



# PhenoPro

translational medicine

**Infrafrontier / IMPC / UAB**

**Industry liaison meeting**

**Barcelona, Nov. 13th, 2014**

[www.phenopro.fr](http://www.phenopro.fr)

## A service organization in translational medicine

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PhenoPro is a CRO servicing **pharmaceutical and biotechnology** companies with advanced mouse phenotyping tools and expertise.

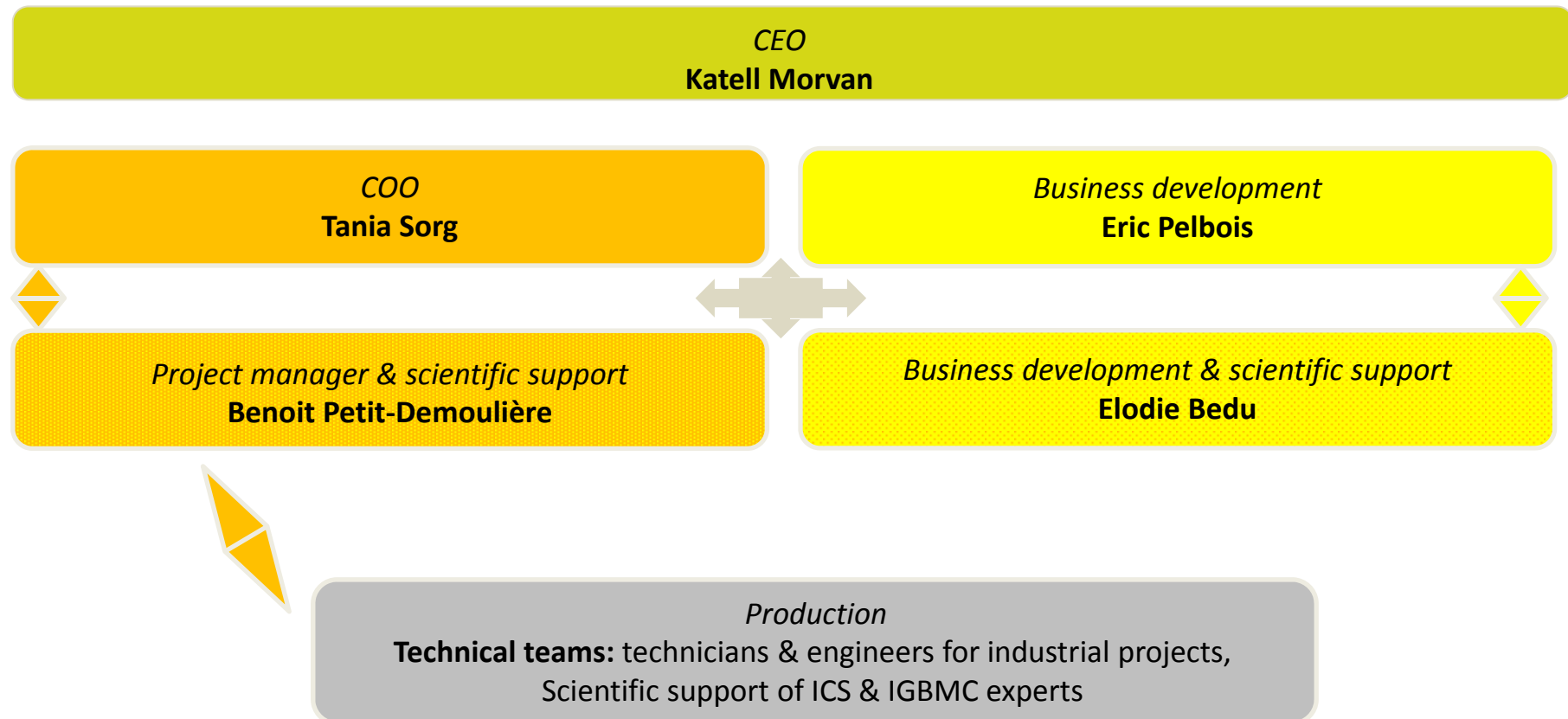
PhenoPro is a spin off from the institut Clinique de la Souris (iCS)

