INCREASING THE VISIBILITY OF BIOBANKS AND SAMPLE COLLECTIONS

BBMRI-ERIC®
The European research infrastructure for biobanking and biomolecular resources in health and life sciences

BIOBANKING IN MICROBIOME RESEARCH

MANUELA PAUSAN, PhD
Scientific Stakeholder Specialist

manuela.pausan@bbmri-eric.eu
www.bbmri-eric.eu
@BBMRIERIC
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CONTENT

- Short intro in BBMRI-ERIC
- Challenges in Microbiome Research
  - Microbiome Data Acquisition - Biobanking
  - Metadata & Co-founders
  - Reporting
- Opportunities for funding cancer - microbiome pilot studies – canSERV project

BBMRI-ERIC

ABOUT US

BBMRI-ERIC is the **European research infrastructure for biobanking**. We **bring together** all the main players from the biobanking field – **researchers, biobankers, industry, and patients** – **to boost biomedical research**. To that end, we **offer quality management services**, **support with ethical, legal and societal issues**, and a number of **online tools and software solutions for biobankers and researchers**.

Our Mission

Establish, operate, and develop a pan-European distributed research infrastructure of biobanks and biomolecular resources

to facilitate the ACCESS to RESOURCES as well as FACILITIES and to support high-quality biomolecular and medical research.

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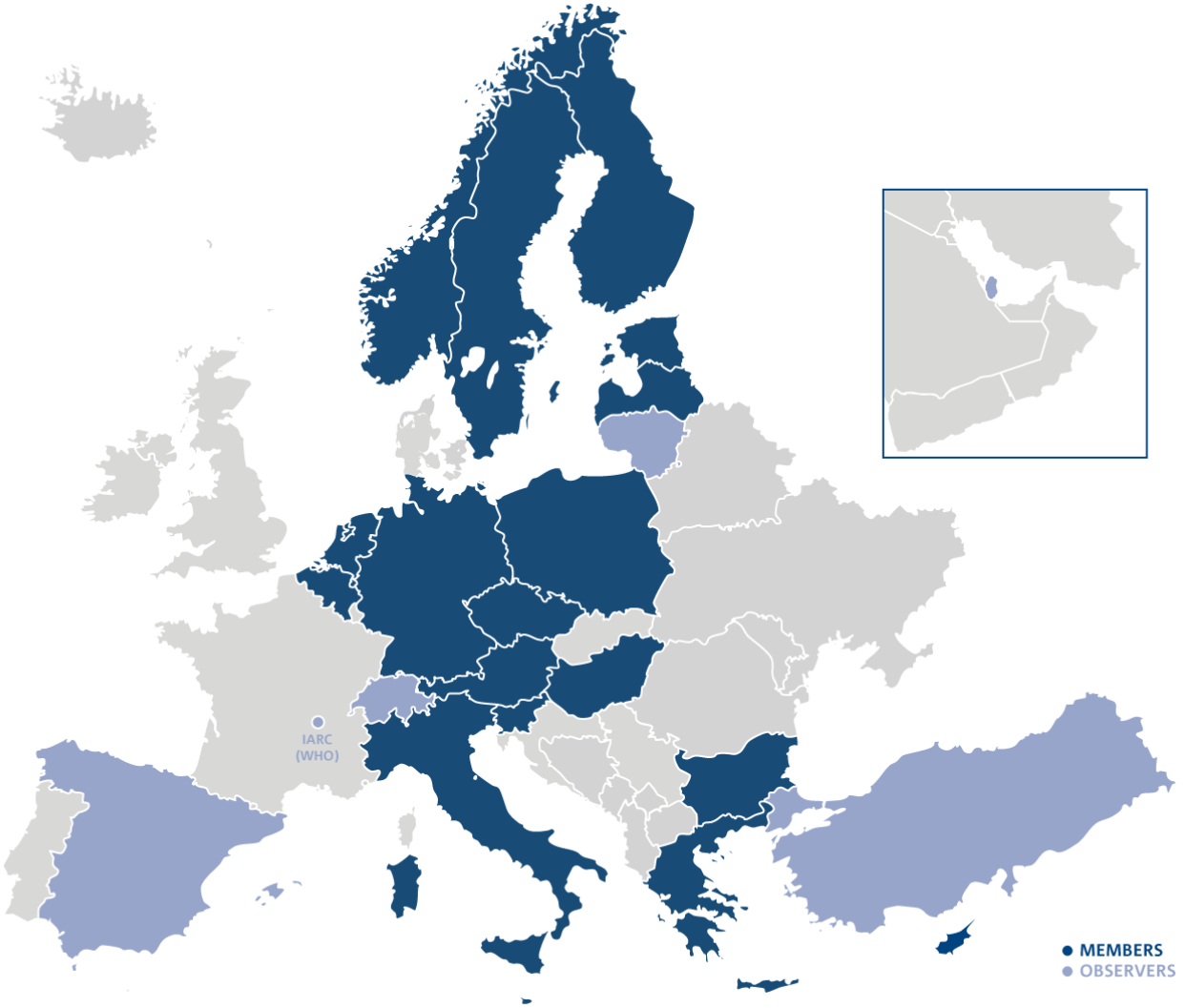
Life Science Research Infrastructure built upon:

18 Member States

Austria
Belgium
Bulgaria
Cyprus
Czech Republic
Estonia
Finland
Germany
Greece
Hungary
Italy
Latvia
Malta
Netherlands
Norway
Poland
Slovenia
Sweden



