Genetically Modified Mouse Strains

Gene targeted mouse strains developed by the CNIO faculty

Targeted Locus	Allele	Targeting Strategy	CNIO Researcher	Reference
Atr	*Atr^{hAtr}*	Knock in of human wild-type Atr exons 8-10 into mouse *Atr*	O. Fernández-Capetillo	Unpublished
Atr	*Atr^{Seckel}*	Knock in of human Atr exons 8-10 with Seckel Syndrome mutation into mouse *Atr*	O. Fernández-Capetillo	Unpublished
Aurkb	*AuroraB^{null}*	Knock out	M. Malumbres	Unpublished
Aurkb	*AuroraB^{lox}*	Conditional knock out (Cre/loxP)	M. Malumbres	Unpublished
Braf	*B-Raf^{geo}*	Knock in of IRES-geo cassette at 3' UTR	M. Barbacid	Unpublished
Braf	*B-Raf^{LSLV600E}*	Knock in of lox-STOP-lox cassette and V600E mutation	M. Barbacid	Unpublished
Cdc14a	*Cdc14a^{null}*	Knock out	M. Malumbres	Unpublished
Cdc14b	*Cdc14b^{null}*	Knock out	M. Malumbres	Unpublished
Cdc20	*Cdc20^{lox}*	Conditional knock out (Cre/loxP)	M. Malumbres	Unpublished
Cdc20	*Cdc20^{mut}*	Gene trap, null	M. Malumbres	Unpublished
Cdc20	*Cdc20^{null}*	Knock out	M. Malumbres	Unpublished
Cdk1	*Cdk1^{mut1}*	Gene trap, null	M. Barbacid	*Nature*, 2007. 448:811-815
Cdk1	*Cdk1^{mut2}*	Gene trap, null	M. Barbacid	*Nature*, 2007. 448:811-815
Cdk2	*Cdk2β^{null}*	Knock out of the splicing variant of Cdk2, Cdk2β	S. Ortega	Unpublished
Cdk2	*Cdk2^{lox}*	Conditional knock out (Cre/loxP)	M. Barbacid	*Nat Genet*, 2003. 35:25-31
Cdk2	*Cdk2^{null}*	Knock out	M. Barbacid	*Nat Genet*, 2003. 35:25-31
Cdk4	*Cdk4^{frt}*	Conditional knock out (Flp/frt)	M. Barbacid	*Mol Oncology*, 2007. 1:72-83
Cdk4	*Cdk4^{null}*	Knock out	M. Barbacid	*Mol Oncology*, 2007. 1:72-83
Cdk4	*Cdk4^{R24C}*	Knock in, R24C miscoding mutation	M. Barbacid	*Nat Genet*, 1999. 22:44-52
Cdk4	*Cdk4^{K35Mlox}*	Knock in, conditional K35M miscoding mutation	M. Barbacid	Unpublished
Cdk6	*Cdk6^{null}*	Knock out	M. Barbacid	*Cell*, 2004. 118:493-504
Cdk6	*Cdk6^{R31C}*	Knock in, R31C miscoding mutation	M. Malumbres	Unpublished
Cdkn1c	*p57Kip2^{null}*	Knock out	M. Barbacid	*Genes & Dev*, 2007. 21:973-983
Cdkn2a	*p16Ink4a^{null}, p19Arf^{null}*	Double knock out for p16*Ink4a* and p19*Arf*	M. Serrano	*Cell*, 1996. 85:27-37
Cdkn2b	*p15Ink4b^{null}*	Knock out	M. Barbacid	*EMBO J*, 2000. 19:3496-3506
Cdkn2c	*p18Ink4c^{null}*	Knock out	M. Barbacid	*EMBO J*, 2000. 19:3496-3506
Chek1	*Chk1^{S280A}*	Knock in, S280A miscoding mutation	O. Fernández-Capetillo	Unpublished
Chek1	*Chk1^{S280E}*	Knock in, S280E miscoding mutation	O. Fernández-Capetillo	Unpublished
Chek1	*Chk1$^{S315A/S345A}$*	Knock in, S315A and S345A miscoding mutations	O. Fernández-Capetillo	Unpublished
Clspn	*Clspn$^{T844A, S846A}$*	Knock in, T844A and S846A miscoding mutations	O. Fernández-Capetillo	Unpublished
Col1a1	*Col1a1^{Fos}*	Knock in (tet-switchable allele)	E.F. Wagner	Unpublished
Col1a1	*Col1a1^{Fra2}*	Knock in (tet-switchable allele)	E.F. Wagner	Unpublished
Col1a1	*Col1a1$^{Jun-Fos}$*	Knock in (tet-switchable allele)	E.F. Wagner	Unpublished
Col1a1	*Col1a1$^{JunB-Fos}$*	Knock in (tet-switchable allele)	E.F. Wagner	Unpublished
Col1a1	*Col1a1$^{JunD-Fos}$*	Knock in (tet-switchable allele)	E.F. Wagner	Unpublished
Col1a1	*Col1a1^{hURI}*	Knock in (tet-switchable allele)	N. Djouder	Unpublished
Cpeb4	*Cpeb4^{lox}*	Conditional knock out (Cre/loxP), reversible	F.X. Real (from EMMA)	Unpublished
Fntb	*FT^{lox}*	Conditional knock out (Cre/loxP)	M. Barbacid	*Cancer Cell*, 2005. 7:313-324
Fntb	*FT^{null}*	Knock out	M. Barbacid	*Cancer Cell*, 2005. 7:313-324
Fos	*Fos^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*J Neurosci*, 2003. 23:9116-9122
Fos	*Fos^{S362A}*	Knock in, S362A miscoding mutation	E.F. Wagner	*Oncogene*, 2010.
Fos	*Fos$^{S362A/S374A}$*	Knock in, S362A and S374A miscoding mutations	E.F. Wagner	*Oncogene*, 2010.
Fos	*Fos$^{S362D/S374D}$*	Knock in, S362D and S374D miscoding mutations	E.F. Wagner	*Oncogene*, 2010.
Fos	*Fos^{S374A}*	Knock in, S374A miscoding mutation	E.F. Wagner	*Oncogene*, 2010.
Fosl1	*Fra1^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*EMBO J*, 2004. 23:2789-2799
Fosl2	*Fra2^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*Development*, 2004. 131:5717-5725
Fosl2	*Fra2^{null}*	Knock out	E.F. Wagner	*Development*, 2004. 131:5717-5725
Fzr1	*Fzr1^{lox}*	Conditional knock out (Cre/loxP)	M. Malumbres	*Nat Cell Biol*, 2008. 10:802-811
Fzr1	*Fzr1^{null}*	Knock out	M. Malumbres	*Nat Cell Biol*, 2008. 10:802-811
Hras	*H-Ras^{geo}*	Knock in of IRES-geo cassette at 3' UTR	M. Barbacid	*J Clin Invest*, 2008. 118:2169-2179
Hras	*H-Ras^{G12Vgeo}*	Knock in of G12V mutation and IRES-geo cassette at 3' UTR	M. Barbacid	*J Clin Invest*, 2008. 118:2169-2179
Hras	*H-Ras^{LSLG12Vgeo}*	Knock in of lox-STOP-lox cassette, G12V mutation and IRES-geo cassette at 3' UTR	M. Barbacid	*J Clin Invest*, 2008. 118:2169-2179
Hras	*H-Ras^{LSLG12VD38Egeo}*	Knock in of lox-STOP-lox cassette, G12V/D38E mutations and IRES-geo cassette at 3' UTR	M. Barbacid	Unpublished

