

ICPerMed
Stakeholder Forum
6 October 2022



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Scientific Director IRYCIS, Co-Chair Biomarkers Platform, National Director EATRIS Spain

Our mission: Accelerate the translation of research discoveries into patient benefit



We **support, using our capacities and expertise,** academia, industry, patients and policy makers.

EATRIS acts as facilitator for the development and adoption of Personalised Medicine in Europe and globally.

Who we are : A LAAAAARGE COMMUNITY

Facilities, resources and services to support translational research & Personalized Medicine



EATRIS countries

Bulgaria, Croatia, Czech Republic, Finland, France, Italy, Latvia, Luxembourg, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden



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Research Institutes



5 Scientific Platforms

- ATMPs
- Biomarker
- Imaging & Tracing
- Small Molecules
- Vaccine, inflammation and immune monitoring



Legal status

Non-profit, ERIC legal status

Examples of key actions



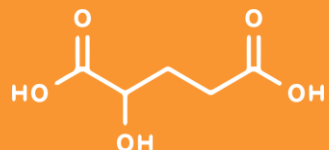
Five Scientific Platforms: dynamizing research

eatris



ADVANCED THERAPY MEDICINAL PRODUCTS

Tissue engineering,
Gene therapy, Cell
therapy, GMP
facilities, vector
design & production



BIOMARKERS

Biobank facilities,
Multiplexed
immunostaining,
Deep genome
sequencing



IMAGING AND TRACING

(pre-clinical) PET
imaging, GMP
tracer development
and production,
(Ultra) high field
MRI, Optical and
hybrid imaging



SMALL MOLECULES

Advanced
screening (also in
3D cultures),
Development of
xenograft and *in
vivo* models, Drug
(re-)formulation,
(Pre-)clinical
validation
nanomedicines



VACCINE, INFLAMMATION AND IMMUNE MONITORING

Antigen
characterisation,
Vaccine
formulation,
Process
development

What we do to facilitate the progress of Personalised Medicine



1

Provide **access to research services** and expertise to industry, academia and research funders, particularly at the preclinical level

2

Develop **new research tools** that facilitate patient stratification

3

Train the next generation of scientific experts in Personalised Medicine

4

Improve the translational **research eco-system** to accelerate the progress of Personalised Medicine

EATRIS PLUS:

a flagship project for creating new services and resources for Personalised Medicine R&D

EATRIS-Plus is aiming to enhance EATRIS' **long-term sustainability** by maturing key capacities of the infrastructure and offering **access to scientific tools and services** to support Personalised Medicine.

- 20 partners (including 14 EATRIS nodes)
- 2 non-member countries represented: Ireland & Germany
- 4 years of funding (2020-2023) - €4,9 million
- Project runs until December 2023

Find out more: eatris.eu/eatrisplus

Reflecting & Addressing the Infrastructure's Objectives



provide access to infrastructure tools and resources
novel academia-industry collaboration models



strengthen operational practices, quality excellence and financial performance



drive patient empowerment through active involvement in the research process



build lasting partnerships with key stakeholders at global level

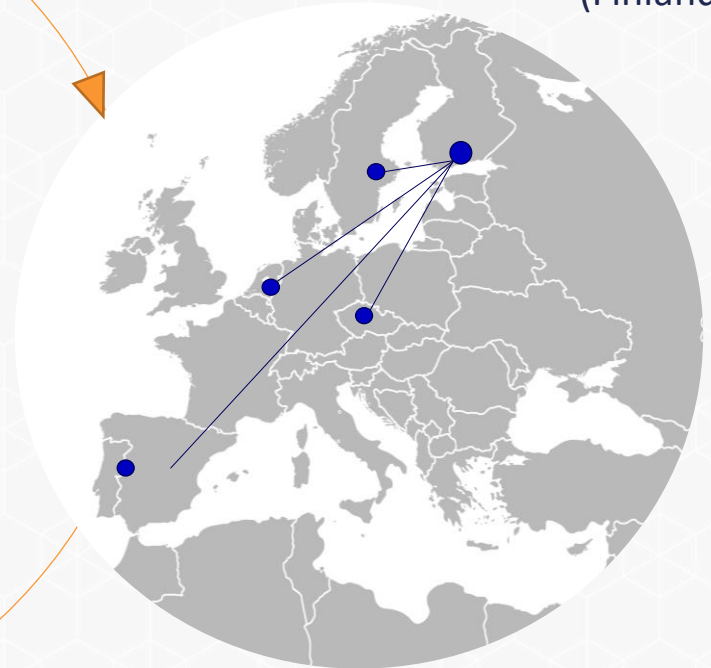
WP1:
Multi-omic
technologies
(Checz Rep)



WP2:
Data Stewardship
& Integration
(The Netherlands)



WP3:
Quality
Assessment
(Finland)



- Whole Genome Sequencing, IMTM/UP, CZ
- Epigenetic modifications DNA- UU, SE
- Metabolomic analysis- RUMC, NL
- Proteome analysis- IMTM/UP, CZ
- Transcriptome RNA- FIMM/UH, FI
- MicroRNA sequencing- FIMM/UH, FI
- MicroRNA qRT-PCR, IRYCIS, ES