It is dedicated to provide **high quality standard services** for:

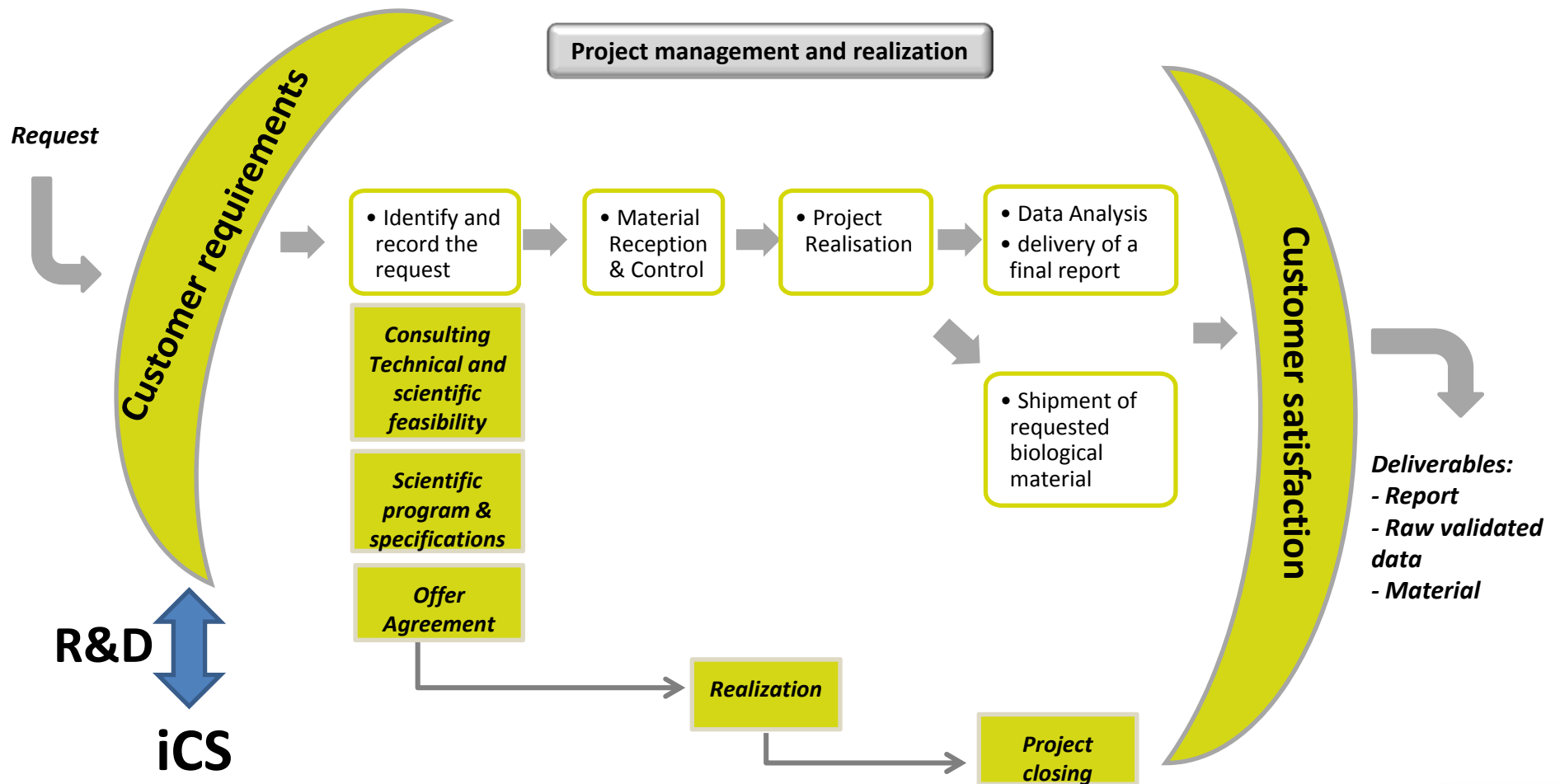
- Target identification / validation of mouse mutant models
- Characterization of mouse mutant models, functional genomics and understanding of the *in vivo* and disease mechanisms
- *in vivo* preclinical drug screening, efficiency / risk assessment, target reorientation

