



University of Athens - Medical School

pMedGR

The Greek Research Infrastructure for Personalized Medicine

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Bioinformatics leader for the pMedGR program



Coordinators



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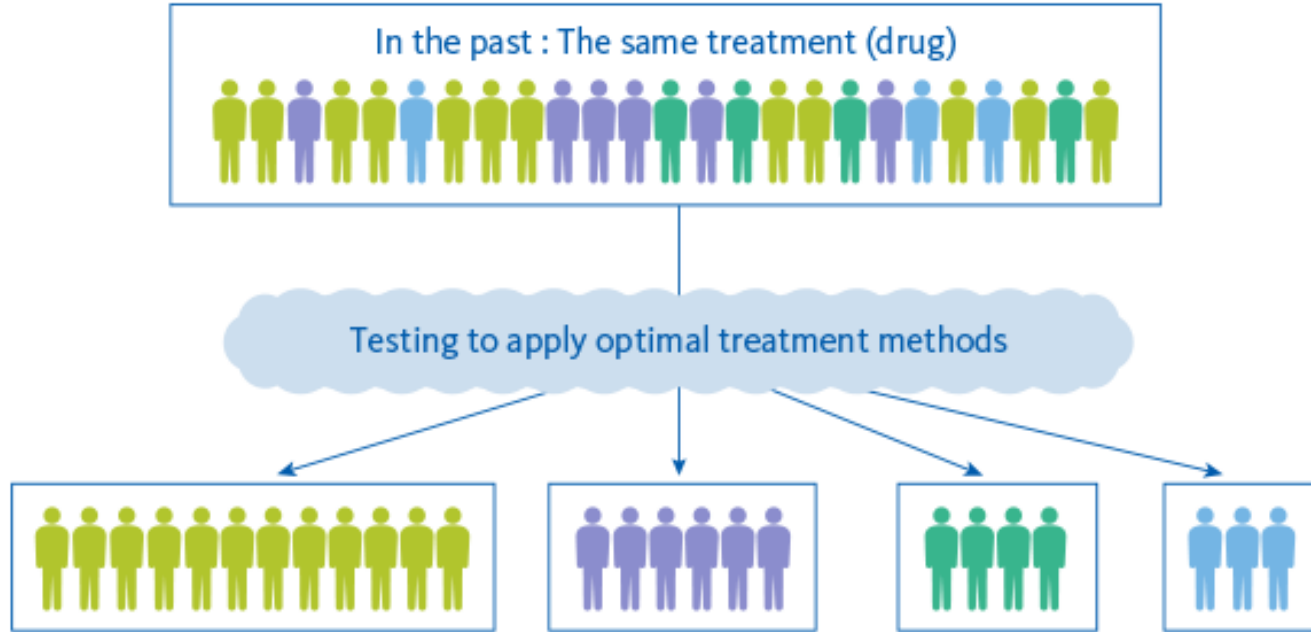


Prof. George Kollias

- Professor of Experimental Physiology at the National and Kapodistrian Medical School of the University of Athens
- President and Scientific Director at the Biomedical Sciences Research Center BSRC "Alexander Fleming"

