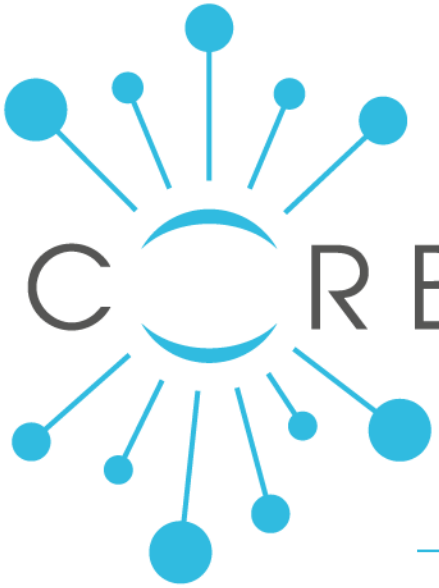


CORBEL shared services for life-science

Coordinated Research Infrastructures Building Enduring Life-science services

Peter M. Abuja
BBMRI-ERIC/Medical University of Graz, Austria

BACKGROUND

Since 2015, thirteen ESFRI Research Infrastructures from the field of BioMedical Science (BMS RI) joined their scientific capabilities and services to transform the understanding of biological mechanisms and accelerate its translation into medical care.

- BBMRI-ERIC gateway for health — *biobanking & biomolecular resources*
- elixir — *curated databases*
- erinha — *highly pathogenic microorganisms*
- INFRAFRONTIER — *functional genomics*
- MIRRI — *microorganisms*
- eatris — *translational research*
- EMBRC — *marine model organisms*
- eu-openscreen — *screening & medicinal chemistry*
- instruct ERIC — *structural biology*
- ECRIN European Clinical Research Infrastructure Network — *clinical trials*
- EMPHASIS — *plant phenotyping*
- EURO-BIOIMAGING — *biological/medical imaging*
- ISBE — *systems biology*

BACKGROUND

- 4 year project: 2015-2019
- 37 partners in 13 BMS RIs
- budget: €14.8 million
- builds on BioMedBridges (2012-2015)
- co-coordinated by ELIXIR and BBMRI-ERIC

MISSION

Modern biological and biomedical research involves complex projects and a variety of different technologies.

Some of the most **important discoveries** are made at the **interface between different disciplines.**

➡ CORBEL **harmonises access and services** for complex research projects involving more than one RI offering