… and growing interest

7 Observers

IARC/WHO
Lithuania
Qatar
Spain
Switzerland
Turkey

Comprising

- > 400 biobanks
- 24 National Nodes
- 3 Expert Centres
- 1 Headquarter
- & affiliated partners

MEMBERS OF BBMRI-ERIC
OBSERVERS OF BBMRI-ERIC

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BBMRI enabling personalised medicine through:

Biobanking Development

- Biobanks & Universities
- National Nodes
- Expert Centres
- Sustainability

ELSI Services & Research

- Knowledge Base
- Helpdesk Network
- Ethics Check
- Training
- Code of Conduct for Health Research

IT Services & Research

- Discovery of biobanking resources
- Access to samples and data
- Data deposition, pooling, analyses
- Interoperability
- Data protection and access control
- Quality controlling & reusability
- Training & Support

Outreach, Education & Communication

Public Affairs & Stakeholder Engagement

- Member States & Strategic Partners
- EU & Global Affairs
- Patients & Public
- Scientific Societies
- Industry Collaborations

Quality Management Services & Research

- Knowledge Hub
- Training & Support
- Auditing
- Quality Assurance

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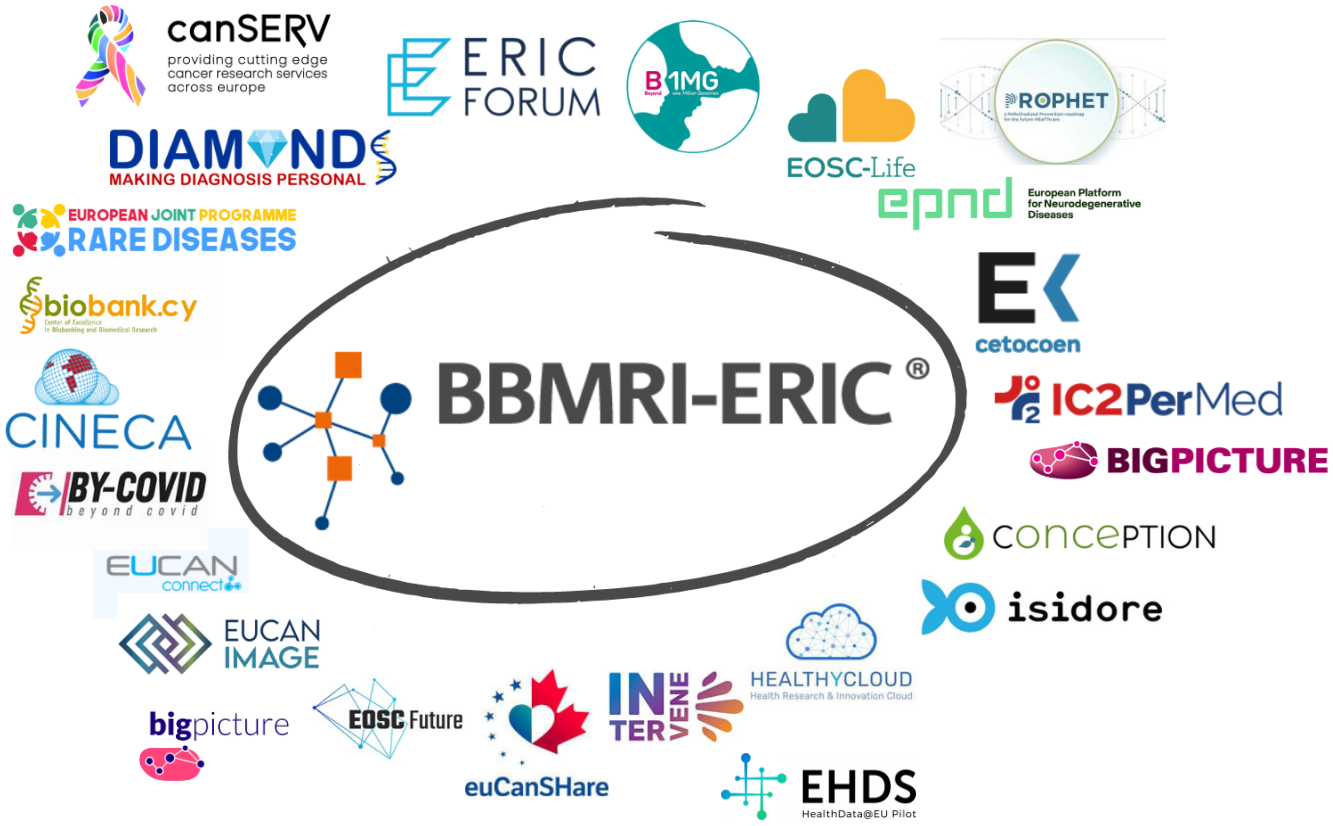
BBMRI-ERIC is part of 47 EU-FUNDED PROJECTS with our PARTNERS

Project management & engagement

- 20 completed projects
- 23 active projects
- 2 project coordination
  - ERIC Forum
  - CanSERV
- 4 projects in preparation



