032 (Q91VR1)	17b3	M
ENSMUSG00000039872	11e2	M
ENSMUSG00000034361 (Cpne2)	8c5	M
ENSMUSG00000040071	10a1	M
ENSMUSG00000002936 (Hipk2)	6b1	M
ENSMUSG00000038995 (2810418J22Rik)	9f4	P
ENSMUSG00000048188 (C330007P06Rik)	18b3	P
ENSMUSG00000049233 (0610008C08Rik)	13d1	P
ENSMUSG00000032470 (Mras)	9f1	M
ENSMUSG00000050525	15f3	M
ENSMUSG00000029911 (Ssbp1)	6b2	P
ENSMUSG00000027596 (a)	2h2	M
ENSMUSG00000040782 (Cop1-pending)	1h1	M
ENSMUSG00000029162 (Khk)	5b1	M
ENSMUSG00000047828 (NM_176956)	12f2	M
ENSMUSG00000007222	11b4	M
ENSMUSG00000035148 (Gpr33)	12c1	M
ENSMUSG00000031741 (Slc6a2)	8c5	M
ENSMUSG00000000579	13b1	P
ENSMUSG00000040003 (Acvrinp1)	5a3	M
ENSMUSG00000042363 (1110067D22Rik)	11a3.2	P
ENSMUSG00000051576	2a1	P
ENSMUSG00000036745 (4921517B04Rik)	3h3	P
ENSMUSG00000038718 (Pbx1)	2b	M
ENSMUSG00000031993 (3526401K03Rik)	9a5.2	M
ENSMUSG00000026973 (Pla2g1br)	2c3	M
ENSMUSG00000047971	1h2	P
ENSMUSG00000031520 (Vegfc)	8b3.1	M
ENSMUSG00000037808 (NM_176836)	9a2	P
ENSMUSG00000037683	2a2	P
ENSMUSG00000029275 (Gfi1)	5e5	M
ENSMUSG00000043629 (NM_144953)	1c1	M
ENSMUSG00000037085 (4632406N01Rik)	15d2	P
ENSMUSG00000026502 (5830417C01Rik)	1h3	M
ENSMUSG00000047767	7f1	P
ENSMUSG00000015843 (Rxrg)	1h2	M
ENSMUSG00000035493 (Tgfbi)	13b2	M
ENSMUSG00000046709	5e4	P
ENSMUSG00000038702	1e1	P
ENSMUSG00000050348	2h2	M
ENSMUSG00000009097 (Tbx1)	16b1	P
ENSMUSG00000042794	15a2	M
ENSMUSG00000037638	12f2	M
ENSMUSG00000045498 (Pcdhb3)	18b3	P
ENSMUSG00000044878	13d1	M
ENSMUSG00000036524 (2610010G17Rik)	18b3	M
ENSMUSG00000037674	9d	P
ENSMUSG00000038570	7d2	M
ENSMUSG00000029056 (NM_172990)	4e2	P
ENSMUSG00000022831 (Hcls1)	16b4	M
ENSMUSG00000034354 (NM_028860)	11a1	M
ENSMUSG00000021379 (Idb4)	13b1	M
ENSMUSG00000042930	14d2	P
ENSMUSG00000027381 (Bcl2l11)	2f3	P
ENSMUSG00000030652 (Coq7)	7f3	M
ENSMUSG00000047704	2h3	P
ENSMUSG00000045323	9a1	P
ENSMUSG00000022445 (Cyp2d26)	15e2	M
ENSMUSG00000028343 (Txndc4)	4b2	P
ENSMUSG00000049223	8a2	M
ENSMUSG00000029838 (PTN_MOUSE)	6b1	P
ENSMUSG00000029907	6c1	M
ENSMUSG00000051451 (NM_145151)	7e1	P
ENSMUSG00000035736 (Olfr37a)	4b1	M
ENSMUSG00000034141	1d	P
ENSMUSG00000028194 (Ddah1)	3h3	M
ENSMUSG00000007486 (Stard5)	7d2	P
ENSMUSG00000026241 (Nppc)	1c5	M
ENSMUSG00000023791 (2010319C14Rik)	16b2	M
ENSMUSG00000039410	4e2	P
ENSMUSG00000027454 (2810418N01Rik)	2h1	P
ENSMUSG00000022141 (4933421G18Rik)	15a2	M
ENSMUSG00000021303 (Gng4)	13a2	M
ENSMUSG00000040289 (Hey1)	3a1	P
ENSMUSG00000037228	2a1	M
ENSMUSG00000030664 (1110006G14Rik)	7f3	M
ENSMUSG00000038128 (Camk4)	18b3	P
ENSMUSG00000021099 (Six6)	12c3	P
ENSMUSG00000026289 (1500009K01Rik)	1c5	P
ENSMUSG00000044716 (NM_172708)	5b1	M
ENSMUSG00000029158 (2310016N21Rik)	5d	M
ENSMUSG00000046784	6d1	M
ENSMUSG00000050295 (Foxc1)	13a4	M
ENSMUSG00000021023 (1110008L16Rik)	12c1	M
ENSMUSG00000002428 (Smarca3)	3a3	M
ENSMUSG00000049946 (NM_173411)	8b3.2	P
ENSMUSG00000026316	1d	M
ENSMUSG00000026893 (NM_145523)	2c3	P
ENSMUSG00000046785 (Q8VEH5)	9f2	P
ENSMUSG00000015981 (NM_021302)	7f5	M
ENSMUSG00000048776 (Pthlh)	6g3	M
ENSMUSG00000047054	7a1	M
ENSMUSG00000022240 (Catnd2)	15b3.1	M
ENSMUSG00000021763	13d2.2	M
ENSMUSG00000037605	5e1	M
ENSMUSG00000038331 (NM_139146)	1c1	M
ENSMUSG00000026692 (Fmo4)	1h1	P
ENSMUSG00000008206 (2900019C14Rik)	8a1.2	M
ENSMUSG00000028036 (Ptgfr)	3h4	P
ENSMUSG00000043412 (Ppp1r2)	9d	P
ENSMUSG00000037214	8a3	M
ENSMUSG00000048489 (NM_145980)	6f1	P
ENSMUSG00000044869	3g1	P
ENSMUSG00000030069 (Prok2)	6e1	P
ENSMUSG00000041551 (Btg2)	1e4	P
ENSMUSG00000028456 (Unc13h1)	4b1	M
ENSMUSG00000028975 (Pex14)	4e1	P
ENSMUSG00000038185	3f2	M