WP 1

Multi-omic technologies for Personalised Medicine

- **Mapping and benchmarking EATRIS' omic technical capacities**
- Establishment and validation of **reference tools for multi-omic technologies**
- Samples processing and analysis using multi-omics methods, definition of quality criteria for data outputs
- Developing a **repository for mapping reference values** for age-matched and gender-match stratified populations
- Analysing a healthy cohort that will be the basis for the normal reference database that relates to the personalised medicine

WP 2

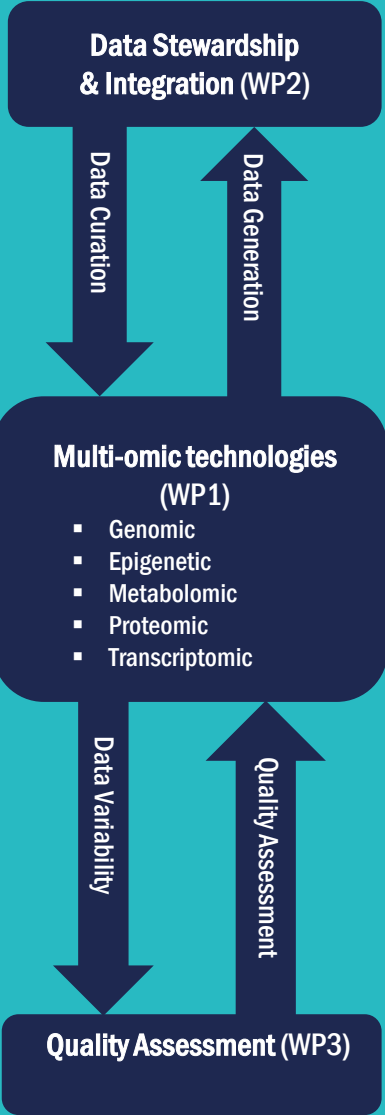
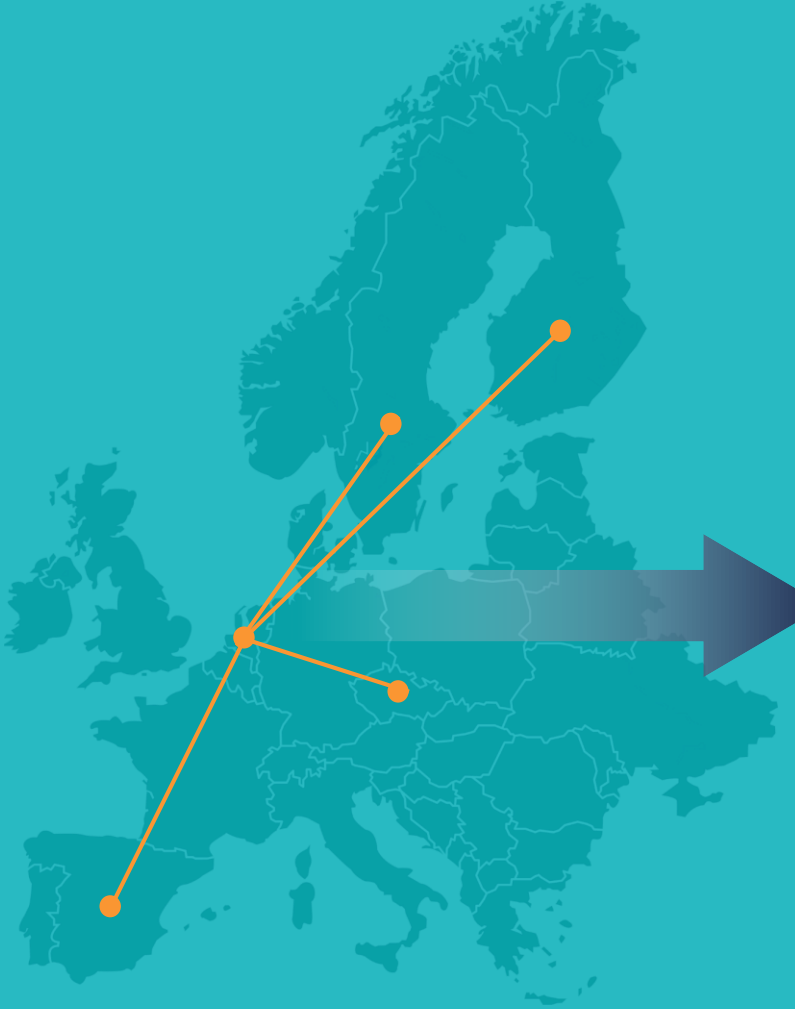
Data stewardship and
integration of omic research
in Personalised Medicine

- **FAIRification of data** and analysis pipelines
- **Design workflows** for joint analysis of cross-omics data from different cohorts
- Demonstrate **added value of the cross-omics analysis to Personalised Medicine**

WP 3

Quality Assessment for
multi-omic technologies

- Establishment of **reference materials and agreement on SOPs**
- Inter- and intra-laboratory quality assessment
- **Assembling EATRIS-Plus Multi-omic Toolbox**
- Establishing the **EATRIS Quality Certificate**



Academia & Industry
Pilot Access

PM ORIENTED



Multi-Omic Toolbox

An open access resource, containing:

- SOPs
- Guidelines for best practices
- Reference materials
- Quality parameters
- Data analytical tools
- Criteria for reference values
- Troubleshooting guidelines
- Repository of multi-omic data

To enable high-quality research in the context of patient stratification and accelerate PM solutions implementation.