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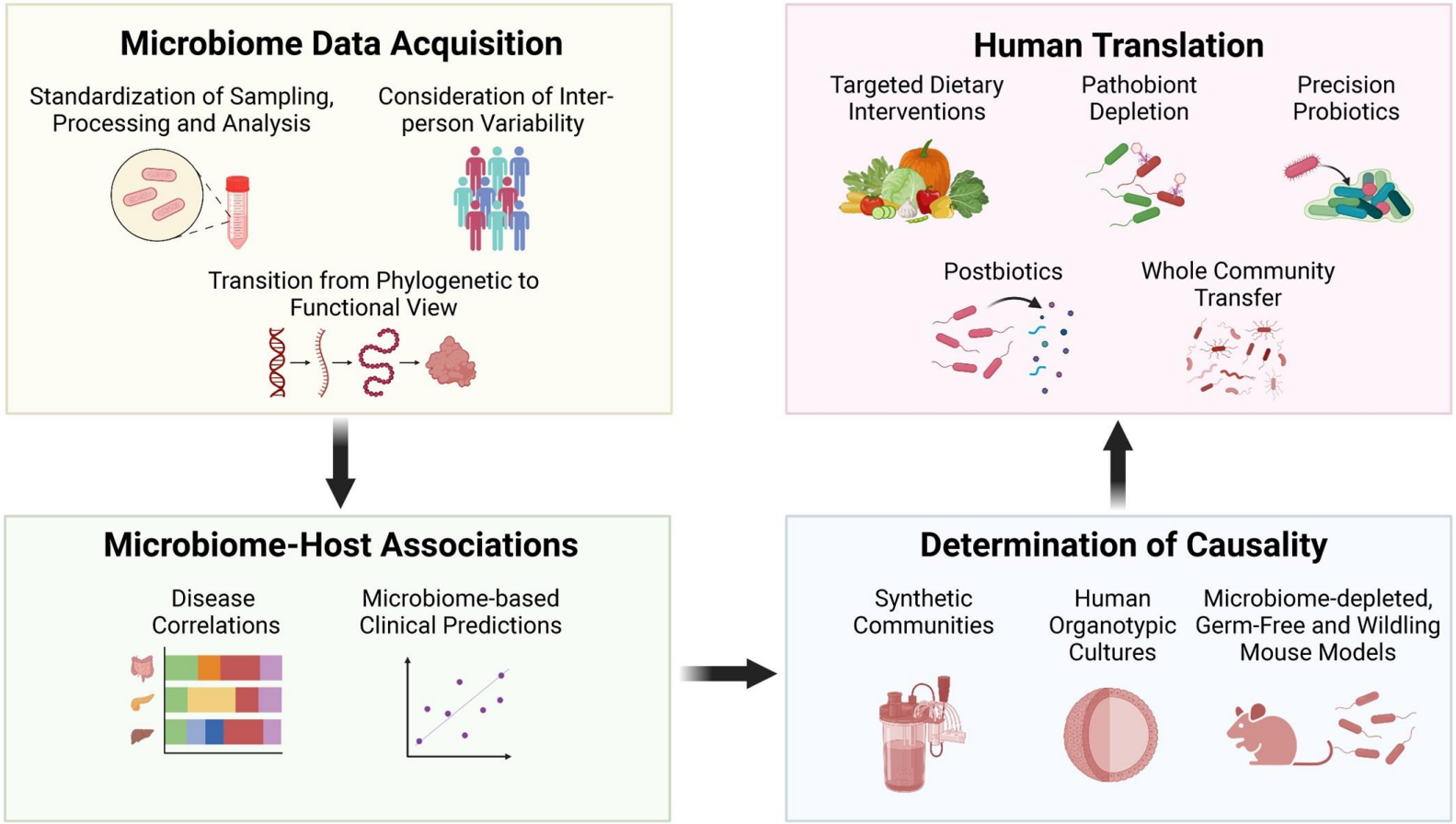
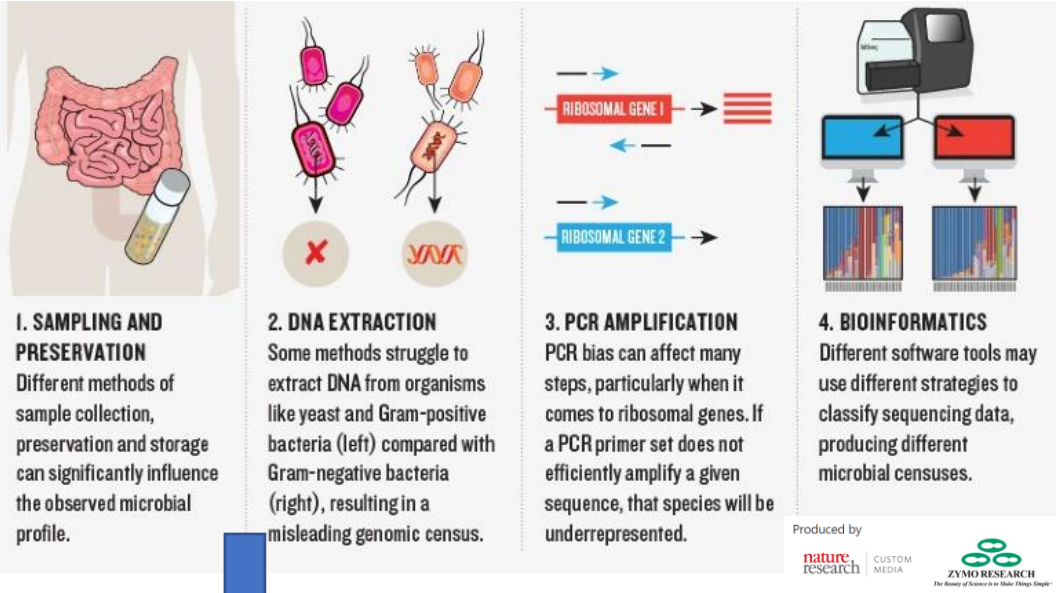
CHALLENGES IN MICROBIOME RESEARCH



