

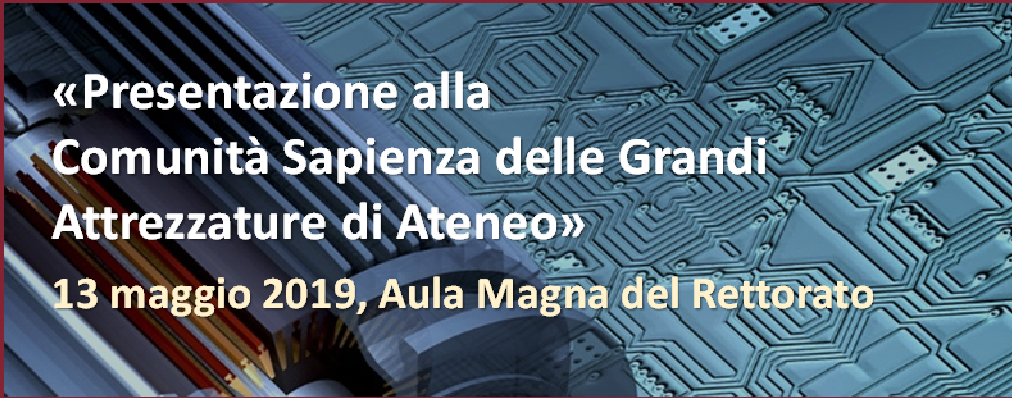
Integrated Platform for phenotypic, functional, and molecular profiles of mouse models

Proponente: Antonio Musarò

Co-proponenti: Antonio Filippini; Maurizio Inghilleri



SAPIENZA
UNIVERSITÀ DI ROMA

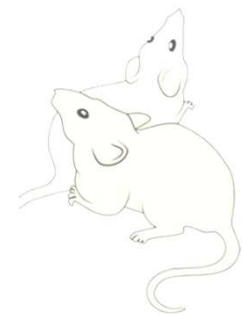
A detailed image of a microchip or circuit board, showing intricate patterns and components, serving as a background for the event information.

**«Presentazione alla
Comunità Sapienza delle Grandi
Attrezzature di Ateneo»**
13 maggio 2019, Aula Magna del Rettorato

DESCRIPTION

40 Participants (IF: 938.58);
4 Macroarea: A, B, C, D
12 Departments

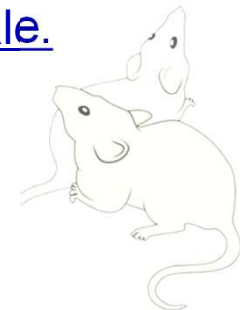
Location: Department SAIMLAL; unit of Histology and Medical
Embryology (Via A. Scarpa-Rome)



DESCRIPTION

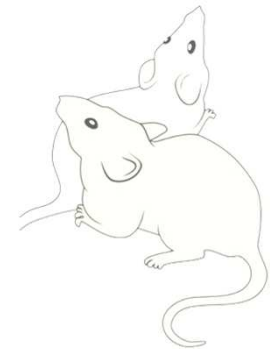
Biological research has entered a new stage—the **post-genome era**, and the main work of this era is to **decipher the function of each gene** in our genome. Utilization of transgenic and knockout mouse models has been powerful for elucidating the function of genes as well as finding new therapeutic interventions for human diseases. Despite the remarkable toolkit available for generating mutations in mice, the biggest challenge faced by the mouse-genetics community is determining the phenotype of each mutant. Indeed, a profound understanding of the systems biology of the mouse will require a comprehensive phenotypic description of every mutant generated.

Gli animali geneticamente modificati possono rappresentare modelli sperimentali di patologie di interesse clinico, oltre che per lo studio di processi e meccanismi fisiologici. Mentre la “cassetta degli attrezzi” metodologica necessaria per generare le specifiche mutazioni è ricca e ben collaudata, un problema di fondo, comune a tali modelli animali, consiste soprattutto nella loro caratterizzazione fenotipica, prerequisito essenziale per il loro impiego come modello sperimentale.