- ~ PhenoPro's **processes and expertise are based on the iCS know-how**
- ~ Through its alliances, PhenoPro provides access to the latest **innovation** in its fields
- ~ PhenoPro' services are based on **Standardized Operational Procedures** and quality system management and offers customized protocols
- ~ PhenoPro' services help to **accelerate the drug discovery process, optimize the research costs, and bring a go / no go step in your decision tree.**

## Organigram PhenoPro



## Project management



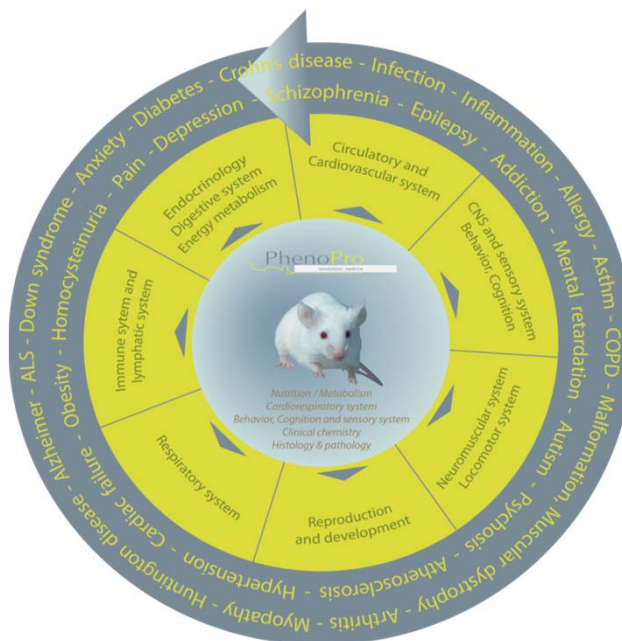
**Investigate all physiological systems and the related diseases**

## Molecular Phenotyping

## Model validation

- Basal conditions
- Challenges

## Proof of concept and side-effects



## Renal function

## Information Technology



More than 250 assays available for various functions

### Behavior, cognition & sensory system



- General health, sensory-motor function & pain
- Learning & memory
- Schizophrenia
- Circadian activity & biological rhythm
- Emotional behavior: Depression & Anxiety
- Epilepsy

### Nutrition & Metabolism



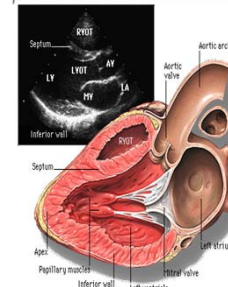
- Energy intake
- Energy expenditure
- Glucose homeostasis
- Bone & Muscle metabolism
- Intestinal and renal function

### Clinical chemistry



- Common serum chemistry
- Enzymatic activities
- Lipids & lipoproteins
- Hormones
- Hematology & Coagulation
- Immunology

### Cardiovascular system



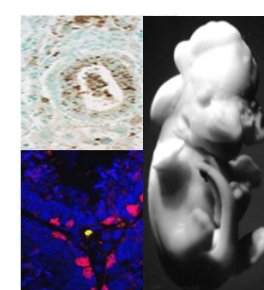
- Blood pressure
- Cardiac electrophysiology
- Cardiac anatomy & function
- Hypertension models
- Hypertrophy models
- Heart failure models

