

MIRRI-ERIC as a microbial, genetics and data resources hub to advance scientific discovery

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ECCO 2024

Bari 20th September 2024



Summary

- A single-stop point for FAIR microbial resources
- From idea to reality
- MIRRI-ERIC today
- A Hub advancing scientific discovery
 - MIRRI-ERIC services
 - MIRRI-ERIC and European Projects
- Shaping the future

A single-stop point for FAIR microbial resources

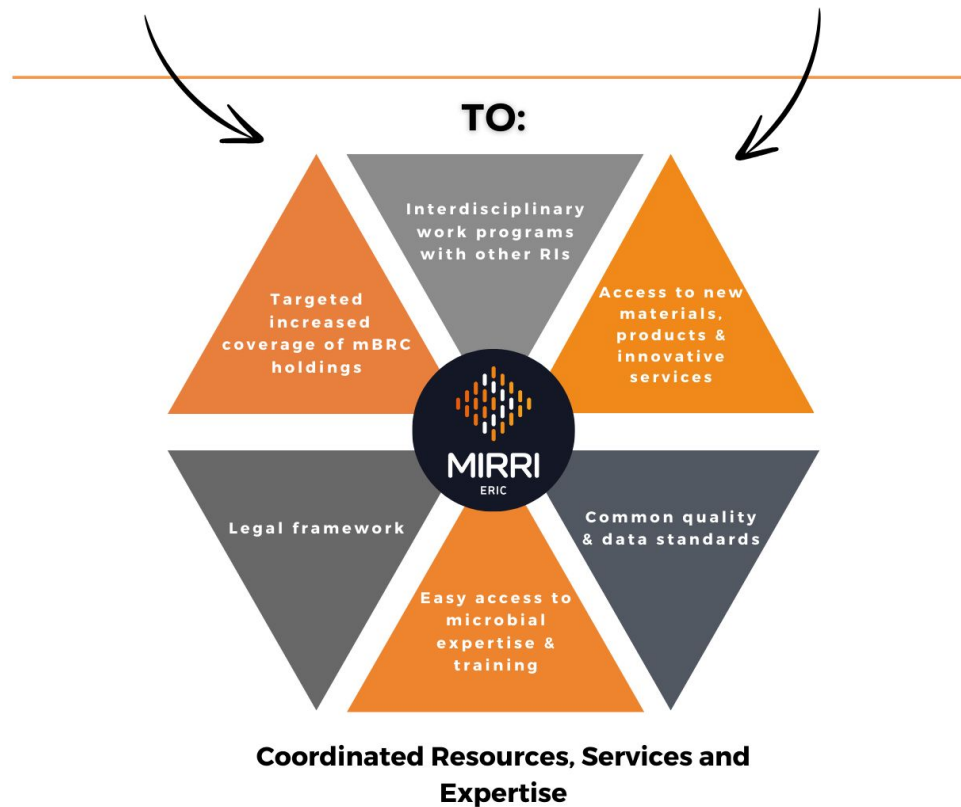
FROM:

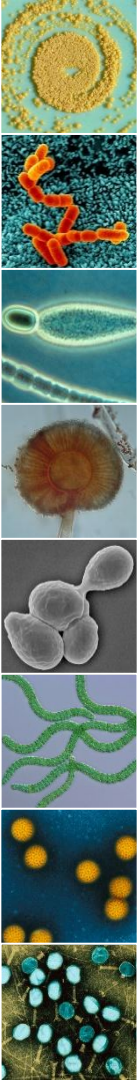


Fragmented Microbial Resources, Services and Expertise in Europe



A single-stop point for FAIR microbial resources





A single-stop point for FAIR microbial resources

To facilitate access to the broadest range of high-quality microorganisms and derivatives, associated data and services, focused on Health & Food, Agro-Food, and Environment & Energy.



A microbial, genetics and data resources hub to advance scientific discovery through a single-stop point, where microbial biodiversity meets biotechnology research and bioeconomy.



A single-stop point for FAIR microbial resources

To bring microbial collections to XXI century innovations

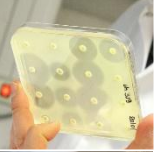
- **Preservation** (in 2008, less than 1% of studied microorganisms were deposited in reference biobanks)
- **Taxonomic characterisation**
- **Data annotation**
- **Systematic investigation**
- **Service development**

=

**Findable, Accessible, Available and Reusable microbial biodiversity
leading to enhanced research and innovation for public good.**



From idea to reality



**“They don't know that dreams
are a constant in life”**

(...)



**“They don't know that dreams
are canvas, are colour, are brush”**

(...)