Genes predicted to be expressed from the maternal allele are denoted by *M*, paternally expressed genes by *P*. Predictions are sorted by descending score.

References

Albrecht, U., Sutcliffe, J. S., Cattanach, B. M., Beechey, C. V., Armstrong, D., Eichele, G., and Beaudet, A. L. 1997. Imprinted expression of the murine Angelman syndrome gene, Ube3a, in hippocampal and Purkinje neurons. *Nat Genet* **17**:75–78.

Alders, M., Hodges, M., Hadjantonakis, A. K., Postmus, J., van Wijk, I., Bliek, J., de Meulemeester, M., Westerveld, A., Guillemot, F., Oudejans, C., Little, P., and Mannens, M. 1997. The human Achaete-scute homologue 2 (ASCL2,HASH2) maps to chromosome 11p15.5, close to IGF2 and is expressed in extravillus trophoblasts. *Hum Mol Genet* **6**:859–867.

Amiel, A., Korenstein, A., Gaber, E., and Avivi, L. 1999. Asynchronous replication of alleles in genomes carrying an extra autosome. *Eur J Hum Genet* **7**:223–230.

Barlow, D. P., Stoger, R., Herrmann, B. G., Saito, K., Schweifer, N. B., Stoger, R., Herrmann, B. G., Saito, K., and Schweifer, N. 1991. The mouse insulin-like growth factor type-2 receptor is imprinted and closely linked to the Tme locus. *Nature* **349**:84–87.

Bartolomei, M. S., Zemel, S., and Tilghman, S. M. 1991. Parental imprinting of the mouse H19 gene. *Nature* **351**:153–155.

Bentley, L., Nakabayashi, K., Monk, D., Beechey, C., Peters, J., Birjandi, Z., Khayat, F. E., Patel, M., Preece, M. A., Stanier, P., Scherer, S. W., and Moore, G. E. 2003. The imprinted region on human chromosome 7q32 extends to the carboxypeptidase A gene cluster: an imprinted candidate for Silver-Russell syndrome. *J Med Genet* **40**:249–256.

Blin-Wakkach, C., Lezot, F., Ghoul-Mazgar, S., Hotton, D., Monteiro, S., Teillaud, C., Pibouin, L., Orestes-Cardoso, S., Papagerakis, P., Macdougall, M., Robert, B., and Berdal, A. 2001. Endogenous Msx1 antisense transcript: in vivo and in vitro evidences, structure, and potential involvement in skeleton development in mammals. *Proc Natl Acad Sci U S A* **98**:7336–7341.

Boccaccio, I., Glatt-Deeley, H., Watrin, F., Roeckel, N., Lalande, M., and Muscatelli, F. 1999. The human MAGEL2 gene and its mouse homologue are paternally expressed and mapped to the Prader-Willi region. *Hum Mol Genet* **8**:2497–2505.