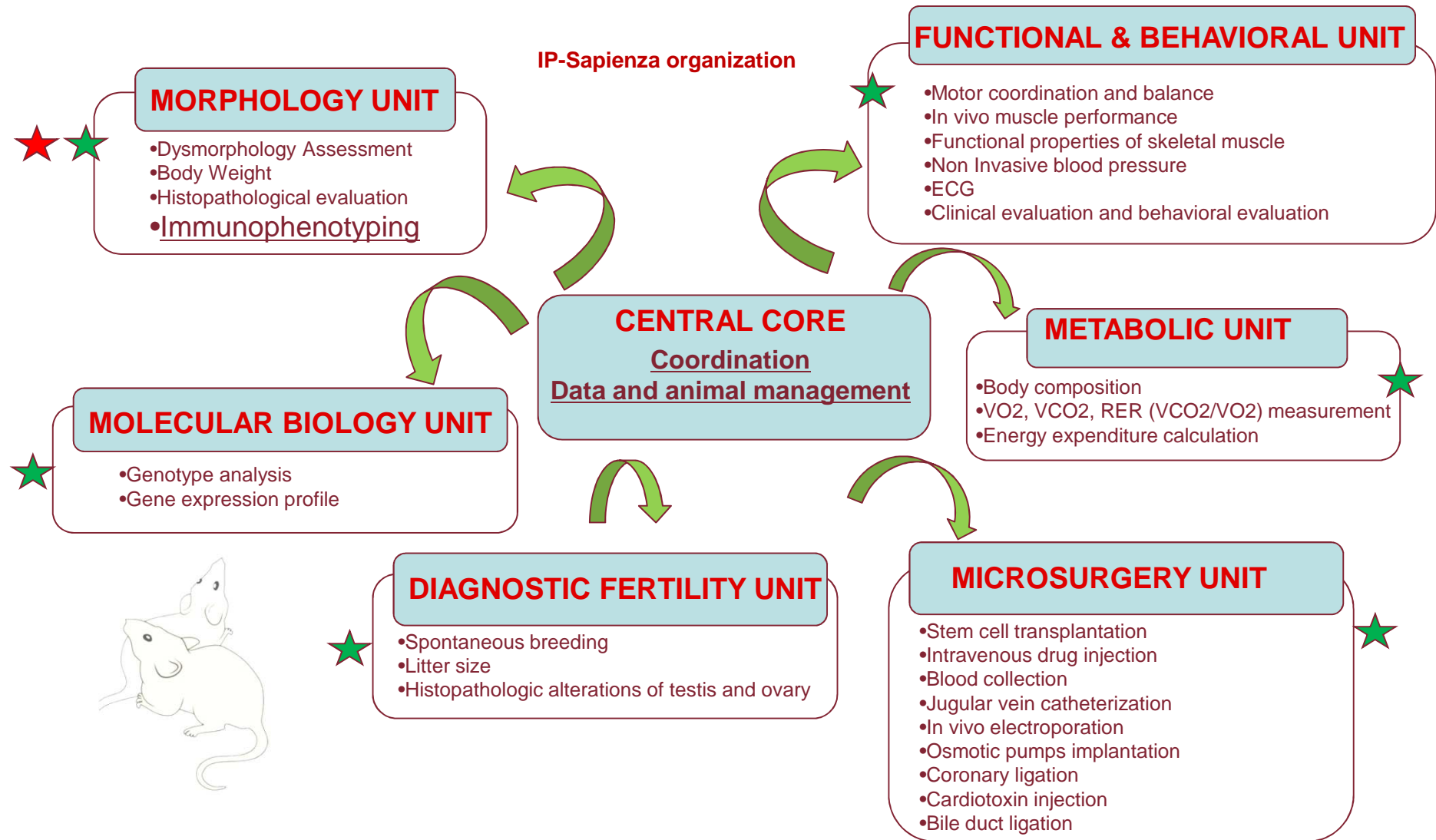


DESCRIPTION

Major goal: to build a multi-disciplinary and multi-technological platform to address the phenotypic, functional, and molecular characterization of genetic modified mice.



