

The MICROBE project: MICRObiome Biobanking (RI) Enabler

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Introduction

Microbiomes are complex communities of microorganisms (bacteria, archaea, protists, fungi, microalgae) and their “theatre-of-activity” characteristic of a specific habitat. They are everywhere in, on and around us i.e. in/on humans, animals, plants, in soil and aquatic habitats. They play a key role in maintaining life on Earth by providing essential ecosystem services and are indispensable for One Health - the health of humans, animals, and environment.

By harnessing microbiomes and their functions, society would be better placed to tackle global challenges like health, food waste management, and climate change mitigation. To facilitate science necessary to achieve key advances in microbiome research, methodologies and technologies are required to capture, and ensure long-term maintenance of microbiomes. Research infrastructures (RIs) currently lack optimized methodologies and technologies to preserve and provide access to microbiome samples and associated data.

Material & methods

The MICROBE project (funded by EU Horizon programme Grant-No. 101094353; 2023-2027) brings together key research actors, biological resource centres and European infrastructures to address these issues.

Results/findings

MICROBE is developing (1) technical solutions for microbiome preservation, propagation and functionality assessment, (2) novel ecological concepts (i.e., “core microbiome”, “microbial keystone taxa”), and (3) data infrastructures. (4) MICROBE also addresses essential biobanking framework issues like standardization, pre-analytical microbiome sample quality and quality control, ethical and legal requirements, and new business opportunities.

Discussion/conclusion

Long-term ambition is to ensure widespread uptake of developed methods and guidelines in microbiome research communities and to enable RIs to support this field, ultimately enabling the development of novel microbiome-based applications.

Key words: microbiome, biobanking, quality, pre-analytics, one health