**“They don't know, nor do they dream,
that dreams command reality”**



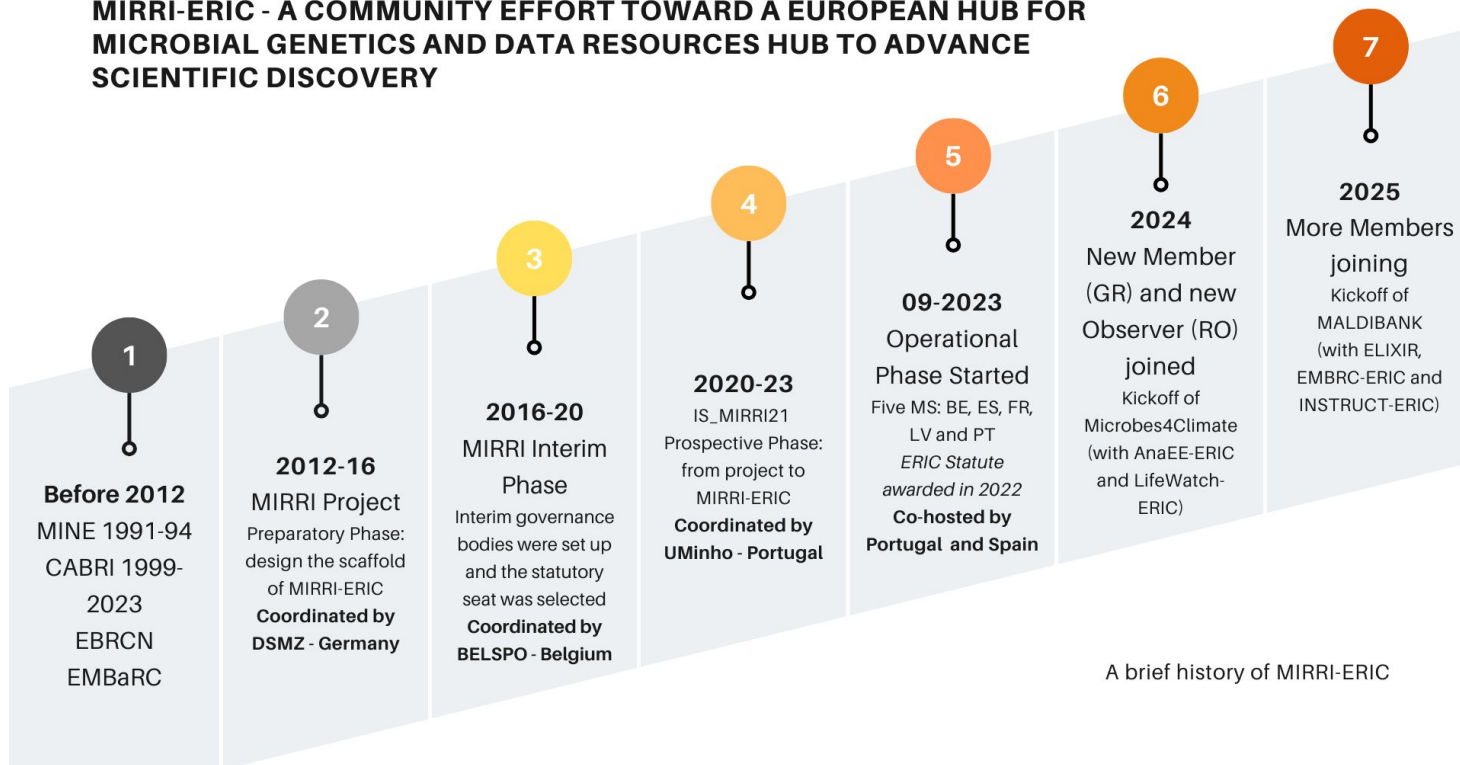
In Philosopher's Stone (by António Gedeão)