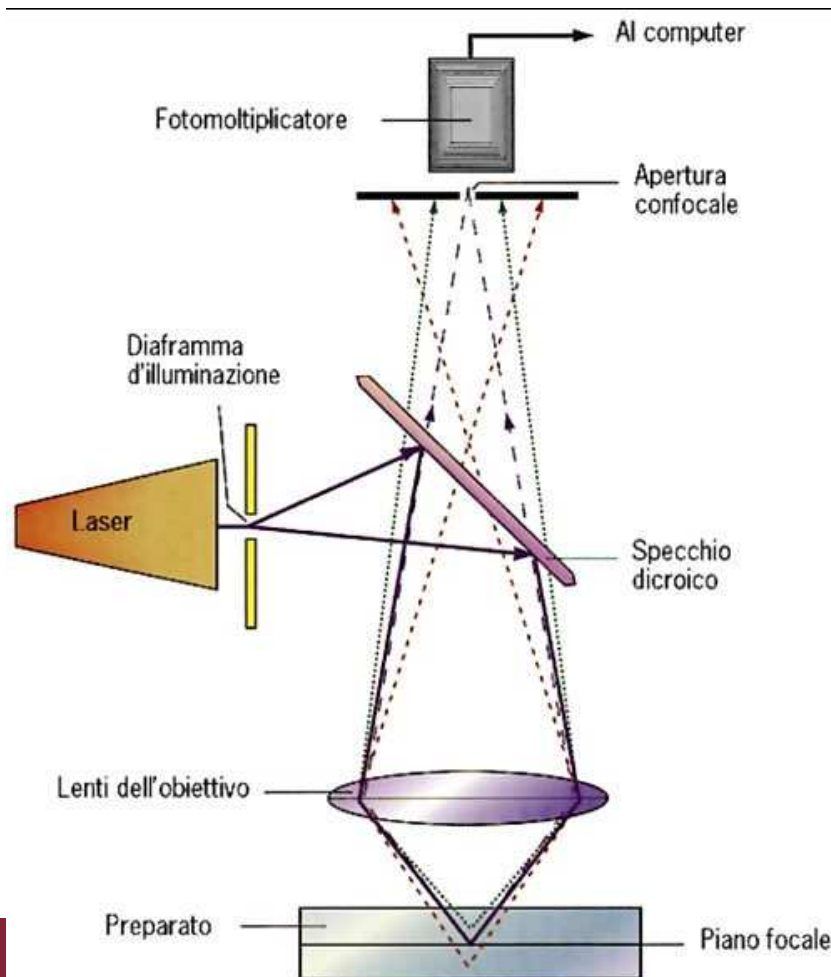
Proponiamo la realizzazione di una “piattaforma” multi-tecnologica e multi-disciplinare con cui standardizzare e portare a compimento la caratterizzazione morfo-funzionale, molecolare e clinica dei diversi modelli sperimentali



Of note, most of the "hubs" related to the platform (functional unit, performance and metabolic unit, molecular biology unit, microsurgery unit, diagnostic fertility unit) are already activated and equipped. We would like to expand and implement the morphology unit for the analysis of immunophenotyping of complex structures. Several approaches can be proposed, according to our expertise.

We plan to implement the morphology unit with a confocal microscopy service for multilabel in situ immunophenotyping.

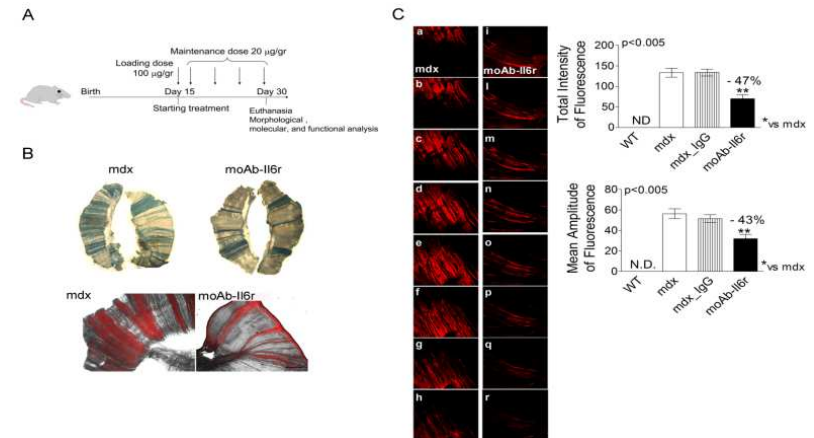
Confocal microscopy is a specialized form of standard fluorescence microscopy that uses particular optical components **to generate high-resolution images** of material stained with fluorescent probes. Laser scanning confocal microscopy provides a means **to acquire and analyze images of complex morphological structures** and to help place molecules or cells of interest in their proper morphological context, provides three-dimensional data.