Puschhof J, Elinav E (2023), PLOS Biology 21(3)

MICROBIOME DATA ACQUISITION

STANDARDIZATION OF PROCESSING



Variables

- Donor (e.g. demographics, genetics, diseases, medication, life style)
- Collection site
- Collection method/device
- Specimen (heterogeneous)
- Storage/transport (e.g. duration, temperature, oxygen, light)
- Stabilization
- Microbiome DNA extraction
- Contamination (from e.g. samples, humans, reagents, environment)

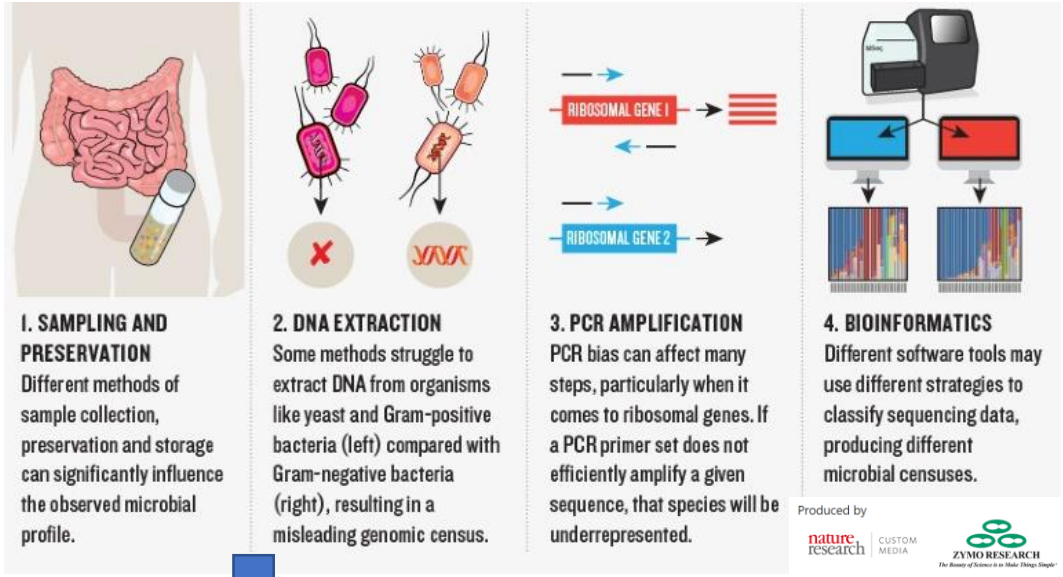
Impact microbiome DNA analysis result

Different microbiome composition/yield/integrity…

- Undesired growth/decline of microorganisms
- Degradation of microbiome DNA
- Contamination with microbiome (‚cells', DNA)
- Different lysis requirements of cells
- Presence of human/host cells/DNA
- Inhibitory compounds

MICROBIOME DATA ACQUISITION

STANDARDIZATION OF PROCESSING



- Human Microbiome Project
- MetaHIT
- International Human Microbiome Standards (IHMS)
- ISO/AWI TS 18701

ISO/AWI TS 18701: Molecular in vitro diagnostic examinations — Specifications for pre-examination processes for human specimens — Isolated microbiome DNA

Contents

MICROBIOME DATA ACQUISITION

STANDARDIZATION OF PROCESSING

ISO/AWI TS 18701: Molecular in vitro diagnostic examinations — Specifications for pre-examination processes for human specimens — Isolated microbiome DNA

Scope:
Requirements & recommendations for the **pre-examination phase of human specimens,** e.g. stool, saliva, skin and urogenital specimens, **intended for microbiome DNA examination(s)**

Relevant for target groups:
- In vitro diagnostics developers and manufacturers
- Medical labs (lab developed tests ISO15189/IVDR)
- Regulatory bodies
- Biobanks
- Research labs etc.

*Led by K. Zatloukal & C. Stumptner

MICROBIOME DATA ACQUISITION - METADATA

BIOBANKING

ISO/AWI TS 18701: Molecular in vitro diagnostic examinations — Specifications for pre-examination processes for human specimens — Isolated microbiome DNA

5 Outside the laboratory	Patient/specimen donor	Demographics (e.g. age, gender, geography), disease/health condition, medication and treatment (incl. e.g. antibiotics), nutrition (incl. prebiotics, habits), frequency, life style, (smoking, personal care habits, stress, physical activity)
	Selection of specimen collection method & device(s) Specimen collection & stabilization	Collection method & device(s) (e.g. swab, tape, tube, collection site, spatula), process of collecting (incl. self-collection by donors), contamination, (pre-)treatment of collection site, labelling, stabilization (chemical, physical)
	Specimen storage & transport	Intermediate storage, with/without stabilizer, transport container, temperature, duration, oxygen, UV-light
6 Inside the laboratory	Specimen reception	Identification
	Sample preparation	Homogenization, enrichment (e.g. centrifugation), aliquoting, labelling
	Sample Storage	Duration, temperature, humidity, oxygen, UV-light
	Microbiome DNA isolation Quantity and quality assessment of microbiome DNA	Isolation method (e.g. cell lysis), reagents/kit (e.g. type, lot.no., contaminants), process of the isolation, host DNA content, quantity/quality assessment (e.g. method, process)
	Storage of microbiome DNA	Duration, temperature