From idea to reality

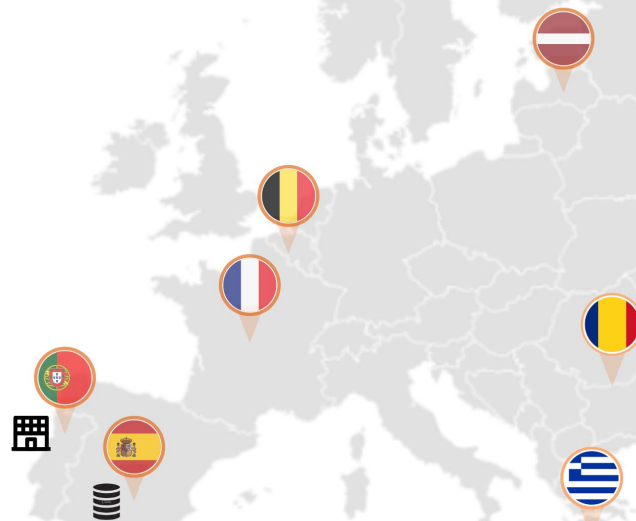
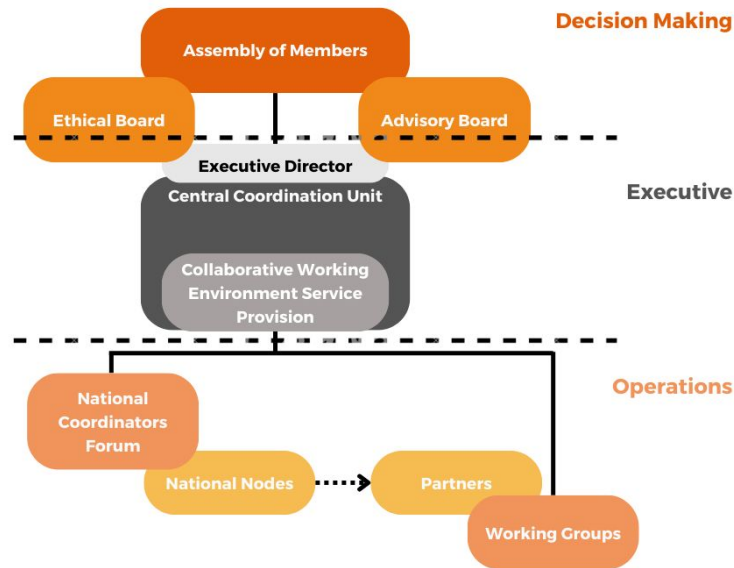
MIRRI-ERIC - A COMMUNITY EFFORT TOWARD A EUROPEAN HUB FOR MICROBIAL GENETICS AND DATA RESOURCES HUB TO ADVANCE SCIENTIFIC DISCOVERY



