

## Offers of the Transgenic Rat Nantes facility

### 1. Generation of transgenic or KO rats

- DNA, mRNA (ZFNs) and lentiviral vectors microinjection
- embryo freezing
- Q-PCR genotyping (zygosity animals)
- identification transgenes integration site (LM-PCR)

### 2. Immunomonitoring

- immunophenotype
- analysis of immune responses

### 3. Services

- technical advice
- distribution of transgenic rats

### 4. Research and development

- development of new procedures

### 5. Teaching/diffusion of transgenic technology

- organization of meetings and workshops
- training of students and technicians

#### Publications PTF rat transgenics

Charreau, B., et al. (1996) *Transg. Res.* 5:223; Charreau, B., et al (1996) *Transg. Res.* 5:443; Tesson, L., et al. (1999) *Transplant. Proc.* 31:1533; Charreau, B., et al. (1999) *Mol. Med.* 5:617; Ménoret, S., et al (2001) *Transgenics.* 3:237; Stockmann H. et al (2002) *Transplant. Int.* 15:595; Tesson, L., et al (2002) *Transg. Res.* 11:43; Aubert, D., et al. (2002) *Mol. Ther.* 5:1; Ménoret, S., et al. (2002) *Hum. Gene Ther.* 13:1383; Pitard B. et al (2002) *Hum Gene Ther.* 13:1767; Braudeau C. et al (2003) *Exp. Biol. Med.* 228:466; Ménoret S. et al (2004) *Transplantation* 77:1468; Tesson, L., et al. (2005) *Transgenic Res.* 14:531; Toumaniantz, G et al. (2005) *J Hypertens.* 23:A12; Tomat S, et al. (2009) *Xenotransplantation* : 16(2):83-90 ; Cozzi J, et al. (2009) *Methods Mol Biol.* 2009;561:73-88; Geurts AM, et al. (2009) *Science.* 325(5939):433; Rémy S, et al. (2010) *Transgenic Res.* 19(3):363-71; Ménoret S, et al. (2010) *Transgenic Res.* 19(4):711-4; Ménoret S, et al. (2010) *Methods Mol Biol.* 597:81-92; Remy S, et al. (2010) *Methods Mol Biol.* 597:109-25; Geurts AM, et al. (2010) *Methods Mol Biol.* 597:211-25; Tesson L, et al. (2010) *Methods Mol Biol.* 597:277-85; Remy S, et al. (2010) *Transgenic Res.* 19(5):745-63.; Menoret S, et al. (2010) *Eur J Immunol. In press* ; Iscache AL, et al. (2010) *submitted*

## CONTACT

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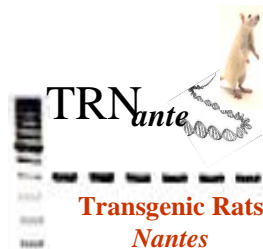
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<http://www.ifr26.nantes.inserm.fr/ITERT/transgenese-rat/>



Transgenic rat common  
facility of IFR 26 and  
Biogenouest  
Functional exploration platform

**OPEN A NEW SERVICE !!!**

**IMMUNOMONITORING OF  
TRANSGENIC OR  
KO RATS**



**INSERM UMR643, Nantes**

Institut de transplantation  
et de recherche en transplantation



**IFR<sub>26</sub>**  
**IFR<sub>TN</sub>**

<http://www.ifr26.nantes.inserm.fr/ITERT/transgenese-rat/>

The facility is part of the IFR-26, Biogenouest and IBISA facilities and is situated within the INSERM U643 unit. The facility is open for projects from academical and industrial origin.

The INSERM U643 is currently the only French academic organization to generate transgenic rats. Other services include determination of zygosity, identification of transgene insertion site into the genome, embryo cryopreservation and immunotyping of transgenic rats or KO rats.

## Cellular immunophenotyping:

Organs or tissues that can be analyzed : spleen, thymus, lymph nodes, blood, bone marrow  
Cytofluorimetry and/or cryostat immunohistology.

**T Lymphocytes** : CD4, CD8alpha, CD8beta, CD25, CD90, TCR ab, including Treg cells (CD4<sup>+</sup>CD25<sup>+</sup>, CD8<sup>+</sup>CD45RC<sup>low</sup>), etc...; simple and multi-colour

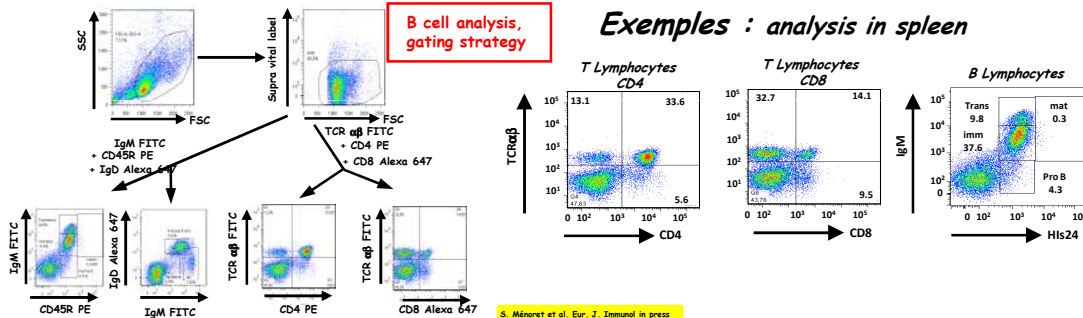
**B lymphocytes** : IgM, CD45R, IgD; simple and multi-colour

