

Supplementary Table 1: Silencing classes for informative and well-expressed X-linked genes in BC and CB crosses.

Silencing classes for the 173 informative and well-expressed X-linked genes in BC and/or CB crosses.

All genes			All genes			Consistent genes			
Genes	BC	CB	Genes	BC	CB	Genes	BC	CB	All
1110012L19Rik	Early	Early	<i>Mdr1</i>	Late	NA	1110012L19Rik	Early	Early	Early
1810030O07Rik	NA	Esc	<i>Med12</i>	Early	NA	<i>Acsl4</i>	Late	Inter	Late
A230072C01Rik	NA	Late	<i>Med14</i>	Late	Esc	<i>Alg13</i>	Bias	Bias	Bias
<i>Abcb7</i>	Early	Late	<i>Mmgt1</i>	Late	Esc	<i>Amot</i>	Late	Bias	Late
<i>Abcd1</i>	Esc	NA	<i>Mospd1</i>	Late	Late	<i>Apex2</i>	Inter	Late	Inter
<i>Acof9</i>	Late	Early	<i>Mpp1</i>	Late	Esc	<i>Apoo</i>	Inter	Late	Inter
<i>Acsl4</i>	Late	Inter	<i>Msl3</i>	Esc	Esc	<i>Araf</i>	Esc	Bias	Esc
<i>Alg13</i>	Bias	Bias	<i>Mtm1</i>	Early	NA	<i>Atp6ap2</i>	Esc	Esc	Esc
<i>Amot</i>	Late	Bias	<i>Naa10</i>	Bias	Bias	<i>Atrx</i>	Inter	Early	Inter
<i>Apex2</i>	Inter	Late	<i>Ndufb11</i>	Bias	Esc	<i>Bcap31</i>	Inter	Late	Bias
<i>Apoo</i>	Inter	Late	<i>Nkap</i>	Esc	Bias	<i>Brwd3</i>	Late	Late	Late
<i>Araf</i>	Esc	Bias	<i>Nono</i>	Inter	Late	<i>Cdk16</i>	Late	Late	Late
<i>Atp11c</i>	Inter	NA	<i>Nsdhl</i>	NA	Inter	<i>Cul4b</i>	Late	Bias	Bias
<i>Atp6ap2</i>	Esc	Esc	<i>Ocr1</i>	Inter	Early	<i>Dkc1</i>	Bias	Bias	Bias
<i>Atp7a</i>	Early	NA	<i>Odf1</i>	Bias	Early	<i>Ebp</i>	Late	Bias	Late
<i>Atrx</i>	Inter	Early	<i>Ogt</i>	Esc	Bias	<i>Eda</i>	Late	Late	Late
BC065397	NA	Late	<i>Otud5</i>	Bias	Late	<i>Eif2s3x</i>	Bias	Esc	Esc
<i>Bcap31</i>	Inter	Late	<i>Pbdc1</i>	Esc	Esc	<i>Eif4</i>	Late	Late	Late
<i>Bex1</i>	NA	Late	<i>Pcyt1b</i>	Late	Late	<i>Fancb</i>	Late	Late	Late
<i>Bhlhb9</i>	NA	Late	<i>Pdha1</i>	Bias	Esc	<i>Fthl17f</i>	Late	Late	Late
<i>Brc3</i>	NA	Inter	<i>Pdzd11</i>	Inter	Inter	<i>G6pdx</i>	Inter	Late	Inter
<i>Brwd3</i>	Late	Late	<i>Pgk1</i>	Inter	NA	<i>Gata1</i>	Late	Late	Late
<i>Ccdc22</i>	Late	NA	<i>Pgrmc1</i>	Late	Late	<i>Gla</i>	Inter	Inter	Inter
<i>Cdk16</i>	Late	Late	<i>Phf6</i>	Late	NA	<i>Gnl3l</i>	Inter	Early	Late
<i>Cenpi</i>	Late	NA	<i>Phf8</i>	Late	Late	<i>Gpkow</i>	Late	Late	Late
<i>Cetn2</i>	Late	NA	<i>Pim2</i>	Late	Late	<i>Hccs</i>	Bias	Bias	Bias
<i>Cited1</i>	Bias	Inter	<i>Plp2</i>	Late	Late	<i>Hdac6</i>	Late	Late	Late