A brief history of MIRRI-ERIC



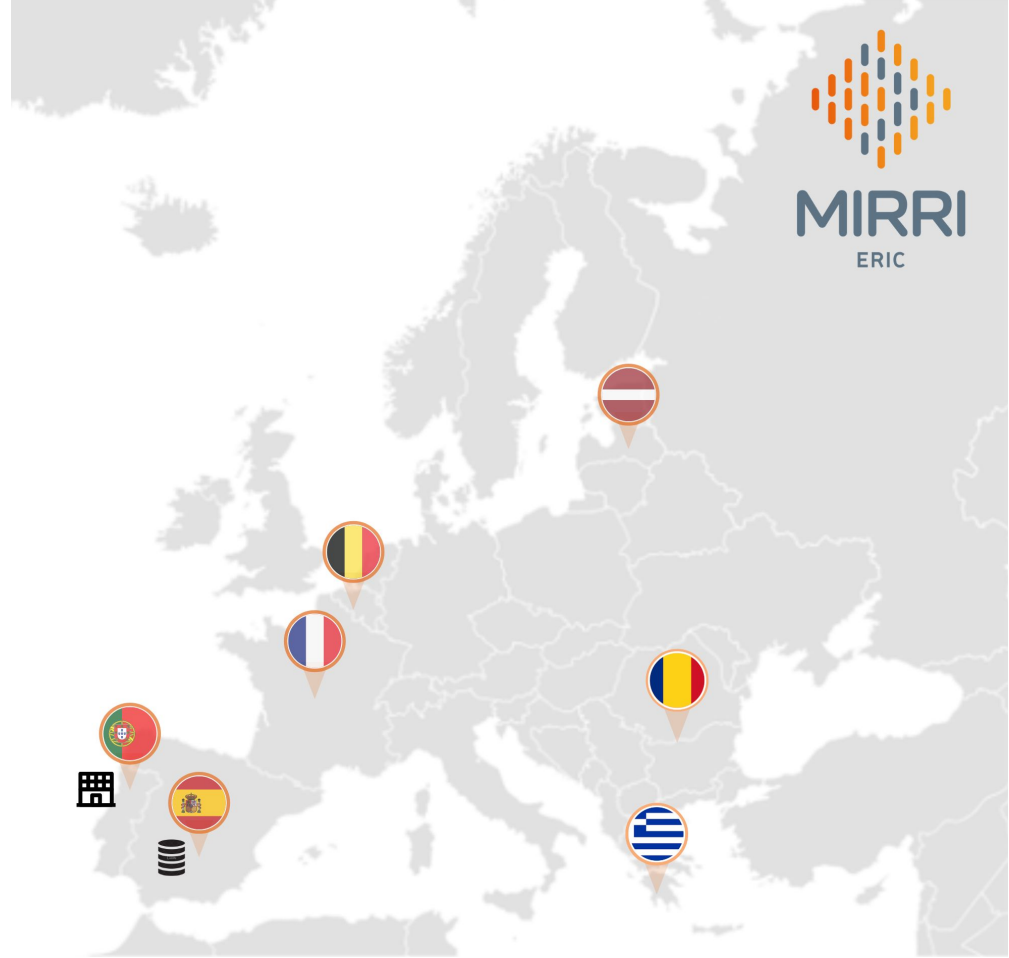
MIRRI-ERIC today





MIRRI-ERIC today

We expect more MS and Partners join soon, particularly those involved in the prospective phase of MIRRI-ERIC, and whose collections are already deposited and exposed in MIRRI-ERIC catalog.



MIRRI-ERIC today



BCCM/DCG - Diatoms Collection, Ghent University

BCCM/GeneCorner - Plasmid Collection, Ghent University

BCCM/IHEM - Fungi Collection: Human and Animal Health, Sciensano, Brussels

BCCM/ITM - Mycobacteria Collection, Institute of Tropical Medicine, Antwerp

BCCM/MUCL - Agro-food and Environmental Fungi Collection, Université catholique de Louvain

BCCM/ULC - Cyanobacteria Collection, University of Liège

BCCM/LMG - Bacteria Collection, University of Ghent



INRAE

- CIRM-CFBP - Plant associated bacteria collection
- CIRM-BIA - Food associated bacteria collection
- CIRM-BP - Pathogenic bacteria collection
- CIRM-CF - Filamentous fungi collection
- CIRM-Levures - Yeasts collection

Institut Pasteur (IP)

- CRBIP-CNCM - National Collection of Microorganisms associated with patents
- CRBIP-CIP - Collection of bacteria of the Institut Pasteur
- CRBIP-CVIP - Collection of Viruses of the Institut Pasteur
- CRBIP-pCC - Collection of cyanobacteria of the Institut Pasteur



MUM - Micoteca da Universidade do Minho, CEB/UMinho

PVCC - Portuguese Yeast Culture Collection, UCIBIO/UNLisboa

ACOI - Coimbra Culture Collection of Algae, UCoimbra

LEGE-CC - Blue Biotechnology and Ecotoxicology Culture Collection, CIIMAR/Uporto

UCCCB - University of Coimbra Bacteria Culture Collection

CMOCC - Mountain Research Centre Culture Collection, CIMO/IPBragança

AVFMCC/INIAV - Agronomic, Veterinary and Food Microbial Culture Collections

BIOTROP - Biotropical Resources - GHTM-IHMT/Global Health and Tropical Medicine, UNLisboa

CDB - Collection of Department of Biology, CBMA/UMinho

IVDP - Institute of Douro and Porto Wines

LRV - Azores Regional Laboratory of Veterinary



NKUA - National Kapodistrian University of Athens

AUA-DC - Agricultural University of Athens - Dairy Collection

BPIK - Benaki Phytopathological Institute Collection



MSCL - Microbial Strain Collection of Latvia



CMIH-ICCF - National Institute for Chemical Pharmaceutical Research and Development - Culture Collection of Industrial Importance Microorganisms

MCUB - Microgen Center-Microbial Collection of the University of Bucharest

CNCBC-IC - "Cantacuzino" National Medico-Military Institute for Research and Development - National Collection of Bacterial and Cell Cultures



CECT - Spanish Type Culture Collection

BEA - Spanish Bank of Algae

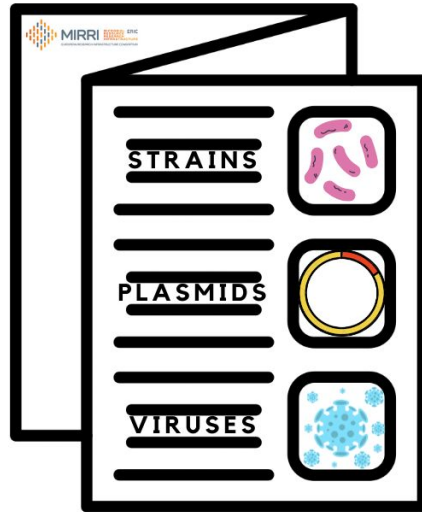
ISCIH - Instituto de Salud Carlos III

Fundación MEDINA



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MIRRI-ERIC SERVICES MIRRI-ERIC CATALOG OF MICROBIAL RESOURCES



SERVICE DESCRIPTION:

Catalog of microbial resources and associated data deposited at MIRRI-ERIC's Partners and collaborating Organisations Culture Collections (CC):

