



HEREDITARY

HetERogeneous sEmantic
Data integration for the
guT-bRain interplay



Funded by
the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No GA 101137074. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Transforming healthcare through Advanced Data Integration

HEREDITARY is an European research project aimed at improving disease detection, treatment responses, and the generation and exploration of medical knowledge. By developing a robust, interoperable, and secure framework, HEREDITARY integrates multimodal health data, including genetic information, while ensuring compliance with privacy-preserving policies across nations.

Key Objectives

Secure Data Integration:



- Develop a federated, scalable, and privacy-preserving system for linking health data across different sources.
- Ensure compliance with GDPR and other relevant regulations for secure data access and sharing.

Advanced Analytics and Learning:



- Utilize cutting-edge machine learning and AI to analyze multimodal and genomic data.
- Identify new risk factors, understand disease mechanisms, and optimize treatment strategies for neurodegenerative and gut-brain related disorders.

Empowering Decision-Making:



- Create data-driven solutions for researchers, clinicians, and policymakers.
- Enhance public awareness and involvement through citizen science initiatives and patient organizations.

The consortium

HEREDITARY consortium involves 18 partners from 11 countries.



Austria

Belgium



Bulgaria

Denmark



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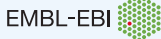


Radboudumc



The
Netherlands

United Kingdom



University of Colorado

United States



How do we achieve our goals?

HEREDITARY's framework consists of five interconnected layers:

- 1. Federated Networking Infrastructure:** Ensures secure, privacy-preserving data processing and analysis.
- 2. Clinical Use Cases:** Tackles diverse clinical, genomic, and environmental data sources with the Federated Networking Infrastructure to target neurodegenerative diseases.
- 3. Semantic Data Integration:** Harmonizes multi-modal data using advanced ontologies and a federated semantic polystore system.
- 4. Analytics and Learning Platform:** Applies state-of-the-art machine learning workflows to derive insights from the semantic layer.
- 5. Visual Analytics and Interaction:** Provides interactive tools for data exploration and decision-making support.

Collaborative approach: The project involves multiple partners, including universities, research centers, and clinical institutions across Europe and the USA. This collaboration ensures the integration of vast, diverse datasets and the development of comprehensive, effective solutions.

Focus on Key Disease Areas: HEREDITARY targets two main groups of diseases:

- 1. Neurodegenerative diseases:** Including ALS, MS, Parkinson's, Alzheimer's, and others, with a focus on phenotypic characterization and early detection using non-invasive methods like ocular analysis.
- 2. Gut-Brain disorders:** Investigating the impact of the gut microbiome on brain function and its role in diseases such as diabetes, obesity, depression, and ADHD.

Impact and benefits:

Enhanced disease understanding:

By linking and analyzing multimodal health data, HEREDITARY aims to uncover new insights into the complex interactions between the gut and brain, leading to better understanding and treatment of related diseases.



Personalized Medicine:

The project will pave the way for precision medicine by identifying biomarkers and genetic factors that influence disease progression and treatment responses.



Public engagement and trust:

Through citizen science initiatives and the involvement of patient organizations, HEREDITARY ensures that the public plays a central role in guiding research and benefits directly from its outcomes.



Join us on our journey

HEREDITARY is committed to transforming health-care by unlocking insights previously beyond reach. Stay informed and get involved through our project updates, publications, and events. Together, we can make a significant impact on the future of medical research and patient care.

Start date: 1 January 2024

End date: 31 December 2027

Duration: 48 months

EU contribution: 9.988.833,75€

Funded by: Horizon Europe programme

Project ID: 101137074

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