



Phenotypos

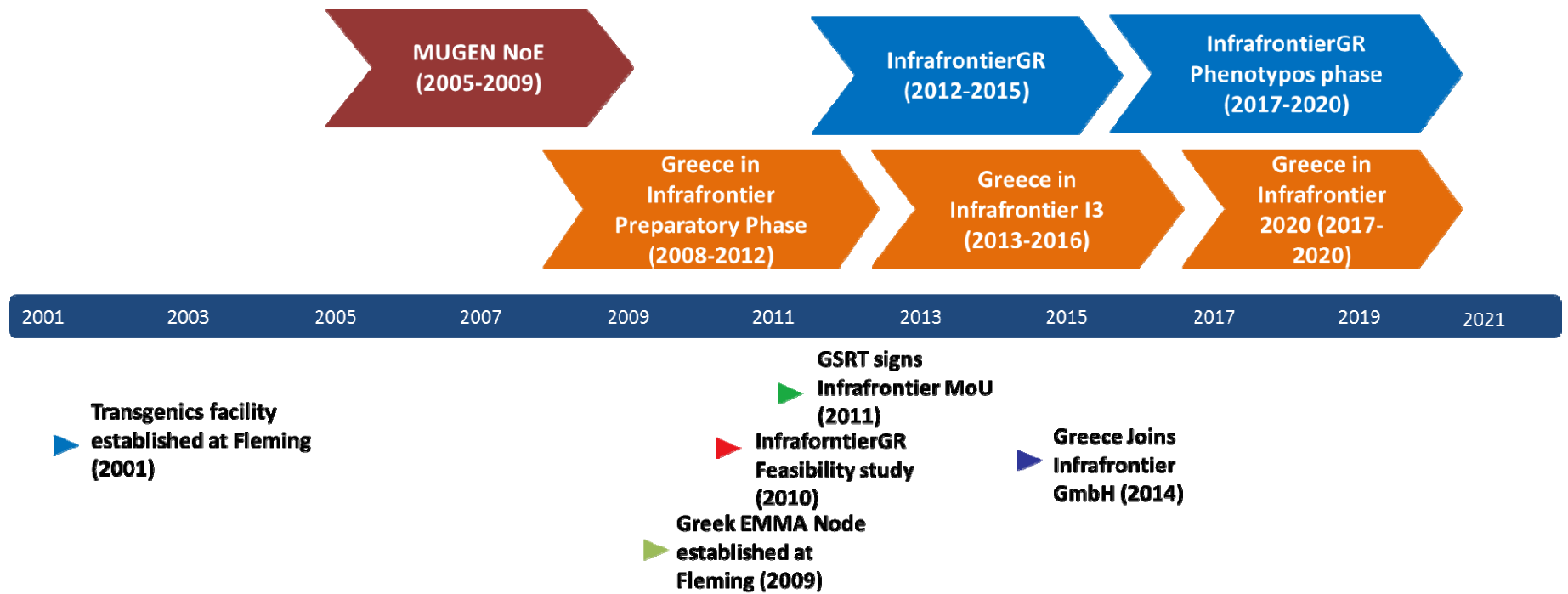
*The next Phase of the Greek Research Infrastructure for Phenotyping
of biological model organisms for chronic degenerative diseases*