Gene targeted mouse strains developed by the CNIO faculty (continued)

Targeted Locus	Allele	Targeting Strategy	CNIO Researcher	Reference
Hspc300	*Hspc300^{mut}*	Gene trap, null	M. Malumbres	Unpublished
Jmjd2c	*Gasc1^{mut}*	Gene trap, null	O. Fernández-Capetillo	Unpublished
Jun	*Jun^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*EMBO J*, 2002. 21:1782-1790
Jun	*Jun$^{S63A/S73A}$*	Knock in, S63A and S73A miscoding mutations	E.F. Wagner	*Nat Genet*, 1999. 21:326-329
Junb	*Junb^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*J Cell Biol*, 2004. 164:613-623
Kdr	*Flk-1^{lox}*	Conditional knock out (Cre/loxP)	E.F. Wagner	*Dev Biol*, 2003. 262:225-241
Kntc2	*Hec1^{mut}*	Gene trap, null	M. Malumbres	Unpublished
Kras	*K-Ras^{geo}*	Knock in of IRES-geo cassette at 3' UTR	M. Barbacid	Unpublished
Kras	*K-Ras^{lox}*	Conditional knock out (Cre/loxP)	M. Barbacid	Unpublished
Kras	*K-Ras^{LSLG12Vgeo}*	Knock in of lox-STOP-lox cassette, G12V mutation and IRES-geo cassette at 3' UTR	M. Barbacid	*Cancer Cell*, 2003. 4:111-120
Kras	*K-Ras^{LSLG12Vfrtgeo}*	Knock in of lox-STOP-lox cassette, Frt-exon1 with G12V mutation-Frt casette and IRES-geo cassette at 3' UTR	M. Barbacid	Unpublished
Kras	*K-Ras^{V14I}*	*Knock in of V14I mutation*	*M. Barbacid*	Unpublished
Kras	*K-Ras^{LSLV14I}*	*Knock in of lox-STOP-lox cassette, V14I mutation*	*M. Barbacid*	Unpublished
Kras	*K-Ras^{null}*	Knock out	M. Barbacid	Unpublished
L3mbtl1	*L3mbtl1^{lox}*	Conditional knock out (Cre/loxP)	O. Fernández-Capetillo	Unpublished
Mad1	*Mad1^{mut}*	Gene trap, null	M. Malumbres	Unpublished
Mapk8	*Jnk1^{null}*	Knock out	E.F. Wagner	*J Exp Med*, 2001. 193:317-328
Mapk9	*Jnk2^{null}*	Knock out	E.F. Wagner	*Immunity*, 1998. 9:575-585
Mapk14	*p38α^{lox}*	Conditional knock out (Cre/loxP)	A.R. Nebreda[1]	*Nat Genet*, 2007. 39:750-758
Mapk14	*p38α^{null}*	Knock out	A.R. Nebreda[1]	*Mol Cell*, 2000. 6:109-116
Mapk14	*p38βKIα*	Knock in	A.R. Nebreda[1]	Unpublished
Mecp2	*Mecp2^{null}*	Knock out	M. Esteller[2]	Unpublished
Mir-203	*Mir-203^{null}*	Knock out	M. Malumbres	Unpublished
Mwd	*Mwd^{lox}*	Conditional knock out (Cre/loxP)	E.Moreno[3]	Unpublished
Mwd	*Mwd^{null}*	Knock out	E.Moreno[3]	Unpublished
Nsmce2	*Mms21^{mut}*	Gene trap, null	O. Fernández-Capetillo	Unpublished
Nsmce2	*Mms21^{SUMODead}*	Knock in that eliminates SUMO ligase activity	O. Fernández-Capetillo	Unpublished
Numa1	*Numa1$^{mut/lox}$*	Gene trap, conditional knock out (FLEX system)	M. Malumbres	Unpublished
Pawr	*Par4^{null}*	Knock out	M. Serrano	*EMBO Rep*, 2003. 4:1-6
Pi3kca	*Pi3kca^{R1047Hlox}*	Conditional knock in (Cre/loxP) of the R1047H miscoding mutation	P. Pizcueta	Unpublished
Pi3kca	*Pi3kca^{R916Plox}*	Conditional knock in (Cre/loxP) of the R916P miscoding mutation	P. Pizcueta	Unpublished
Pds5A	*Pds5A^{null}*	Knock out	A. Losada	Unpublished