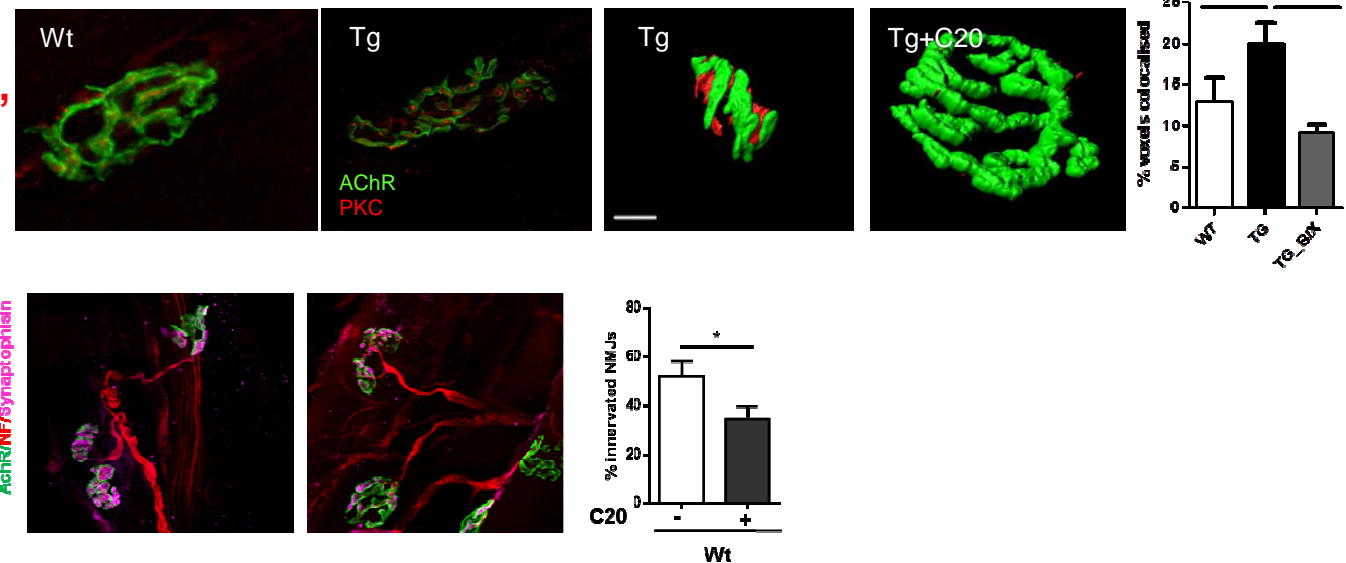
- *La luce monocromatica, di lunghezza d'onda breve, è emessa da una sorgente laser, attraverso un diaframma e deviata da uno specchio dicroico, che permette il passaggio di determinate lunghezze d'onda*
- *Le lenti dell'obiettivo focalizzano la luce in un punto del piano ottico del campione*
- *I fluorocromi usati per colorare vengono eccitati ed emettono a lunghezza d'onda maggiore, in grado di attraversare lo specchio e focalizzarsi nel piano del diaframma*
- *Il foto-moltiplicatore amplifica l'intensità del segnale e lo trasmette al computer che elabora l'immagine*
- *La luce che proviene dai piani superiori o inferiori al piano focale non passa attraverso il diaframma e non contribuisce alla formazione dell'immagine*
- *Diversi punti dello stesso piano e dei piani consecutivi vengono illuminati e registrati mediante la scansione col laser*

Using confocal Microscopy to Image:

- tissue development
- rescue of a pathologic tissue phenotype



- Proteins co-localization, protein function, and 3D structure generation



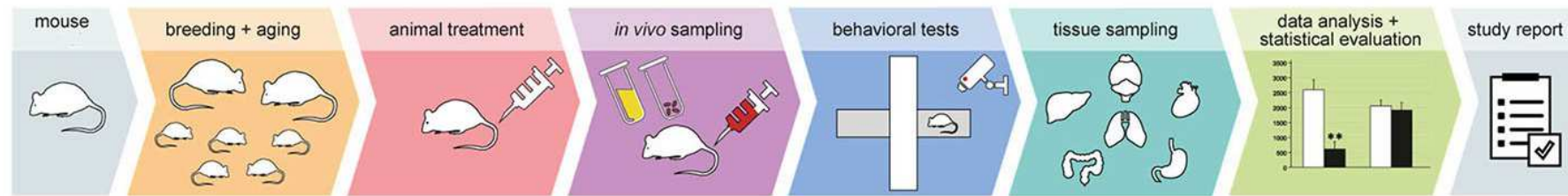
- imaging biologico ad elevata risoluzione
- ricostruzioni tridimensionali di campioni microscopici con risoluzione submicrometrica
- analisi fine di strutture complesse

Authorized access and users

Entry to the platform facility is only permitted to authorized personnel. To be eligible for access, the personnel must fulfill the following:

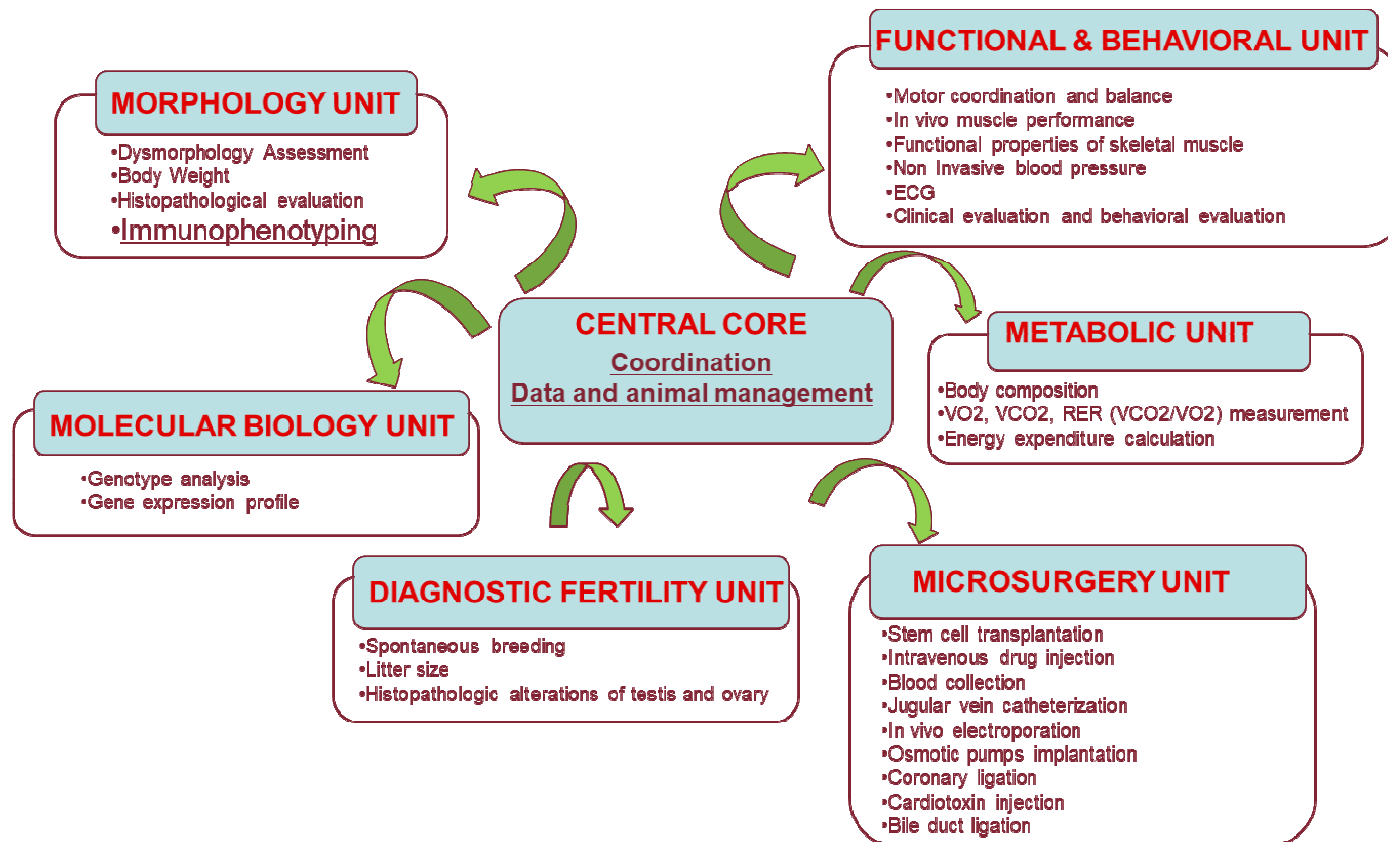
1. Personnel working with animals must have the Responsible Care and Use of Laboratory Animals certificate.
2. Personnel working with animals must have a protocol or part of the researchers in the protocol that is approved by the Institutional Care and Use Committee.
3. Personnel must submit a security access application form to the Laboratory Animal Facility Manager.
4. The users of the platform must be properly trained.

Our project aims to standardize the phenotyping procedures and to assist investigators in their experimental design and execution by providing an extensive baseline phenotypic profile of mice and specific morphological, functional and molecular analysis.