Stumptner C, Stadlbauer V, O'Neil D, Gessner A, Hiergeist A, Zatloukal K, Abuja PM, 2022, Nutrients

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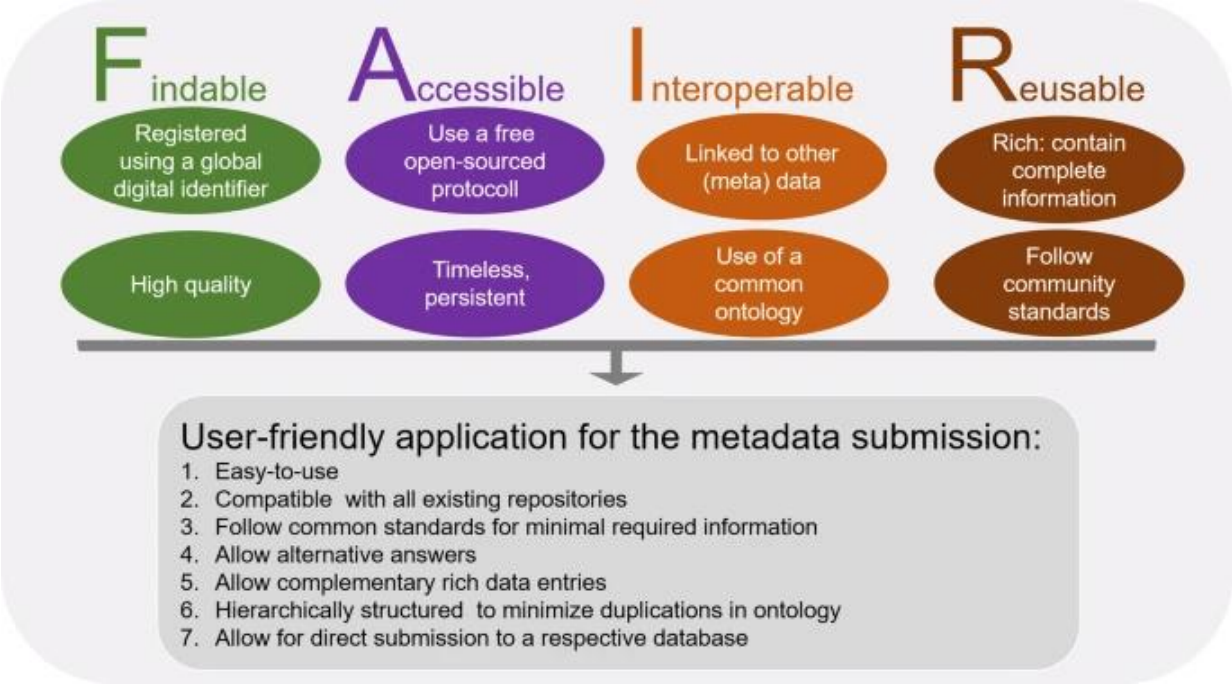
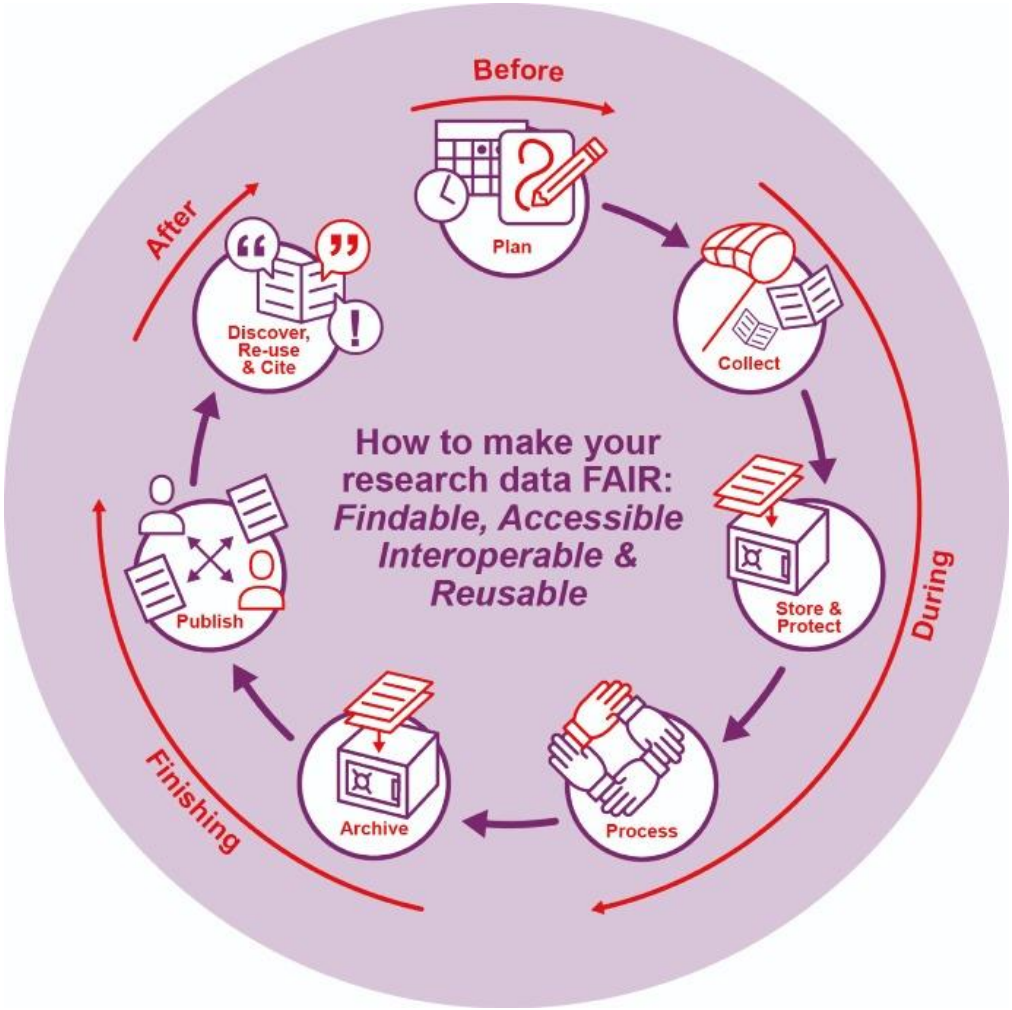
MICROBIOME METADATA

