# GENETIC ENGINEERING and MODEL VALIDATION

Our mission is to develop the most adapted, highly physiologically relevant animal models for your research program.
The genetic engineering services are flexible and extensive to help you generate your **custom-made mouse model**, from the design of vectors construction to the functional validation of the mouse model. Additional services are proposed for genotyping. Our deliverables are transgenic or chimera mice, in **SPF or SOPF status**.

## GENETIC ENGINEERING

- Knock-out constitutive, conditional
- Knock-out tissues specific and/or inducible
- Knock-in, genetic targeted insertion

Point mutation, complex and multi-allelic modifications, reporter Tag (Rosa26, HPRT, Random transgenesis,…), depletion of cell types (hDTR, DTα chains,…), interactoms, cell tracking.

- Humanization
- Nuclease genome engineering "NEW offer" (CRISPR/Cas9 or TALEs)

150 vectors / year

**R&D program :** New engineering tools, lentigenesis.

All mouse strains and lines provided by PHENOMIN are available on the web site www.phenomin.fr.

## ES CELLS SERVICE

- Derivation of WT and mutant new ES cell lines from different genetic background (C57BL/6N, Sv129/PAS and BALB/cN ES)
- Mutant ES clones production
- ES validation
- *In vitro* analysis of gene function
- Extensive quality controls to secure your mouse model and injection of EUCOMM / KOMP / IKMC mutant clones

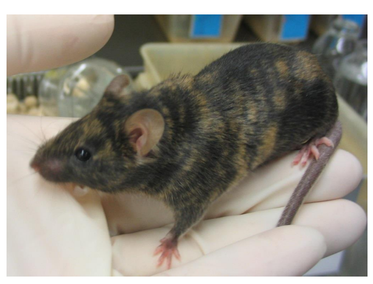
200 mutant ES clones / year
250 ES validations / year

**R&D program :** ES cell differentiation, rat ES cells.

**We provide you with expert's advices, we define a targeted strategy in accordance with your needs and ensure a high scientific and technical output.**

## MICROINJECTION

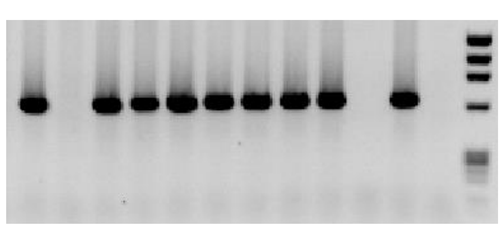
- Injection of DNA into fertilized eggs from random insertion of transgenes
- Injection of validated ES cell into blastocysts
- Efficient germ line transmission rate

450 projects / year

## GENOTYPING SERVICE

- Fully automated genotyping platform
- Validation of genetic modification
- Confirmation of mutation by sequencing
- Short range PCR or qPCR
- Easy-to-use genotyping protocol provided for each lines generated



60 000 samples / year

## VALIDATION OF GENETIC MODIFIED MOUSE MODEL

The gene expression service validates the consequences of the genetic modifications introduced *in vivo*. Gene expression analyses are specifically pertinent to select transgenic lines established by pronuclear integration (transgene localization, expression level of the transgene, copy number determination, …), to validate genetically modified mouse models (expected expression of conditional alleles, level of transcripts, splice variants, hypomorphic effects, cell/tissue specific gene inactivation, …) and to correlate the gene expression analysis with the phenotype of the animals upon clinical evaluation.

| Gene expression validation and copy number determination | Functional validation |
|---|---|
| Northern Blot, Southern Blot | Immunohistochemistry |
| ddPCR ( as replacement of qPCR) qRT-PCR | Western Blot |

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EXCELLENCE IN MOUSE PHENOGENOMICS