<i>Ctps2</i>	Bias	NA	<i>Pls3</i>	Inter	NA	<i>Hmgn5</i>	Inter	Early	Inter
<i>Cul4b</i>	Late	Bias	<i>Pnma5</i>	Early	Early	<i>Hsd17b10</i>	Late	Inter	Late
<i>Ddx3x</i>	Esc	Late	<i>Pola1</i>	Late	Late	<i>Htatsf1</i>	Late	Late	Late
<i>Dkc1</i>	Bias	Bias	<i>Porcn</i>	Inter	Late	<i>Huwe1</i>	Bias	Late	Bias
<i>Dlg3</i>	Early	NA	<i>Pqbp1</i>	Bias	Late	<i>Idh3g</i>	Esc	Bias	Bias
<i>Ebp</i>	Late	Bias	<i>Praf2</i>	Late	Bias	<i>Ids</i>	Late	Late	Late
<i>Eda</i>	Late	Late	<i>Prdx4</i>	Inter	Esc	<i>Jade3</i>	Late	Late	Late
<i>Eif1ax</i>	Late	Esc	<i>Prps1</i>	Bias	Bias	<i>Kdm5c</i>	Esc	Esc	Esc
<i>Eif2s3x</i>	Bias	Esc	<i>Psmd10</i>	Early	Late	<i>Kdm6a</i>	Late	Bias	Bias
<i>Eif4</i>	Late	Late	<i>Rab9</i>	Bias	Early	<i>Kif4</i>	Early	Early	Early
<i>Emd</i>	Early	NA	<i>Rbm3</i>	Esc	Bias	<i>Lage3</i>	Inter	Late	Bias
<i>Eras</i>	Early	NA	<i>Rbm3</i>	Early	Early	<i>Lamp2</i>	Esc	Bias	Bias
<i>Ercc6l</i>	Early	Late	<i>Rbm3</i>	Late	Late	<i>Las1l</i>	Inter	Early	Early
<i>Fam3a</i>	Early	Late	<i>Renbp</i>	Esc	Late	<i>Magt1</i>	Early	Inter	Early
<i>Fam50a</i>	Esc	Early	<i>Rgn</i>	Late	Late	<i>Map7d2</i>	Inter	Late	Late
<i>Fancb</i>	Late	Late	<i>Ribc1</i>	Early	NA	<i>Mbtps2</i>	Esc	Bias	Esc
<i>Flna</i>	Early	NA	<i>Rlim</i>	Early	Early	<i>Mospd1</i>	Late	Late	Late
<i>Fmr1</i>	Late	NA	<i>Rpgr</i>	NA	Late	<i>Msl3</i>	Esc	Esc	Esc
<i>Fmr1nb</i>	Early	NA	<i>Rpl10</i>	Inter	NA	<i>Naa10</i>	Bias	Bias	Bias
<i>Fthl17f</i>	Late	Late	<i>Sat1</i>	Inter	Bias	<i>Ndufb11</i>	Bias	Esc	Bias
<i>Ftj1</i>	Esc	Late	<i>Sic25a14</i>	Early	Late	<i>Nkap</i>	Esc	Bias	Bias
<i>Fundc1</i>	Esc	NA	<i>Sic25a53</i>	Early	NA	<i>Nono</i>	Inter	Late	Inter
<i>G6pdx</i>	Inter	Late	<i>Sic35a2</i>	Late	Early	<i>Ocr1</i>	Inter	Early	Late
<i>Gata1</i>	Late	Late	<i>Sic6a8</i>	Inter	Late	<i>Ogt</i>	Esc	Bias	Esc
<i>Gdi1</i>	Esc	NA	<i>Smc1a</i>	Inter	Bias	<i>Otud5</i>	Bias	Late	Late
<i>Gemin8</i>	Early	Esc	<i>Sms</i>	Esc	Esc	<i>Pbdc1</i>	Esc	Esc	Esc
<i>Gla</i>	Inter	Inter	<i>Snx12</i>	Early	NA	<i>Pcyt1b</i>	Late	Late	Late
<i>Gm6880</i>	Early	NA	<i>Suv39h1</i>	Esc	Esc	<i>Pdha1</i>	Bias	Esc	Esc
<i>Gnl3l</i>	Inter	Early	<i>Syap1</i>	Esc	Esc	<i>Pdzd11</i>	Inter	Inter	Inter
<i>Gpc4</i>	Early	NA	<i>Tab3</i>	Late	Inter	<i>Pgrmc1</i>	Late	Late	Late