Pds5B	*Pds5B^{lox}*	Conditional knock out (Cre/loxP)	A. Losada	Unpublished
Plk1	*Plk1^{null}*	Knock out	M. Malumbres	Unpublished
Plk1	*Plk1^{lox}*	Conditional knock out (Cre/loxP)	M. Malumbres	Unpublished
Plk1	*Plk1^{mut}*	Genetrap, null	M. Malumbres	Unpublished
Setd8	*Set8^{null}*	Gene trap, null	O. Fernández-Capetillo	Unpublished
Stag1	*Stag1$^{mut/lox}$*	Gene trap, conditional knock out (FLEX system)	A. Losada	Unpublished
Terc	*Terc^{null}*	Knock out	M.A. Blasco	*Cell*, 1997. 91:25-34
Tpx2	*Tpx2$^{mut/lox}$*	Gene trap, conditional knock out (FLEX system)	M. Malumbres	Unpublished
Vav1	*Vav1^{null}*	Knock out	M. Barbacid	*EMBO J*, 1995. 14:1-11
Vav2	*Vav2^{null}*	Knock out	M. Barbacid	*Nat Immunology*, 2001. 2:548-555

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[2]Current address: ICO-IDIBELL, Barcelona, Spain
[3]Current address: University of Bern, Switzerland

Transgenic mouse strains developed by the CNIO faculty

Strain	Description	Contact Investigator	Reference
Tg.βActin-LSL-Pim1	Conditional Pim1 expression driven by the βActin promoter	P. Pizcueta	Unpublished
Tg.βActin-LSL-Pim2	Conditional Pim2 expression driven by the βActin promoter	P. Pizcueta	Unpublished
Tg.BAC-Chek1	Murine BAC Chek1 transgene	O. Fernández-Capetillo	Unpublished
Tg.BAC-Sirt1	Murine BAC Sirt1 transgene	M. Serrano	*Proc Natl Acad Sci USA*, 2008. 105:9793-9798
Tg.BAC-p53	Murine BAC p53 transgene	M. Serrano	*EMBO J*, 2002. 21:6225-6235
Tg.CMV-Topbp1	Topbp1 expression driven by the CMV promoter	O. Fernández-Capetillo	Unpublished
Tg.H2k-cFos-LTR	Fos expression driven by the H2k promoter	E.F. Wagner	*J Cell Biol*, 1993. 122:685-701

Transgenic mouse strains developed by the CNIO faculty (continued)

Tg.H2k-Fra1-LTR	Fra1 expression driven by the H2k promoter	E.F. Wagner	*Nat Med*, 2000. 6:980-984
Tg.H2k-Fra2-LTR	Fra2 expression driven by the H2k promoter	E.F. Wagner	*Proc Natl Acad Sci USA*, 2008. 105:10525-10530
Tg.K5-Hamlet	p18-Hamlet expression driven by the Keratin 5 promoter	A.R. Nebreda[1]	Unpublished
Tg.K5-Sos-F	Sos-F expression driven by the Keratin 5 promoter	E.F. Wagner	*Cell*, 2000. 102:211-220
Tg.K5-Tert	Tert expression driven by the Keratin 5 promoter	M.A. Blasco	*EMBO J*, 2001. 20:2619-2630
Tg.K5-Trf2	Trf2 expression driven by the Keratin 5 promoter	M.A. Blasco	*Nat Genet*, 2005. 37:1063-1071
Tg.MMTV-Akt1	Akt1 expression driven by the MMTV promoter	A. Carnero[4]	*Carcinogenesis*, 2007. 28:584-594
Tg.MMTV-p110α	p110α expression driven by the MMTV promoter	A. Carnero[4]	*Cancer Research*, 2008. 68:9643-9653
Tg.MMTV-Pten(NLSmut)	NLS-defective-Pten mutant expression driven by the MMTV promoter	A. Carnero[4]	Unpublished
Tg.PAC-Ink4a/Arf/Ink4b	P1-derived artificial chromosome Ink4a/Arf/Ink4b transgene	M. Serrano	*Genes Dev*, 2004. 18:2736-2746
Tg.Vkappa-miR217	B cell-specific miR217 transgene	A.R. Ramiro	Unpublished