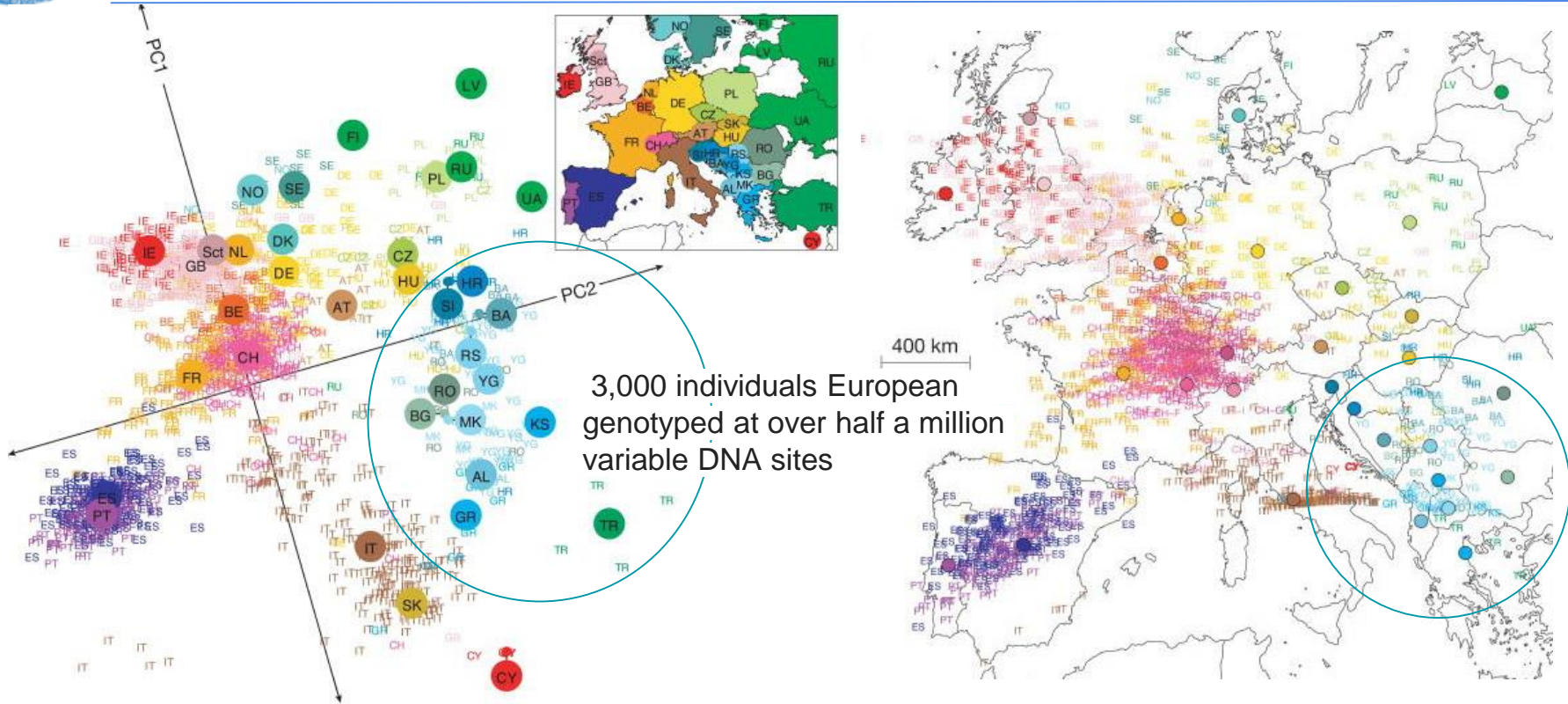


Personalized Medicine



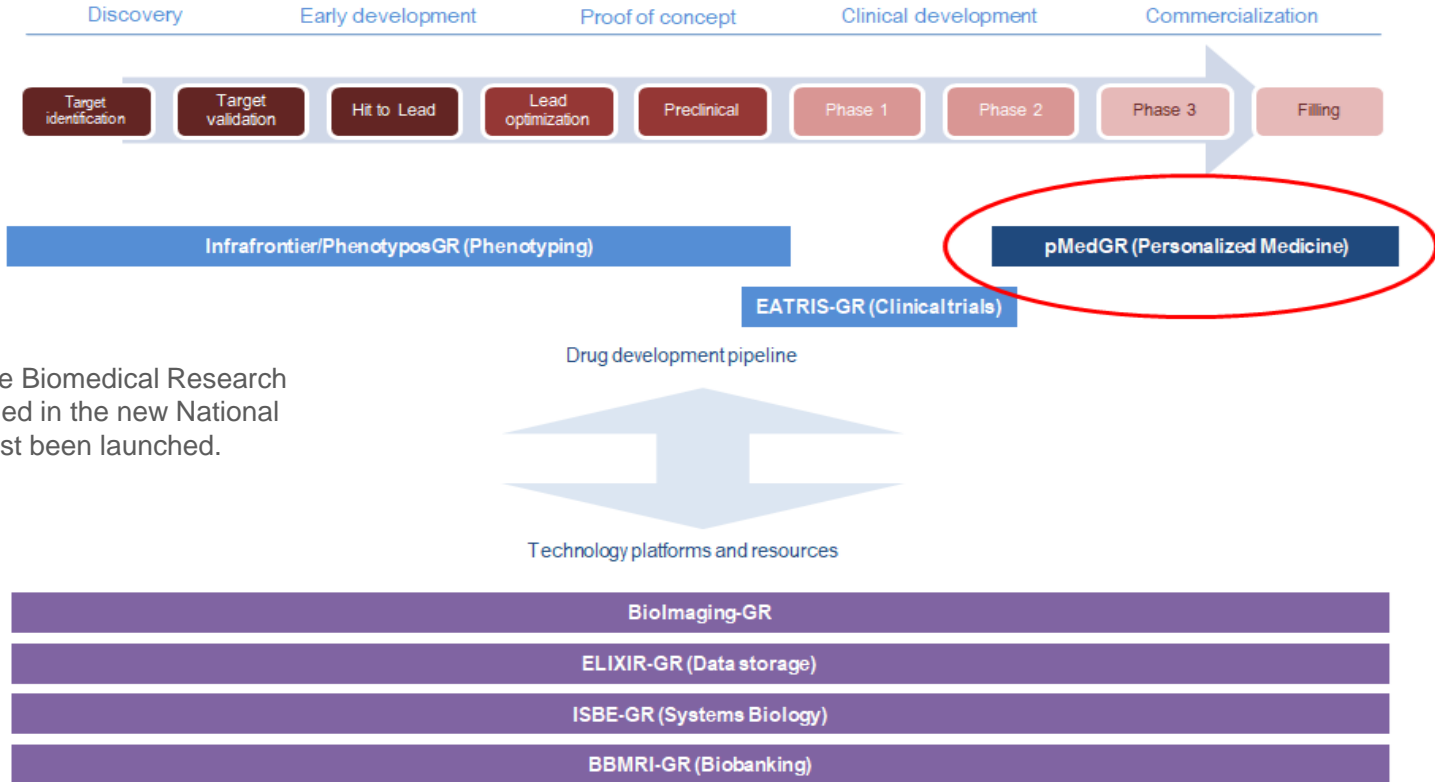


Genetic diversity within Europe





National Biomedical Research road map



pMedGR is one of the Biomedical Research Infrastructures included in the new National Roadmap that has just been launched.



About pMedGR



4.000.000 Euros



Three years (started 19/12/2017)



Medical School
Center of new technology and precision medicine

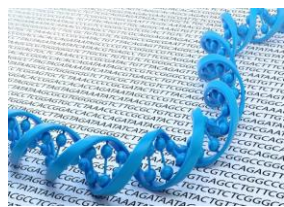


pMedGR - Structure



Clinical Tissue Sampling Facility

The Unit will determine strategies and implement best practices for collecting, cataloguing, and storing samples and specimens (fresh, frozen or FFPE samples) for use.



Personalised Genomics Facility

The Unit will provide services and support in high-throughput, genome wide research, including genomic applications (whole genome sequencing, exome sequencing, whole genome mapping, genotyping etc), transcriptomic (RNA-Seq, smallRNA-Seq), epigenomic (MeDIP-Seq, CHIP-Seq, bisulfide sequencing etc), metagenomic and genotyping services.



Proteomics and Metabolomics

The Unit will provide the following services:

- improved sample separation and sensitivity
- accurate quantization in parallel with identification
- high-throughput analysis of proteins and metabolites
- metabolic profiling and fingerprinting

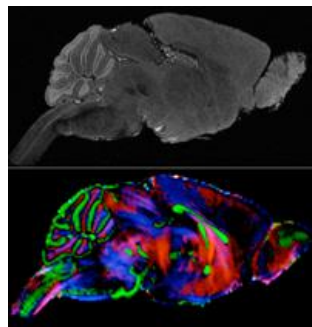


Data Analysis, Integration and Modeling Unit

The Unit will provide bioinformatic and data analysis resources for individual medical genomic applications through the following pipelines:

