Our **IMMUNO-ONCOLOGY** offer

ENTER IN OUR

360° MODEL RANGE

› Discover the **NXG** model and all our range

OUR IMMUNO-ONCOLOGY RESEARCH MODELS

360° MODEL RANGE

www.janvier-labs.com

JANVIER LABS
Expertise in Rodent Research Models

COMMITTED TO RESEARCH FOR MORE THAN 60 YEARS

Founded in 1960, JANVIER LABS is an independent company specialised in breeding of laboratory rodents and associated services.

As an international player in the field of biomedical research, JANVIER LABS provides scientists (biotech and pharmaceutical companies, academics) with a comprehensive range of rodent research models from model creation, reproductive sciences, customized breeding to laboratory services.

JANVIER LABS offers solutions adapted to your needs in order to ensure the success of your research programmes.

JANVIER LABS HAS THE LARGEST AND MOST ADVANCED BREEDING SITE IN EUROPE

1 unique production site
in Europe
22,000 sqm of facilities
on more than 8 hectares

Breeding capacity
3,000,000 rodents a year

45,000 km a week travelled
by our integrated transport department

3,000 customers
on worldwide
300 international
employees

60 YEARS EXPERTISE

JANVIER LABS provides scientists with immunodeficient models that fulfill the highest standards. With a unique state-of-the-art site based in Europe, JANVIER LABS ensures rigorous breeding conditions. Our experts bring broad expertise to guarantee the success of your research.

01 IMMUNO-PHENOTYPING BY CENTRE IMMUNOPHENOMIQUE (CIPHE)

We work with recognized experts in immunology for a comprehensive characterization of our models

02 SOPF HEALTH QUALITY

Our robust health policy ensures the highest health standards for your models

03 CONTROLLED MICROBIOTA

All our models have the same microbiota that is analyzed, monitored and stable over time

04 GENETIC STABILITY

JANVIER LABS GENETIC POLICY® allows to ensure the genetic homogeneity of all the strains

05 SCIENTIFIC SUPPORT

A team of experts to assist you in the choice of the relevant models and to advice all along your research projects

06 TRANSPORT

Our 100% in-house transport department ensures the welfare of your models and a delivery flexibility