Bonthron, D. T., Hayward, B. E., Moran, V., and Strain, L. 2000. Characterization of TH1 and CTSZ, two non-imprinted genes downstream of GNAS1 in chromosome 20q13. *Hum Genet* **107**:165–175.

Buettner, V. L., Longmate, J. A., Barish, M. E., Mann, J. R., and Singer-Sam, J. 2004. Analysis of imprinting in mice with uniparental duplication of proximal chromosomes 7 and 15 by use of a custom oligonucleotide microarray. *Mamm Genome* **15**:199–209.

Byrne, J. A. and Smith, P. J. 1993. The 11p15.5 ribonucleotide reductase M1 subunit locus is not imprinted in Wilms' tumour and hepatoblastoma. *Hum Genet* **93**:275–277.

Byun, D. S., Cho, K., Ryu, B. K., Lee, M. G., Park, J. I., Chae, K. S., Kim, H. J., and Chi, S. G. 2003. Frequent monoallelic deletion of PTEN and its reciprocal associatioin with PIK3CA amplification in gastric carcinoma. *Int J Cancer* **104**:318–327.

Chai, J. H., Locke, D. P., Greally, J. M., Knoll, J. H., Ohta, T., Dunai, J., Yavor, A., Eichler, E. E., and Nicholls, R. D. 2003. Identification of four highly conserved genes between breakpoint hotspots BP1 and BP2 of the Prader-Willi/Angelman syndromes deletion region that have undergone evolutionary transposition mediated by flanking duplicons. *Am J Hum Genet* **73**:898–925.

Chess, A., Simon, I., Cedar, H., and Axel, R. 1994. Allelic inactivation regulates olfactory receptor gene expression. *Cell* **78**:823–834.

Chibuk, T. K., Bischof, J. M., and Wevrick, R. 2001. A necdin/MAGE-like gene in the chromosome 15 autism. *BMC Genet* **2**.

Cichon, S., Nothen, M., Wolf, H., and Propping, P. 1996. Lack of imprinting of the human dopamine D4 receptor (DRD4) gene. *Am J Med Genet* **67**:229–231.

Clark, L., Wei, M., Cattoretti, G., Mendelsohn, C., and Tycko, B. 2002. The Tnfrh1 (Tnfrsf23) gene is weakly imprinted in several organs and expressed at the trophoblast-decidua interface. *BMC Genet* **11**.

Cooper, P. R., Smilinich, N. J., Day, C. D., Nowak, N. J., Reid, L. H., Pearsall, R. S., Reece, M., Prawitt, D., Landers, J., Housman, D. E., Winterpacht, B. B. R. C. A., Zabel, B. U., Pelletier, J., Weissman, B. E., Shows, T. B., and Higgins, M. J. 1998. Divergently transcribed overlapping genes expressed in liver and kidney and located in the 11p15.5 imprinted domain. *Genomics* **49**:38–51.

Cost, G. J., Thompson, J. S., Reichard, B. A., Lee, J. Y., and Feinberg, A. P. 1997. Lack of imprinting of three human cyclin-dependent kinase inhibitor genes. *Cancer Res* **57**:926–929.

Dallosso, A. R., Hancock, A. L., Brown, K. W., Williams, A. C., Jackson, S., and Malik, K. 2004. Genomic imprinting at the WT1 gene involves a novel coding transcript (AWT1) that shows deregulation in Wilms' tumours. *Hum Mol Genet* **13**:405–415.

Dao, D., Frank, D., Qian, N., O'Keefe, D., Vosatka, R. J., Walsh, C. P., and Tycko, B. 1998. IMPT1, an imprinted gene similar to polyspecific transporter and multi-drug resistance genes. *Hum Mol Genet* **7**:597–608.

DeChiara, T. M., Robertson, E. J., and Efstratiadis, A. 1991. Parental imprinting of the mouse insulin-like growth factor II gene. *Cell* **64**:849–859.

Deltour, L., Montagutelli, X., Guenet, J. L., Jami, J., and Paldi, A. 1995. Tissue- and developmental stage-specific imprinting of the mouse proinsulin gene, Ins2. *Dev Biol* **168**:686–688.

Dotan, Z. A., Dotan, A., Litmanovitch, T., Ravia, Y., Oniashvili, N., Leibovitch, I., Ramon, J., and Avivi, L. 2000. Modification in the inherent mode of allelic replication in lymphocytes of patients suffering from renal cell carcinoma: a novel genetic alteration associated with malignancy. *Genes Chromosomes Cancer* **27**:270–277.