### Respiratory system

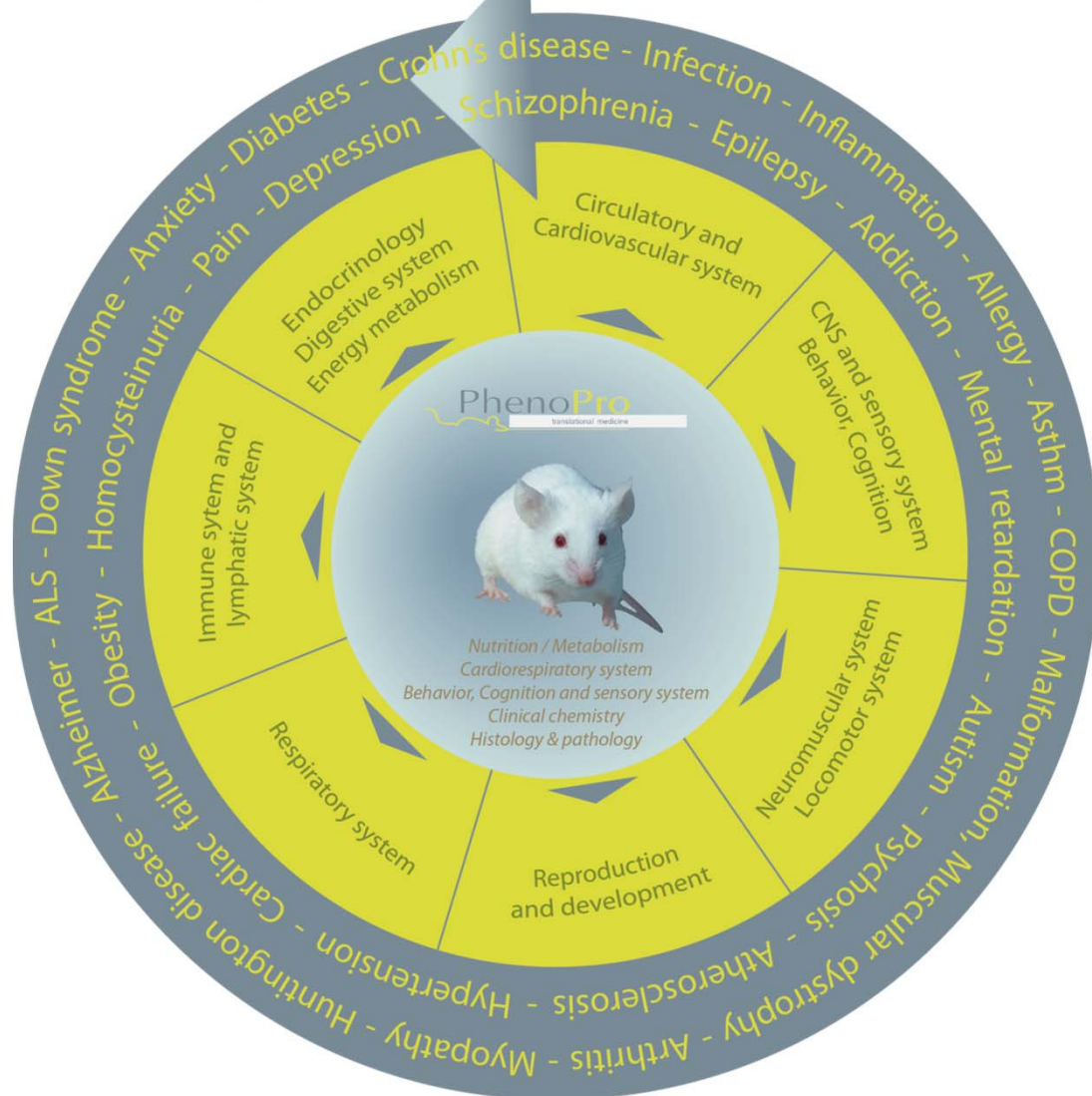


- Plethysmography
- Bronchoalveolar lavages
- Asthma models
- Airway inflammation models
- Lung fibrosis models