[1]Current address: Institute for Research in Biomedicine (IRB), Barcelona, Spain
[4]Current address: Institute of Biomedicine in Seville, Spain

Gene targeted mouse strains provided by external research groups

Targeted Locus	Allele	Targeting Strategy	Source	Reference
Aicda	*Aid^{null}*	Knock out	T. Honjo, Kyoto, Japan	*Cell*, 2000. 102:553-563
Apc	*Apc^{lox}*	Conditional knock out (Cre/loxP)	A. Clarke, Cardiff, UK	*Proc Natl Acad Sci USA*, 2006. 103:14122-14127
Apc	*Apc^{Min}*	Chemically induced mutation ApcD850	E. Batlle, Barcelona, Spain	*Science*, 1990. 247: 322-324.
Atm	*Atm^{null}*	Knock out	A. Wynshaw-Boris, San Diego, USA	*Cell*, 1996. 86:159-171
Aurka	*AuroraA^{lox}*	Conditional knock out (Cre/loxP)	T. Van Dyke, Chapel Hill, USA	*Mol Cell Biol*, 2009. 29:1059-1071
Bbc3	*Puma^{null}*	Knock out	A. Strasser, Victoria, Australia	*Science*, 2003. 302:1036-1038
Braf	*B-Raf^{lox}*	Conditional knock out (Cre/loxP)	A.J. Silva, Los Angeles, USA	*J Neurosci*, 2006. 83:28-38
CcnE1	*CcnE1^{null}*	Knock out	P. Sicinski, Boston, USA	*Cell*, 2003. 114:431-443
CcnE2	*CcnE2^{null}*	Knock out	P. Sicinski, Boston, USA	*Cell*, 2003. 114:431-443
Cdkn1a	*p21Cip1^{null}*	Knock out	G. Hannon, New York, USA	*Nature*, 1995. 377:552-557
Cdkn1b	*p27Kip1^{null}*	Knock out	J. Roberts, Seattle, USA	*Cell*, 1996. 85:733-744
Cdkn2a	*p16Ink4a^{null}*	Knock out	A. Berns, Amsterdam, The Netherlands	*Nature*, 2001. 413:83-86
Cdkn2a	*p19Arf^{GFP}*	Knock in of GFP at the *p19Arf* locus; p19Arf knock out	C.J. Sherr, Memphis, USA	*Proc Natl Acad Sci USA*, 2003. 100:15930-15935
Cdkn2a	*p19Arf^{null}*	Knock out	C.J. Sherr, Memphis, USA	*Cell*, 1997. 91:649-659
C-kit	*c-kit$^{IRES-Cre-ERT2}$*	Knock in of IRES-Cre-ERT2 in *c-kit* locus	D. Saur, Munich, Germany	Unpublished
Ctnnd1	*p120^{lox}*	Conditional knock out (Cre/loxP)	A. Reynolds, Nashville, USA	*Dev Cell*, 2006. 10:21-31
Dicer1	*Dicer^{lox}*	Conditional knock out (Cre/loxP)	C. Tabin, Boston, USA	*Proc Natl Acad Sci USA*, 2005. 102:10898-10903
E2f1	*E2f1^{null}*	Knock out	A.M. Zubiaga, Bilbao, Spain	*Cell*, 1996. 85:549-561
E2f2	*E2f2^{null}*	Knock out	A.M. Zubiaga, Bilbao, Spain	*Immunity*, 2001.15:959-970
Egfr	*Egfr^{lox}*	Conditional knock out (Cre/loxP)	M. Sibilia, Vienna, Austria	Unpublished
Egfr	*Egfr^{wa2}*	Spontaneous mutation EGFRV743G	A.Dunn, Victoria, Australia	*Genes Dev*, 1994. 8:399413
Ercc4	*Xpf^{null}*	Knock out	F.W. Alt, Boston, USA	*Mol Cell Biol*, 2004. 24:1200-1205
Gata6	*Gata6^{lox}*	Conditional knock out (Cre/loxP)	S.A. Duncan, Milwaukee, USA	*BMC Dev Biol*, 2006. 6:19
H2afx	*H2a.x^{null}*	Knock out	A. Nussenzweig, Bethesda, USA	*Science*, 2002. 296:922-227
H2afz	*H2a.z^{null}*	Knock out	L. Lyons, Rundle Mall, Australia	*Curr Biol*, 2001. 11:1183-1187
Hdac4	*Hdac4^{lox}*	Conditional knock out (Cre/loxP)	E.N. Olson, Texas, USA	*Cell*, 2004. 119:555-566
Hras	*H-Ras^{null}*	Knock out	E. Santos, Salamanca, Spain	*Mol Cell Biol*, 2001. 21:1444-1452
Ikbkb	*Ikkb^{lox}*	Conditional knock out (Cre/loxP)	M. Karin, San Diego, USA	*Science*, 2002. 297:2048-2051
Il6	*Il6^{null}*	Knock out	The Jackson Laboratory, Bar Harbor, USA	*Nature*, 1994. 368:339-342
Jund	*Jund^{null}*	Knock out	M. Yaniv, Paris, France	*Development*, 2000. 127:143-153
Kras	*K-Ras^{Hras}*	Knock in of H-*ras* cDNA in the K-*ras* gene	R. di Lauro, Naples, Italy	*EMBO Rep*, 2005. 6:432-437
Kras	*K-Ras^{Kras}*	Knock in of K-*ras* cDNA in the K-*ras* gene	R. di Lauro, Naples, Italy	*EMBO Rep*, 2005. 6:432-437
Ku80	*Ku80^{null}*	Knock out	A. Nussenzweig, Bethesda, USA	*Nature*, 1996. 382:551-555
Lhx1	*Lhx1^{lox}*	Conditional knock out (Cre/loxP)	H. Westphal, Bethesda,USA	*Proc Natl Acad Sci USA*, 2007. 104: 13182–13186
Lif	*Lif^{null}*	Knock out	C. Stewart, Singapore	*Nature*, 1992. 359:76–79
Lgr5	*Lgr5$^{eGFP-IRES-CreERT2}$*	Knock in of eGFP-IRES-CreERT2 in *Lgr5* locus	H. Clevers, Utrecht, The Netherlands	*Nature*, 2007. 449:1003-1007
Map2k1	*Mek1^{lox}*	Conditional knock out (Cre/loxP)	M. Baccarini, Vienna, Austria	Unpublished
Map2k2	*Mek2^{null}*	Knock out	J. Charron, Quebec, Canada	*Mol Cell Biol*, 2003. 23:4778-4787
Mapk1	*Erk2^{lox}*	Conditional knock out (Cre/loxP)	S.M. Hedrick, San Diego, USA	*Immunity*, 2005. 23:431-443
Mapk3	*Erk1^{null}*	Knock out	S.M. Hedrick, San Diego, USA	*Immunity*, 2005. 23:431-443

