

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 — Europe

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 Europe.

Strain	Species	Hair	T Cells	B Cells	NK Cells
Athymic Nude	Mouse	NO	NO	YES	YES
CD1-Nude	Mouse	NO	NO	YES	YES
NU/NU Nude	Mouse	NO	NO	YES	YES
Swiss Nude	Mouse	NO	NO	YES	YES
NMRI Nude	Mouse	NO	NO	YES	YES
BALB/c Nude*	Mouse	NO	NO	YES	YES
NIH III	Mouse	NO	NO	NO	Impaired
CB17 <i>SCID</i>	Mouse	YES	NO	NO	YES
SHO (<i>SCID</i> Hairless Outbred)	Mouse	NO	NO	NO	YES
SHC (<i>SCID</i> Hairless Congenic)	Mouse	NO	NO	NO	YES
<i>SCID</i> Beige	Mouse	YES	NO	NO	Impaired
NOD <i>SCID</i> *	Mouse	YES	NO	NO	Impaired
NOD <i>SCID</i> gamma (NSG)*	Mouse	YES	NO	NO	NO
NOD rag gamma (NRG)*	Mouse	YES	NO	NO	NO
RNU Rat	Rat	NO	NO	YES	YES

* JAX™ Mice Strains

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: criver.com/core-library.

EVERY STEP OF THE WAY

Xenograft data

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

Immunodeficient mouse model poster

To request a printed poster listing the range of JAX™ and Charles River immunodeficient mice bred in Europe, with information on features, degree of immunodeficiency, and gene functions, email us at askcharlesriver@crl.com.

JAX™ Mice Strain: NOD SCID gamma (NSG) Mice

NOD.Cg-Prkdc^{scid} Il2rg^{tm1Wjl}/SzJ



Origin: The breeding colony for this strain is derived from and systematically reinfused with pedigreed JAX™ Mice stock obtained from The Jackson Laboratory. Charles River adheres to The Jackson Laboratory's breeding protocols and genetic quality programme to maintain this breeding colony. Mice from this colony are genetically equivalent to those bred by The Jackson Laboratory and are considered authentic JAX™ Mice strains, which are designated with a 'J' as the final letter in the strain nomenclature. JAX™ Mice strains are for internal research use only and should not be propagated for distribution or sale. **Coat Colour:** White (albino). **Strain Characteristics:** For comprehensive strain information, see the strain data sheet at jax.org/strain/005557. For physiological strain data, see Mouse Phenome Database at jax.org/mpd-005557. **Bred in:** France, UK.

Non-profit research institutions require an MTA, and commercial organisations require a license prior to shipping. The commercial license incurs an additional fee. Please contact your local Charles River office for further information regarding terms and conditions.

JAX™ Mice Strain: NOD rag gamma (NRG) Mice

NOD.Cg-Rag^{1tm1Mom} Il2rg^{tm1Wjl}/SzJ



Origin: The breeding colony for this strain is derived from and systematically reinfused with pedigreed JAX™ Mice stock obtained from The Jackson Laboratory. Charles River adheres to The Jackson Laboratory's breeding protocols and genetic quality programme to maintain this breeding colony. Mice from this colony are genetically equivalent to those bred by The Jackson Laboratory and are considered authentic JAX™ Mice strains, which are designated with a 'J' as the final letter in the strain nomenclature. JAX™ Mice strains are for internal research use only and should not be propagated for distribution or sale. **Coat Colour:** White (albino). **Strain Characteristics:** For comprehensive strain information, see the strain data sheet at jax.org/strain/007799. **Bred in:** UK.

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JAX™ Mice Strain: NOD SCID

NOD.CB17-Prkdc^{scid}/J



Origin: The breeding colony for this strain is derived from and systematically reinfused with pedigreed JAX™ Mice stock obtained from The Jackson Laboratory. Charles River adheres to The Jackson Laboratory's breeding protocols and genetic quality programme to maintain this breeding colony. Mice from this colony are genetically equivalent to those bred by The Jackson Laboratory and are considered authentic JAX™ Mice strains which are designated with a 'J' as the final letter in the strain nomenclature. JAX™ Mice Strains are for internal research use only and should not be propagated for distribution or sale. **Coat Colour:** Albino **Strain Characteristics:** For comprehensive strain information, see the strain data sheet at jax.org/strain/001303. For physiological strain data, see Mouse Phenome Database at jax.org/mpd-001303. **Bred in:** France.

The Jackson Laboratory's Genetic Stability Programme is covered by 2009 US patent 7,592,501 and 2012 US patent 8,110,721.

NOD SCID Mice

NOD.CB17-Prkdc^{scid}/NCrCrI

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 2005 from Frederick Cancer Research and Development Center. To Charles River UK in 2009. **Coat Colour:** Albino **Bred in:** UK.

SCID Beige

CB17.Cg-Prkdc^{scid}Lyst^{fbg-J}/CrI

Origin: A congenic mouse that possesses both genetic autosomal recessive mutations SCID and beige. 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 USA in 1993 and to Charles River Germany in 2007. To Charles River UK in 2015. **Coat Colour:** White (albino) **Bred in:** Germany, UK.

SCID Hairless Outbred Mice (SHO)

CrI:SHO-Prkdc^{scid}Hr^{hr}

Origin: The hairless SCID mouse was produced by Charles River Research Models in 2007 by intercrossing the CrI:Ha-Prkdc^{scid} and CrI:SKH1-Hrhr 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 Colour: Hairless, albino background **Bred in:** Germany.