OUR 360° IMMUNODEFICIENT MODELS

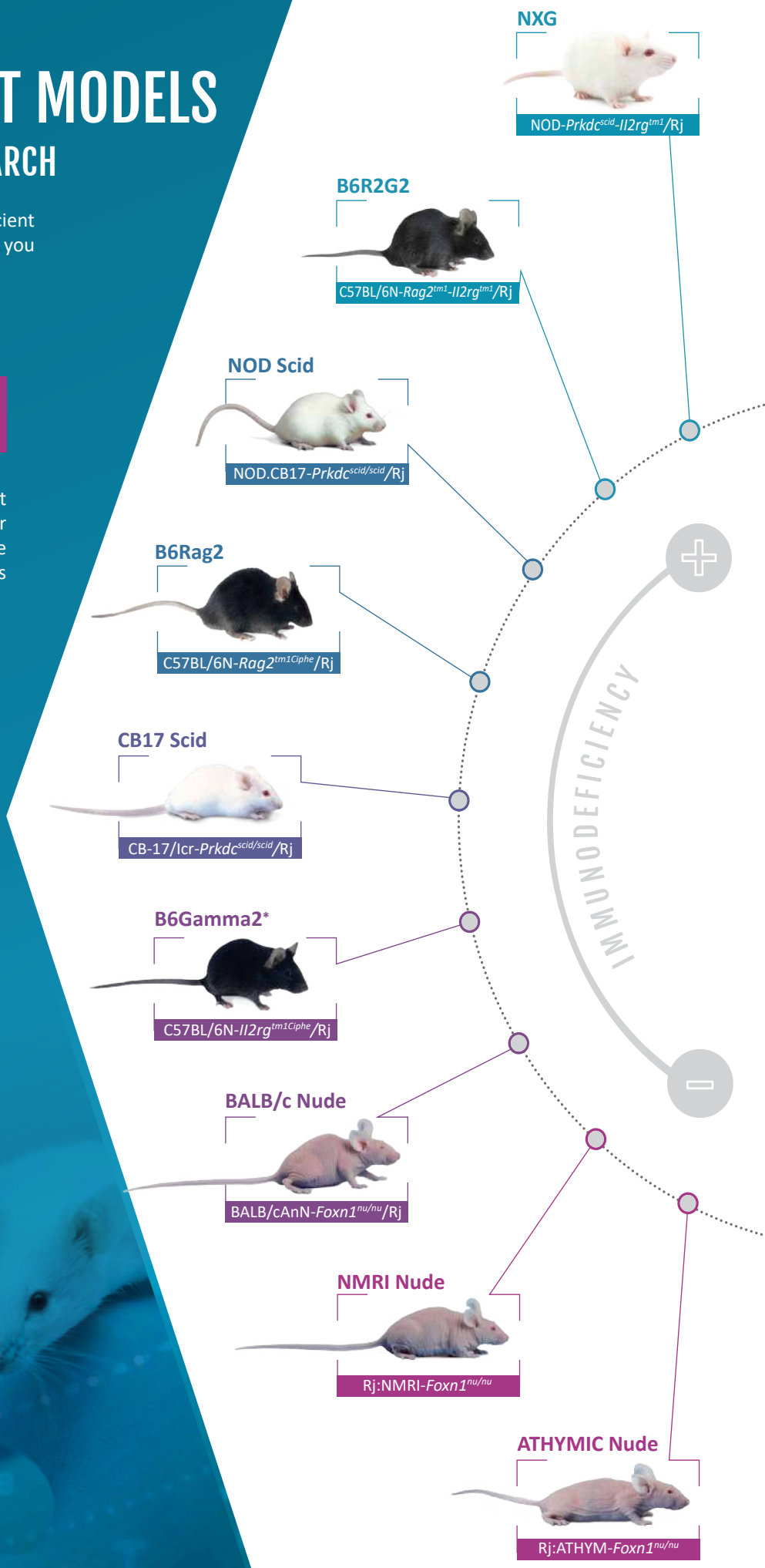
ADDED VALUE FOR YOUR RESEARCH

JANVIER LABS offers a range of immunodeficient models that are entirely characterized to support you during your research programmes.

IMMUNODEFICIENT MODELS: FIELDS OF APPLICATION

JANVIER LABS research models show different immunodeficiency levels so that each of your studies benefit from a model with its own immune characteristics. They cover numerous study areas such as:

- Infectious diseases
- The understanding of immune system and of its mechanisms
- The development of new vaccines and immunotherapy products
- Tissue grafts including tumors
- The development and the optimization of anti-cancer immunotherapies
- The development of new imaging methods
- The understanding inflammation process



YOU DO NOT FIND YOUR MODEL?

Have your model created by experts in immunology

We work with the Centre Immunophénomique in Marseille, France, to provide you with a unique and integrated service offering:

- Creation
- Immunophenotyping
- Customized Breeding
- Laboratory services
- Transport