Analysis of genetic variability

- Transcriptome profiling
- Pharmacogenomic analyses
- Individual epigenetic profiling
- Modeling
- Efficient reference genome indexing
- ExomeSeq data analysis



Advanced Imaging Facility

The Unit will employ new approaches for the discovery and validation of novel biomarkers. These include:

- light sheet and multi-photon microscopy system
- echographic apparatus for assessing novel treatment strategies for heart and vascular diseases
- probe-based in vivo imaging for assessing novel biomarkers for disease progression



pMedGR and Bioinformatics data production



Illumina NGS 550 (~350.000 €)



CyTOF Helios - Mass Cytometer (~870.000 €)



Thermo Scientific Q Exactive HF-X Hybrid Quadrupole-Orbitrap
Mass Spectrometry System (~650.000 €)



Servers (~30.000 €)



pMedGR and Genomics, Proteomics and Metabolomics



Whole genome sequencing mRNA sequencing
De novo sequencing small-RNA sequencing
Targeted sequencing total RNA sequencing
Exome sequencing Targeted RNA sequencing
Amplicon sequencing Ribosome profiling
Mate pair sequencing HLA sequence based-typing
ChIP-seq CLiP-Seq (RNA-protein interactions)
Epigenetic methylation CNV-seq (Variations)



Signaling pathways
Cytokine expressions
Cloud-based technologies



Mass analysis
Mass quantification
Protein identification
PPI complexes
mAntibody subunits
Peptide, proteins, small-molecule applications
Real-time data acquisition



pMedGR and



- Services and pipelines
- Data production
- Data storage
- Data analysis
- Data sharing