- biological and medical technologies
- biological samples and
- data services

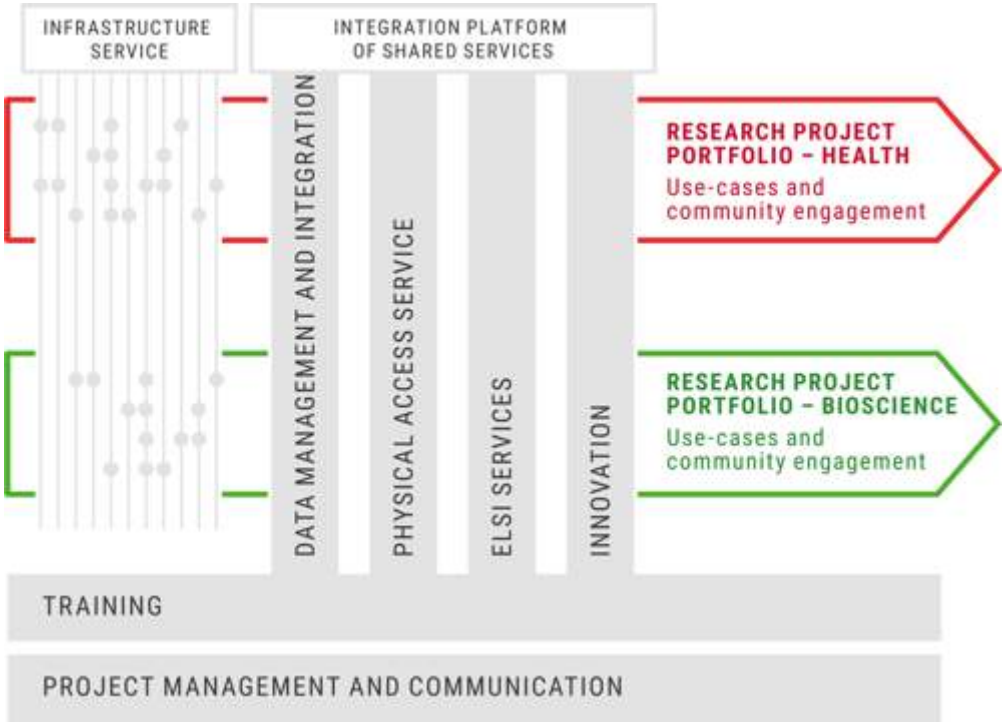
MISSION

By creating a platform of user-aligned services, CORBEL supports European research in **bridging the translation gap** between the **understanding of biological mechanisms** and innovative medicines and **personalising diagnostics and treatments**.

This creates a **knowledge network** that is essential for innovation in academia and industry.

	BIOLOGICAL SCIENCES	BIOLOGICAL RESOURCES & PRODUCTION SYSTEMS	MEDICAL SCIENCES
BBMRI-ERIC			*biobanking*
EATRIS-ERIC			*translational medicine*
ECRIN-ERIC			*clinical research*
ELIXIR		*bioinformatics*	
EMBRC	*marine biology*		
EURO-BIOIMAGING		*imaging*	
EU-OPENSCREEN		*chemical biology*	
INFRAFRONTIER		*functional genomics*	
INSTRUCT		*structural biology*	
ISBE		*systems biology*	
MIRRI	*microorganisms*		

IMPLEMENTATION

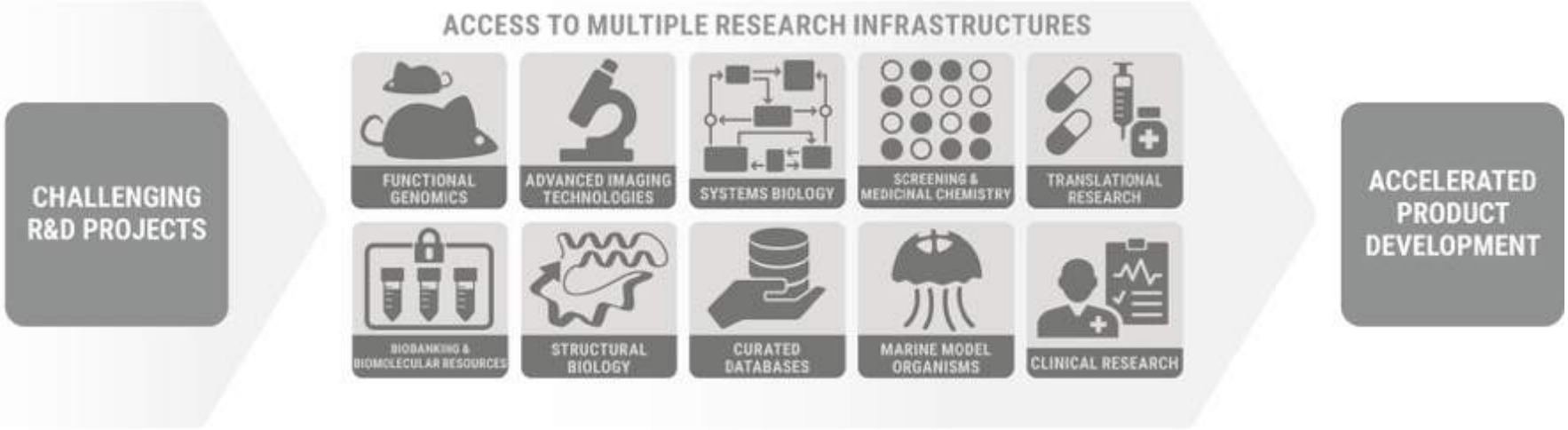


Selected **use cases** in health and bioscience, developed as part of certain work packages (WPs), will identify the optimal pathway (**innovation pipeline)** and the needed **underlying services** for the translation of basic biological research to societal innovation.

