

Large Infrastructures and Networks

ATHENA



Secure exchange of health data across European Union member states

- Unified and **interoperable** digital health ecosystem
- Common European data **governance principles, standards, and infrastructure** for health data exchange
→ privacy, security, and compliance with regulatory frameworks (GDPR)
- Connection of health data from various sources (health records, genomics, patient-reported outcomes)
→ **patient-centered healthcare**
- **Control of individuals** over their health data (data portability, consent management, transparency)
- Interoperability - seamless flow of health data across borders and healthcare systems
→ cross-border healthcare, research collaborations
- Common health goals across the European Union

Type of collaboration
Aligning EDITH data management strategy with the EHDS



Open research infrastructure that gathers data, tools and computing facilities for brain-related research

- **EBRAINS Knowledge Graph**: a metadata management system built for EBRAINS
- seamless **integration** of various components
- analysis, simulation, and visualization tools without complex installation procedures.
- **CWL Standardised Workflows** (unique Digital Object Identifiers)
- **National Nodes** structure

Type of collaboration
Technology roadmap alignment, collaboration and standardisation

eOSC European Open Science Cloud

a 'Web of FAIR Data and Services' for science in Europe

- seamless and **open environment** for researchers to access, share, and **reuse** digital resources across disciplines.
- **federated** infrastructure
- diverse datasets, tools, and services (easily integrated)
- principles of **open science** - transparency, accessibility, inclusivity
- common set of standards and policies to facilitate the integration of data and services
- data-driven research
- adoption of **FAIR** (Findable, Accessible, Interoperable, and Reusable) principles to enhance the quality and usability of research data

*Type of collaboration
Standards and federation*



European Life-sciences Infrastructure for Biological Information

pan-European research infrastructure that focuses on facilitating access to and management of biological data for life sciences research.

- **distributed infrastructure**, connecting bioinformatics resources, databases, and services across Europe to enable seamless collaboration and data sharing
- bioinformatics tools and resources (FAIR principles)
- **harmonization** of biological data.
- long-term sustainability of bioinformatics resources by providing training, best practices, and support for data management and analysis.
- platform for the development and implementation of **data standards** and **workflows** to enhance the quality and interoperability of biological data.
- **ELIXIR Nodes** (distributed across different countries)

Type of collaboration
Standards and data sharing including model development and simulation

Open Access Infrastructure for Research in Europe

pan-European infrastructure dedicated to supporting and promoting open access to scholarly publications and research data

- **network** of interconnected repositories
- **open science principles**, emphasizing transparency, accessibility, and reusability of research outputs.
- implementing and advancing **open access policies**
- centralized gateway for researchers to **deposit, access**, and link their publications and datasets
- ensuring that publicly funded research outputs are **openly** accessible.
- **OpenAIRE Research Graph**: connects publications, projects, datasets, and other research entities, enhancing the discoverability of research outputs.
- OpenAIRE in **EOSC**: foundation for **open access** and **open data services** within the broader European research landscape

Type of collaboration

Open Access to EDITH Publications, deposited in an OpenAIRE-compliant repository

Computing Infrastructures and Initiatives (1/2)

- **EuroHPC:** advances European petascale and pre-exascale systems.
- **LUMI:** key EuroHPC pre-exascale system.
- **PRACE:**
 - bottom-up, science-driven computing and data management
 - complementing Euro-HPC
- **Fenix: e-infrastructure:** data repositories, supercomputing resources.

Computing Infrastructures and Initiatives (2/2)

- National / Regional resource federations, e.g. **PL-Grid** infrastructure
- **GÉANT**: connects European research networks
- **EGI**: open solutions for advanced computing and data analytics.
- **CompBioMed**: computational methods for biomedical applications.
- **PerMedCo**: HPC Center of Excellence for Personalized Medicine in Europe.
 - PerMedCoE's tools / benchmarking are valuable for multiscale resource integration and model validation in the HDT creation.

Other initiatives



EUDAT CDI (Collaborative Data Infrastructure)

- pan-European initiative, collaborative framework for preserving, sharing, and managing research data across diverse scientific communities.
- one of the largest infrastructures of integrated data services and resources supporting research in Europe. (network of more than 20 European research organisations, data and computing centres)

European Cancer Imaging Initiative



- innovation and deployment of digital technologies in cancer treatment and care
- achieve more precise and faster clinical decision-making, diagnostics, treatments and predictive medicine for cancer patients.

Other initiatives



European
Genomic Data
Infrastructure

Genomic Data Infrastructure (GDI)

- access to genomic and related phenotypic and clinical data across Europe
- federated, sustainable and secure infrastructure to access the data

Research Data Alliance (RDA)



- open and interoperable sharing of research data (global scale).
- launched as a community-driven initiative in 2013 by the European Commission, the United States Government's National Science Foundation and National Institute of Standards and Technology, and the Australian Government's Department of Innovation

Other initiatives



Gaia-X

- digital governance that can be applied to any existing cloud/ edge technology stack to obtain transparency, controllability, portability and interoperability across data and services

Starting now (January 2024):

Virtual Brain Twin

- Ecosystem for generating **virtual brain twins** for psychiatric patients.
- Virtual Brain Twin platform
 - **Big data, multiscale modelling, and high-performance computing (HPC)**
 - Embedded in the European digital neuroscience research infrastructure **EBRAINS**
 - Aimed for **neuroscientists, clinical researchers, and mathematical modelers**, and in the future, to **clinicians, and patients** as well.
 - Pave the way for **personalised treatment of psychiatric disorders**
 - Potential to **significantly improve** the quality of life of patients

Other large infrastructures and networks?

<http://www.edith-csa.eu>

Deliverables available under tab 'dissemination/material'

Indication of interest via de contact form on site