charles river

Summary

Oncology is one of the leading areas of research into new therapeutics. To help our clients identify the best fit for their oncology research, Charles River maintains a global portfolio of high-quality animal models with varying levels of immunodeficiency and phenotypic characteristics.

RESEARCH MODELS

Immunodeficient Models — North America

Due to the challenges inherent in researching and developing anticancer therapeutics, it is important to have the right tools and resources. Charles River offers the following immunodeficient models to our clients in North America.

Strain	Species	Hair Coat	Mature T Cells	Mature B Cells	NK Cells	Genetics
Athymic Nude	Mouse	No	Absent	Present	Present	Outbred
BALB/c Nude	Mouse	No	Absent	Present	Present	Inbred
CD-1® Nude	Mouse	No	Absent	Present	Present	Outbred
Fox Chase SCID®	Mouse	Yes	Absent	Absent	Present	Congenic
Fox Chase SCID® Beige	Mouse	Yes	Absent	Absent	Defective	Congenic
NCG	Mouse	Yes	Absent	Absent	Absent	Coisogenic
NOD SCID	Mouse	Yes	Absent	Absent	Defective	Congenic
NIH-III Nude	Mouse	No	Absent	Absent	Defective	Outbred
NU/NU Nude	Mouse	No	Absent	Present	Present	Outbred
RNU Nude	Rat	No	Absent	Present	Present	Outbred
SCID Hairless Congenic (SHC™)	Mouse	No	Absent	Absent	Present	Congenic
SCID Hairless Outbred (SHO®)	Mouse	No	Absent	Absent	Present	Outbred
NCI SCID/NCr	Mouse	Yes	Absent	Absent	Present	Congenic

Tools to Help Find the Right Oncology Model

The CORE

The CORE (Collection of Oncology Research Experiments) is an online library of peer-reviewed publications designed to help researchers find the most appropriate research model for their oncology cell lines. Search through the publications on our website at: http://www.criver.com/core.

Xenograft data

Charles River has compiled xenograft data on certain immunodeficient models to assist in expediting the model selection process. Download the data at: http://www.criver.com/xenograft.

Athymic Nude Mice

Strain Code: 490 (homozygous), 491 (heterozygous)

Nomenclature Crl:NU(NCr)-*Foxn1*^{nu} **Origin** This immunodeficient nude mouse originated from NIH and was originally thought to be a BALB/c congenic. It was later determined that it was not inbred and is therefore maintained as an outbred. It is not associated with any stock or strain. The animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. To Charles River from NCI in 2010. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

Fox Chase SCID® Mice

Strain Code: 236

Nomenclature CB17/Icr-*Prkdc*^{scid}/IcrIcoCrl **Origin** SCID mice possess a genetic autosomal recessive mutation (SCID). Discovered in 1980 by Bosma in C.B-17/Icr mice at Fox Chase Cancer Center. SCID mice show a severe combined immunodeficiency affecting both B and T lymphocytes. They have normal natural killer (NK) cells, macrophages and granulocytes. To Charles River in 1991 from an Iffa Credo foundation colony. **Coat Color** White (albino)
Research Application Tumor biology and xenograft research

Fox Chase SCID® Beige Mice

Strain Code: 250

Nomenclature CB17.Cg-*Prkdc*^{scid} *Lyst*$^{bg\text{-}J}$/Crl **Origin** A congenic mouse that possesses both autosomal recessive mutations SCID (*Prkdc*^{scid}) and beige (*Lyst*$^{bg\text{-}J}$). The SCID mutation results in severe combined immunodeficiency affecting both the B and T lymphocytes. The beige mutation results in defective natural killer (NK) cells. This mouse was developed by Croy et al. at the University of Guelph by an intercross of C.B-17 SCID/SCID to C57BL/6 bg/bg mice. To Charles River in 1993.
Coat Color White (albino) **Research Application** Tumor biology and xenograft research

NCG Mice

Strain Code: 572

Nomenclature NOD-*Prkdc*^{em26Cd52}*Il2rg*^{em26Cd22}/NjuCrl **Origin** Co-developed by Nanjing Biomedical Research Institute of Nanjing University and Nanjing Galaxy Biopharma in 2014 and transferred to Charles River in 2016. This model was created by sequential CRISPR/Cas9 editing of the *Prkdc* and *Il2rg* loci in the NOD/Nju mouse, generating a mouse coisogenic to the NOD/Nju. The NOD/Nju carries a mutation in the Sirpa (*SIRP* α) gene that allows for engrafting of foreign hematopoietic stem cells. The *Prkdc* knockout generates a SCID-like phenotype lacking proper T-cell and B-cell formation. The knockout of the *Il2rg* gene further exacerbates the SCID-like phenotype while additionally resulting in a decrease of NK cell production.
Coat Color White (albino) **Research Application** Oncology, immunology, infectious disease, graft vs. host disease, diabetes, regenerative medicine and human organ transplantation