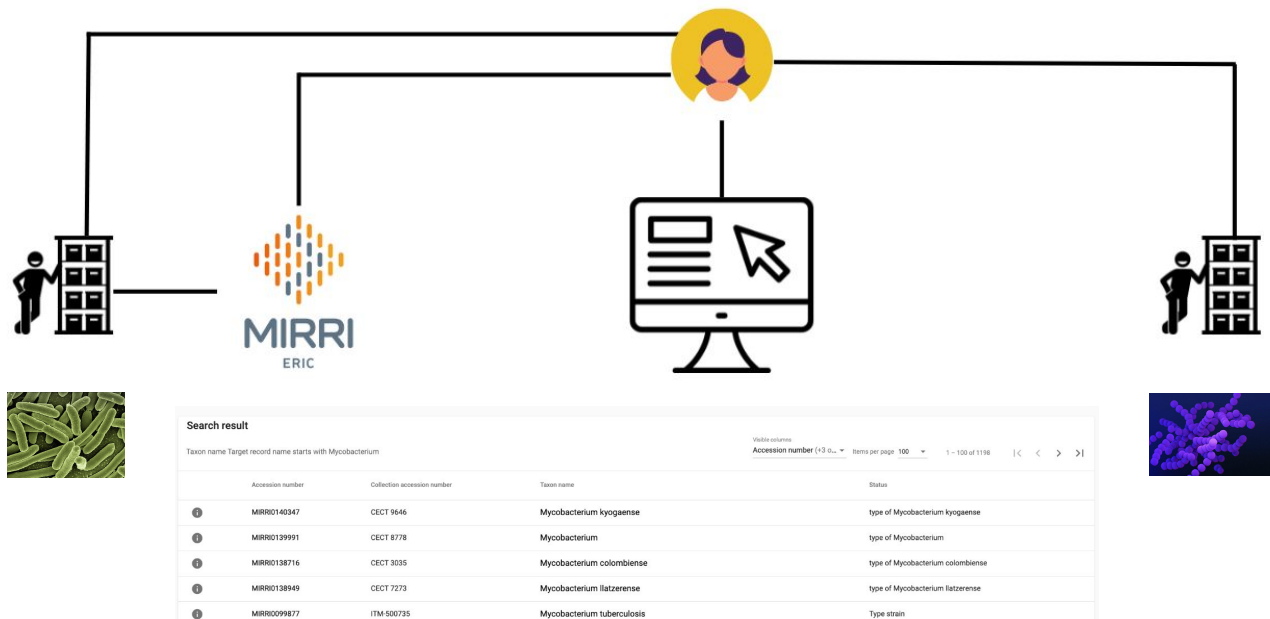
- A)** Interface for searching the MIRRI-ERIC Catalog (Democratise Access)
- B)** Deposit of new strains (Preserve Biodiversity)
- C)** Provision of reference strains (Enhance Research)
- D)** Continuous updated of the catalog (Make Microbial Resources FAIR)

PARTICIPANT NODES:



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USERS' JOURNEY:



https://catalog.mirri.org/page/Strains_catalog_query

Developed and delivered in collaboration between all nodes and provided through the CWE.

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Data retrieval from MIRRI-ERIC Catalog

Dataverse Search User Guide Support Sign Up Log In

Data MIRRI

Metrics 57 Downloads Contact Share

The root dataverse.

Search this dataverse... Advanced Search

Dataverses (2)
Datasets (179,107)
Files (179,110)

Dataverse Category
Organization or Institution (2)

Publication Year
2022 (179,109)

Author Name
CBS & NCCB (65,483)
BCCM/IHEM (18,528)
BCCM/LMG (18,239)
BCCM/MUCL (17,560)
CIRM-CFBP (12,700)

More...

1 to 10 of 179,109 Results Sort

MIRRI0159440
Aug 17, 2022 - MIRRI
CIRM-CF, 2022, "MIRRI0159440", <https://doi.org/10.57907/MIRRI/KYYSVH>, Data MIRRI, V1
Organism type: Microalgae ; Taxon name: Agaricus bisporus var. bisporus ; Collection: BRFM 3347 ; Country: Spain

MIRRI0159439
Aug 17, 2022 - MIRRI
CIRM-CF, 2022, "MIRRI0159439", <https://doi.org/10.57907/MIRRI/S6FFHT>, Data MIRRI, V1
Organism type: Microalgae ; Taxon name: Agaricus bisporus var. bisporus ; Collection: BRFM 3346 ; Country: Spain

MIRRI0159438
Aug 17, 2022 - MIRRI
CIRM-CF, 2022, "MIRRI0159438", <https://doi.org/10.57907/MIRRI/0YH8DN>, Data MIRRI, V1
Organism type: Microalgae ; Taxon name: Agaricus bisporus var. bisporus ; Collection: BRFM 3345 ; Country: Greece