Gene targeted mouse strains provided by external research groups (continued)

Targeted Locus	Allele	Targeting Strategy	Source	Reference
Mapk11	*p38β*^{null}	Knock out	J.S. Arthur, Dundee, UK	*Mol Cell Biol*, 2005. 25:10454-10464
miR106a~363	*miR106a~363*	Knock out	T. Jacks, Cambridge, USA	*Cell*, 2008. 132: 875-886
miR106b~25	*miR106b~25*	Knock out	T. Jacks, Cambridge, USA	*Cell*, 2008. 132: 875-886
Mlh1	*Mlh1*^{null}	Knock out	R.M. Liskay, Portland, USA	*Nat Genet*, 1996. 13:336-342
Mtap	*Mtap*^{mut}	Gene trap, null	MMRRC (Mutant Mouse Regional Resource Centers), Davis, USA	*Am J Med Genet A*, 2007. 143:1630-1639
Myb	*Myb*^{hypomorph}	Knock out (hypomorph)	J. Frampton, Birmingham, UK	*EMBO J*, 2003. 22: 4478–4488
Myb	*Myb*^{lox}	Conditional knock out (Cre/loxP)	J. Frampton, Birmingham, UK	*Genesis*, 2005. 43:189-195
Myc	*Myc*^{lox}	Conditional knock out (Cre/loxP)	I. Moreno de Alboran, Madrid, Spain	*Immunity*, 2001. 14:45-55
Nanog	*Nanog*^{null}	Knock out	S. Yamanaka, Ikoma, Japan	*Cell*, 2003. 113:631-642
Nf1	*Nf1*^{null}	Knock out	L. Parada, Dallas, USA	*Science*, 1999. 286:2176-2179
N-Ras	*N-Ras*^{null}	Knock out	A. Pellicer, New York, USA	*Proc Natl Acad Sci USA*, 1995. 92:1709-1713
Nr5a2	*Nr5a2*^{null}	Knock out	J. Auwerx, Lausanne, Switzerland	*Mol Cell*, 2004. 15:499–509
Nr5a2	*Nr5a2*^{lox}	Conditional knock out (Cre/loxP)	J. Auwerx, Lausanne, Switzerland	*Proc Natl Acad Sci USA*, 2007. 104:13098–13103
Nupr1	*p8*^{null}	Knock out	J. Iovanna, Marseille, France	*J Biol Chem*, 2004. 279:7199-7207
Pim1	*Pim1*^{null}	Knock out	A. Berns, Amsterdam, The Netherlands	*Mol Cell Biol*, 2004. 24:6104-6115
Pim2	*Pim2*^{null}	Knock out	A. Berns, Amsterdam, The Netherlands	*Mol Cell Biol*, 2004. 24:6104-6115
Pim3	*Pim3*^{null}	Knock out	A. Berns, Amsterdam, The Netherlands	*Mol Cell Biol*, 2004. 24:6104-6115
Psen1	*Psen1*^{lox}	Conditional knock out (Cre/loxP)	J. Shen, Boston, USA	*J Neurosci*, 2005. 25:6755-6764
Psen2	*Psen2*^{null}	Knock out	J. Shen, Boston, USA	*Trends Pharmacol Sci*, 2006. 27:33-40
Pten	*Pten*^{lox}	Conditional knock out (Cre/loxP)	H. Wu, Los Angeles, USA	*Development*, 2002. 129:4159-4170
Pten	*Pten*^{null}	Knock out	P.P. Pandolfi, New York, USA	*Nat Genet*, 1998. 19:348-355
Ptgs2	*Cox2*^{null}	Knock out	J.E. Dinchuk / J.M. Trzaskos, Wilmington USA / The Jackson Laboratory, Bar Harbor, USA	*Nature*, 1995. 378:406-409
Raf1	*C-Raf*^{null}	Knock out	M. Baccarini, Vienna, Austria	*EMBO J*, 2001. 20:1952-1962
Rag1	*Rag1*^{null}	Knock out	The Jackson Laboratory, Bar Harbor, USA	*Cell*, 1992. 68:869-877
Rbpj	*Rbp-J*^{lox}	Conditional knock out (Cre/loxP)	T. Honjo, Kyoto, Japan	*Int Immunol*, 2002. 14:637-645
S100a9	*S100a9*^{null}	Knock out	W. Nacken, Münster, Germany	*Mol Cell Biol*, 2003. 23:1034-1043