### Anatomopathology



- Necropsy
- Tissue collection
- Histology H&E staining
- Specific stainings
- Immunohistochemistry
- Evaluation of early embryonic death



- **Broad disease focused**  
Metabolic disorders  
Neurologic disorders  
Respiratory disorders
- **Broad comprehensive**
- **Targeted phenotyping**

# PhenoPro

translational medicine

## Expanding the Phenotyping Services

phenomin



### Institut Clinique de la souris

Large scale facility for generation, phenotyping and pharmacology projects

### Laboratoire «Transgénèse et Archivage d'Animaux Modèles»

Small animal imaging, archiving and distributing

### Centre d'immunophénomique,

Designing mouse models to decipher immunity and infection- Immunophenotyping

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## Immunophenotyping module



- **Scientific manager**
- *Marie Malissen*
- **R&D manager**
- *Herve Luche*
- **Instrument specialist**
- *Pierre Grenot*

### **ImmunophenotypingBioassay**

*Marielle Mello*  
*Lillia Hadjem*  
*Camille Santa Maria*



### **CyTOF Operator**

*Emilie Gregori*



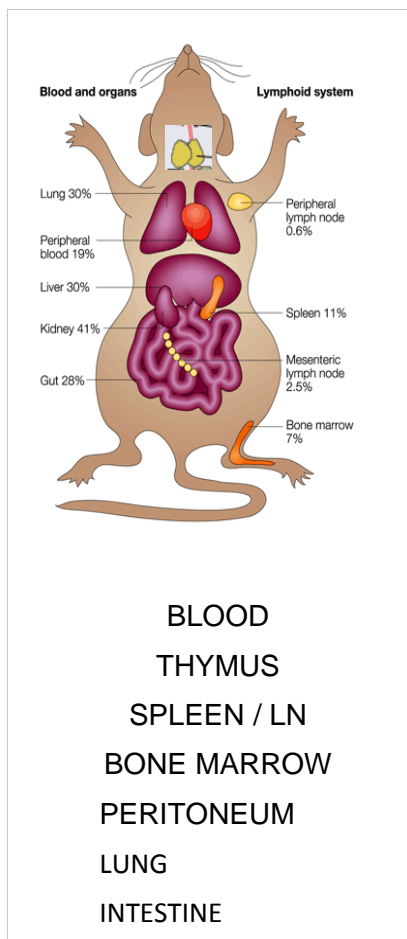
# PhenoPro translational medicine Immunophenotyping module / Activities



	Services open to academic and industrial partners	International consortium Collaboration
Immunophenotyping services	<div>Multiparametric Cytometry</div> <div>Spleen/LN/Thymus BM/Peritoneum/Lung</div> <div>Reporter gene expression</div> <div>Fate Mapping</div>	<div>Immunophenome Spleen Thymus</div>  <div>IMPC</div>
Functional Assays	<div>Differentiation/Effector function</div> <div>Inflammation Immunization</div>	
Cell Sorting Activities	<div>Multiparametric cell sorting</div>	<div>Spleen CD4 BM Neutro</div>  <div>Immgen V2</div>
Mass Cytometry		

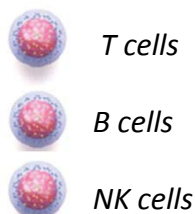
## Mouse innate and adaptive immune system

### IMMUNE ORGANS

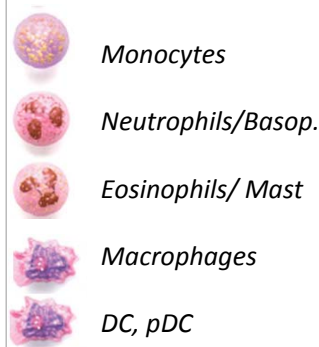


### CELL TYPES

#### Lymphocytes



#### Myeloid cells



### HIGH CONTENT PANELS

#### Flow cytometry

**BLOOD** >20 parameters  
quantitative analysis of hematopoietic cells

**THYMUS**  
T cell development 17 parameters  
Dendritic cells 20 parameters

**SPLEEN / LN**  
1- Orientation panel 20 parameters  
2- T-lymphocyte 17 parameters  
3- B-lymphocyte 16 parameters  
4- Myeloid cells 18 parameters  
5- Dendritic cells 20 parameters

