



The EUCAN Cluster

The EUCAN Cluster consists of seven projects (CINECA, EUCANCan, EUCAN-Connect, euCanSHare, iReceptor Plus, and ReCoDID) that received funding under the same Horizon 2020 call, *SC1-BHC-05-2018*.

This document provides a high-level overview of each project in the cluster.

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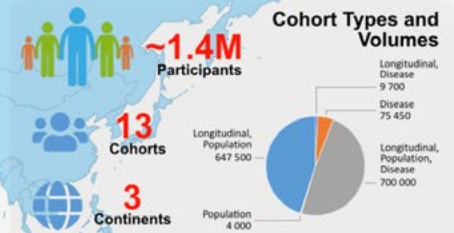
CINECA

Common Infrastructure for National Cohorts
in Europe, Canada, and Africa



Common Infrastructure for
National Cohorts in Europe,
Canada, and Africa

Accelerating disease research and
improving health by facilitating
transcontinental human data
exchange



 Federated Data
Discovery

 Authentication &
Authorisation

 Harmonised
Metadata

 Federated Data
Analysis

 ELSI Framework

Acronym

CINECA

Full Title

Common Infrastructure for National Cohorts in Europe, Canada, and Africa

Programme

European Union's Horizon 2020 research and innovation programme

Contract Number

825775 (H2020), 404896 (CIHR)

Duration

48 months

Project Funding

H2020 & CIHR

Project Website

www.cineca-project.eu

Coordinator

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Project Management

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Partners

- Biobanking and Biomolecular resources Research Infrastructure- European Research Infrastructure Consortium, BBMRI-ERIC, Austria
- Centre for Genomic Regulation, CRG, Spain
- Clinicageno Limited, Clinicageno, United Kingdom
- ERASMUS University Medical Centre Rotterdam, EMC, Netherlands
- European Molecular Biology Laboratory, European Bioinformatics Institute, EMBL-EBI, United Kingdom
- Institute of Translational Genomics, Helmholtz Zentrum München, Germany
- IT Center for Science, CSC, Finland
- Masaryk University, MU, Czech Republic
- National Institute for Health and Medical Research, INSERM, France
- Royal Institution for the Advancement of Learning, McGill University, MCG, Canada
- SIB Swiss Institute of Bioinformatics, SIB, Switzerland
- Simon Fraser University, SFU, Canada
- The Hospital for Sick Children, SickKids, Canada
- The Hyve BV, The Hyve, Netherlands
- University Medical Center Groningen, UMCG, Netherlands
- University of Applied Sciences Western Switzerland, HES-SO, Switzerland
- University of Cape Town, UCT, South Africa
- University of Tartu, UTARTU, Estonia