Eggermann, K., Wollmann, H. A., Binder, G., Kaiser, P., Ranke, M. B., and Eggermann, T. 1999. Biparental expression of IGFBP1 and IGFBP3 renders their involvement in the etiology of Silver-Russell syndrome unlikely. *Ann Genet* **42**:117–121.

Esumi, S., Kakazu, N., Taguchi, Y., Hirayama, T., Sasaki, A., Hirabayashi, T., Koide, T., Kitsukawa, T., Hamada, S., and Yagi, T. 2005. Monoallelic yet combinatorial expression of variable exons of the protocadherin-alpha gene cluster in single neurons. *Nat Genet* **37**:171–176.

Gabriel, J. M., Higgins, M. J., Gebuhr, T. C., Shows, T. B., Saitoh, S., and Nicholls, R. D. 1998. A model system to study genomic imprinting of human genes. *Proc Natl Acad Sci U S A* **95**:14857–14862.

Giddings, S. J., King, C. D., Harman, K. W., Flood, J. F., and Carnaghi, L. R. 1994. Allele specific inactivation of insulin 1 and 2, in the mouse yolk sac, indicates imprinting. *Nat Genet* **6**:310–313.

Glenn, C. C., Porter, K. A., Jong, M. T., Nicholls, R. D., and Driscoll, D. J. 1993. Functional imprinting and epigenetic modification of the human SNRPN gene. *Hum Mol Genet* **2**:2001–2005.

Goldberg, M., Wei, M., Yuan, L., Murty, V., and Tycko, B. 2003. Biallelic expression of HRAS and MUCDHL in human and mouse. *Hum Genet* **112**:334–342.

Gould, T. D. and Pfeifer, K. 1998. Imprinting of mouse Kvlqt1 is developmentally regulated. *Hum Mol Genet* **7**:483–487.

Greally, J. M., Starr, D. J., Hwang, S., Song, L., Jaarola, M., and Zemel, S. 1998. The mouse H19 locus mediates a transition between imprinted and non-imprinted DNA replication patterns. *Hum Mol Genet* **7**:91–95.

Guillemot, F., Nagy, A., Auerbach, A., Rossant, J., and Joyner, A. L. 1994. Essential role of Mash-2 in extraembryonic development. *Nature* **371**:333–336.

Hagiwara, Y., Hirai, M., Nishiyama, K., Kanazawa, I., Ueda, T., Sakaki, Y., and Ito, T. 1997. Screening for imprinted genes by allelic message display: identification of a paternally expressed gene impact on mouse chromosome 18. *Proc Natl Acad Sci U S A* **94**:9249–9254.

Hatada, I. and Mukai, T. 1993. A new imprinted gene cloned by a methylation-sensitive genome scanning method. *Nucleic Acids Res* **21**:5577–5582.

Hatada, I. and Mukai, T. 1995. Genomic imprinting of p57KIP2, a cyclin-dependent kinase inhibitor, in mouse. *Nat Genet* **11**:204–206.

Hayashizaki, Y., Shibata, H., Hirotsune, S., Sugino, H., Okazaki, Y., Sasaki, N., Hirose, K., Imoto, H., Okuizumi, H., and Muramatsu, M. 1994. Identification of an imprinted U2af binding protein related sequence on mouse chromosome 11 using the RLGS method. *Nat Genet* **6**:33–40.

Hernandez, A., Fiering, S., Martinez, E., Galton, V. A., and St Germain, D. 2002. The gene locus encoding iodothyronine deiodinase type 3 (Dio3) is imprinted in the fetus and expresses antisense transcripts. *Endocrinology* **143**:4483–4486.

Hitchins, M. P., Bentley, L., Monk, D., Beechey, C., Peters, J., Kelsey, G., Ishino, F., Preece, M. A., Stanier, P., and Moore, G. E. 2002. DDC and COBL, flanking the imprinted GRB10 gene on 7p12, are biallelically expressed. *Mamm Genome* **13**:686–691.

Hoshiya, H., Meguro, M., Kashiwagi, A., Okita, C., and Oshimura, M. 2003. Calcr, a brain-specific imprinted mouse calcitonin receptor gene in the imprinted cluster of the proximal region of chromosome 6. *J. Hum. Genet* **48**:208–211.

Huff, V., Meadows, A., Riccardi, V. M., Strong, L. C., and Saunders, G. F. 1990. Parental origin of de novo constitutional deletions of chromosomal band 11p13. *Am J Hum Genet* **47**:155–160.

Ishihara, K., Kato, R., Furuumi, H., Zubair, M., and Sasaki, H. 1998. Sequence of a 42-kb mouse region containing the imprinted H19 locus: identification of a novel muscle-specific transcription unit showing biallelic expression. *Mamm Genome* **9**:775–777.