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

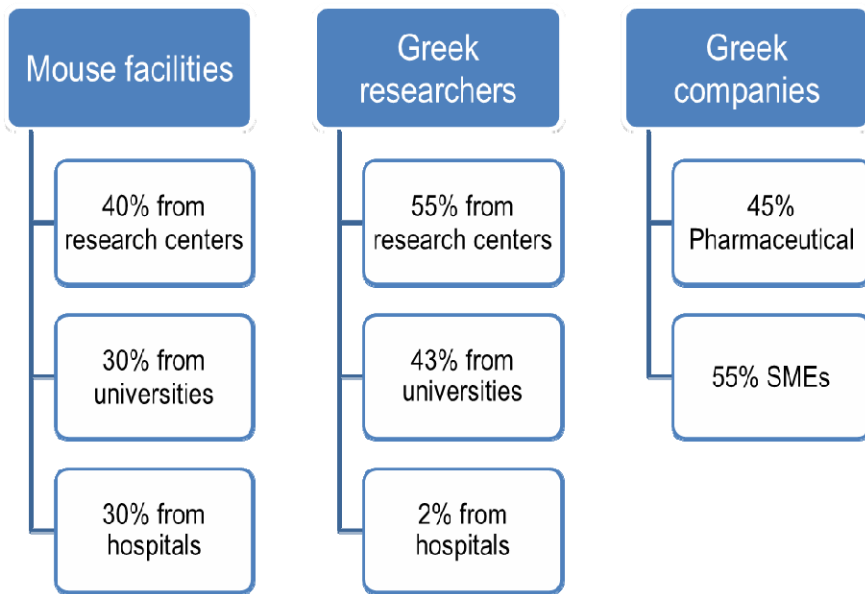
INFRAFRONTIER.GR History of Development



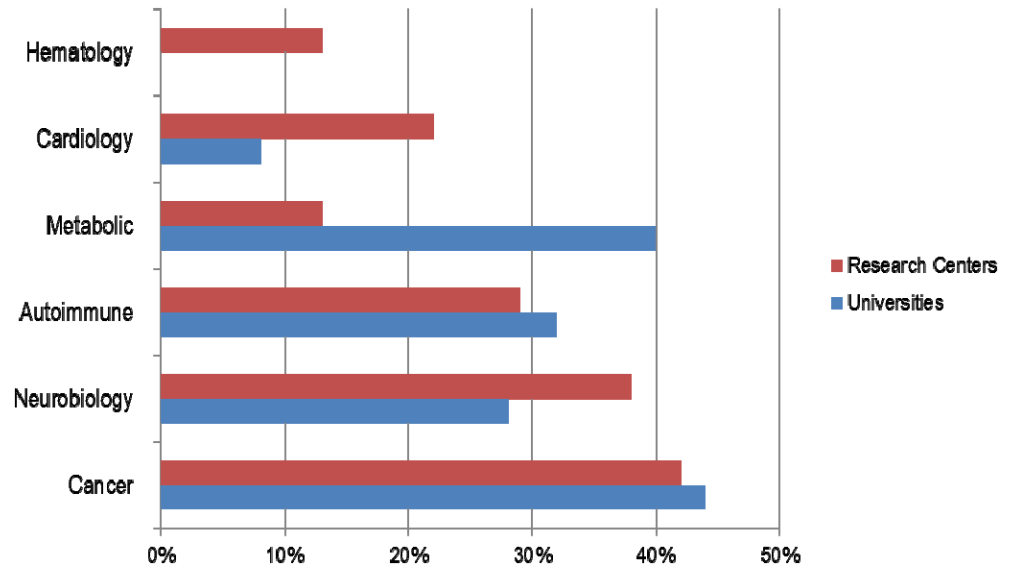
- Phenotypic pipelines focus upon **human disease states for translatability**
- Driven by **Research** and not by Instrumentation
- Based on partner **Greek Centers of Scientific Excellence** and applicability of research activities
- Phenotypic pipelines are standardized & Benchmarked based on **validated animal models** of human disease provided by partners
- Transition from Academic Analysis to Service Provision:
Standardization, 4Rs, Bench to Bedside approach