Sirt1	*Sirt1*^{null}	Knock out	F.W. Alt, Boston, USA	*Proc Natl Acad Sci USA*, 2003. 100:10794-10799
Sirt6	*Sirt6*^{null}	Knock out	F.W. Alt, Boston, USA	*Cell*, 2006. 124:315-329
Skp2	*Skp2*^{null}	Knock out	K. Nakayama, Fukuoka, Japan	*EMBO J*, 2000. 19:2069-2081
Snai1	*Snai1*^{lox}	Conditional knock out (Cre/loxP)	T. Gridley, Bar Harbour, USA	*Genesis*, 2006. 44:7-11
Timp3	*Timp3*^{null}	Knock out	R. Khokha, Toronto, Canada	*J Clin Invest*, 2001. 108:817-829
Trp53	*p53*^{LSL}	Knock in of lox-STOP-lox cassette	T. Jacks, Cambridge, USA	*Nature*, 2007. 445:661-665
Trp53	*p53*^{null}	Knock out	The Jackson Laboratory, Bar Harbor, USA	*Curr Biol*, 1994. 4:1-7
Vegfa	*Vegfa*^{lox}	Conditional knock out (Cre/loxP)	H.P. Gerber, San Francisco, USA	*Development*, 1999. 126:1149-1159
Xpa	*Xpa*^{null}	Knock out	H. van Steeg, Bilthoven, The Netherlands	*Nature*, 1995. 377:169-173
Xpc	*Xpc*^{null}	Knock out	E.C. Friedberg, Dallas, USA	*Mutat Res*, 1997. 374:1-9
Xrcc5	*Ku80*^{null}	Knock out	A. Nussenzweig, Bethesda, USA	*Nature*, 1996. 382:551-555

Transgenic mouse strains provided by external research groups

Strain	Description	Source	Reference
Tg.Ela-Myc	c-Myc expression driven by the Ela promoter	E. Sandgren, Philadelphia, USA	*Proc Natl Acad Sci USA*, 1991. 88:93-97
Tg.Ela-tPA	tPA expression driven by the Ela promoter	P. Navarro, Barcelona, Spain	Unpublished
Tg.Emu-Myc	c-Myc expression driven by the murine IgH enhancer	I. Moreno de Alboran, Madrid, Spain	*Cell*, 1985. 40:71-79
Tg.K14-EmtB3-GFP	Ensconsin (E-MAP115) and GFP expression driven by the K14 promoter	E. Fuchs, New York, USA	*J Cell Biol*, 2007. 176:147-154
Tg.MMTV-CyclinD1	Cyclin D1 expression driven by the MMTV promoter	E. Schmidt, Charlestown, USA	*Am J Pathol*, 2004. 164:1031-1038
Tg.MMTV-ErbB2	ErbB2 expression driven by the MMTV promoter	The Jackson Laboratory, Bar Harbor, USA	Unpublished
Tg.MMTV-Myc	c-Myc expression driven by the MMTV promoter	P. Leder, Boston, USA	*Cell*, 1986. 45:485-495
Tg.MMTV-PyMT	PyMT expression driven by the MMTV promoter	W. Muller, Hamilton, Canada	*Mol Cell Biol*, 1992. 12:954-961
Tg.(tet0-DTA)	Expression of diphtheria toxin A (DTA) under the control of a tetO and a CMV minimal promoter	The Jackson Laboratory, Bar Harbor, USA	*Proc Natl Acad Sci USA*, 1998. 95:11371-11376
Tg.Tyr-N-Ras^{Q61K}	Miscoding mutant N-RasQ16K expression driven by the tyrosinase promoter	F. Beermann, Lausanne, Switzerland	*Cancer Res*, 2005. 65:4005-4011
Tg.WAP-p53^{R172H}	Miscoding mutant p53R172H expression driven by the rat whaey acidic protein promoter	J.M. Rosen, Houston, USA	*Mol Cell Biol*, 1997. 17:3155-3163
Tg.TRE-H2bGFP	Tg, expresses H2b-GFP in tet inducible manner	E. Fuchs, New York, USA	*Science*, 2004. 303:359-363