**BONE MARROW**  
Stem cells/Myeloid cells precursors  
B cell development

**LUNG**  
(Steady state/ Inflammation) 17 parameters  
**PERITONEUM**  
(Steady state/ Inflammation) 16 parameters

### DESIGN PANEL AND CONSULTING

## *In vitro* and *in vivo* Functional assays

### CELL TYPES

#### Lymphocytes



*T cells*



*B cells*



*NK cells*

#### Myeloid cells



*Monocytes*



*Neutrophils*



*Eosinophils*



*Macrophages*



*DC, pDC*

#### ACTIVATION / DIFFERENTIATION

- Surface markers
- Proliferation assays
- Cytokines, chemokines production

#### DIFFERENTIATION EFFECTOR T CELLS

- Th1, Th2, Th17, Treg
- Cytotoxicity, Lytic granules

#### B CELL RESPONSE IMMUNISATION

- T-cell dependent
- T-cell independent

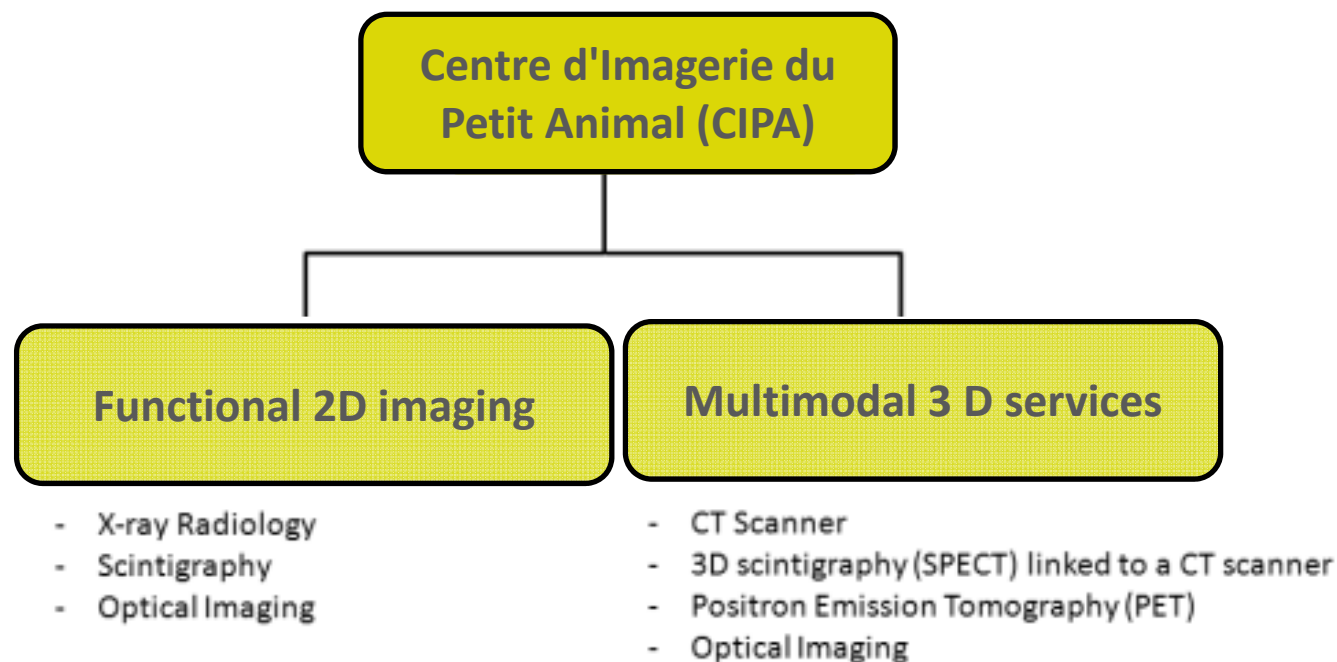