It is a condition of sale that customers (or their employees) purchasing or receiving SHO mice are not permitted to breed or cross breed SHO mice without the prior written approval of Charles River.



SCID Mice

CB17/lcr-Prkdc^{scid}/lcrIcoCrl

Origin: The *SCID* autosomal recessive mutation was detected in 1980 by MJ Bosma and his group in an inbred strain (C.BKa-Ighb/lcr also known as C.B-17) of specific pathogen-free mice at the Fox Chase Cancer Center, Philadelphia, PA, USA. Mice homozygous for the *scid* mutation, hereafter designated *SCID* mice, were established as a coisogenic partner strain of the normal C.B-17 strain. In 1989, Charles River France obtained *SCID* mice under licence from FCCC. **Coat Colour:** Albino **Bred in:** France, Germany, UK.



BALB/c-Nude Mice

CAnN.Cg-Foxn1^{nu}/Crl

Origin: Developed through crosses and backcrosses between BALB/cABom-nu and BALB/cAnNCrj-nu at Charles River Japan (CRJ). Pedigreed pregnant females of BALB/cAnNCrj-nu were received from CRJ in 1985. This mouse is inbred, and genetic monitoring results confirm it to be a BALB/c nude. It also lacks a thymus and is therefore T-cell deficient.

Coat Colour: Homozygotes: hairless, unpigmented; Heterozygotes: haired, albino **Bred in:** Germany, UK.



JAX™ Mice Strain: CByJ.Cg-Foxn1^{nu}/J

Origin: The breeding colony for this strain is derived from and systematically reinfused with pedigreed JAX™ Mice stock obtained from The Jackson Laboratory. Charles River adheres to The Jackson Laboratory's breeding protocols and genetic quality programme to maintain this breeding colony. Mice from this colony are genetically equivalent to those bred by The Jackson Laboratory and are considered authentic JAX™ Mice strains, which are designated with a 'J' as the final letter in the strain nomenclature. JAX™ Mice Strains are for internal research use only and should not be propagated for distribution or sale. **Coat Colour:** Homozygotes: hairless, unpigmented; Heterozygotes: haired, albino **Strain Characteristics:** For comprehensive strain information, see the strain data sheet at jax.org/strain/000711.

Bred in: France.



Nude Mice

Crl:CD1-Foxn1^{nu}

Origin: Developed from the transfer of the nude gene to a CD-1 mouse through a series of crosses and back-crosses, beginning in 1979 at Charles River, Wilmington, MA. The animal does not have a thymus and is therefore unable to produce T cells, and is consequently immunodeficient. **Coat Colour:** Homozygotes: hairless, unpigmented; Heterozygotes: haired, albino **Bred in:** Germany, Italy, UK.

Crl:NU(Ico)-Foxn1^{nu}

Origin: The mutation occurred in 1962, in a colony of albino outbred mice maintained at the Ruchill Hospital in Glasgow. In 1966, Flanagan gave the first detailed description of this mutant. It was not until 1968, however, that it was first noticed that the thymus was missing (Pantelouris EM). These nude mice originate from the Swiss strain. In 1974, The Gustave Roussy Institute (Villejuif, France) obtained the mice from Dr Carl Hansen's department at the NIH, Bethesda, MD, USA. The first pairs were introduced into Charles River France in 1976. **Coat Colour:** Homozygotes: hairless, unpigmented; Heterozygotes: haired, albino **Bred in:** France.



Athymic Nude Mice

CrI:NU(NCr)-Foxn1^{nu}

Nomenclature: CrI: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 Colour:** Hairless, albino background **Bred in:** Germany, UK.



Nude Rats

CrI:NIH-Foxn1^{nu}

Origin: The NIH nude rat was developed in 1979/80 through a series of matings involving 8 inbred rat strains. To Charles River, USA, from the NIH Animal Genetic Resources. Caesarean-derived in 2001. This athymic model shows depleted cell populations in thymus-dependant areas of peripheral lymphoid organs. **Coat Colour:** Homozygotes: White, black or black and white, hairless; Heterozygotes: White, black, or black and white, haired **Bred in:** Germany.

Other Immunodeficient Models Available from Charles River

- NIH-III Mouse
CrI:NIH-LyStbg Foxn1^{nu} Btkxid
- NMRI-nude
CrI:NMRI-Foxn1^{nu}
- NU/NU Mouse
CrI:NU-Foxn1^{nu}
- SCID Hairless Congenic (SHC) Mice
CB17.Cg-PrkdcscidHrhr/lcrCrI

JAX™ Mice and Research Services Provided Through Charles River

The Jackson Laboratory and Charles River, Inc. have a cooperative agreement to provide local supplies of JAX™ Mice to biomedical researchers in 29 European countries. For more information, please visit criver.com/jaxmice.

Immunodeficient Models Available from The Jackson Laboratory

Many additional immunodeficient mouse models are available from The Jackson Laboratory and may be obtained by importation through Charles River. Charles River serves as the exclusive European commercial distributor of The Jackson Laboratory's JAX™ Mice strains.

Dedicated Supply of JAX™ Mice

As a result of the collaborative agreement between The Jackson Laboratory and Charles River, Charles River's European facilities are able to offer dedicated supplies of certain JAX™ Mice strains that are typically only available as imported strains or recovered embryos. Contact your local Charles River office for additional information.