STANDARDIZATION



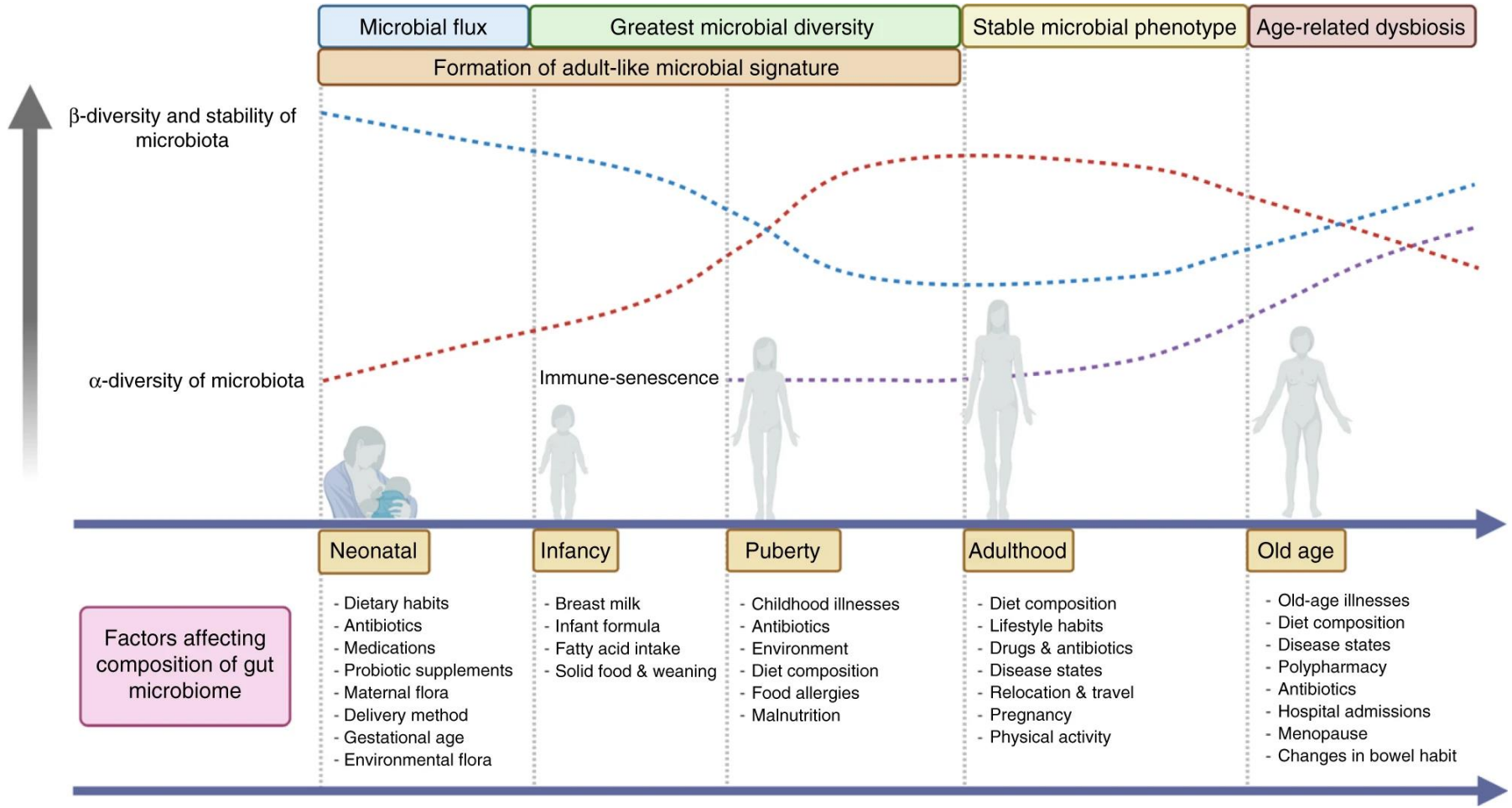
Cernava, T., Rybakova, D., Buscot, F. *et al.*, 2022, *Environmental Microbiome*



https://www.rug.nl/digital-competence-centre/research-data/fair-data-open-science?lang=en