INFRAFRONTIER.GR The need-Feasibility Study Data on Demand 2012

Participants in Web Based Questionnaire



Interest for mouse models: Disease Areas

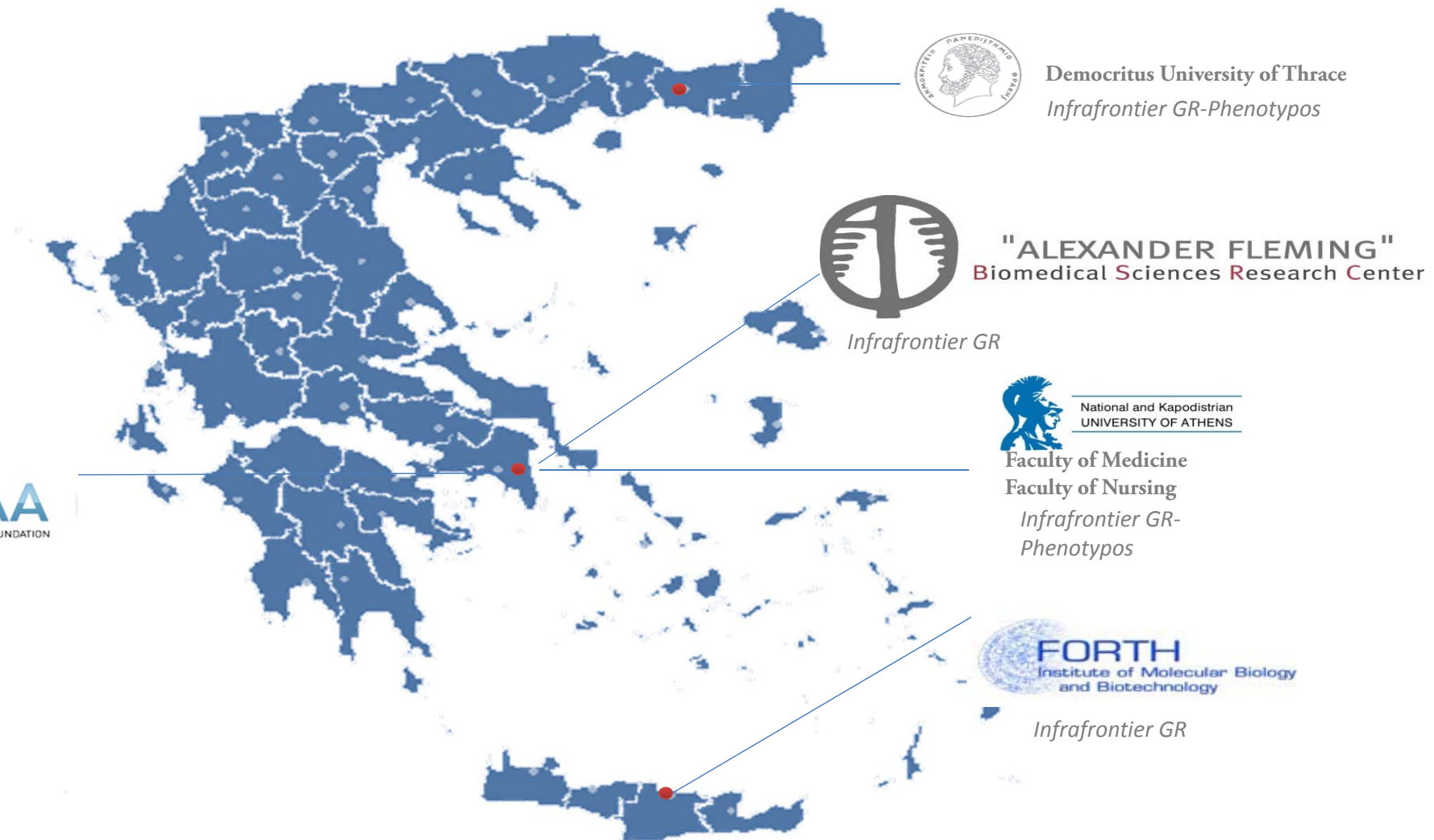


Facts : 54% of Researchers in RCs work with mice

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



Democritus University of Thrace
Infrafrontier GR-Phenotypos



"ALEXANDER FLEMING"
Biomedical Sciences Research Center

Infrafrontier GR



National and Kapodistrian
UNIVERSITY OF ATHENS

Faculty of Medicine
Faculty of Nursing
Infrafrontier GR-Phenotypos



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PHENOTYPOS service pipelines



Intestinal Inflammation

Joint Inflammation

Neuro-Inflammation

Generic Inflammation

Purpose: Generic Assessment of inflammatory responses

Relevant Disease States: Infectious and autoinflammatory

Endotoxemia

Systemic inflammatory
response induced by
constituents of Gram
negative bacteria

Sterile Inflammation

Assessment of the
continuum of the
inflammatory response

Psoriatic Skin Inflammation

Skin Inflammation

Immunopathologies as Main Diseases

Cognitive Deficits & Neurodegeneration	Tau-pathies & α Synuclein-o-pathies
	Fragile X & Neurofibromatosis
Metabolic & Cardiovascular Syndromes	HFD, NASH
	Cardio-Vascular Dysfunction
Aging & Cancer	Genetic & Epigenetic Defects, Senescence
	Cancer models (Liver)
	Tumor Transplantation