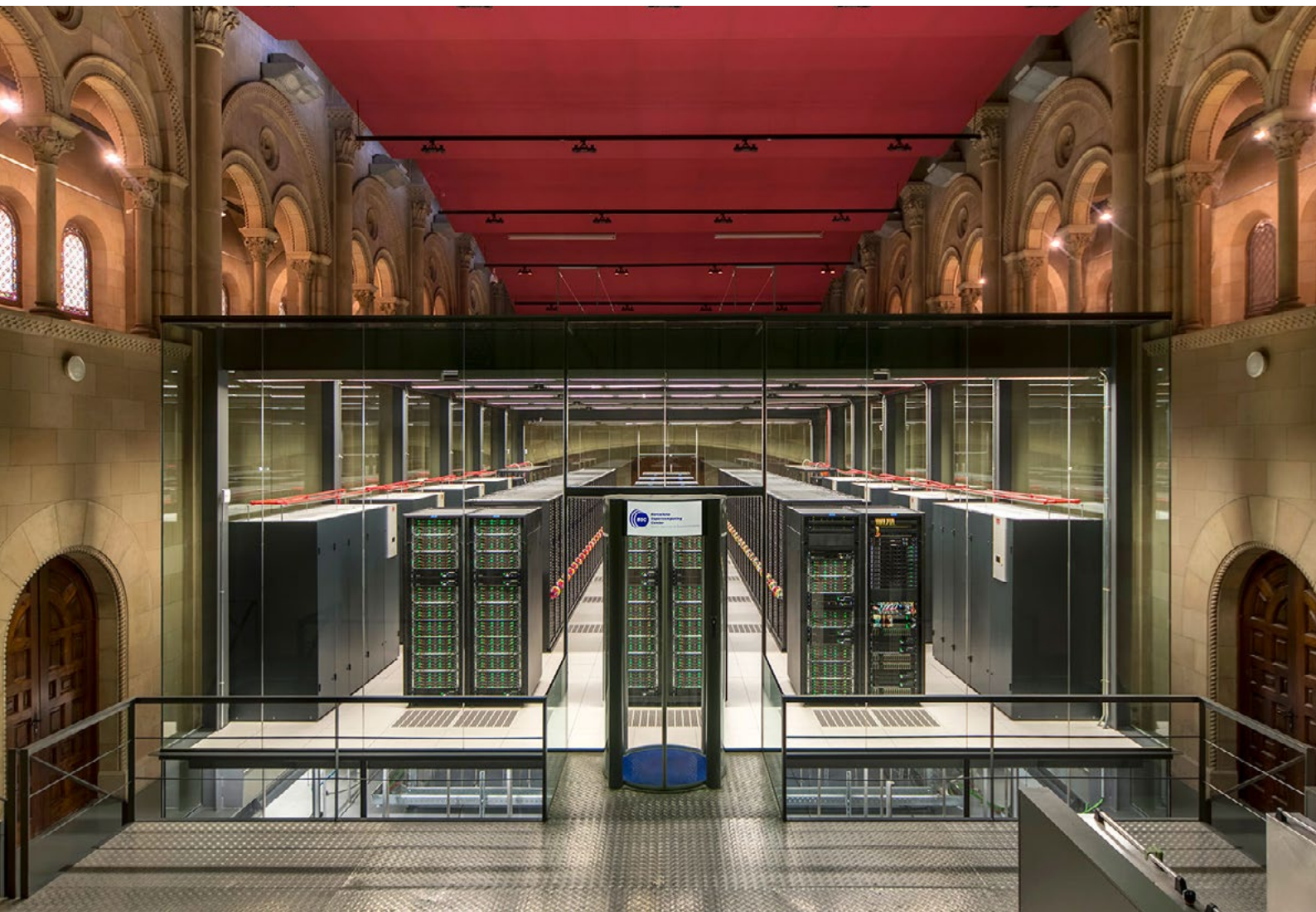
CINECA Abstract

National healthcare initiatives and human cohort studies are generating large biomolecular datasets, which researchers and clinicians require better access to in order to harvest their potential to positively impact human health. It is now evident that the current model of cohort data access and distribution for localised analysis is no longer pragmatic. Issues such as cohort data size and scale, lack of data harmonisation and interoperability, bespoke data access protocols, as well as ethical, legal, and societal reasons prohibiting the transfer of data out of legal jurisdictions, mean that federated access models are more appropriate.

The aim of CINECA (Common Infrastructure for National Cohorts in Europe, Canada, and Africa) is to deliver a federated cloud-based infrastructure for the discovery of human genetic and phenotypic data, facilitating secure international data access and analysis, for research and clinical applications. We have assembled a virtual cohort of 1.4 million individuals from population, longitudinal and disease studies hosted on international initiatives such as CanDIG, H3Africa, and the European Genome-phenome Archive (EGA). CINECA is developing an infrastructure that will permit the effective use of widely dispersed data, increasing the size and quality of datasets available for disease research. In alignment with community standards, using standardised interfaces, data analysis will be federated and migrated to the data, respecting data access restrictions.

EUCANCan

EUCANCan: a federated network of aligned and interoperable infrastructures for the homogeneous analysis, management and sharing of genomic oncology data for Personalised Medicine.





Acronym

EUCANCan

Full Title

EUCANCan: a federated network of aligned and interoperable infrastructures for the homogeneous analysis, management and sharing of genomic oncology data for Personalised Medicine.