FACTORS INFLUENCING THE HUMAN MICROBIOME

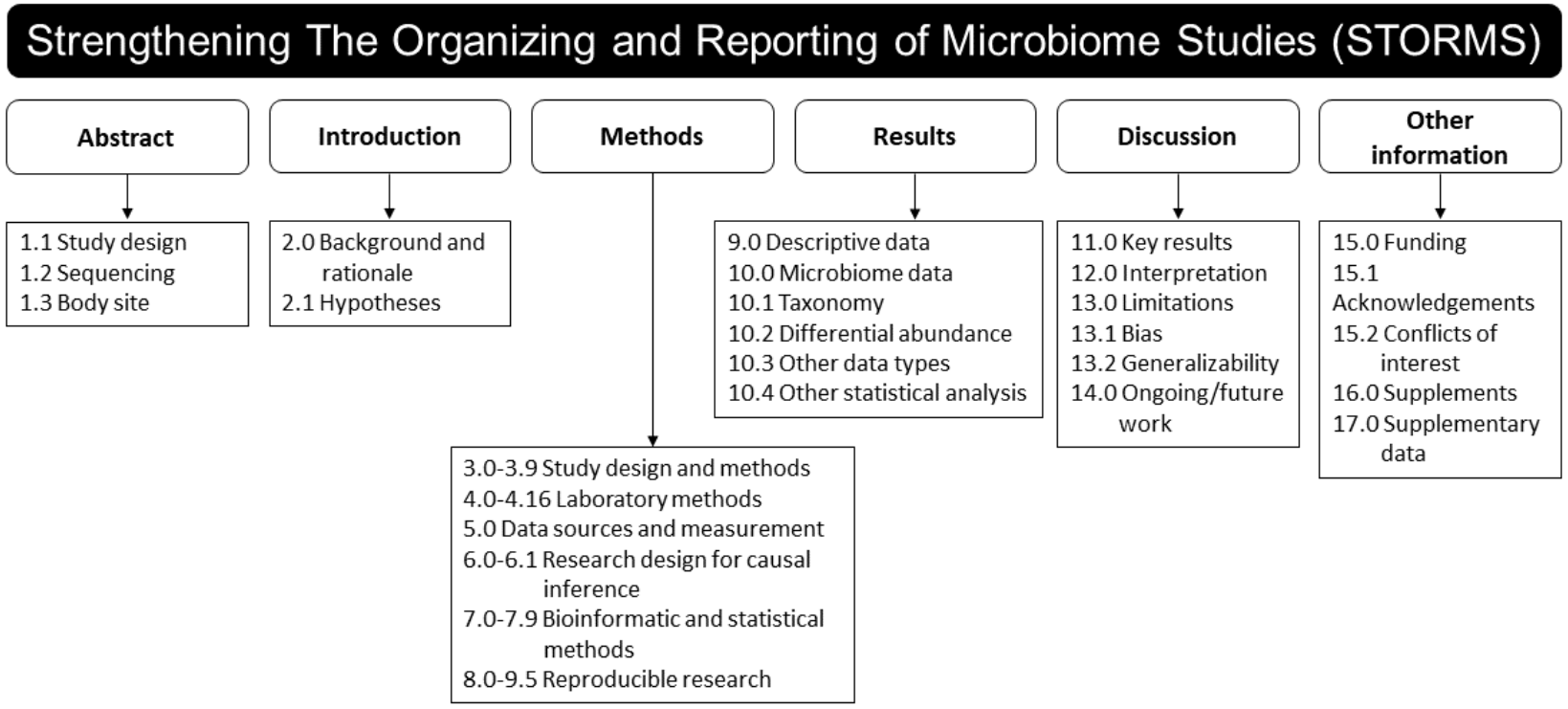
Co-Founders



Lee, K.A., Luong, M.K., Shaw, H. *et al.,* 2021, *Br J Cancer*

REPORTING OF MICROBIOME STUDIES

Strengthening The Organization And Reporting Of Microbiome Studies (**STORMS**)