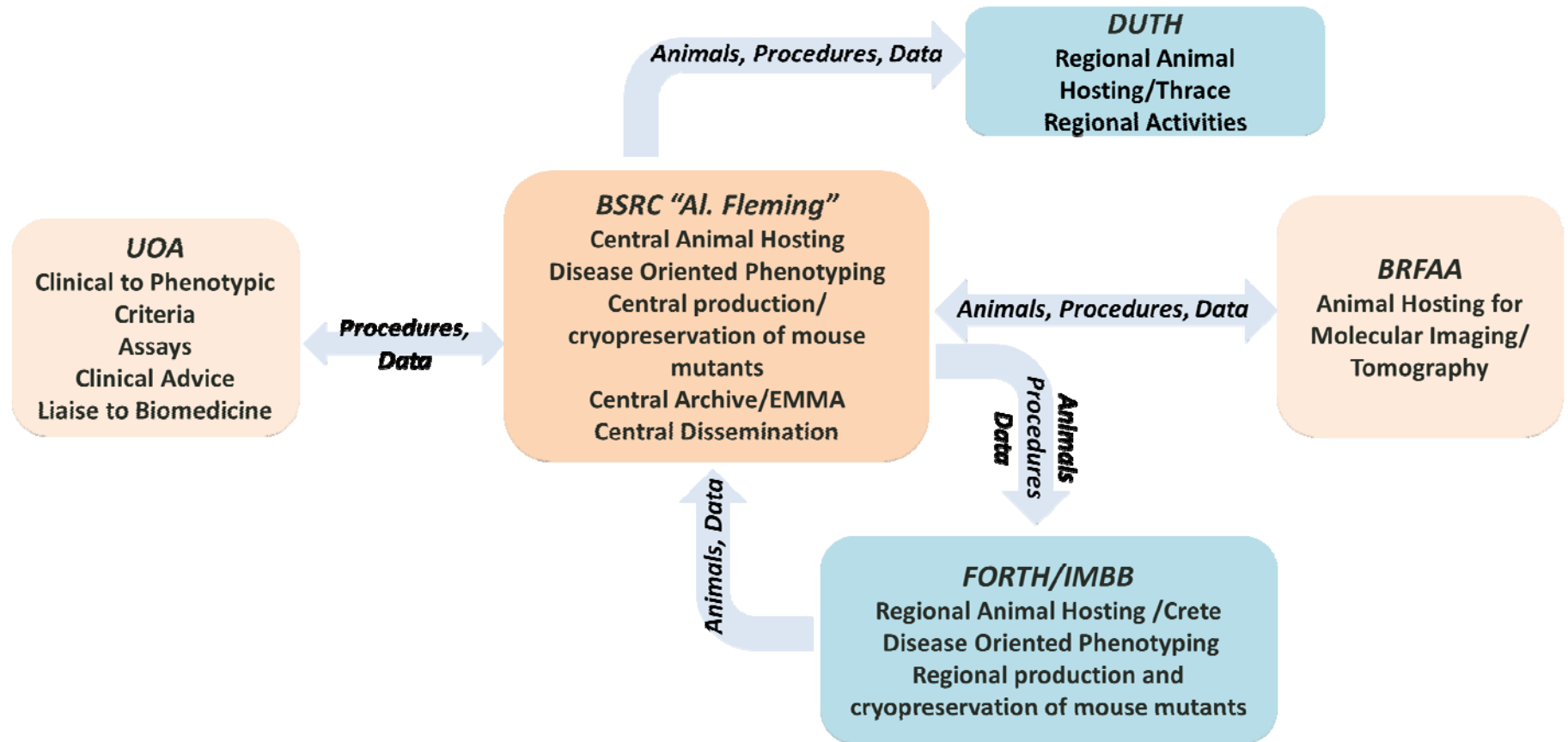
Immunopathologies as Comorbidities

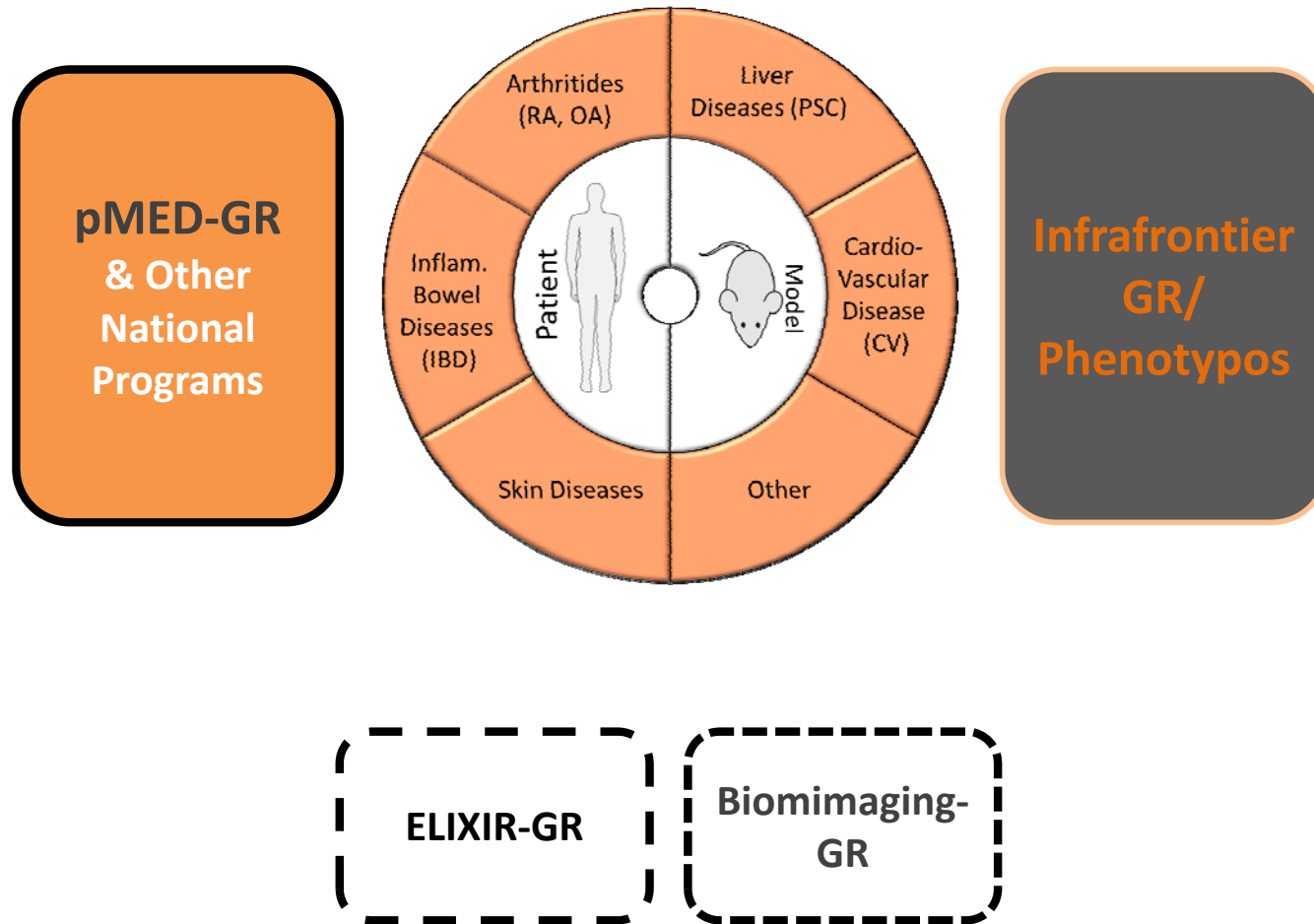
Alignment



Pipeline Institute	Tissue/Model Disease	Phenotyping Infrastructure	No. of Assays
Fleming UOA	Gastrointestinal (<i>IBD, Cancer</i>)	<u>Clinical/Non Invasive</u> <ul style="list-style-type: none"> • 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 (<i>Arthritides, Psoriasis</i>)		>10
Fleming, FORTH, BRFAA UOA	Cardiovascular (<i>Inflammatory, Atherosclerosis</i>)		TBD
	Metabolic (<i>Obesity, NASH, Diabetes</i>)		TBD
Fleming, UOA BRFAA	Central Nervous System I (<i>Multiple Sclerosis</i>)		>7
	Central Nervous System II (<i>Behavioural, Alzheimer's</i>)	<u>Analytical/Invasive</u> <ul style="list-style-type: none"> • Micro-CT • Tissue preparation • Tissue staining and Histopathology • Optical Microscopy • Analytical and Confocal Microscopy • Molecular Analysis I: Targeted Proteomics • Molecular Analysis II: Genomic and Epigenetic Analyses 	TBD
Fleming	Multiorgan/Infectious (<i>Septic Shock</i>)		>8
FORTH	Aging (<i>Degenerations/Cancer</i>)		TBD

Phenotype to Genotype Relationships
Blomedical Translation







Mouse archiving and distribution

Services are provided by Fleming's CryoUnit and include storage, archiving and transportation of mutant strains through embryo rederivation, cryopreservation and recovery of mouse embryo and sperm. The Unit is the National node of the European Mutant Mouse Archive (EMMA) since 2009 and all services are provided in accordance with EMMA standards and protocols.

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Mouse mutant generation