- Medical Infrastructure/Users Forum (MIUF)
  - To support health and medical research by Ris
- ‚common services‘:
  - Harmonising animal model phenotypes and clinical outcomes
  - Access to patient-level clinical trial data
  - Data integration and management services for biomarker studies
  - Integration of population cohorts for prognostic biomarkers
- Development of a **common access framework** that facilitates user access to services and resources across all eleven RIs
  - access in more than 25 countries
  - access via more than 120 national nodes

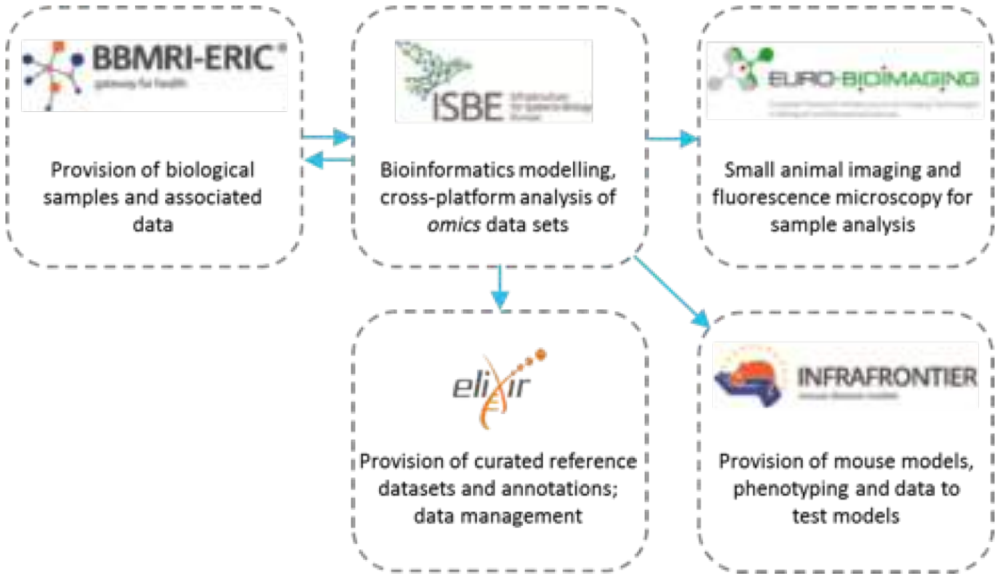
- Access to resources, data and services
  - Providing a common access framework based on identified commonalities
  - Collating regulatory policies, potential for standardization
  - Data management standards and infrastructure
  - Secure access to sensitive data
- Access calls (resources of multiple RIs) – only RI work is funded
  - Genotype-to-phenotype analysis
  - Predictive systems pharmacology for safer drugs and chemical products
  - Structure-function analysis of large protein complexes
  - Marine metazoan developmental models
  - Complex multimodal biomarker profiling

- Specific industry-targeted access models
  - open access pre-competitive → commercial (IP management, use rights, etc.)