**NK cells**

**Dendritic cell subsets** : mDCs (CD4<sup>+</sup>, CD4<sup>-</sup>), pDCs

**Monocytes/macrophages**

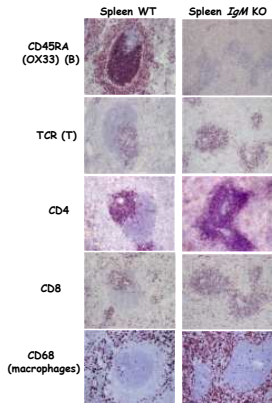
**Cytokines/immune mediators** (IDO 1, IDO 2, heme-oxygenase-1, iNOs, IFNgamma, etc)



### Exemples : analysis in spleen

S. Ménoiret et al. Eur. J. Immunol in press

Immunohistology on spleen cryostat sections from IgM KO rats

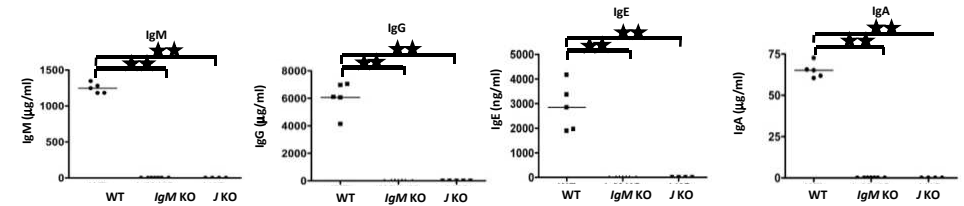


S. Ménoiret et al. Eur. J. Immunol in press

organ	subset	IgM KO <sup>a</sup>	JH KO <sup>e</sup>	WT <sup>b</sup>
bone marrow	Total cells <sup>c</sup>	52.4±15.2***	70.6±13.2*	124.3±22.1
	CD45R <sup>high</sup> IgM <sup>high</sup> mature B	0.06±0.05***	0.2±0.2**	1.5±0.7
	CD45R <sup>low</sup> IgM <sup>high</sup> transitional B	0.01±0.01***	0±0***	5±2.5
	CD45R <sup>low</sup> IgM <sup>low</sup> immature B	0.81±0.28***	2.2±0.3**	11.5±5.1
	CD45R <sup>low</sup> IgM <sup>int</sup> pro/pre B	6.1±5.59***	10.7±1.7**	47.7±22.5
	TCR <sup>+</sup> T cells	17.9±4.7**	13.1±1.26	6.5±5.5
spleen	Total	46.3±9.7***	56.8±11.9**	341.5±81.1
	IgM <sup>+</sup> B	1.01±0.37***	3.4±2.3**	148.7±32
	CD45R <sup>+</sup> B	2.6±0.6***	7.3±5.2**	168.1±57.4
	TCR <sup>+</sup> T	39.1±9.8***	44±11.3**	130.5±38.8
Lymph nodes	Total	12.9±7	11.7±1.7	30±12.2
	IgM <sup>+</sup> B	0.45±0.34*	0.5±0.6*	11±5
	CD45R <sup>+</sup> B	0.42±0.23*	0.5±0.4*	13.1±4.8
	TCR <sup>+</sup> T	11.7±6.8	11.2±2.1	19.3±7.8
thymus	Total	82.1±24.2	47.8±6.6	76±50.4
	CD45R <sup>+</sup> B	0.31±0.05	0.6±0.5	0.8±0.5
	TCR <sup>+</sup> T	12.9±0.8	8.8±1.6	11.4±8

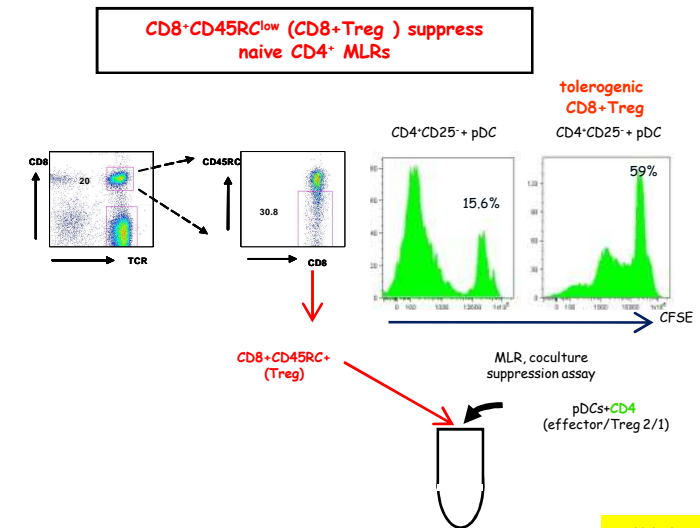
## Serum concentration of immunoglobulins.

IgM, IgG and sub-types : IgG1, IgG2a, IgG2b, IgG3, IgE, IgA



## In vitro analysis of immune responses :

- Mixed lymphocyte reactions
- Concavalin A-induced lymphocyte proliferation or CD3/CD28 stimulation
- Cytokines secreted into the cell culture after stimulation (by ELISA)
- Cellular cytotoxicity
- Suppressive assays for analysis of Tregs



X-L. Li et al. J. Immunol. 2010

## In vivo analysis of immune responses:

- KLH or OVA immunization and analysis of antibody and cellular responses.
- Heart or skin grafting and analysis of antibody and cellular allogeneic responses

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