Fleming's Transgenics facility offers state-of-the-art genome manipulation services for the generation of transgenic mice carrying a disrupted or mutated specific genetic locus or an inserted cassette in their genome. Services include embryonic stem cell gene targeting, blastocyst injection, chimera production, germline transmission, DNA microinjection in the pronucleus, generation of founders.

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Mouse phenotyping

InfrafrontierGR offers standardized, high-quality mouse phenotyping services including histopathology, flow cytometry, cell sorting, confocal, PET/CT and micro-CT imaging, endoscopy, genomics and proteomics services. Services offered are disease oriented and focus on models of chronic inflammatory diseases and cancer, however it is envisioned that neurological/ cognitive, cardiovascular and metabolic phenotyping pipelines will soon be introduced.

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Mouse hosting

InfrafrontierGR's Animal house offers mouse husbandry, housing and shipment services to the biomedical research community. The facility is registered under the Veterinary Authority of the Prefecture of Attica and has an updated Operations License for Breeding, Use and Supply of laboratory mice. Mice are maintained and reproduced under optimal conditions that ensure the highest standards of hygiene.

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EMMA strains

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ABOUT

INFRAFRONTIER-GR is the Greek node of the large-scale [ESFRI](#) research infrastructure [Infrafrontier](#): The European Infrastructure for phenotyping and archiving of model mammalian genomes. INFRAFRONTIER-GR provides a sustainable, open access pan-Hellenic Research Infrastructure (RI) that aims to increase local competitiveness in translational