Contact us

OUR IMMUNODEFICIENT MOUSE MODELS

	NXG	B6R2G2	NOD Scid	B6Rag2	CB17 Scid	B6 Gamma2*	BALB/c Nude	NMRI Nude	ATHYMIC Nude
Background	NOD	C57BL/6NRj	NOD	C57BL/6NRj	CB17	C57BL/6NRj	BALB/c	NMRI	BALB/c
Breeding	Inbred	Inbred	Inbred	Inbred	Inbred	Inbred	Inbred	Outbred	Outbred
Coat	Albino	Black	Albino	Black	Albino	Black	Nude	Nude	Nude
T Lymphocytes	Absent	Absent	Absent	Absent	Absent	+/-	Absent	Absent	Absent
B Lymphocytes	Absent	Absent	Absent	Absent	Absent	+/-	Normal	Normal	Normal
Leakiness	-	-	Medium	-	High	-	-	-	-
NK cells	Absent	Absent	Dysfunctional	Normal	Low	Absent	Normal	Normal	Normal
Dendritic cells	Dysfunctional	Dysfunctional	Low	Dysfunctional	Low	+/-	Normal	Normal	Normal
Macrophages	Dysfunctional	Normal	Dysfunctional	Normal	Dysfunctional	Normal	Normal	Normal	Normal
Complement	-	Normal	-	Normal	Normal	Normal	Normal	Normal	Normal
Irradiation tolerance	Low	High	Low	High	Low	High	High	High	High
Life span	89 Wk.	Min 54 Wk.	36 Wk.	Min 54 Wk.	36 Wk.	Min 54 Wk.	54 Wk.	54 Wk.	54 Wk.
Humoral immunity	Absent	Absent	Absent	Absent	Absent	Absent	Normal	Normal	Normal
Lymphoma outcome	Low	Indefinite	High	Indefinite	Low	Indefinite	Indefinite	Indefinite	Indefinite
Genes of interest	Scid (Prkdc) IL2rg Sirpa	RAG 2 IL2rg	Scid (Prkdc)	RAG 2	Scid (Prkdc)	IL2rg	Foxn1	Foxn1	Foxn1

*Cryopreserved

PHENOTYPIC CHARACTERISATION

All our models are entirely characterized. The immunological and haematological parameters were characterized by Centre Immunophénomique (Ciphe) in Marseille, France.

01 HAEMATOLOGICAL PARAMETERS

Designation	Unit
Red blood cell absolute count	(x1E6/uL)
Platelet absolute count	(x1E3/uL)
Reticulocyte absolute count	(x1E3/uL)
White blood cell count	(x1E3/uL)
Reticulocytes percentage	(%)
Hematocrite	(%)
Mean corpuscular hemoglobin	(pg)
Hemoglobin	(g/dL)
Mean corpuscular hemoglobin concentration	(g/dL)
Mean corpuscular volume	(f1-)
Platelet larger cell ratio	(0/0)
Plateletcrite	(%)
Low fluorescence ratio reticulocyte	(%)
Medium fluorescence ratio reticulocyte	(%)
High fluorescence ratio reticulocyte	(%)
Immature reticulocyte fraction	(%)

02 IMMUNOLOGICAL PARAMETERS

All our immunodeficient models were immunophenotyped.
Example of a cytometric analysis of the spleen of our B6R2G2 and C57BL/6N (Wild Type) models.