https://www.stormsmicrobiome.org/

Mirzayi, C., Renson, A., Genomic Standards Consortium. et al., 2021, Nat Med

canSERV
providing cutting edge cancer research services across europe

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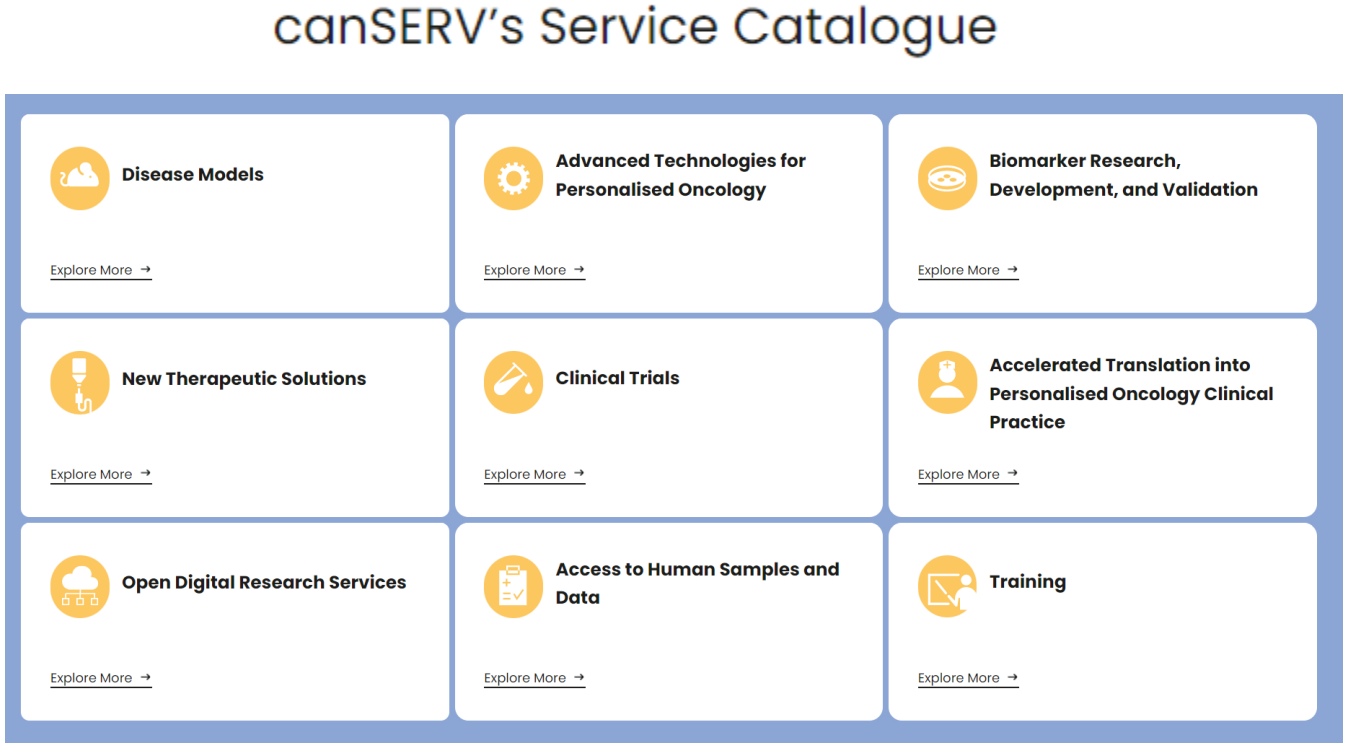
canSERV

HORIZON PROJECT

- canSERV's **mission** is to make **cutting-edge and customised research services** available to the **cancer research community EU wide, enable innovative R&D projects** and **foster precision medicine** for patients' benefit across Europe.
- **19 Partners, 400+ Services**



Funded by the European Union
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canSERV
providing cutting edge cancer research services across europe

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canSERV

OPEN CALLS – "ADVANCING PERSONALISED ONCOLOGY"

Submission Deadline:
25th April 2023, 12:00 CEST

Open Calls

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THANK YOU!

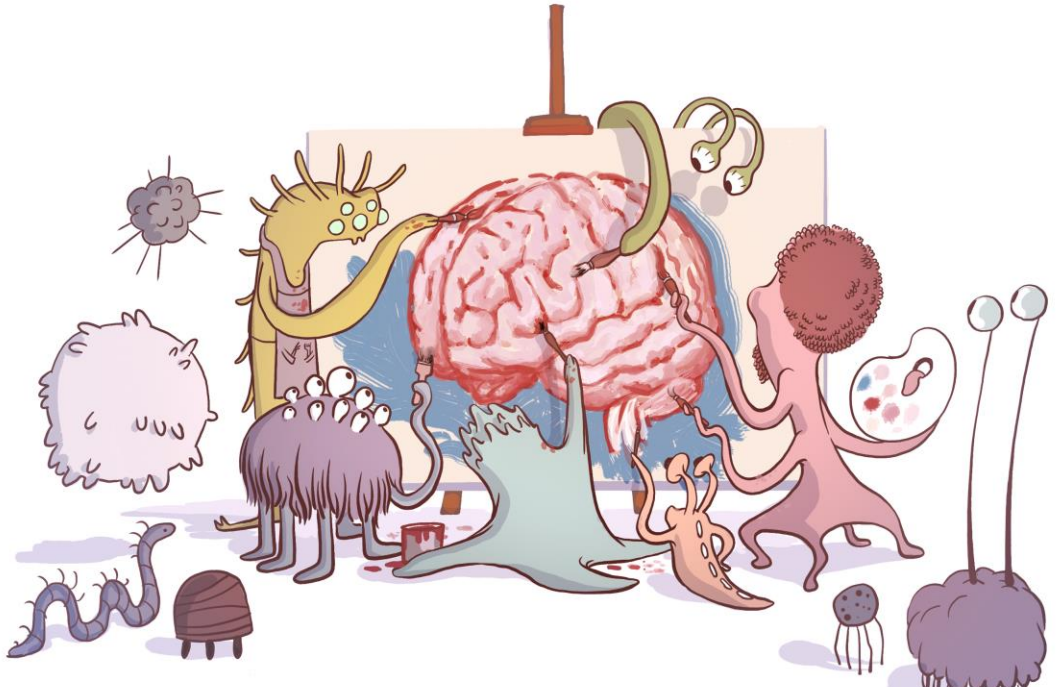

Illustration by Benjamin Arthur for NPR

manuela.pausan@bbmri-eric.eu
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World Microbiome Day | 27th June