Ishii, T., Serizawa, S., Kohda, A., Nakatani, H., Shiroishi, T., Okumura, K., Iwakura, Y., Nagawa, F., Tsuboi, A., and Sakano, H. 2001. Monoallelic expression of the odourant receptor gene and axonal projection of olfactory sensory neurones. *Genes Cells* **6**:71–78.

Jinno, Y., Yun, K., Nishiwaki, K., Kubota, T., Ogawa, O., Reeve, A. E., and Niikawa, N. 1994. Mosaic and polymorphic imprinting of the WT1 gene in humans. *Nat Genet* **6**:305–309.

John, R. M., Aparicio, S. A., Ainscough, J. F., Arney, K. L., Khosla, S., Hawker, K., Hilton, K. J., Barton, S. C., and Surani, M. A. 2001. Imprinted expression of neuronatin from modified BAC transgenes reveals regulation by distinct and distant enhancers. *Dev Biol* **236**:387–399.

Kagitani, F., Kuroiwa, Y., Wakana, S., Shiroishi, T., Miyoshi, N., Kobayashi, S., Nishida, M., Kohda, T., Kaneko-Ishino, T., Ishino, F., Maecker, H. T., Do, M. S., and Levy, S. 1997. Peg5/Neuronatin is an imprinted gene located on sub-distal chromosome 2 in the mouse. *Nucleic Acids Res* **25**:3428–3432.

Kashiwagi, A., Meguro, M., Hoshiya, H., Haruta, M., Ishino, F., Shibahara, T., and Oshimura, M. 2003. Predominant maternal expression of the mouse Atp10c in hippocampus and olfactory bulb. *J. Hum. Genet* **48**:194–198.

Kato, M. V., Ikawa, Y., Hayashizaki, Y., and Shibata, H. 1998. Paternal imprinting of mouse serotonin receptor 2A gene Htr2 in embryonic eye: a conserved imprinting regulation on the RB/Rb locus. *Genomics* **47**:146–148.

Kayashima, T., Ohta, T., Niikawa, N., and Kishino, T. 2003*a*. On the conflicting reports of imprinting status of mouse ATP10a in the adult brain: strain-background-dependent imprinting? *J Hum Genet* **48**:492–493.

Kayashima, T., Yamasaki, K., Yamada, T., Sakai, H., Miwa, N., Ohta, T., Yoshiura, K., Matsumoto, N., Nakane, Y., Kanetake, H., Ishino, F., Niikawa, N., and Kishino, T. 2003*b*. The novel imprinted carboxypeptidase A4 gene (CPA4) in the 7q32 imprinting domain. *Hum Genet* **112**:220–226.

Kelly, B. and Locksley, R. 2000. Coordinate regulation of the IL-4, IL-13, and IL-5 cytokine cluster in Th2 clones revealed by allelic expression patterns. *J Immunol* **165**:2982–2986.

Kim, J., Bergmann, A., Wehri, E., Lu, X., and Stubbs, L. 2001. Imprinting and evolution of two Kruppel-type zinc-finger genes, ZIM3 and ZNF264, located in the PEG3/USP29 imprinted domain. *Genomics* **77**:91–98.

Kim, J., Lu, X., and Stubbs, L. 1999. Zim1, a maternally expressed mouse kruppel-type zinc-finger gene located in proximal chromosome 7. *Hum Mol Genet* **8**:847–854.

Kim, J., Noskov, V. N., Lu, X., Bergmann, A., Ren, X., Warth, T., Richardson, P., Kouprina, N., and Stubbs, L. 2000. Discovery of a novel, paternally expressed ubiquitin-specific processing protease gene through comparative analysis of an imprinted region of mouse chromosome 7 and human chromosome 19q13.4. *Genome Res* **10**:1138–1147.

Kimura, M. I., Kazuki, Y., Kashiwagi, A., Kai, Y., Abe, S., Barbieri, O., Levi, G., and Oshimura, M. 2004. Dlx5, the mouse homologue of the human-imprinted DLX5 gene, is biallelically expressed in the mouse brain. *J Hum Genet* **49**:273–237.

Kitsberg, D., Selig, S., Brandeis, M., Simon, I., Keshet, I., Driscoll, D. J., Nicholls, R. D., and Cedar, H. 1993. Allele-specific replication timing of imprinted gene regions. *Nature* **364**:459–463.

Kobayashi, S., Kohda, T., Ichikawa, H., Ogura, A., Ohki, M., Kaneko-Ishino, T., and Ishino, F. 2002. Paternal expression of a novel imprinted gene, Peg12/Frat3, in the mouse 7C region homologous to the Prader-Willi syndrome region. *Biochem Biophys Res Commun* **290**:403–408.