Contact us


SPLEEN

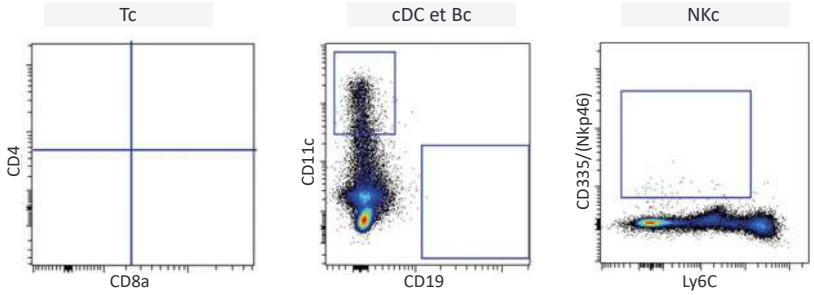

THYMUS


PERIPHERAL BLOOD

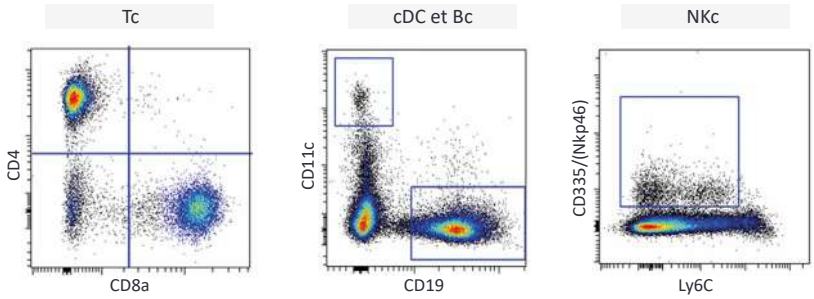

BONE MARROW

All lymphoid organs of our models were analysed in most of the 12 cell populations below.

B6R2G2 C57BL/6N-*Rag2*^{tm1}-*Il2rg*^{tm1}/Rj



C57BL/6N *C57BL/6NRj*



01 NEUTROPHILS
02 MONOCYTES
03 EOSINOPHILS
04 Bc
05 B1 B-Cells
06 B2 B-Cells
07 L-T
08 CD8 T-Cells
09 eff. CD8 T-Cells
10 CD4 T-Cells
11 eff. CD4 T-Cells
12 NK cells

12 POPULATIONS

We also offer an immunophenotyping service for the immunodeficient models at each stage of your research protocols.

Contact us

COMPARISON RADAR CHART B6R2G2 VS C57BL/6N

OUR IMMUNODEFICIENT RAT MODELS

JANVIER LABS also offers immunodeficient rat models.
All our rat models have no T lymphocyte.

FISCHER Nude
F344/HanZtm-*Foxn1*^{rnu}/Rj

LOU Nude*
LOU/M-*Foxn1*^{rnu}/Rj

ATHYMIC Nude
Rj:ATHYM-*Foxn1*^{rnu}

*Cryopreserved

NXG mouse

- **Strain name:** NOD-*Prkdc*^{scid}-*IL2rg*^{Tm1}/Rj
- **Type:** Inbred transgenic mouse, GEMM
- **Origin:** JANVIER LABS, in 2019
- **Colour and related genotype:** Albino mouse

Presentation of the model

The NXG or NOD Xenograft Gamma strain is a model of an inbred strain (NOD background) with 2 mutations of interest, similar to its genetic equivalents NSG, NcG, NOG, etc. (NOD SCID Gamma). The *Prkdc*^{scid} mutation, commonly known as «SCID» for «Severe Combined Immunodeficiency», blocks the development of T and B cells and induces immune deficiency.
Mice homozygous for this mutation show a complete absence of T and B lymphocytes at the periphery. The combination of these two mutations *Prkdc*^{scid} and *IL2rg*^{Tm1}, in NOD background, induces a severe immunodeficiency with absence of T, B and NK lymphocyte compartments.

The NXG owns the key feature of the NOD fund which gives an advantage for human transplantation on and xenografting in general. The γc B6N model was created at the Center of Immunophenomics (Ciphe, Marseille, France) in 2019, and the NOD SCID backcross was performed by **JANVIER LABS** in 2019.
Animals are bred to maintain both the genetic background and the mutations of interest in their homozygous forms.

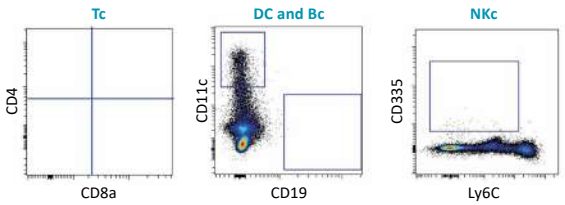
The inbreeding mode is used for NXG strain and the phenotype is checked according to the **JANVIER LABS GENETIC POLICY®.**

Phenotypic characterisation

This model has been entirely characterized. The immunological and hematological parameters were characterized by Center of Immunophenomics (Ciphe, Marseille, France) and confirm the severe immunodeficiency.