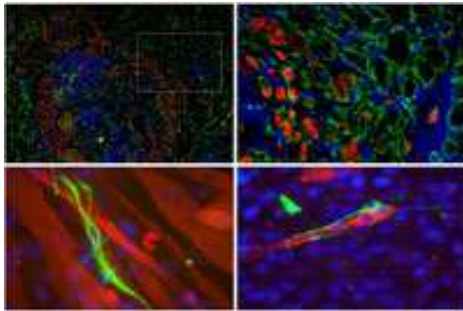


Research Lines

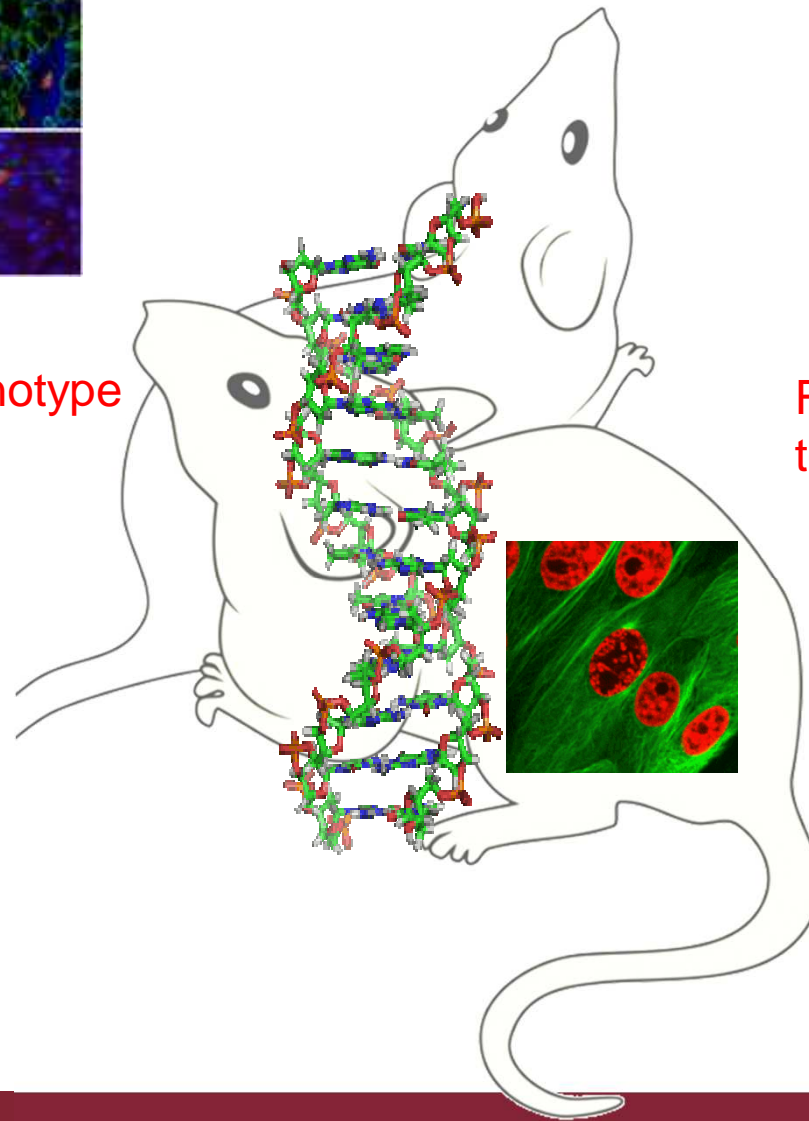
The project provides a baseline for multi-disciplinary and multi-technological platform to address the phenotypic, functional and basic molecular characterization of genetic modified mice and to perform microsurgery, behavioral, and preclinical studies.



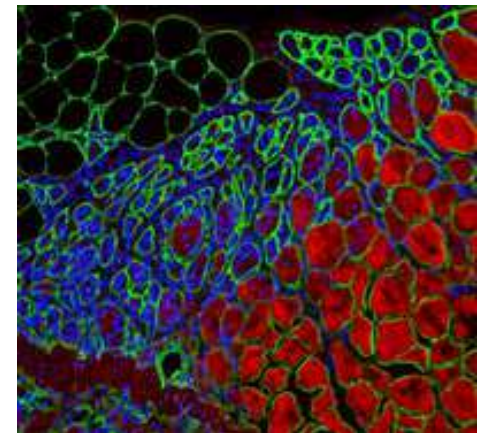
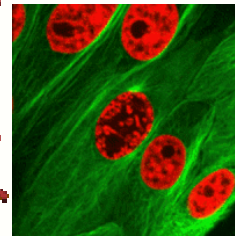
IP-Sapienza



From genes to phenotype



From basic research
to translational medicine



CONTATTI

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