#### BONE MARROW CHIMERAS

#### INFLAMMATION MODELS

- Peritonitis
- IBD model

#### TUMOR MODEL

- Melanoma cell line



**Areas of expertise:** Oncology, infectiology, Inflammation and vectorisation of medicinal products.

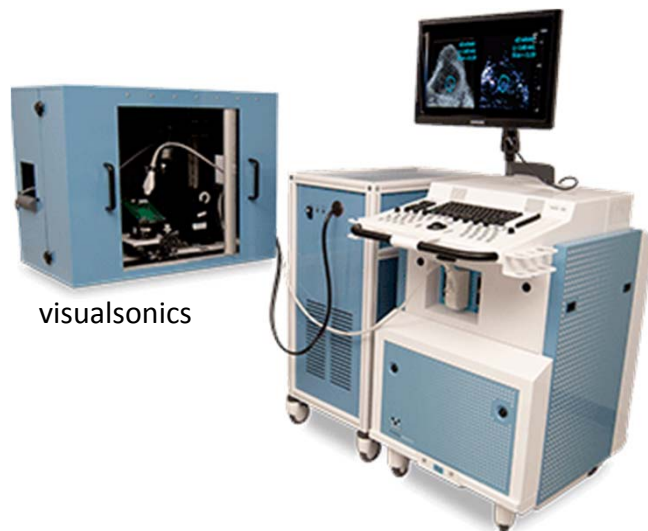
**Services:**

- Fusion of pictures in order to associate the anatomic information with functional molecular imaging methods such as bioluminescence, Infra Red fluorescence, Positron Emission Tomography (PET) et tomoscintigraphy (SPECT)
- Xenograft: pancreas, colon, prostate, lungs, bone
  - Human cell lines
  - Murine cell lines: melanome B16, breast cancer 4T1, lymphome EL4

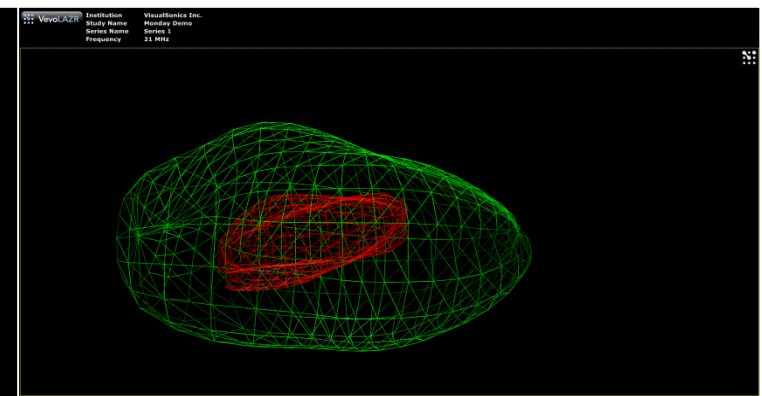
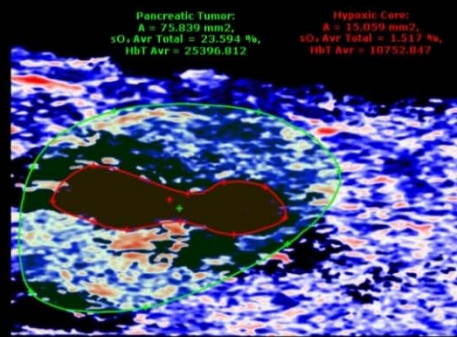
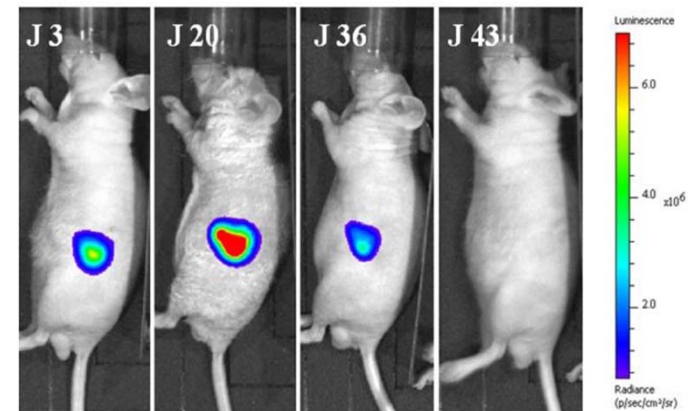