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Data retrieval from MIRRI-ERIC Catalog in the CWE

Download your dataset

MIRRI0159440
Version 1.0

CIRM-CF, 2022, "MIRRI0159440", <https://doi.org/10.57907/MIRRI/KYYSVH>, Data MIRRI, V1

Cite Dataset [Learn about Data Citation Standards.](#)

Access Dataset [Contact Owner](#) [Share](#)

Dataset Metrics [8 Downloads](#)

Description [Organism type: Microalgae ; Taxon name: Agaricus bisporus var. bisporus ; Collection: BRFM 3347 ; Country: Spain](#)

Subject [Medicine, Health and Life Sciences](#)

Keyword [Microorganism, Microalgae](#)

Files [Metadata](#) [Terms](#) [Versions](#)

1 File

| File | Download |
|--|--------------------------|
| MIRRI0159440.json Plain Text - 11.1 KB Published Aug 17, 2022 9 Downloads MDS: 347...cc1 Strain json file | Download |

JSON Raw Data Headers

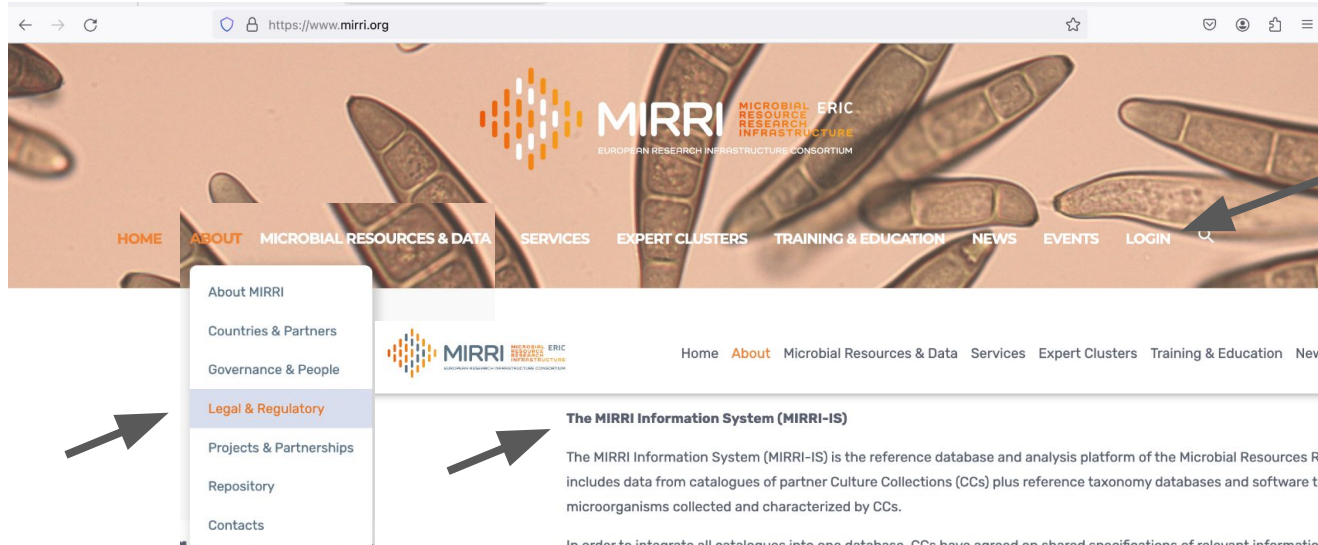
Save Copy Collapse All Expand All Filter JSON

RecordDetails:

- Collection providing data:
 - Value:
 - 0:
 - Name:
 - Value: "CIRM-CF"
 - Field Type: 5
 - Is Empty: false
 - Summary: null
 - Record ID: 11
 - Target Field Value: null
 - Field Type: 118
 - Is Empty: false
- Sequences AmdS:
 - Value: []
 - Field Type: 114
 - Is Empty: true
- Sequences AmdS12:
 - Value: []
 - Field Type: 114
 - Is Empty: true
- Sequences c16S rRNA:
 - Value: []
 - Field Type: 114
 - Is Empty: true
- Sequences CαM:
 - Value: []
 - Field Type: 114
 - Is Empty: true
- Sequences cbhI:
 - Value: []
 - Field Type: 114
 - Is Empty: true
- Sequences Cit1:
 - Value: []

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Information Upload to the MIRRI-ERIC Catalog in the CWE



The screenshot shows the MIRRI website interface. The top navigation bar includes links for HOME, ABOUT, MICROBIAL RESOURCES & DATA, SERVICES, EXPERT CLUSTERS, TRAINING & EDUCATION, NEWS, EVENTS, and LOGIN. An arrow points from the text 'Register or login MIRRI-ERIC CWE' to the LOGIN link. A dropdown menu is open under the ABOUT link, with an arrow pointing to the 'Legal & Regulatory' option. Another arrow points from the 'Legal & Regulatory' option to the 'The MIRRI Information System (MIRRI-IS)' section on the page.