INNOVATION PIPELINE

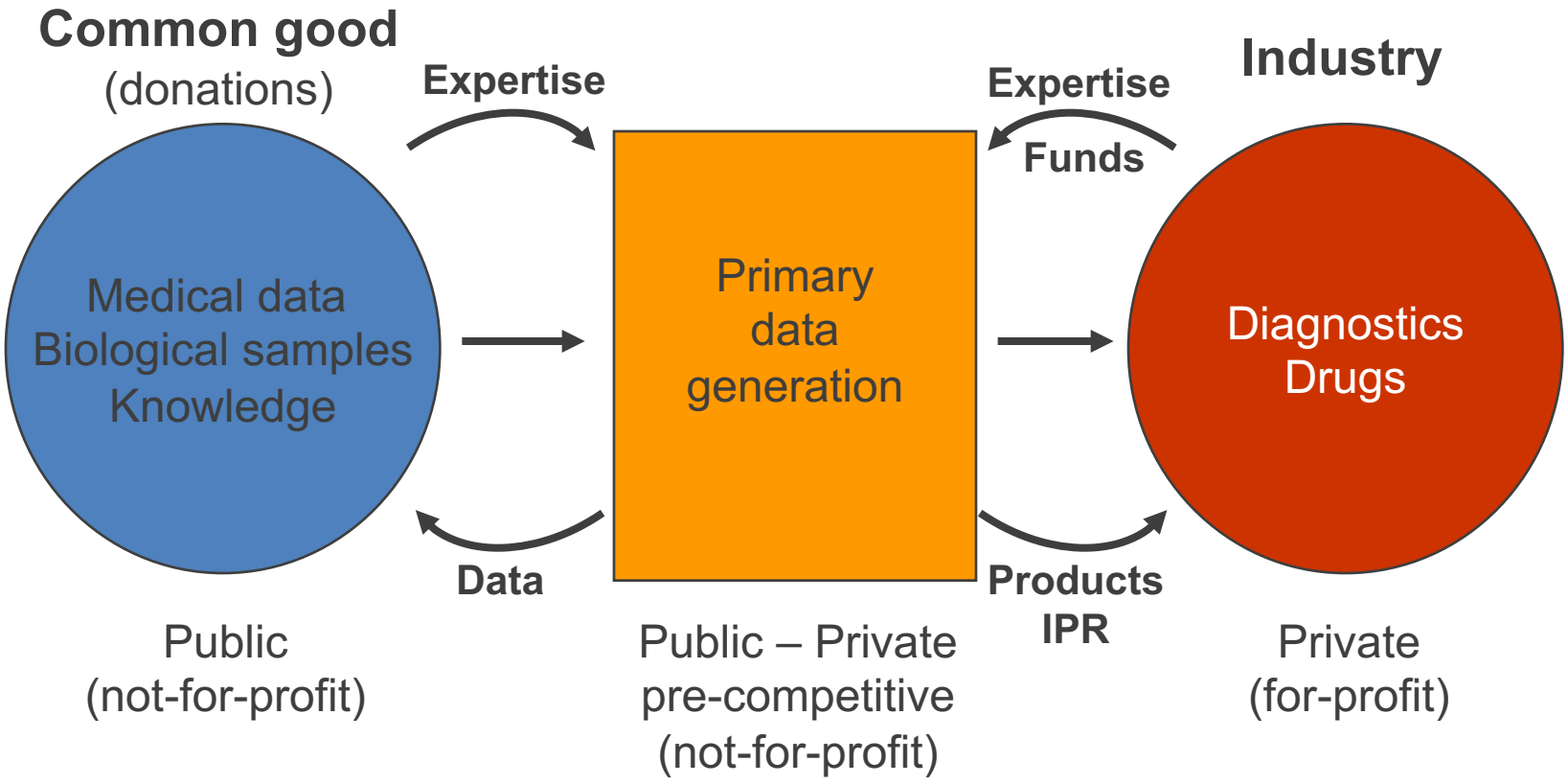
example for an Innovation Pipeline:



- **Individually**, the services offered by the BMS RIs are critical to their own user communities.
- **Collectively**, through CORBEL, they will be transformative across the range of life-science disciplines: from generation of knowledge at the bench to patient treatment at the bedside.

- Innovation Office
  - Innovation Helpdesk
  - Real-time advice for RIs, free of charge;
  - Template documents for frequently occurring technology transfer situations (MTA, CDA, etc.)
  - Yearly joint industry/RI workshops on innovation, knowledge sharing etc.
  - Guidelines and assistance with cross-infrastructure, industry/academia collaboration and knowledge sharing;
  - Access to specialist knowledge in relation to business development and legal, regulatory or ethical aspects;
  - On a case-by-case basis, hands on involvement by Innovation Office staff with real collaboration and negotiation cases.