NOD SCID Mice

Strain Code: 394

Nomenclature NOD.CB17-*Prkdc*^{scid}/NCrCrl **Origin** The SCID mutation has been transferred onto a non-obese diabetic background. Animals homozygous for the SCID mutation have impaired T- and B-cell lymphocyte development. The NOD background additionally results in deficient natural killer (NK) cell function. To Charles River in 2003 from NIH.
Coat Color White (albino) **Research Application** Tumor biology and xenograft research

Nude Mice – BALB/c

Strain Code: 194 (homozygous), 195 (heterozygous)

Nomenclature CAnN.Cg-*Foxn1*^{nu}/Crl **Origin** Developed through crosses and back-crosses between BALB/cABom-nu and BALB/cAnNCrj-nu at Charles River Japan. Pedigreed pregnant females of CAnN.Cg-*Foxn1*^{nu}/Crl were received from Charles River Japan in 1985. This mouse is inbred, and genetic monitoring results confirm it to be a BALB/c nude. The homozygous animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

Nude Mice – CD-1®

Strain Code: 086 (homozygous), 087 (heterozygous)

Nomenclature Crl:CD1-*Foxn1*^{nu} **Origin** Developed from the transfer of the nude gene from Crl:NU-*Foxn1*^{nu} to a CD-1 mouse through a series of crosses and backcrosses beginning in 1979 at Charles River Wilmington, MA. The animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

Nude Mice – NIH-III

Strain Code: 201 (homozygous), 202 (heterozygous)

Nomenclature Crl:NIH-*Lyst*$^{bg\text{-}J}$ *Foxn1*^{nu} *Btk*^{xid} **Origin** Most commonly called the NIH-III, it was developed at NIH. In addition to the nude gene, which results in the absence of thymus and T-cell function, this mouse has two other mutations important in regulating the function of the immune system. These are designated as x-linked immune defect *Btk*^{xid} and beige *Lyst*$^{bg\text{-}J}$. The xid mutation affects the maturation of T-independent B lymphocytes. It has been demonstrated that beige (*bg*) homozygotes have defective natural killer (NK) cells that are cytotoxic *in vitro* to tumor cells. However, the extent of the T-independent B-lymphocyte and NK-cell deficiencies in the NIH-III have not been established. **Coat Color** Hairless, light to dark gray pigmented skin **Research Application** Tumor biology and xenograft research

Nude Mice – NU/NU

Strain Code: 088 (homozygous), 089 (heterozygous)

Nomenclature Crl:NU-*Foxn1*^{nu} **Origin** This immunodeficient nude mouse originated from NIH and was originally thought to be a BALB/c congenic. It was later determined that it was not inbred, and is therefore maintained as an outbred and is not associated with any stock or strain. The animal lacks a thymus, is unable to produce T cells, and is therefore immunodeficient. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

Nude (RNU) Rats

Strain Code: 316 (homozygous), 118 (heterozygous)

Nomenclature Crl:NIH-*Foxn1*^{rnu} **Origin** The NIH nude rat was developed in 1979-1980 through a series of matings involving eight inbred rat strains. To Charles River from the National Institute of Health in 2001. This athymic nude rat is T-cell deficient and shows depleted cell populations in thymus-dependent areas of peripheral lymphoid organs. **Coat Color** White, black, black & white **Research Application** Tumor biology and xenograft research

SCID Hairless Congenic (SHC™) Mice

Strain Code: 488

Nomenclature CB17.Cg-*Prkdc*^{scid} *Hr*^{hr}/IcrCrl **Origin** The hairless SCID congenic was created in 2009 by Charles River Research Models by using marker-assisted accelerated backcrossing to place the hairless gene (*Hr*^{hr}) present in the Crl:SKH1-*Hr*^{hr}stock onto a CB17/Icr-*Prkdc*^{scid}/IcrIcoCr genetic background. These mice are homozygous for both *Hr*^{hr} and *Prkdc*^{scid} mutations, so they exhibit the severe combined immunodeficiency phenotype characteristic of SCID mice and are also hairless. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

SCID Hairless Outbred (SHO®) Mice

Strain Code: 474

Nomenclature Crl:SHO-*Prkdc*^{scid} *Hr*^{hr} **Origin** The hairless SCID mouse was produced by Charles River Research Models in 2007 by intercrossing the Crl:HA-*Prkdc*^{scid} and Crl:SKH1-*Hr*^{hr} stocks. The resulting animals are homozygous for the *Prkdc*^{scid} and the *Hr*^{hr} mutations and thus exhibit the severe combined immunodeficiency phenotype characteristic of SCID mice and are also hairless. **Coat Color** Hairless, albino background **Research Application** Tumor biology and xenograft research

NCI SCID/NCr Mice

Strain Code: 561

Nomenclature CB17/Icr-*Prkdc*^{scid}/IcrCr **Origin** SCID mice possess a genetic autosomal recessive mutation *Prkdc*^{scid}. Discovered in 1980 by Bosma in C.B-17/Icr mice at Fox Chase Cancer Center. SCID mice show a severe combined immunodeficiency affecting both B and T lymphocytes. They have normal natural killer (NK) cells, macrophages, and granulocytes. NCI received this mouse in 1991. To Charles River in 2014. **Coat Color** White (albino) **Research Application** Tumor biology and xenograft research