Programme

European Union's Horizon 2020 research and innovation programme

Contract Number

GA No 825835

Duration

48 months (01/01/2019- 31/12/2023)

Project Funding

5,999,453.75 EUR

Project Website

www.eucancom.com

Coordinator

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Project Management

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Partners

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- Deutsches Krebsforschungszentrum Heidelberg, Germany
- Ontario Institute for Cancer Research, Canada
- Centre National de la Recherche Scientifique, France
- Hartwig Medical Foundation, Netherlands
- Fundacio Centre de Regulacio Genomica, Spain
- European Molecular Biology Laboratory, Germany
- Consorci Institut D'Investigacions Biomediques August Pi I Sunyer, Spain
- Institut Català D'Oncologia, Spain
- Fundació Proveda Institut D'Investigació Oncològica Vall D'Hebron, Spain
- Universitätsklinikum Heidelberg, Germany
- Charité – Universitätsmedizin Berlin, Germany
- Institut Curie, France
- The Royal Institution for the Advancement of Learning/Mc Gill University, Canada
- Universidad del País Vasco/ Euskal Herriko Unibertsitatea, Spain
- Heidelberger Akademie der Wissenschaften, Germany
- LINQ management GmbH, Germany
- Steinbeis Transfer GmbH, Germany



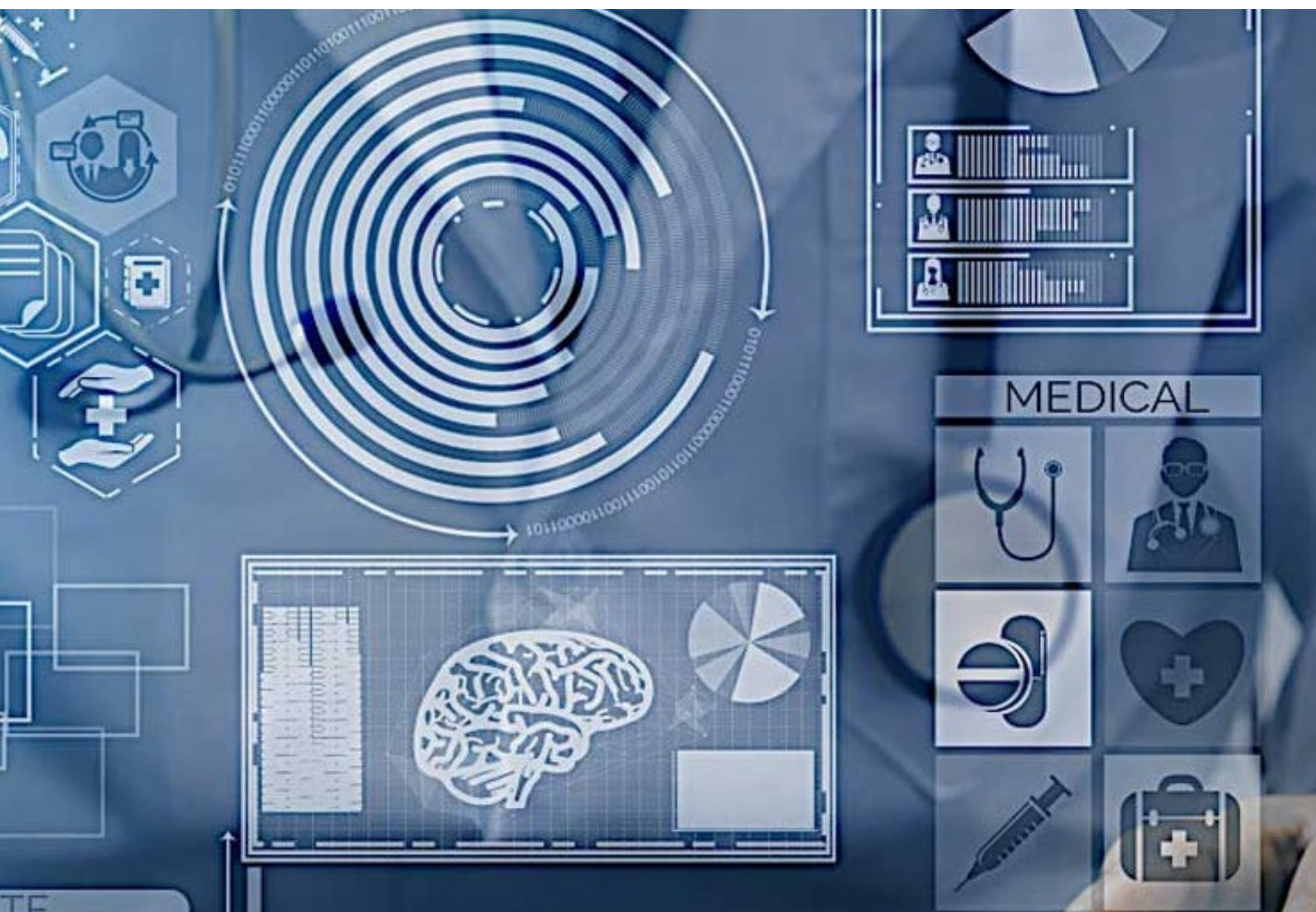
EUCANCan Abstract

EUCANCan is a European Canadian cooperation funded by the European Union's Horizon 2020 research and innovation programme and the Canadian Institutes of Health Research. The four-year project aims to enhance modern oncology by implementing a cultural, technological and legal integrated framework across Europe and Canada. The framework will facilitate efficient analysis, management and sharing of cancer genomic data and lay the ground for new global models for enriching personalised medicine initiatives.