### Opto-Acoustic Tomography : Echography and Fluorescence coupling

application : hypoxia, angiogenesis, nanoparticles

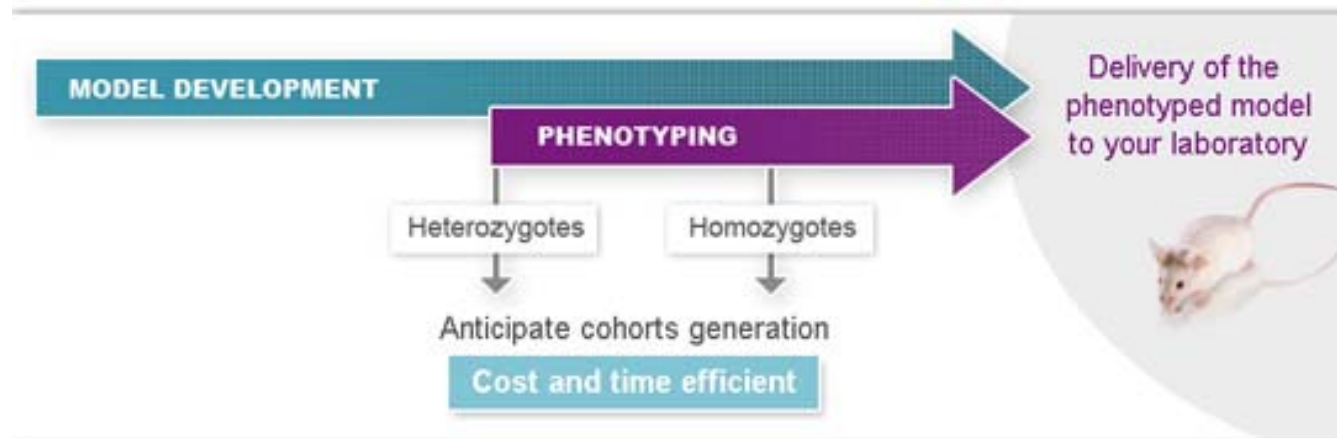


Orthotopic model of pancreatic adenocarcinoma  
bioluminescence and hypoxia



## Partnership with Genoway

- One-stop shop: a complete range of services from creation to phenotyping of genetically modified models, integrating design, generation, delivery and phenotypic characterization of mouse models
- Substantial time and cost savings from integrated offers (from line creation to phenotyping)
- Customized breeding plans in order to reduce development time and cost of experimental cohorts.
- Centralized project management & administrative work / agreement



## PhenoPro' Services: a tool box company

- Design of phenotyping or pharmacological flow schemes including validated assays & protocols: standardized or customized
- Planning and management of phenotyping and pre-clinical projects
- Flexibility to adjust protocols to the partner demand
- Data recording & processing
- Data validation & analysis
- Reporting
- Delivery of raw data and of biological samples
- Access to the Phenomin iCS / CIPHE / CIPA experts network

### Partnering with PhenoPro :

- **Academic experts and team network :** facilitates access to expertise and innovation
- Access to the Phenomin Infrastructure
- **Report & Analysis :** full data integration leading to a comprehensive view of your model, recommendations and go-no go decision

## Contacts



### EXCELLENCE IN MOUSE PHENOTYPING

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