<i>Gpkow</i>	Late	Late	<i>Taf1</i>	Late	NA	<i>Phf8</i>	Late	Late	Late
<i>Gspt2</i>	Inter	NA	<i>Taz</i>	Early	Late	<i>Pim2</i>	Late	Late	Late
<i>Haus7</i>	Early	NA	<i>Tbc1d25</i>	Esc	Bias	<i>Plp2</i>	Late	Late	Late
<i>Hccs</i>	Bias	Bias	<i>Tfe3</i>	Late	Bias	<i>Pnma5</i>	Early	Early	Early
<i>Hcfc1</i>	Bias	Early	<i>Timm17b</i>	Bias	Bias	<i>Pola1</i>	Late	Late	Late
<i>Hdac6</i>	Late	Late	<i>Tkt1l</i>	Early	Early	<i>Porcn</i>	Inter	Late	Esc
<i>Hmgb3</i>	Late	Early	<i>Tmem164</i>	Late	NA	<i>Pqbp1</i>	Bias	Late	Late
<i>Hmgn5</i>	Inter	Early	<i>Tmem185a</i>	Late	NA	<i>Praf2</i>	Late	Bias	Late
<i>Hprt</i>	Inter	Bias	<i>Trap1a</i>	Early	Esc	<i>Prps1</i>	Bias	Bias	Bias
<i>Hsd17b10</i>	Late	Inter	<i>Tsr2</i>	Bias	Late	<i>Rbm3</i>	Esc	Bias	Bias
<i>Htatsf1</i>	Late	Late	<i>Txlng</i>	Bias	Late	<i>Rbm3</i>	Early	Early	Early
<i>Huwe1</i>	Bias	Late	<i>Uba1</i>	Esc	Bias	<i>Rbm3</i>	Late	Late	Late
<i>Idh3g</i>	Esc	Bias	<i>Ubl4a</i>	Late	Late	<i>Rgn</i>	Late	Late	Late
<i>Ids</i>	Late	Late	<i>Usp9x</i>	Esc	Late	<i>Rlim</i>	Early	Early	Early
<i>Igbb1</i>	Esc	Late	<i>Utp14a</i>	Esc	Bias	<i>Sic6a8</i>	Inter	Late	Late
<i>Ikbkg</i>	Late	Esc	<i>Uxt</i>	Late	Esc	<i>Sms</i>	Esc	Esc	Esc
<i>Ii2rg</i>	Late	NA	<i>Vbp1</i>	Inter	Bias	<i>Suv39h1</i>	Esc	Esc	Esc
<i>Irak1</i>	Inter	NA	<i>Vma21</i>	NA	Late	<i>Syap1</i>	Esc	Esc	Esc
<i>Jade3</i>	Late	Late	<i>Wdr13</i>	Bias	Late	<i>Tab3</i>	Late	Inter	Inter
<i>Kdm5c</i>	Esc	Esc	<i>Wdr45</i>	Late	Bias	<i>Tbc1d25</i>	Esc	Bias	Bias
<i>Kdm6a</i>	Late	Bias	<i>Wnk3</i>	Late	NA	<i>Tfe3</i>	Late	Bias	Late
<i>Kif4</i>	Early	Early	<i>Xiap</i>	Late	Bias	<i>Timm17b</i>	Bias	Bias	Bias
<i>Kif8</i>	Inter	NA	<i>Xist</i>	Esc	Esc	<i>Tkt1l</i>	Early	Early	Early
<i>Kihl15</i>	Late	NA	<i>Yipf6</i>	Early	Bias	<i>Tsr2</i>	Bias	Late	Bias
<i>Lage3</i>	Late	Inter	<i>Zfx</i>	Early	Late	<i>Txlng</i>	Bias	Late	Late
<i>Lamp2</i>	Esc	Bias	<i>Zmym3</i>	Late	Early	<i>Uba1</i>	Esc	Bias	Esc
<i>Las1l</i>	Inter	Early	<i>Zrsr2</i>	Early	Bias	<i>Ubl4a</i>	Late	Late	Late
<i>Magea5</i>	Late	NA				<i>Utp14a</i>	Esc	Bias	Esc
<i>Maged1</i>	Early	NA				<i>Wdr13</i>	Bias	Late	Bias
<i>Magt1</i>	Early	Inter				<i>Wdr45</i>	Late	Bias	Bias
<i>Map7d2</i>	Inter	Late				<i>Xiap</i>	Late	Bias	Bias
<i>Mbtps2</i>	Esc	Bias				<i>Xist</i>	Esc	Esc	Esc