The EUCANCan consortium tackles multiple cultural, technical and ethico-legal data sharing restraints and restrictions. The work of the consortium is organized into four main areas:

1. Homogenize protocols for genome analysis (variant calling and interpretation) that allows the direct comparison of genomic results without the need for reanalysis.
2. Generation of standards for the organization, indexing and sharing of clinical data, close or inside healthcare systems.
3. Implement interoperability protocols for data storage, indexing, and exchange between the different nodes, including replicated data portals for searching and accessing data.
4. Definition of an ethico-legal frame that allows the free and legal exchange of genomic and clinical data between countries and rescues the compromise that the research community has with patients, promoting ethical practices of cooperation and data sharing.

EUCAN-Connect



Acronym

EUCAN-Connect

Programme

H2020-SC1-2018-Single-Stage-RTD

Contract Number

GA No 824989

Duration

60 months

Project Website

www.eucanconnect.com

Coordinator

Morris Swertz and Eleanor Hyde

Partners

- UMCG
- The Research Institute of the Mc Gill University Health Centre
- University of Cambridge
- University of Newcastle
- Erasmus MC
- BBMRI-ERIC
- University of Copenhagen
- EPIGENY
- INESC TEC
- ISGlobal
- University of Oulu
- Stichting VUMC
- ISPUP
- After amendment addition of two beneficiaries and one linked third party:
- University of Glasgow
- Arjuna Technologies Ltd
- Research BV

EUCAN-Connect Abstract

EUCAN-Connect aims to promote collaborative and multidisciplinary research in high-value cohort and molecular data on a large scale in order to improve statistical power with the aims of making new discoveries about the factors that impact human life course and facilitating their translation into personalized diagnostics, treatment and prevention policies.

- Deploy FAIR federated data platform to make cohort data findable, accessible, interoperable and reusable and enable large-scale pooled analyses using federated technologies. Deposit, curate and analyse data with privacy-protecting features that account for ethical, legal and societal implications;
- Promote use of EUCAN-Connect platform, first proof-of-concept in smaller scientific communities focussed on cardio-metabolic, respiratory and musculoskeletal health and disease outcomes across the life course then scaling up to the wider cohort research community to maximize the diversity of data available;
- Sustainably increase discovery power for personalized medicine using cohort data while involving public research infrastructures led by BBMRI-ERIC and involving, where possible, SMEs for professional support, starting with the one SME partner involved in this project;
- Using cutting edge information- and bio-technology, and building on extensive experience and understanding of the governance and handling of health-related research data, EUCAN-Connect will set up a meta-network that bridges existing and emerging cohort networks, federates currently parallel cataloguing and curation efforts, and standardizes, scales-up and matures cohort data access and federated analysis infrastructure.

euCanSHare

A EU-Canada joint infrastructure for
next-generation multi-Study Heart Research



euCanSHare

Acronym

euCanSHare

Full Title

A EU-Canada joint infrastructure for next-generation multi-Study Heart Research

Programme

Horizon 2020

Contract Number

GA No 825903

Duration

5 years

Project Website

www.eucanshare.eu/project

Coordinator

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- Erasmus Universitair Medisch Centrum Rotterdam (EMC)
- Katholieke Universiteit Leuven (KU LEUVEN) Queen Mary University of London (QMUL)
- Barcelona Supercomputing Center- Centro Nacional De Supercomputacion (BSC)
- Fundacio Centre de Regulacio Genomica (CRG)
- European Society of Cardiology (ESC)
- Biobanks and Biomolecular Resources Research Infrastructure Consortium (BBMRI-ERIC) Terveiden ja Hyvinvoinnin Laitos (THL)
- Universitätsmedizin Greifswald (UMG)
- Nostrum Biodiscovery Sociedad Limitada (NBD)