Background	Breeding	Coat	T Lymphocytes	B Lymphocytes	Leakiness	NK cells	Dendritic cells
NOD	Inbred	Albino	Absent	Absent	-	Absent	Dysfunctional
Macrophages	**Complement**	**Irradiation tolerance**	**Life span**	**Humoral immunity**	**Lymphoma outcome**	**Genes of interest**	
Dysfunctional	-	Low	89 Wk.	Absent	Indefinite	Scid (Prkdc) IL2rg Sirpa	

Flow cytometry analysis, spleen



- Flow cytometry analysis of the spleen of our NXG shows a complete absence of T, B or NK lymphocytes, confirming the severe immunodeficiency.
- All our immunodeficient models were analysed in the same way, on most lymphoid organs (spleen, thymus, bone marrow and peripheral blood).

Humanized NXG-HIS mouse

Strain name: NOD-*Prkdc*^{scid}-*IL2rg*^{Tm1}/Rj

Type: Inbred transgenic mouse, GEMM

Origin: JANVIER LABS, in 2021

Colour and related genotype: Albino mouse

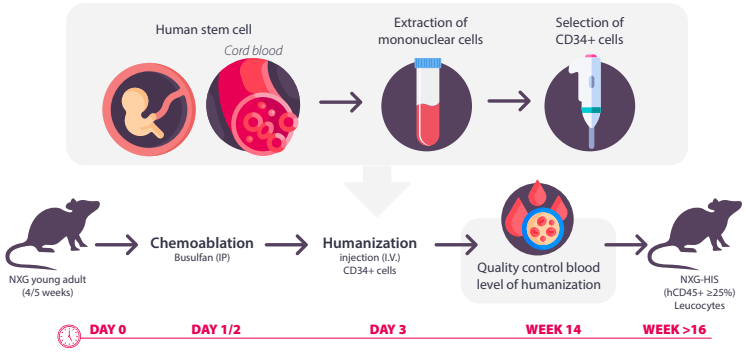
Presentation of the model

The NXG-HIS is the humanized model corresponding to the NXG or NOD Xenograft Gamma strain which is an inbred strain model (on the NOD background) with 2 mutations of interest, (*Prkdc*^{scid} and *IL2rg*^{Tm1}). The combination of these mutations induces a severe immunodeficiency with an absence of T, B and NK lymphocyte compartments.
NXG mouse is therefore genetically similar to NSG, NcG, NOG, etc. (NOD SCID Gamma). The NXG strain also carries the NOD polymorphism of the Sirpα gene.

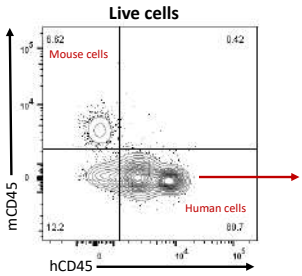
The Sirpα protein is expressed on the surface of macrophages. The NOD Sirpα allele allows high affinity binding to the CD47 ligand expressed by human hematopoietic cells. This interaction induces a “don’t eat me” signal that blocks murine macrophage activations and prevents phagocytosis of transplanted human cells.
The NOD Sirpα allele is a key feature of the NOD background which gives an advantage for human transplantation and xenografting in general.

Humanization process

The humanization protocol has been standardized in **JANVIER LABS’** laboratories. The depletion of the bone marrow is carried out by injection of busulfan the day before the injection of human cells CD34+. Flow cytometry analyses are performed to measure the rate of humanization 14 weeks after injection. Animals are available and can be used for preclinical studies, with SOPF status and for a humanization rate (%CD45+ human) greater than or equal to 25% minimum.



Flow cytometry analysis, spleen



Quality control allows to measure the relative humanization rate of humanized mice in the peripheral blood. The standardization of quality control is performed by flow cytometry of the different human populations: hematopoietic, lymphoid and myeloid. Each NXG-HIS is tested and analysed before sending and use. Analyses of the rate of humanization (absolute number and percentage) in the first weeks show a stability of at least 22 weeks post-injection.

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