Kuroiwa, Y., Kaneko-Ishino, T., Kagitani, F., Kohda, T., Li, L. L., Tada, M., Suzuki, R., Yokoyama, M., Shiroishi, T., Wakana, S., Barton, S. C., Ishino, F., and Surani, M. A. 1996. Peg3 imprinted gene on proximal chromosome 7 encodes for a zinc finger protein. *Nat Genet* **12**:186–190.

Lee, Y. J., Park, C. W., Hahn, Y., Park, J., Lee, J., Yun, J. H., Hyun, B., and Chung, J. H. 2000. Mit1/Lb9 and Copg2, new members of mouse imprinted genes closely linked to Peg1/Mest(1). *FEBS Lett* **472**:230–234.

Lin, Z. and Floros, J. 2002. Heterogeneous allele expression of pulmonary SP-D gene in rat large intestine and other tissues. *Physiol Genomics* **11**:235–243.

MacDonald, H. R. and Wevrick, R. 1997. The necdin gene is deleted in prader-willi syndrome and is imprinted in human and mouse. *Hum Mol Genet* **6**:1873–1878.

Maecker, H. T., Do, M. S., and Levy, S. 1998. CD81 on B cells promotes interleukin 4 secretion and antibody production during T helper type 2 immune responses. *Proc Natl Acad Sci U S A* **95**:2458–2462.

Malik, K., Salpekar, A., Hancock, A., Moorwood, K., Jackson, S., Charles, A., and Brown, K. W. 2000. Identification of differential methylation of the WT1 antisense regulatory region and relaxation of imprinting in Wilms' tumor. *Cancer Res* **60**:2356–2360.

Marker, P. C., King, J. A., Copeland, N. G., Jenkins, N. A., and Kingsley, D. M. 1995. Chromosomal localization, embryonic expression, and imprinting tests for bmp7 on distal mouse chromosome 2. *Genomics* **28**:576–580.

Meguro, M., Kashiwagi, A., Mitsuya, K., Nakao, M., Kondo, I., Saitoh, S., and Oshimura, M. 2001. A novel maternally expressed gene, ATP10C, encodes a putative aminophospholipid translocase associated with Angelman syndrome. *Nat Genet* **28**:19–20.

Mitsuya, K., Sui, H., Meguro, M., Kugoh, H., Jinno, Y., Niikawa, N., and Oshimura, M. 1997. Paternal expression of WT1 in human fibroblasts and lymphocytes. *Hum Mol Genet* **6**:2243–2246.

Miyoshi, N., Kuroiwa, Y., Kohda, T., Shitara, H., Yonekawa, H., Kawabe, T., Hasegawa, H., Barton, S. C., Surani, M. A., Kaneko-Ishino, T., and Ishino, F. 1998. Identification of the Meg1/Grb10 imprinted gene on mouse proximal chromosome 11, a candidate for the Silver-Russell syndrome gene. *Proc Natl Acad Sci U S A* **95**:1102–1107.

Miyoshi, N., Wagatsuma, H., Wakana, S., Shiroishi, T., Nomura, M., Aisaka, K., Kohda, T., Surani, M. A., Kaneko-Ishino, T., and Ishino, F. 2000. Identification of an imprinted gene, Meg3/Gtl2 and its human homologue MEG3, first mapped on mouse distal chromosome 12 and human chromosome 14q. *Genes Cells* **5**:211–220.

Mizuno, Y., Sotomaru, Y., Katsuzawa, Y., Kono, T., Meguro, M., Oshimura, M., Kawai, J., Tomaru, Y., Kiyosawa, H., Nikaido, I., Amanuma, H., Hayashizaki, Y., and Okazaki, Y. 2002. Asb4, Ata3, and Dcn are novel imprinted genes identified by high-throughput screening using RIKEN cDNA microarray. *Biochem Biophys Res Commun* **290**:1499–1505.

Mostoslavsky, R., Singh, N., Tenzen, T., Goldmit, M., Gabay, C., Elizur, S., Qi, P., Reubinoff, B. E., Chess, A., Cedar, H., and Bergman, Y. 2001. Asynchronous replication and allelic exclusion in the immune system. *Nature* **414**:221–225.

Okita, C., Meguro, M., Hoshiya, H., Haruta, M., Sakamoto, Y., and Oshimura, M. 2003. A new imprinted cluster on the human chromosome 7q21-q31, identified by human-mouse monochromosomal hybrids. *Genomics* **81**:556–559.

Ono, R., Kobayashi, S., Wagatsuma, H., Aisaka, K., Kohda, T., Kaneko-Ishino, T., and Ishino, F. 2001. A retrotransposon-derived gene, PEG10, is a novel imprinted gene located on human chromosome 7q21. *Genomics* **73**:232–237.

