360° MODEL RANGE

B6R2γc mouse (B6R2G2)

- **Strain name:** C57BL/6N-*Rag2*^{Tm1}-*IL2rg*^{Tm1}/Rj
- **Type:** Inbred mutated mouse, GEMM
- **Origin:** Ciphe, Marseille France, in 2019
- **Colour and related genotype:** Black mouse, a (*a/a*) non agouti

PRESENTATION OF THE MODEL

The B6Rag2γc mouse is a severely immunodeficient mouse with two Knock Out (KO) genetic mutations: the γc KO gene (Interleukin 2 receptor gamma chain, *IL2rg*^{Tm1}) and the Rag2 KO gene (the 2 recombinase acti vati on gene) on a C57BL/6N geneti c background.

The *Rag2*^{Tm1} mutation commonly called Rag2 is a KO mutation of the gene coding for the 2 recombinase enzyme that plays a key role in producing T and B receptors of the cells. This lack blocks the development of T and B cells and leads to an immune defi ciency.

Homozygous mice for this mutation appear with a total lack of peripheral T and B lymphocyte cells.

The *IL2rg*^{Tm1} mutati on called γc is a KO mutati on of the gene coding for the c gamma chain that is common (in parti cular) to interleukins (IL-2, IL-4, IL-7, IL-9 and IL-15).

This gene is necessary for the differentiation and the function of numerous hematopoieti c cells with a full impact on the development of Natural Killer cells (NK).

The combination of both mutations *Rag2*^{Tm1}-*IL2rg*^{Tm1} on a B6 background, leads to a severe immunodefi ciency with no T, B and NK lymphoid cells.

The B6Rag2γc (*IL2rg and Rag2*) mouse has proven to be helpful for studies that include, for instance, transplants of allogeneic or syngeneic tumoral stem cells.

The B6Rag2γc strain is also helpful in combinati on with B6Rag2 and B6γc mice for studies aiming at understanding the role of T, B and NK cells in host resistance to tumors and infecti ous agents in parti cular.

JANVIER LABS obtained the B6Rag2γc (C57BL/6N-*Rag2*^{Tm1}-*IL2rg*^{Tm1}/Rj) through a homologous recombination (ES cells from B6N mice), developed at the Centre d'Immunophénomique (Ciphe, Marseille, France) in 2019.

Whereas other animal models that carry similar genes generally appear with a B6-129s joint genetic background, the JANVIER LABS B6Rag2γc strain is specifically and exclusively expressed on a C57BL/6NRj background.
Thus the genetic nature of the strain is perfectly controlled and homogeneous. Animals are bred so as to maintain both the genetic background and the mutations of interest in their homozygous forms.

The B6Rag2γc strain is bred in an inbred manner and the phenotype is controlled according to the JANVIER LABS GENETIC POLICY®.

Main application and research fields

- **Oncology**
  - Tumor implantation studies
  - Studies on gene therapy
  - Studies of cancer therapies
- Implantation of human cells in a murine model. This is a step in the humanization process.
- Infectious Diseases
- The B6 R2G2 strain is useful in tumor implantation studies using an invasive radiotherapy treatment; it generally resists such a phase.
- Immunology and immunotherapy
- Transplants and grafts

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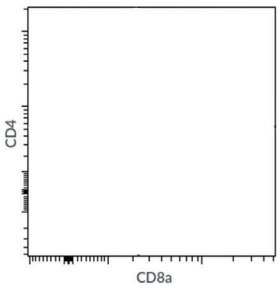
GROWTH CURVE AND REPRODUCTIVE DATA

■ Haematological parameters

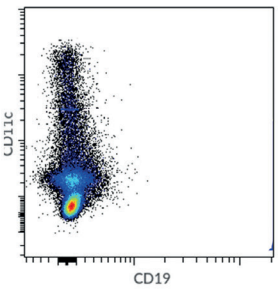
						Mean	Standard deviation
Concentration	Hemoglobin	Blood	(g/dL)	F		16	0
				M		17	0
	Mean corpuscular hemoglobin concentration	Blood	(g/dL)	F		31	0
				M		30	1
	Platelet absolute count	Blood	(K/uL)	F		1,169	55
				M		1,417	82
	Red blood cell absolute count	Blood	(M/uL)	F		11	0
				M		11	0
Frequencies	Hematocrite	Blood	(%)	F		51	1
				M		56	2
	High fluorescence ratio reticulocyte	Blood	(%)	F		44	3
				M		40	4
	Immature reticulocyte fraction	Blood	(%)	F		65	1
				M		59	3
	Low fluorescence ratio reticulocyte	Blood	(%)	F		35	1
				M		41	3
	Medium fluorescence ratio reticulocyte	Blood	(%)	F		22	2
				M		20	2
	Platelet larger cell ratio	Blood	(%)	F		3	1
				M		2	1
	Plateletcrite	Blood	(%)	F		1	0
				M		1	0
	Reticulocyte absolute count	Blood	(%)	F		4	1
				M		4	1
Quantity	Mean corpuscular hemoglobin	Blood	(pg)	F		15	0
				M		15	0
	Mean corpuscular volume	Blood	(fL)	F		48	0
				M		49	1

FLOW CYTOMETRY ANALYSIS, SPLEEN

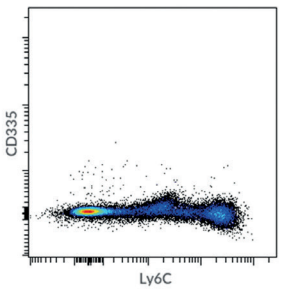
Tc



DC et Bc



NKc



All lymphoid organs of our models were analysed.

PHENOTYPIC CHARACTERISATION

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

Background	Breeding	Coat	T Lymphocytes	B Lymphocytes	Leakiness	NK cells	Dendritic cells
C57Bl/6NRj	Inbred	Black	Absent	Absent	-	Absent	Dysfunctional
Macrophages	**Complement**	**Irradiation tolerance**	**Life span**	**Humoral immunity**	**Lymphoma outcome**	**Genes of interest**	
Normal	Normal	High	Min. 54 Wk.	Absent	Indefinite	RAG 2 IL2rg	

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