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- The Research Institute of The McGill University Health Centre (RI-MUHC)
- Royal Institution for the Advancement of Learning McGill University
- McMaster University (MCM)

euCanSHare Abstract

Despite continuous advances in diagnosis and treatment, cardiovascular diseases (CVDs) remain the main cause of death worldwide. CVDs account for about 17.9 million annual deaths¹ – 31% of all deaths worldwide – and greatly reduce the quality of life of affected patients, challenging the sustainability of modern healthcare systems. In Europe, CVDs are responsible for 30.4% and 25.3% of deaths before the age of 65, in men and women, respectively.²

Many cardiovascular drugs have shown limited efficacy on general populations. Personalised medicine approaches offer solutions to improve risk assessment, early diagnosis and patient-tailored treatment protocols. Data-driven, multi-cohort approaches are needed to link molecular, imaging, functional and clinical data. However, such integration presents a formidable challenge in terms of data storage and access frameworks, interoperability and IT architectures, especially across diverse jurisdictions.

iReceptor Plus

Architecture and tools for the query of antibody and T-Cell Receptor sequencing data repositories for enabling Improved personalized medicine and immunotherapy



Acronym

iReceptor Plus

Full Title

Architecture and tools for the query of antibody and T-Cell Receptor sequencing data repositories for enabling Improved personalized medicine and immunotherapy

Programme

Horizon 2020

Contract Number

GA No 825821

Duration

4 years

Project Funding

8.4 Million EUR

Project Website

www.ireceptor-plus.com

Coordinator

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Project Management

Interteam

Partners

- Bar Ilan University
- Simon Fraser University
- Sorbonne Université
- The Governing Council of the University of Toronto, CA
- Deutsches Krebsforschungszentrum
- Acondicionamiento Tarrasense Associacion
- INESC TEC – Instituto de Engenharia de Sistemas e Computadores, Tecnologia E Ciência
- University of Haifa
- Universitetet I Oslo
- MITMYNID, Lda
- Ascora GmbH
- Medgenome Inc
- Infinidat Ltd
- 10x Genomics
- Clalit Health Services (on behalf of Rabin Medical Center)
- University of Texas Southwestern Medical Center
- Assistance Publique
- Oslo Universitetssykehus
- TIME.LEX
- Interteam Ltd

iReceptor Plus Abstract

The international iReceptor Plus consortium aims to promote human immunological data storage, integration and controlled sharing for a wide range of clinical and scientific purposes.

The four-year project, which is co-funded by the EU and Canadian government, aims to develop an innovative platform to integrate distributed repositories of Adaptive Immune Receptor Repertoire sequencing (AIRR-seq) data. This information will be used for enabling improved personalized medicine and immunotherapy in cancer, inflammatory and autoimmune diseases, allergies and infectious diseases.

iReceptor Plus will enable researchers around the world to share and analyze huge immunological datasets taken from healthy individuals and sick patients that have been sequenced and stored in databanks in multiple countries.

Currently, most AIRR-seq data are stored and curated by individual labs, using a variety of tools and technologies. The innovative platform will lower the barrier to access and analyze large AIRR-seq datasets which will ease the availability of these important data to academia, industry and clinical partners.

iReceptor Plus will advance the understanding of immune responses, and thus provide new targets for therapies and new methods for monitoring therapeutic efficacy.

The project will offer a totally new class of biomarkers to support novel treatments. The ability to share and compare AIRR-seq data will also promote the discovery of biomedical interventions that manipulate the adaptive immune system such as vaccines and other immunotherapies.

ReCoDID

Reconciliation of Cohort Data for Infectious Diseases



Acronym

ReCoDID

Full Title

Reconciliation of Cohort Data for Infectious Diseases

Programme

Horizon 2020 Research and Innovation Programme

Contract Number

GA No 825746

Duration

48 months (01/01/2019- 31/12/2023)

Project Funding

5,000,000 EUR

Project Website

www.recodid.eu

Coordinator

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- UC Berkeley – UCB: Eva Harris
- University of Colorado – UCD: Thomas Jaenisch

Latin America

- Sustainable Sciences Institute – ICS: Angel Balmaseda
- Universidad Industrial de Santander – UIS: Luis Villar

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CINECA

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EUCAN Connect

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EUCANCan

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euCanSHare

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iReceptor plus

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ReCoDID

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