medicine via the generation, distribution and disease-oriented phenotyping of mutant mouse genomes. Since 2009, INFRAFRONTIER-GR coordinator [Fleming](#) is also a full member of INFRAFRONTIER's archiving node, the [European Mutant Mouse Archive \(EMMA\)](#), a major European biomedical repository that provides collection, archiving and distribution services of mutant mouse strains to the biomedical research community.

News & Events



18-08-2017

INFRAFRONTIER / IMPC Stakeholder Meeting
14-16 November 2017, Athens, Royal Olympic Hotel
Focus of this meeting is on 'Advancing Personalised Medicine with Animal Models'.

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10-08-2017

Announcement - Award of the Program entitled "InfrafrontierGR/Phenotypes"
InfrafrontierGR/Phenotypes (MIS 5002135), ranked second in the evaluation under the call 039 "STRENGTHENING RESEARCH AND INNOVATION INFRASTRUCTURE". The program focuses on the establishment of phenotypic screens for modifiers of inflammatory, metabolic and neurodegenerative mouse models of human disease.

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07-08-2017

INFRAFRONTIER2020 Project - Trans-national Access call - July 2017
Call for the the derivation of germ-free mice (axenic service). The INFRAFRONTIER2020 participating axenic- and gnotobiology platforms support research into host-microbiota interactions to study the role of the microbiome in both health and disease. Access to the axenic service will be granted on the basis of scientific excellence and supports pilot projects for the derivation of germ-free mice.

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On behalf of all scientists &
Technicians of INFRAFRONTIER-GR
Thank you for listening!!!