Multi-Omic Toolbox



- Multiomic Toolbox WG: WP1, WP2, WP3
- Consolidating contents: “in house” and complementary
- Organizing contents for easy information access and flow : categories, subheads, icons, searching tools, questions...
- Harmonization with other EATRIS Tools
- Attending Broad range of potential users: different interest, different paths
- Dinamyc tool: prototype for “challenging” by users and relevant stakeholders
- Linking other EATRIS Plus resources: Education and training & Regulatory & QC & Patient Engagement



Add Value in Personalized Medicine based on OMICs approaches



1st EATRIS-Plus Multi-omics Stakeholder Group workshop



March 2021

Discussion topics

- Moving beyond genomics
- Evaluating new technologies
- Data standardization
- Capture variability omics data at source
- Data privacy and regulatory aspects
- Implementation in clinical care



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Check for updates

Tackling the translational challenges of multi-omics research in the realm of European personalised medicine: A workshop report

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TABLE 3 Summary of challenges and recommendations from the EATRIS + multi-omics workshop (March 2021).

Challenge	Recommendation
Moving beyond genomics	<ul style="list-style-type: none">• Communicate and educate on the pros and cons of other omics technologies such as proteomics, metabolomics and lipidomics• Develop multi-modal data integration models that showcase the added value of multi-omics approaches in Personalized Medicine
New technologies, new challenges	<ul style="list-style-type: none">• Share lessons-learned, failures and successes when evaluating new technologies in Personalized Medicine• Evaluate the added value of Artificial Intelligence and Digital health in Personalized Medicine, particularly in combination with multi-omics data
Data standardisation	<ul style="list-style-type: none">• Adopt international standards of health data and models including the FAIR principles of data stewardship (e.g., OMOP, FHIR, CDISC)• Define criteria for quantity, quality and FAIR levels of data prior to multi-modal data analyses for a specific objective in Personalized Medicine• Work with flexible and dynamic mathematical models to adapt to changing data collections in Personalized Medicine
Variability in omics data at source	<ul style="list-style-type: none">• Use internationally recognised laboratory standards and standard operating procedures for omics analyses• Adopt and apply quality assurance and control schemes for laboratories, such as the EATRIS Certificate of Commitment to Quality• Include confounding factors such as population diversity in biological systems in the multi-modal data analysis
Data privacy and regulatory aspects	<ul style="list-style-type: none">• Consider ethical, legal, societal aspects when designing multi-omics Personalized Medicine studies• Comply with international standards on data security, including the General Data Protection Regulation in personal data• Report of the successes and failures of implementations from the European landscape
Implementation of Personalized Medicine in routine clinical care	<ul style="list-style-type: none">• Consider well prior to multi-omics Personalized Medicine implementation: 1) the benefits, 2) the risks, 3) associated ethical and social aspects, 4) room for innovation

FAIRification of multi-omics metadata

Workshop at the 21st European Conference on Computational Biology (ECCB)
Organized by Gary Saunders, Anna Niehues, Emanuela Oldoni

The FAIRification process – two use cases

- The **EATRIS-Plus** multi-omics demonstrator cohort, Anna Niehues
- The **iCAN Digital Precision Cancer Medicine** project, Veronika Suni

Tools, services, and resources to facilitate multi-omics data FAIRification

- **FAIRsharing**: discover and curate an ecosystem of research standards and databases, Allyson Lister
- 10 years of **ISA**: Lessons learned from the community and recent developments, Philippe Rocca-Serra

FAIRification practices at omics data repositories

- **MetaboLights** and FAIRification, Claire O'Donovan
- The **PRIDE** database: Enabling FAIR practices for proteomics data, Deepti J. Kundu and Juan Antonio Vizcaino

Interactive tools to capture and share metadata using templates

- Sharing study meta-data for biologists: the **Phenotype database** as solution, Jildau Bouwman
- **FAIR Genomes and MOLGENIS** as a FAIRification platform, Joeri van der Velde

Panel discussion

Bottlenecks and challenges

- Finding and choosing relevant data and metadata standards
- Increased amount of data standards, and data sets submitted to repositories

Necessary next steps

- Address increased needs for database management and curation

Key messages

- Reach out to communities, tool developers, and service providers to communicate needs of researchers and find solutions together

Many thanks to our committed members



MINISTRY OF EDUCATION,
YOUTH AND SPORTS

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Ministry of Education,
Youth and Sports (MEYS)



ACADEMY OF FINLAND

Republic of Finland
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Translational Trends

