



Microbial collections of Joint Research Unit MIRRI-IT

- Partners
- Associated members

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Microorganisms are the hidden engines of our planet: they sustain life, shape ecosystems, drive nutrient cycles, protect plants, enhance food production, and open the door to new biotechnologies. MIRRI-IT brings together the microbial expertise, resources, and facilities of Italy's research landscape to support science, industry, and society.

WHAT IS MIRRI-IT?

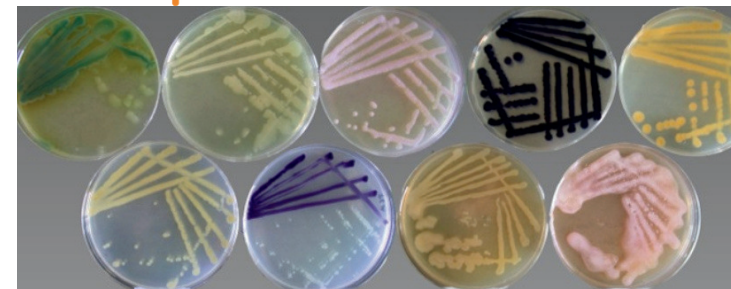
MIRRI-IT is the **Italian node** of MIRRI-ERIC, the European Microbial Resource Research Infrastructure.

The network includes **30 institutions**, preserving, characterizing and making accessible **more than 100,000 microbial strains**, including bacteria, filamentous fungi, yeasts, microalgae, cyanobacteria, viruses and microbiomes.

All microbial resources are accompanied by metadata, standardized procedures and a strong scientific and technological background supporting research and biotechnological innovation.

OUR MISSION

To strengthen Italy's microbial collections and research capacity, ensuring that microbial diversity is preserved, studied and transformed into knowledge, tools and solutions capable of addressing today's environmental, societal and economic challenges.



MIRRI-IT

ITALIAN MICROBIAL RESOURCE RESEARCH INFRASTRUCTURE

A NATIONAL GATEWAY TO MICROBIAL
BIODIVERSITY, SCIENTIFIC EXCELLENCE AND
SUSTAINABLE INNOVATION



Microorganisms for a resilient and
sustainable future

Research • Biotechnology • Agrofood • Environment • Health

MICROORGANISMS: WHERE AND WHY

- Ubiquitous on Earth and essential for all ecosystems
- Biogeochemical cycles and organic matter recycling
- Sustain soil structure, fertility, plant growth and support productivity in both terrestrial and aquatic environments
- Microbiomes are essential for the physiological functioning and health of plants, animals, and humans
- Central role in climate regulation, agriculture, food systems and environmental resilience

90% of microbial biodiversity remains undiscovered



Reservoir of opportunities for science, industry and the bioeconomy. Understanding, preserving and utilizing this microbial wealth is essential for advancing sustainable agriculture, improving food systems, protecting environments and driving new biotechnological applications

WHAT MIRRI-IT PROVIDES

MIRRI-IT harmonizes and strengthens Italy's microbial biobanks through shared standards, interoperable procedures, quality assurance and a common access framework.

Microbial resources and data

- High-quality strains and metadata
- Quality-controlled reference materials for research, diagnostics and industrial use

Advanced technological platforms

- Culturomics, molecular and phenotypic identification
- Genomics, metagenomics, bioinformatics workflows for genome assembly, annotation and microbiome analysis
- Optimized (long term) preservation and quality-control protocols.

Services & training

- Analytical and technological services
- Advanced training courses
- Operating procedures for isolation, preservation and reuse of microorganisms
- Support for regulatory compliance (Nagoya, biosafety)

Impact

- Partnerships with national and international companies, public institutions and research infrastructures.

FOOD SAFETY AND SUSTAINABLE PRODUCTION

Ensuring safe and high-quality foods

- Rapid detection of pathogens and toxins
- Monitoring across the entire food supply chain
- Starter cultures design and use
- Gut health and consumer well-being

Reducing chemical inputs

- Natural alternatives to food preservatives, but also to crop fertilizers and pesticides
- Improved fermentation efficiency and traceability

Novel foods & sustainable proteins

- Mycoproteins as a sustainable alternative to animal-derived proteins
- Microalgae and cyanobacteria for food and supplements (e.g. Spirulina)
- Precision fermentation converting CO₂ for protein-rich foods

Industrial and environmental applications

- Enzymes, bioactive molecules and biomaterials
- Pharmaceuticals, nutraceuticals, pigments and other compounds
- Innovative materials (e.g., mycelium-based biocomposites, bio-packaging, eco-friendly textiles, coatings).