- Need: (human) biological resources (samples, data) for industrial research
- Problem: most of these resources have been created using public funds (research grants, healthcare financing, etc.) and cannot be transferred to the private sector (industry)
  - No distribution of human samples (confidentiality)
  - no paymen,t not even on cost-recovery basis
- Solution: data are generated/provided by trusted partner
  - Used exclusively by industry for a grace period and are then transferred to the public domain


Common good
(donations)
Expertise
Expertise
Funds
Industry
Medical data
Biological samples
Knowledge
Primary
data
generation
Diagnostics
Drugs
Data
Products
IPR
Public
(not-for-profit)
Public – Private
pre-competitive
(not-for-profit)
Private
(for-profit)

- An excellent example of boosting innovation is given by Nestlé:
  - Nestlé which is rooted in the food industry responded to the increasing interest in health-promoting properties of food by extending its research and development into the pharmaceutical sector. Today, Nestlé Health Sciences not only offers Food for Special Medical Purposes and Nutritional Therapies but performs research in its Institute of Health Sciences under a Policy on Public–Private Science & Research Partnerships. It hosts an Open Innovation Platform (HENRi@Nestlé; https://henri.nestle.com) that posts regular challenges regarding a broad variety of nutrition and health-related projects.
    - P. M. Abuja & K. Zatloukal ‚Concept Paper on new business models related to Open Innovation' – presented as D8.2 in CORBEL (2018)

- A sustainable **common service** for all BMS RIs dealing with samples and/or data with ethical, legal and social implications
  - development/improvement of patient information and consent templates
  - integration of the common service into the BBMRI-ERIC tool ***Common Service ELSI***

- RI Staff can acquire complementary skills offered by other Ris through a ‚staff exchange' programme
  - Course format
    - Ethics and Legal Framework @ ECRIN-ERIC
      - Legal and ethical framework for collecting sensitive human data
    - Ethics and Legal Framework @ BBMRI-ERIC
      - GDPR (basic principles) from a biobanking viewpoint, consent issues
    - User Relationship Management @ CCMAR [EMBRC]
      - Experiences and operational best practices in User Access and Service Provision

FUTURE DEVELOPMENTS

The network of ESFRI BMS Research infrastructures is not a closed structures and will expand in the future