Ono, R., Shiura, H., Aburatani, H., Kohda, T., Kaneko-Ishino, T., and Ishino, F. 2003. Identification of a Large Novel Imprinted Gene Cluster on Mouse Proximal Chromosome 6. *Genome Res* **13**:1696–1705.

Overall, M. L., Parker, N. J., Scarcella, D. L., Smith, P. J., and Dziadek, M. 1998. Murine Stim1 maps to distal chromosome 7 and is not imprinted. *Mamm Genome* **9**:657–659.

Paulsen, M., Davies, K. R., Bowden, L. M., Villar, A. J., Franck, O., Fuermann, M., Dean, W. L., Moore, T. F., Rodrigues, N., Davies, K. E., Hu, R. J., Feinberg, A. P., Maher, E. R., Reik, W., and Walter, J. 1998. Syntenic organization of the mouse distal chromosome 7 imprinting cluster and the Beckwith-Wiedemann syndrome region in chromosome 11p15.5. *Hum Mol Genet* **7**:1149–1159.

Paulsen, M., El-Maarri, O., Engemann, S., Strodicke, M., Franck, O., Davies, K., Reinhardt, R., Reik, W., and Walter, J. 2000. Sequence conservation and variability of imprinting in the Beckwith-Wiedemann syndrome gene cluster in human and mouse. *Hum Mol Genet* **9**:1829–1841.

Pereira, J. P., Girard, R., Chaby, R., Cumano, A., and Vieira, P. 2003. Monoallelic expression of the murine gene encoding Toll-like receptor 4. *Nat Immunol* **4**:464–470.

Peters, J., Wroe, S. F., Wells, C. A., Miller, H. J., Bodle, D., Beechey, C. V., Williamson, C. M., and Kelsey, G. 1999. A cluster of oppositely imprinted transcripts at the Gnas locus in the distal imprinting region of mouse chromosome 2. *Proc Natl Acad Sci U S A* **96**:3830–3835.

Piras, G., El, K. h., Kozlov, S., Escalante-Alcalde, D., Hernandez, L., Copeland, N. G., Gilbert, D. J., Jenkins, N. A., and Stewart, C. L. 2000. Zac1 (Lot1), a potential tumor suppressor gene, and the gene for epsilon-sarcoglycan are maternally imprinted genes: identification by a subtractive screen of novel uniparental fibroblast lines. *Mol Cell Biol* **20**:3308–3315.

Plass, C., Shibata, H., Kalcheva, I., Mullins, L., Kotelevtseva, N., Mullins, J., Kato, R., Sasaki, H., Hirotsune, S., Okazaki, Y., Held, W. A., Hayashizaki, Y., and Chapman, V. M. 1996. Identification of Grf1 on mouse chromosome 9 as an imprinted gene by RLGS-M. *Nat Genet* **14**:106–109.

Qian, N., Frank, D., O'Keefe, D., Dao, D., Zhao, L., Yuan, L., Wang, Q., Keating, M., Walsh, C., and Tycko, B. 1997. The IPL gene on chromosome 11p15.5 is imprinted in humans and mice and is similar to TDAG51, implicated in Fas expression and apoptosis. *Hum Mol Genet* **6**:2021–2029.

Rachmilewitz, J., Gonik, B., Goshen, R., Ariel, I., Schneider, T., de Groot, N., and Hochberg, A. 1993. Use of a novel system for defining a gene imprinting region. *Biochem Biophys Res Commun* **196**:659–664.

Reik, W. and Walter, J. 2001. Genomic imprinting: parental influence on the genome. *Nat Rev Genet* **2**:21–32.

Sandell, L. L., Guan, X. J., Ingram, R., and Tilghman, S. M. 2003. Gatm, a creatine synthesis enzyme, is imprinted in mouse placenta. *Proc Natl Acad Sci U S A* **100**:4622–4627.

Schmidt, J. V., Matteson, P. G., Jones, B. K., Guan, X. J., and Tilghman, S. M. 2000. The Dlk1 and Gtl2 genes are linked and reciprocally imprinted. *Genes Dev* **14**:1997–2002.

Schweifer, N., Valk, P. J., Delwel, R., Cox, R., Francis, F., Meier-Ewert, S., Lehrach, H., and Barlow, D. P. 1997. Characterization of the C3 YAC contig from proximal mouse chromosome 17 and analysis of allelic expression of genes flanking the imprinted Igf2r gene. *Genomics* **43**:285–297.

Singh, N., Ebrahimi, F. A., Gimelbrant, A. A., Ensminger, A. W., Tackett, M. R., Qi, P., Gribnau, J., and Chess, A. 2003. Coordination of the random asynchronous replication of autosomal loci. *Nat Genet* **33**:339–341.