Tool strains

CNIO contact for these strains: Sagrario Ortega, Head of the Transgenic Mice Unit (sortega@cnio.es).

Constitutive Cre strains

Strain	Source	Reference
CD19^{Cre}	K. Rajewsky, Boston, USA	*Nucleic Acids Res*, 1997. 25:1317-1318
Mox2^{Cre}	P. Soriano, Seattle, USA	*Genesis*, 2000. 26:113-115
Nex^{Cre}	K.A. Nave, Heidelberg, Germany	*J Neurosci*, 2000. 20:3714-3724
Pax7^{Cre}	M.R. Capecchi, Salt Lake City, USA	*Genes Dev*, 2004. 18:2608-2611
Ptf1a^{Cre}	C. Wright, Nashville, USA	*Nat Genet*, 2002. 32:128-134
Tg.Alfp-Cre	F. Tronche, Paris, France	*Genesis*, 2000. 26:151-153
Tg.CMV-Cre	A. Nagy, Toronto, Canada	*Nucleic Acids Res*, 1995. 23:5080-5083
Tg.Cyp1a1-Cre	A.R. Clarke, Cardiff, UK	*Genes Dev*, 2004. 18:1385-1390
Tg.Cyp19-Cre	G. Leone, Columbus, USA	*Genesis*, 2007. 45:129-34
Tg.EIIa-Cre	H. Westphal, Bethesda, USA	*Transgenic Res*, 1999. 8:265-275
Tg.Fsp-Cre	H.L. Moses, Nashville, USA	*Science*, 2004. 303:848-851
Tg.K5-Cre	J. Takeda, Osaka, Japan	*Proc Natl Acad Sci USA*,1997. 94: 7400–7403
Tg.K14-Cre	E. Fuchs, New York, USA	*Hormone Res*, 2000. 54:296-298
Tg.Lck-Cre	The Jackson Laboratory, Bar Harbor, USA	*Proc Natl Acad Sci USA*, 1995. 92:12070-12074
Tg.LysM-Cre	The Jackson Laboratory, Bar Harbor, USA	*Transgenic Res*, 1999. 8:265-275
Tg.MMTV-Cre	W.J. Muller, Montreal, Canada	*Proc Natl Acad Sci USA*, 2000. 97:3444-3449
Tg.Mx-Cre	K. Rajewsky, Boston, USA	*Science*, 1995. 269:1427-1427
Tg.Nes-Cre	The Jackson Laboratory, Bar Harbor, USA	*Nat Genet*, 1999. 23:99-101
Tg.Prm-Cre	The Jackson Laboratory, Bar Harbor, USA	*Proc Natl Acad Sci USA*, 1997. 94:14602-14605
Tg.PSA61-Cre	J. Trapman, Rotterdam, The Netherlands	*Cancer Research*, 2005. 65:5730-5739
Tg.RIP-Cre	M. Magnuson, Nashville, USA	*J Biol Chem*, 1999. 274: 305-310
Tg.Sca1-Cre	I. Sánchez-García, Salamanca, Spain	Unpublished
Tg.Sox2-Cre	The Jackson Laboratory, Bar Harbor, USA	*Gene Expr. Patterns*, 2002. 2:93-97
Tg.Zp3-Cre	The Jackson Laboratory, Bar Harbor, USA	*Genesis*, 2000. 26:110-112