- BBMRI-ERIC gateway for health — *biobanking & biomolecular resources*
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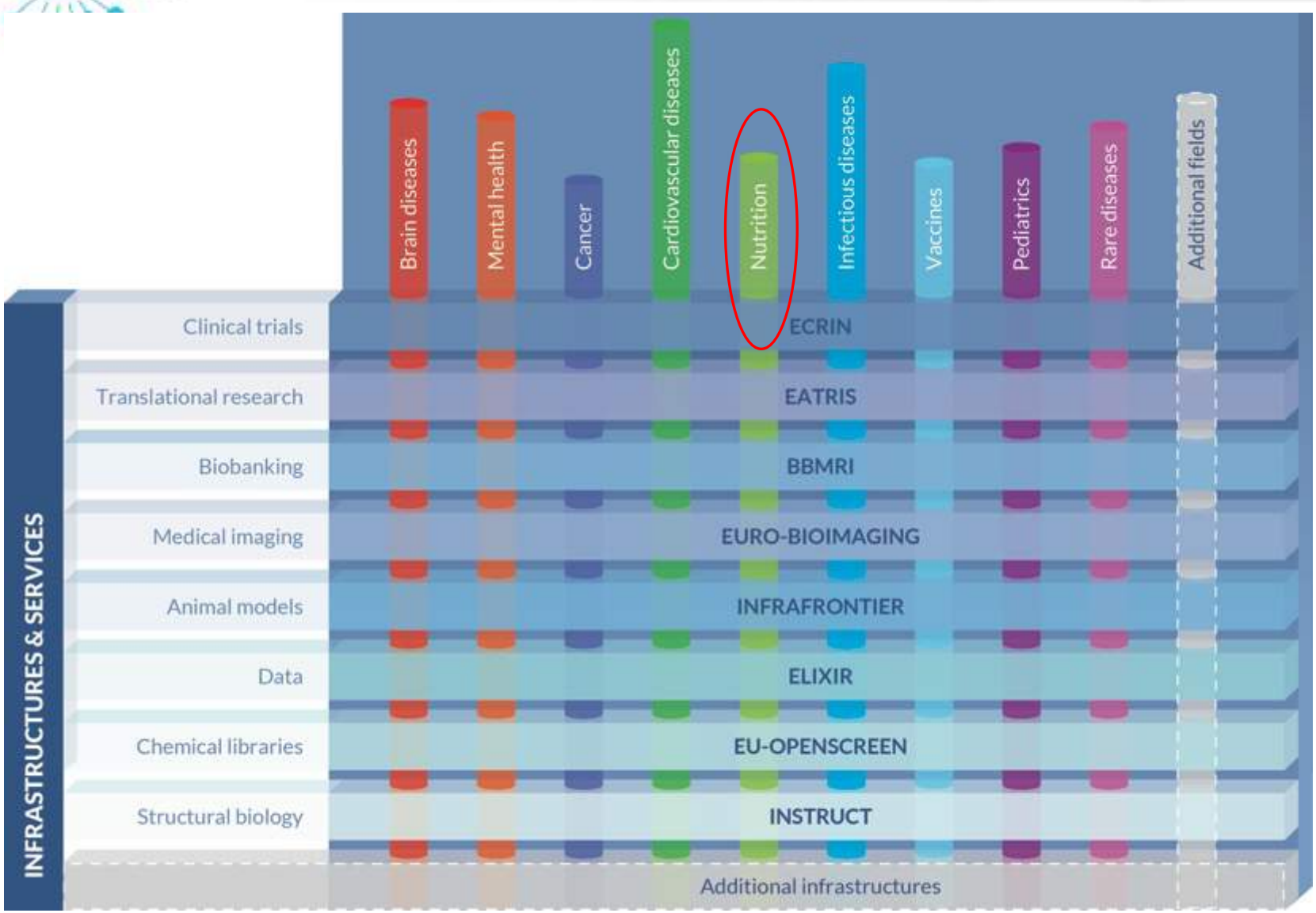
MATRIX OF MEDICAL RESEARCH PRIORITIES



FUTURE DEVELOPMENTS

Two possibilites for new nodes of the RI network

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- EMBRC — *marine model organisms*
- eu-openscreen — *screening & medicinal chemistry*
- instruct ERIC — *structural biology*
- *Sequencing*
- ECRIN — *clinical trials*
- EMPHASIS — *plant phenotyping*
- EURO-BIOIMAGING — *biological/medical imaging*
- ISBE — *systems biology*
- *Food, nutrition, lifestyle, health*

FUTURE DEVELOPMENTS

The network should be complemented by a **health oriented RI** that **focuses on its core competences** and liases with a broad selection of BMS Ris in the network, **interfacing with their core competences**.

The specific **integration of the FNLH community with industry** can be brought as a special asset into the network of ESFRI BMS Research Infrastructures.

BBMRI-ERIC gateway for health
- *biobanking & biomolecular resources*

elixir
- *curated databases*

erinha
- *highly pathogenic microorganisms*

INFRAFRONTIER
- *functional genomics*

MIRRI
- *microorganisms*

eatris
- *translational research*

EMBRC
- *marine model organisms*

eu-openscreen
- *screening & medicinal chemistry*

instruct ERIC
- *structural biology*

Sequencing

ECRIN European Clinical Research Infrastructure Network
- *clinical trials*

EMPHASIS
- *plant phenotyping*

EURO-BIOIMAGING
- *biological/medical imaging*

ISBE
- *systems biology*

Food, nutrition, lifestyle, health

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