Smith, R. J., Dean, W., Konfortova, G., and Kelsey, G. 2003. Identification of novel imprinted genes in a genome-wide screen for maternal methylation. *Genome Res* **13**:558–569.

Takahashi, N. and Ko, M. 1993. The short 3'-end region of complementary DNAs as PCR-based polymorphic markers for an expression map of the mouse genome. *Genomics* **16**:161–168.

Tanamachi, D. M., Hanke, T., Takizawa, H., Jamieson, A. M., and Raulet, D. R. 2001. Expression of natural killer receptor alleles at different Ly49 loci occurs independently and is regulated by major histocompatibility complex class I molecules. *J Exp Med* **193**:307–315.

van Raamsdonk, C. and Tilghman, S. 2000. Dosage requirement and allelic expression of PAX6 during lens placode formation. *Development* **127**:5439–5448.

Vance, R. E., Jamieson, A. M., Cado, D., and Raulet, D. H. 2002. Implications of CD94 deficiency and monoallelic NKG2A expression for natural killer cell development and repertoire formation. *Proc Natl Acad Sci U S A* **99**:868–873.

Wakeling, E. L., Abu-Amero, S. N., Stanier, P., Preece, M. A., and Moore, G. E. 1998. Human EGFR, a candidate gene for the Silver-Russell syndrome, is biallelically expressed in a wide range of fetal tissues. *Eur J Hum Genet* **6**:158–164.

Wakeling, E. L., Hitchins, M. P., Abu-Amero, S. N., Stanier, P., Moore, G. E., and Preece, M. A. 2000. Biallelic expression of IGFBP1 and IGFBP3, two candidate genes for the Silver-Russell syndrome. *J Med Genet* **37**:65–67.

Walter, J. and Paulsen, M. 2003. The potential role of gene duplications in the evolution of imprinting mechanisms. *Hum Mol Genet* **12**:215–220.

Williamson, C. M., Dutton, E. R., Abbott, C. M., Beechey, C. V., Ball, S. T., and Peters, J. 1995. Thirteen genes (Cebpb, E2f1, Tcf4, Cyp24, Pck1, Acra4, Edn3, Kcnb1, Mc3r, Ntsr, Cd40, Plcg1 and Rcad) that probably lie in the distal imprinting region of mouse chromosome 2 are not monoallelically expressed. *Genet. Res* **65**:83–93.

Williamson, C. M., Dutton, E. R., Beechey, C. V., and Peters, J. 1994. Protective protein for beta-galactosidase, Ppgb, maps to the distal imprinting region of mouse chromosome 2 but is not imprinted. *Genomics* **22**:240–242.

Yamada, T., Kayashima, T., Yamasaki, K., Ohta, T., Yoshiura, K., Matsumoto, N., Fujimoto, S., Niikawa, N., and Kishino, T. 2002. The gene TSGA14, adjacent to the imprinted gene MEST, escapes genomic imprinting. *Gene* **288**:57–63.

Yamada, T., Mitsuya, K., Kayashima, T., Yamasaki, K., Ohta, T., Yoshiura, K., Matsumoto, N., Yamada, H., Minakami, H., Oshimura, M., Niikawa, N., and Kishino, T. 2003. Imprinting analysis of 10 genes and/or transcripts in a 1.5-mb mest-flanking region at human chromosome 7q32. *Genomics* **83**:402–412.

Yevtodiyenko, A., Carr, M. S., Patel, N., and Schmidt, J. V. 2002. Analysis of candidate imprinted genes linked to Dlk1-Gtl2 using a congenic mouse line. *Mamm Genome* **13**:633–638.

Yuan, L., Qian, N., and Tycko, B. 1996. An extended region of biallelic gene expression and rodent-human synteny downstream of the imprinted H19 gene on chromosome 11p15.5. *Hum Mol Genet* **5**:1931–1937.

Zhang, G., Taneja, K. L., Singer, R. H., and Green, M. R. 1994. Localization of pre-mRNA splicing in mammalian nuclei. *Nature* **372**:809–812.

Zubair, M., Hilton, K., Saam, J. R., Surani, M. A., Tilghman, S. M., and Sasaki, H. 1997. Structure and expression of the mouse L23mrp gene downstream of the imprinted H19 gene: biallelic expression and lack of interaction with the H19 enhancers. *Genomics* **45**:290–296.

Zwart, R., Sleutels, F., Wutz, A., Schinkel, A. H., and Barlow, D. P. 2001. Bidirectional action of the Igf2r imprint control element on upstream and downstream imprinted genes. *Genes Dev* **15**:2361–2366.