Inducible Cre strains

Strain	Source	Reference
Flt4^{CreERT2}	S. Ortega, CNIO	Unpublished
Ptf1a^{CreERT2}	C. Wright, Nashville, USA	Unpublished
RERT^{ert}	M. Barbacid, CNIO	*Cancer Cell*, 2003. 4:111-120
Rosa26^{CreER}	The Jackson Laboratory, Bar Harbor, USA	*J Neurosci*, 2003. 23:2314-2322
Tie2^{CreERT2}	S. Ortega, CNIO	Unpublished
Tg.aP2-CreERT2	D. Metzger, Strasbourg, France	*Proc Natl Acad Sci USA*, 2001. 98:224-228
Tg.CK7-CreERT2	F.X. Real, CNIO	Unpublished
Tg.Ela-CreERT2	D. Stoffers, Philadelphia, USA	*J Clin Invest*, 2007. 117:971-977
Tg.Hnf1b-CreERT2	J. Ferrer, Barcelona, Spain	*Dev Cell*, 2009. 17:849-860
Tg.K5-CreERT	P. Chambon, Strasbourg, France	*Proc Natl Acad Sci USA*, 1997. 94:14559-14561
Tg.K14-CreERT2	E. Fuchs, New York, USA	*Proc Natl Acad Sci USA*, 1999. 96:8551-8854
Tg.K15-CrePGR	The Jackson Laboratory, Bar Harbor, USA	*Nat Biotechnol*, 2004. 4:411-417
Tg.Osx-tTA:tetO-EGFP/Cre	A. McMahon, Cambridge, USA	*Development*, 2006. 133:3231-3244
Tg.Sca1-CreERT2	I. Sánchez-García, Salamanca, Spain	Unpublished
Tg-SM-CreERT2	S. Ortega, CNIO	*Genesis*, 2000. 28:15-22
Tg.tetOPhCMV-Cre	J.I. Gordon, St. Louis, USA	*Proc Natl Acad Sci USA*, 2000. 97:12601-12606
Tg.Tie2-CreERT2	B. Arnold, Heidelberg, Germany	*Genesis*, 2002. 33:191-197
Tg-UQ-CreERT2	E. Brown, Philadelphia, USA	*Cell Stem Cell*, 2007. 1:113-126
Tg.Villin-Cre	S. Robine, Paris, France	*Genesis*, 2004. 39:186-193

Flp strains

Strain	Source	Reference
Tg.pCAG-Flpe	F. Stewart, Heidelberg, Germany	*Nat Genet*, 2000. 25:139-140
Tg.pCAG-FlpeERT2	S.M. Dymecki, Boston, USA	*Genesis*, 2005. 41:99-109
Tg.SM22-Flpe	F.X. Real, CNIO	Unpublished

Reporter strains

Strain	Source	Reference
Flt4^{EGFPluc}	S. Ortega, CNIO	Unpublished
Ptf1a^{YFP}	M. Magnuson, Nashville, USA	*Dev Biol*, 2008. 316:74-86
Rosa26$^{LSL\text{-}DEVD\text{-}Luc\text{-}DEVD}$	A. Carnero, CNIO	Unpublished
Rosa26$^{LSL\text{-}EYFP}$	The Jackson Laboratory, Maine, USA	*BMC Dev Biol*, 2001. 1:4
Rosa26$^{LSL\text{-}LacZ}$	P. Soriano, Seattle, USA	*Nat Genet*, 1999. 21:70-71
Rosa26$^{LSL\text{-}tdRFP}$	H.J. Fehling, Ulm, Germany	*Eur J Immunol*, 2007. 37:43-53
Tg.Actin-LSL-LucR	A. Berns, Amsterdam, The Netherlands	*Cancer Res*, 2003. 63:7042-7046
Tg.CAG-LSL-KFP	S. Ortega, CNIO	*Genesis*, 2011. 49:36-45
Tg.K14-EGFP-Actin	E. Fuchs, New York, USA	*Dev Cell*, 2002. 3:367-379
Tg.K15-EGFP	G. Cotsarelis, Philadelphia, USA	*Nat Biotechnol*, 2004. 22:411-417
Tg.PSA-Luc;rPB-Tag	Xenogen Corp., Alameda, USA	*Cancer Res*, 2006. 66:4701-4707
Tg.Sox2-EGFP	F.H. Gage, La Jolla, USA	*Cell Stem Cell*, 2007. 1:515-528

Tet transactivator strains (tTA/rtTA)

Strain	Source	Reference
Rosa26$^{LSL\text{-}rtTA\text{-}IRES\text{-}EGFP}$	J. Haigh, Toronto, Canada	*Nucleic Acids Res*, 2005. 33:e51
Rosa26^{rtTA}	K. Hochedlinger, Boston, USA	*Genesis*, 2006. 44:23-28
Tg.Ela-tTA	E.P. Sandgren, Philadelphia, USA	*Cancer Cell*, 2007. 11:291-302
Tg.Emu-tTA	D.W. Felsher, Stanford, USA	*Mol Cell*, 1999. 4:199-207
Tg.K5-rtTA	J.S. Gutkind, Baltimore, USA	*Cancer Res*, 2004. 64:8804-8805
Tg.K5-tTA VP16	A. Glick, Wisconsin, USA	*J Derm Sci*, 1998. 16:S134
Tg.LAP-tTA	H. Bujard, Heidelberg, Germany	*Nucleic Acids Res*, 2002. 30:e134
Tg.SFTPC-rtTA	The Jackson Laboratory, Bar Harbor, USA	*J Biol Chem*, 2000. 275:11858-11862

Other strains

Strain	Source	Reference
B6.SJL-Ptprc^{a} Pep3^{b}/BoyJ	The Jackson Laboratory, Bar Harbor, USA	*Blood*, 2001. 98:3143-3149
Tg.DR4 (*neo*^{R},*hygro*^{R}, *puro*^{R}, Δ*Hprt*)	The Jackson Laboratory, Bar Harbor, USA	*Nucleic Acids Res*, 1997. 25:3745-3746