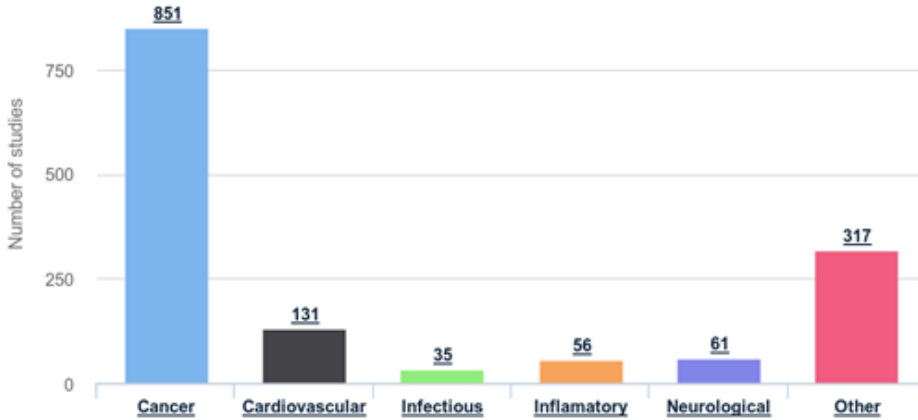


pMedGR and

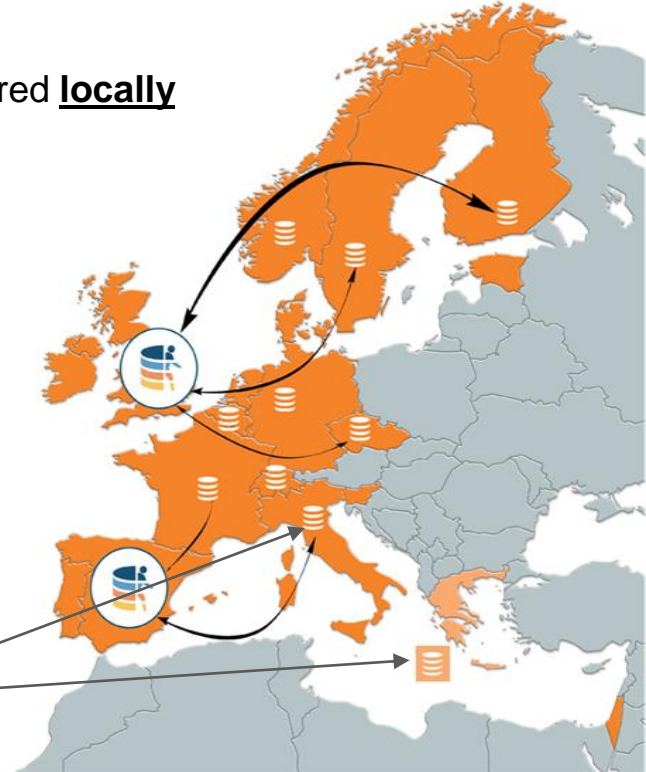


EUROPEAN
GENOME-PHENOME
ARCHIVE

Sensitive controlled-access data are stored **locally**



Local EGA

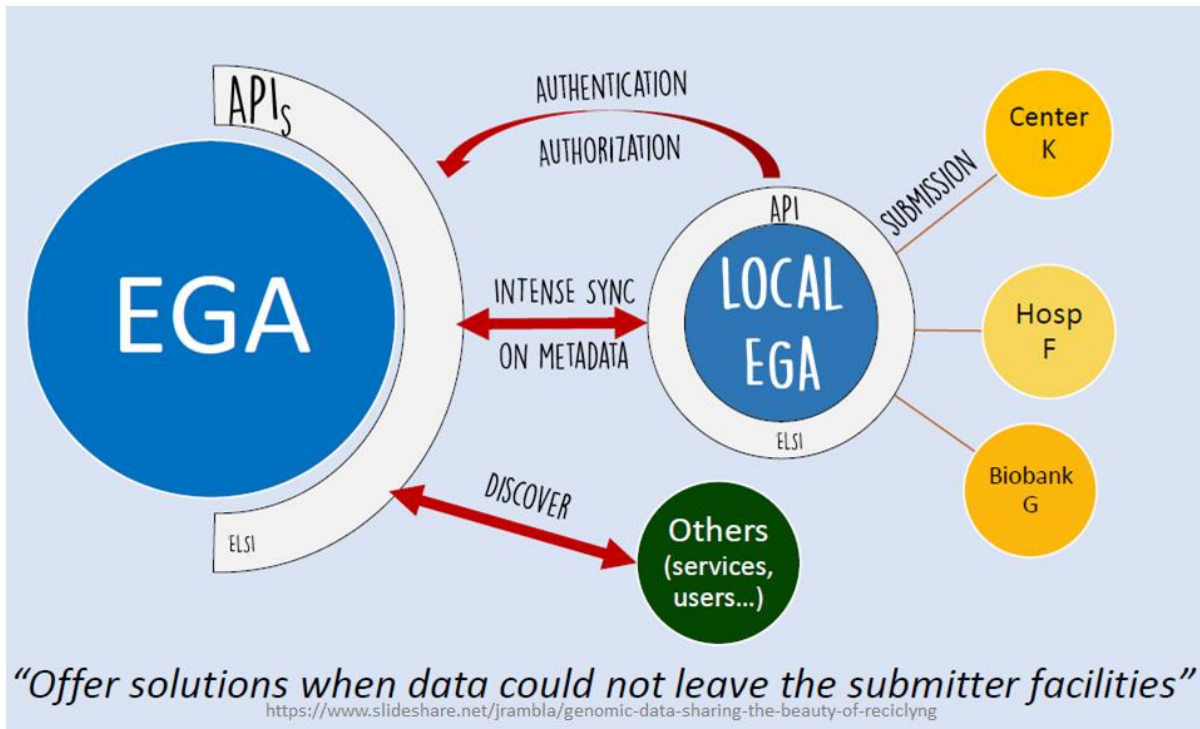




pMedGR and



- Data are stored locally
- Metadata are shared





pMedGR - Aims

- Strengthen basic research
- Move regulatory science forward
- Follow the “Big-Data” revolution
- Revise clinical trial designs
- Educate new generation of Doctors and PhDs
- Fund raising
- Cope with the brain drain phenomenon
- Become a bridge between industry and academia





pMedGR - The Greek Research Infrastructure for Personalized Medicine

Thank you

PARTNERS



University of Athens



BSRC Fleming



BRFAA