Register or login MIRRI-ERIC CWE

Home About Microbial Resources & Data Services Expert Clusters Training & Education News Events Logout

The MIRRI Information System (MIRRI-IS)

The MIRRI Information System (MIRRI-IS) is the reference database and analysis platform of the Microbial Resources Research Infrastructure (MIRRI). It includes data from catalogues of partner Culture Collections (CCs) plus reference taxonomy databases and software tools for phylogenomic analysis of microorganisms collected and characterized by CCs.

In order to integrate all catalogues into one database, CCs have agreed on shared specifications of relevant information for the different resource types.

Guidelines including a description of the datasets have therefore been approved and published. CCs have finally submitted the data of their catalogues according to the shared specifications.

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Information Upload to the MIRRI-ERIC Catalog in the CWE



[Home](#) [About](#) [Microbial Resources & Data](#) [Services](#) [Expert Clusters](#) [Training & Education](#) [News](#) [Events](#) [Logout](#) 

MIRRI-IS data specifications

Here, we report the list of approved documents as a reference for users willing to link their information systems to the MIRRI-IS through its APIs.

Microbial strains (archaea, bacteria, yeasts, filamentous fungi, microalgae).

- [Preface to the MIRRI-IS dataset \(Version 5.1, delivered on March 24th, 2023\)](#)
- [Guide to create an Excel file for uploading Microorganisms dataset \(Version 5.1, delivered on March 24th, 2023\)](#)
- [Specifications \(Version 5.1, delivered on March 24th, 2023\)](#)
- [Excel template for Microorganisms dataset \(Version 5.1.2, delivered on May 12th, 2023\)](#)
- [Data exchange format \(JSON\)](#)
- [Web Services \(APIs\)](#)
- [Dataverse platform](#)

Plasmids

- [Specifications \(release candidate 1\)](#)

Viruses

- [Specifications \(release candidate 2\)](#)



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MIRRI-ERIC SERVICES

Quality Management Advisory

Co-development with the Industry

Research supporting pipelines

Bioinformatics tools for CCs

Training (coming soon:

[BCCM online bash command line training](#) and

[BCCM online Singularity - Nextflow training](#))

Developed and delivered by the Partners. A collaborative integrated upgrade is under development.

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MIRRI-ERIC and European Projects

HoloZcan



Deep Learning Powered Holographic Microscopy for Biothreat Detection on Field

Founded under:
HORIZON-INFRA-2022-TECH-01-01

Coordinated by:
IDEAS SCIENCE KFT.

MIRRI-ERIC partner in the consortium:
Institut Pasteur.

ISIDORE



Integrated Services for Infectious Disease Outbreak Research

Founded under:
HORIZON-INFRA-2021-EMERGENCY-02

Coordinated by:
ERINHA

MIRRI-ERIC partners in the consortium:
Institut Pasteur MUM/UMinho

ResInfra Plus



Towards a Sustainable EU-LAC Partnership in Research Infrastructures (EU-LAC ResInfra Plus)

Founded under:
HORIZON-INFRA-2023-DEV-01

Coordinated by:
MINECO (Spain)

MIRRI-ERIC partner in the consortium:
University of Valencia

AgroServ



Integrated SERVICES supporting a sustainable AGROecological transition

Founded under:
HORIZON-INFRA-2021-SERV-01-03

Coordinated by:
AnaEE / CNRS

MIRRI-ERIC partners in the consortium:
BCCM-MUCL, CIRM-INRAE

canSERV



Providing cutting edge cancer research services across Europe

Founded under:
HORIZON-INFRA-2021-SERV-01-02

Coordinated by:
BBMRI-ERIC

MIRRI-ERIC partners in the consortium:
MUM/UMinho (+ACOI-UC +LEGE-CIMAR)

BIOINDUSTRY 4.0



RI services to promote deep digitalization of Industrial Biotechnology - towards smart biomanufacturing

Founded under:
HORIZON-INFRA-2022-TECH-01-01

Coordinated by:
EU-IBISBA / INRAE

MIRRI-ERIC partners in the consortium:
UVEG, WI-KNAW

MICROBE



MICRObiome Biobanking (R) Enabler

Founded under:
HORIZON-INFRA-2022-TECH-01-01

Coordinated by:
AIT

MIRRI-ERIC partners in the consortium:
CIRM-INRAE



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MIRRI-ERIC and European Projects



