Phenotypos

The next Phase of the Greek Research Infrastructure for Phenotyping of biological model organisms for chronic degenerative diseases

D.L. Kontoyiannis, PhD
• Develop pipelines for disease-oriented phenotyping (i.e. for susceptibility), as well as for generation, archiving and distribution of mouse models of human disease

• Provide high end, open access services to academic and industrial R&D users to develop their scientific and innovation portfolios.

• Liaise with pre-clinical and translational programs for the promotion of human health

• Outreach regional & international research communities
• Phenotypic pipelines focus upon **human disease states for translatability**
• Driven by **Research** and not by Instrumentation
• Based on partner **Greek Centers of Scientific Excellence** and applicability of research activities
• Phenotypic pipelines are standardized & Benchmarked based on **validated animal models** of human disease provided by partners
• Transition from Academic Analysis to Service Provision: **Standardization, 4Rs, Bench to Bedside approach**
Facts: 54% of Researchers in RCs work with mice
Few researchers in Universities work with mice but need to do so
SME’s and Pharma want to expand their portfolios
Problems: Access to specialized facilities, knowledge & services, Cost
The Partner Institutions

- Democritus University of Thrace
  Infrafrontier GR-Phenotypos

- "ALEXANDER FLEMING" Biomedical Sciences Research Center

- National and Kapodistrian University of Athens
  Faculty of Medicine
  Faculty of Nursing
  Infrafrontier GR-Phenotypos

- BIOMEDICAL RESEARCH FOUNDATION ACAD. OF ATHENS

- Institute of Molecular Biology and Biotechnology

- INFRAFRONTIER.GR
PHENOTYPOS service pipelines
Intestinal Inflammation
Joint Inflammation
Neuro-Inflammation

Generic Inflammation
Purpose: Generic Assessment of inflammatory responses
Relevant Disease States: Infectious and autoinflammatory

<table>
<thead>
<tr>
<th>Endotoxemia</th>
<th>Sterile Inflammation</th>
<th>Psoriatic Skin Inflammation</th>
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<tbody>
<tr>
<td>Systemic inflammatory response induced by constituents of Gram negative bacteria</td>
<td>Assessment of the continuum of the inflammatory response</td>
<td>Skin Inflammation</td>
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Immunopathologies as Main Diseases

Cognitive Deficits & Neurodegeneration
- Tau-pathies & αSynuclein-o-pathies
- Fragile X & Neurofibromatosis

Metabolic & Cardiovascular Syndromes
- HFD, NASH
- Cardio-Vascular Dysfunction

Aging & Cancer
- Genetic & Epigenetic Defects, Senescence
- Cancer models (Liver)
- Tumor Transplanation
Alignment
## Alignment of Infrastructures

<table>
<thead>
<tr>
<th>Tissue/Model Disease</th>
<th>Phenotyping Infrastructure</th>
<th>No. of Assays</th>
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| **Gastrointestinal (IBD, Cancer)** | Clinical/Non Invasive  
  - In Vivo whole body Imaging, X-rays, Chemi & Bioluminescence, Fluorescence  
  - UltraSound  
  - PET/CT  
  - Endoscopy  
  - Clinical Biochemistry  
  - Clinical Hematology  
  - Flow Cytometry  
  - Behavioural Analysis  
  - Locomotion, Calorimetry | >12 |
| **Skeletal, Muscle & Skin (Arthritis, Psoriasis)** | | >10 |
| **Cardiovascular (Inflammatory, Atherosclerosis)** | | TBD |
| **Metabolic (Obesity, NASH, Diabetes)** | | TBD |
| **Central Nervous System I (Multiple Sclerosis)** | Analytical/Invasive  
  - Micro-CT  
  - Tissue prepartion  
  - Tissue staining and Histopathology  
  - Optical Microscopy  
  - Analytical and Confocal Microscopy  
  - Molecular Analysis I: Targeted Proteomics  
  - Molecular Analysis II: Genomic and Epigenetic Analyses | >7 |
| **Central Nervous System II (Behavioural, Alzheimer’s)** | | TBD |
| **Multiorgan/Infectious (Septic Shock)** | | >8 |
| **Aging (Degenerations/Cancer)** | | TBD |
On behalf of all scientists & Technicians of INFRAFRONTIER-GR
Thank you for listening!!!