Supplementary Table 2: Summary of escapees and their status in other studies

Information for escapees is provided for CB and BC crosses. Status of each escapee gene has been evaluated in other studies using hybrid cell lines or tissues (Calabrese *et al*, *Cell*, 2012; Berletch *et al*, *PLOS Genet*, 2015; Marks *et al*, *Genome Biol*, 2015; Gendrel *et al*, *Dev Cell*, 2014)

Gene Symbol	BC embryos	CB embryos	TSC (Calabrese et al)	Brain (Berletch et al)	Spleen (Berletch et al)	Ovary (Berletch et al)	Patski (Berletch et al)	NPC* (Marks et al)	NPC** (Gendrel et al)
1810030O07Rik	-	yes	no			yes	yes	yes (1/3)	yes (4/4)
Abcd1	yes	no	no					-	yes (2/4)
Alg13	biased	biased	-			yes		no	yes (1/4)
Amot	no	biased	no				yes	no	no
Araf	yes	biased	no					yes (1/3)	yes (4/4)
Atp6ap2	yes	yes	-					no	yes (2/4)
Cited	biased	no	no					-	no
Ctsp2	biased	-	no				yes	no	yes (3/4)
Cul4b	no	biased	no					-	-
Ddx3x	yes	no	no	yes	yes	yes	yes	yes (3/3)	yes (4/4)
Dkc1	biased	biased	no					yes	no
Ebp	no	biased	no				yes	yes (1/3)	yes (2/4)
Eif1ax	no	yes	-					no	yes (2/4)
Eif2s3x	biased	yes	yes	yes	yes	yes	yes	-	yes (4/4)
Fam50a	yes	no	-				yes	-	yes (2/4)
Ftsj1	yes	no	no					yes (2/3)	yes (4/4)
Fundc1	yes	-	no					no	yes (2/4)
Gdi1	yes	-	no	yes				no	yes (2/4)
Gemin8	no	yes	no					-	yes (4/4)
Hccs	biased	biased	no					no	yes (3/4)
Hcfc1	biased	no	no					yes (2/3)	yes (4/4)
Hprt	no	biased	no					no	no
Huwe1	biased	no	no			yes		no	yes (3/4)
Idh3g	yes	biased	no			yes	yes	no	yes (2/4)
Igfbp1	yes	no	no					no	yes (3/4)
Ikbkg	no	yes	no				yes	no	yes (1/4)
Kdm5c	yes	yes	yes	yes	yes	yes	yes	yes (3/3)	yes (4/4)
Kdm6a	no	biased	yes	yes	yes	yes	yes	yes (3/3)	yes (4/4)
Lamp2	yes	biased	no			yes	yes	no	yes (1/4)
Mbtps2	yes	biased	no					no	yes (1/4)
Med14	no	yes	no					yes (2/3)	yes (4/4)
Mmgt1	no	yes	-			yes		-	yes (2/4)
Mpp1	no	yes	no					no	no
Msl3	yes	yes	no					no	yes (2/4)
Naa10	biased	biased	-					-	yes (2/4)
Ndufb11	biased	yes	no					yes (1/3)	yes (4/4)
Nkap	yes	biased	yes CB only					yes (2/3)***	yes (3/4)
Ofd1	biased	no	no				yes	yes (2/3)	yes (3/4)
Ogt	yes	biased	yes					no	yes (4/4)
Pbdc1	yes	yes	-		yes	yes	yes	-	yes (4/4)
Pdha1	biased	yes	no			yes		no	no
Pqbp1	biased	no	yes BC only					no	yes (3/4)
Praf2	no	biased	-					-	yes (3/4)
Prdx4	no	yes	no					no	no
Prps1	biased	biased	no					no	no
Rab9	biased	no	no					no	yes (3/4)
Rbm3	yes	biased	no					yes (1/3)	yes (2/4)
Renbp	yes	no	no					no	yes (2/4)
Sat1	no	biased	no					no	no
Smc1a	no	biased	no					no	yes (3/4)
Sms	yes	yes	no					no	no
Suv39h1	yes	yes	yes BC only					no	yes (4/4)
Syap1	yes	yes	yes CB only					no	yes (3/4)
Tbc1d25	yes	biased	no					yes (1/3)	yes (2/4)
Tfe3	no	biased	no					-	-
Timm17b	biased	biased	no					yes (2/3)	yes (3/4)
Trap1a	no	yes	no					-	-
Tsr2	biased	no	no					no	no
Txlng	biased	no	no					yes (1/3)	yes (3/4)
Uba1a	yes	biased	-			yes		yes (2/3)	yes (4/4)
Usp9x	yes	no	no			yes		yes (2/3)	yes (3/4)
Utp14a	yes	biased	yes		yes	yes		yes (3/3)	yes (4/4)
Uxt	no	yes	no					-	yes (1/4)
Vbp1	no	biased	no				yes	yes (2/3)	yes (2/4)
Wdr13	biased	no	no				yes	yes (1/3)	yes (3/4)
Wdr45	no	biased	no					yes (1/3)	yes (3/4)
Xiap	no	biased	-					no	no
Xist	yes	yes	yes	yes	yes	yes	yes	yes (3/3)	yes (4/4)
Yipf6	no	yes	yes				yes	no	yes (1/4)
Zrsr2	no	biased	yes					yes (1/3)	yes (3/4)

* NPC data are derived from 3 independent clones. Information of escape for each clone is provided in brackets.

** NPC data are derived from 4 independent clones. Information of escape for each clone is provided in brackets.

*** *Nkap* escapes from Cast Xi and from 129 Xi.