Services offered by MIRRI-ERIC's TNAs

- Provision of microbial resources: Fungi, yeasts, bacteria
- Functional Screening of fungi or bacteria
- Genetic characterisation of plant microbiota (metabarcoding)
- Metabolic characterisation of plant microbiota (Met. Fingerprint/Biolog)
- Training: “In vitro culture of arbuscular mycorrhizal fungi” / “Formulation of bio-control fungal agent”
- Identification-Preservation of fungi focusing on agro-important organisms (biostimulants, biocontrol)





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MIRRI-ERIC and European Projects

TNA projects involving MIRRI-ERIC services



24-C1-Agro-TNA-029 **BIOSTIMULANTS AND ABIOTIC STRESS IN HORTICULTURAL CROPS** (Iman Mirmazloun, HU) **MIRRI (BCCM-MUCL)** : Training *in vitro* culture of arbuscular mycorrhizal fungi – Other RIs involved **AnaEE, EMBRC, Euro-BioImaging**

24-C1-Agro-TNA-013 **BIOFUNGAL** (Liliana Marum, PT): **BIOCONTROL AGAINST FUNGAL DISEASES IN ALMOND TREES** **MIRRI (CIRM-CF)**: Fungal enzymes or metabolites to be tested for antimicrobial Activities – Other RI involved **AnaEE**





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MIRRI-ERIC and European Projects

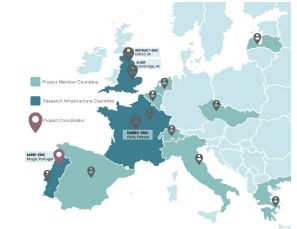
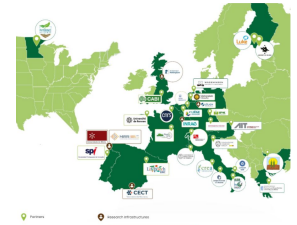
Coordinated by MIRRI-ERIC



MICROBES-4-CLIMATE - Microbial services addressing climate change risks for biodiversity and for agricultural and forestry ecosystems: enabling curiosity-driven research and advancing frontier knowledge



Multi-domain Open MALDI Spectra BANK for Identification of Microorganisms





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MIRRI-ERIC engaging with other RIs and Initiatives



EMPHASIS





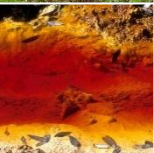
Shaping the future

SO1: Consolidating and Growing. Consolidate and enlarge MIRRI-ERIC Members, establish a solid and sustainable governance and operations structure and enhance its visibility and recognition as ESFRI Landmark.

SO2: Strengthening. Strengthen MIRRI-IS infrastructure, resources and service provision capacity, communicating MIRRI-ERIC as the ESFRI Landmark that nourishes and makes available metadata-enriched microbial resources to academia and industry worldwide.

SO3: Empowering. Develop internal capacity in data management and the capacity of users to access and use MIRRI-ERIC's microbial culture collections, state-of-the-art expertise and their metadata.

SO4: Leveraging. Engage with other Research Infrastructures and international organisations in Europe and worldwide, and demonstrate MIRRI-ERIC's socioeconomic impact.



Shaping the future

- Organisation of the National Nodes
- Service Portfolio Review
- Strengthening of MIRRI-IS and connecting outwards
- Working Groups
 - Data Management and Computing
 - Health and Food Safety
 - Agrofood Security
 - Environment and Energy
 - Quality Management

Thank you all!



MIRRI MICROBIAL ERIC
RESOURCE RESEARCH
INFRASTRUCTURE
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM

A graphic with a dark blue background and a subtle grid pattern. In the center is a smartphone displaying a grayscale image of a microorganism. To the right of the phone, the text "Contact us" is written in a large, white, serif font. Below this text are three white rectangular boxes, each containing a social media icon and a link. The first box has a globe icon and the link "www.mirri.org". The second box has a LinkedIn icon and the link "www.linkedin.com/company/microbial-resource-research-infrastructure/". The third box has a Twitter icon and the link "@mirri live". At the bottom right, the MIRRI logo is displayed, including the stylized dot pattern and the text "MIRRI MICROBIAL ERIC RESOURCE RESEARCH INFRASTRUCTURE EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM".

Contact us

 www.mirri.org

 www.linkedin.com/company/microbial-resource-research-infrastructure/

 [@mirri live](https://twitter.com/mirri_live)

 **MIRRI** MICROBIAL ERIC
RESOURCE RESEARCH
INFRASTRUCTURE
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM