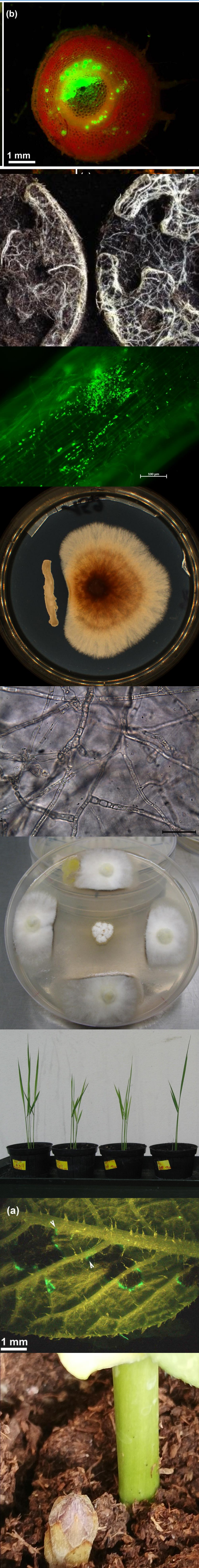


# Exploiting Plant-Microbiomes Networks and Synthetic Communities to improve Crops Fitness



## About the Action

Plants and its microbiome are subjected to several abiotic and biotic stresses, including new plant pathogens, that will be more frequent and intense in the current climate change scenario. Current agricultural practices in Europe depend on agrochemicals and high amounts of water and will therefore not be sufficient to face the upcoming stresses. The COST Action MicropBiomes grounds on the urgent need for a transition to sustainable agriculture to ensure food security and safety, by coordinating and developing knowledge on crop microbiomes (and holobionts) for application in precision sustainable agriculture.

## Aims and Objectives

- Develop understanding at the **molecular level of assemblies and signaling regulating** phytobionts.
- Develop understanding (theoretical vs experimental achievements), regarding **“keystone microorganisms”** to improve microbiome assemblies under different cropping systems.
- Develop understanding (theoretical vs experimental achievements) on the **interference of abiotic stress** (heat and drought) and **biotic stress** (e.g., pathogens) on microbiome associations, and exploit how keystone microorganisms (e.g PGPs and BCAs) improve crop performance/tolerance.
- **Engineering communities** for successfully improving holobiont fitness.
- **Develop databases on plant microbiomes**, and tools to make them (as much as possible) of wide Open Access.
- Provide **inputs to stakeholders** for solutions for a precision 3S-Agriculture.

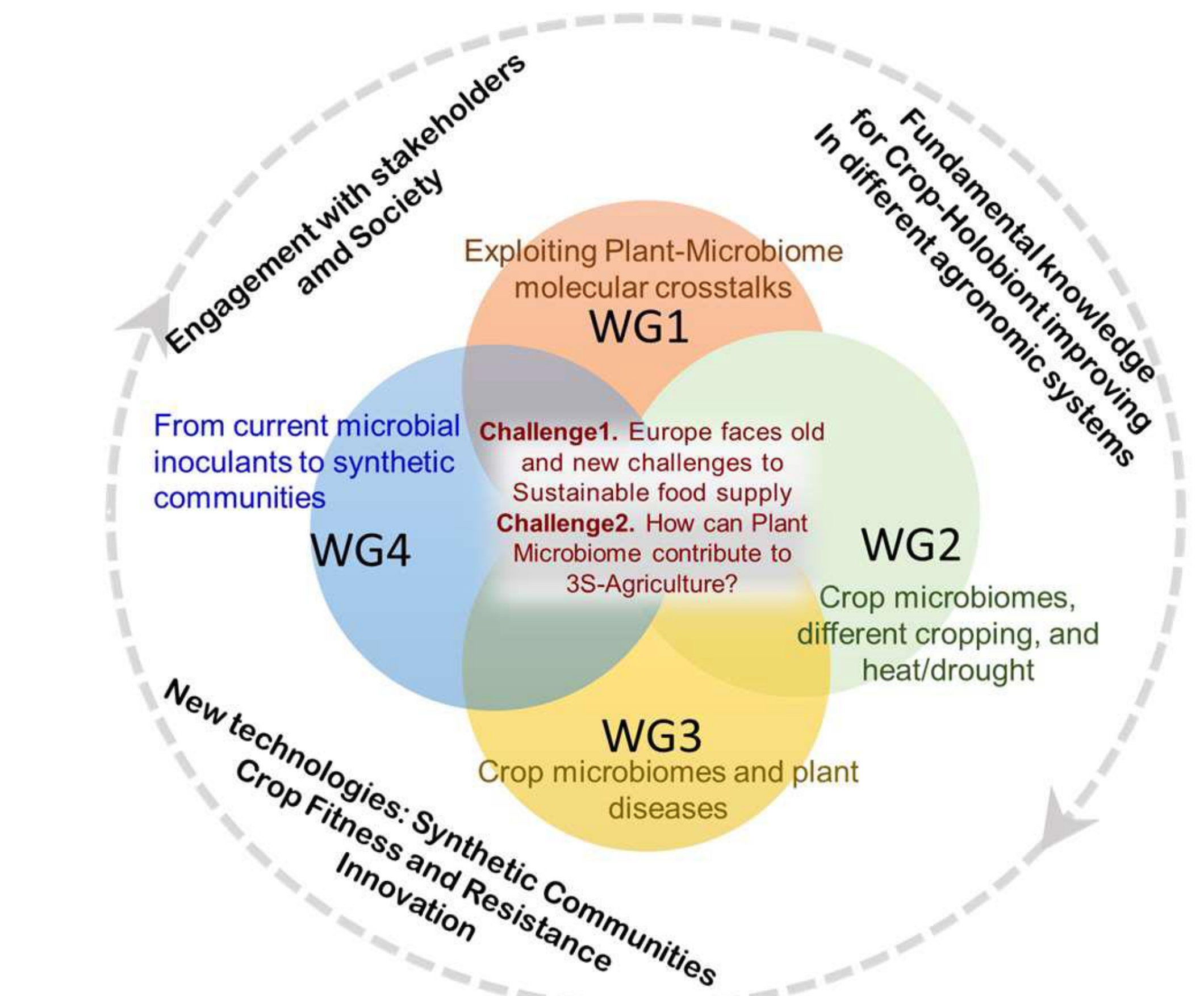
In addition, we aim to stimulate **long-lasting transdisciplinary research on plant microbiomes** by involving long-term interactive balanced networks

## Working groups

WG1	WG2	WG3	WG4	WG5
<b>Exploiting plant-microbiome molecular crosstalks</b> <ul style="list-style-type: none"> <li>• Knowledge advances on plant-microbiome assemblies, and available collections</li> <li>• Knowledge advances on functional molecular models, and transcriptomics, mapping microbe-microbe, and microbe-plant interactions</li> <li>• Explore how microbiome eco-evolutionary dynamics determine host fitness</li> </ul>	<b>Crop-microbiome assembly dynamics in specific environments</b> <ul style="list-style-type: none"> <li>• Study the response of microbiomes to climate and other environmental changes</li> <li>• Study the cooperations of the phyllo/rhizosphere to increase crop tolerance to drought and heat</li> <li>• Compare the effects of soilless systems on the microbiome’s genetic structure</li> </ul>	<b>Crop microbiomes and plant diseases: dysbiosis and defense</b> <ul style="list-style-type: none"> <li>• Study the response of the microbiome towards pathogens</li> <li>• Study the cooperations of the phyllo/rhizosphere to increase crop’s defense</li> </ul>	<b>From microbial inoculants to synthetic communities</b> <ul style="list-style-type: none"> <li>• Data collection and literature review on synthetic communities</li> <li>• Contribute to going beyond the state of the art on stability and efficiency of synthetic communities</li> <li>• Generate knowledge to construct stable and efficient synthetic communities</li> </ul>	<b>Communication and engagement with society</b> <ul style="list-style-type: none"> <li>• Engagement with stakeholders</li> <li>• Coordination of dissemination activities including the website, social media platforms, networking activities (e.g. training schools, workshops)</li> </ul>

Promoting **training and dissemination** through the organization of:

- Training schools (>1/year/WG)
- Short term scientific missions
- Mobility for attending conferences and events



## Outreach



## Contact

**Action Chair:**  
Prof. Dr. Maria Conceição Santos  
Department of Biology, Faculty of Sciences,  
University of Porto  
Rua Campo Alegre, 4169-007 Porto  
Portugal

**Website:** <https://microbiomes.eu>

**Action Vice Chair:** Prof. Dr. Francesco Spinelli

**WG1**  
Chair: Dr. Ahmed Abdelfattah, Leibniz Institute of Agricultural Engineering and bio-economy, Germany  
Co-Chair: Prof. Gabriele Berg, Graz University of Technology, Austria

**WG2**  
Chair: Prof. Elodie Vandelle, University of Verona, Italy  
Co-Chair: Prof. Gordana Racic, Educons University, Serbia

**WG3**  
Chair: Dr. Joël F Pothier, Zurich University of Applied Sciences, Switzerland  
Co-Chair: Dr. Renata Artimová, Institute of forest ecology, Slovakia

**WG4**  
Chair: Dr. Anna Bonaterra, Universitat de Girona, Spain  
Co-Chair: Prof. Claire Prigent-Combaret, University Lyon, France

**WG5**  
Chair: Prof. Caroline De Tender, Ghent University, Belgium  
Co-Chair: Dr. Ralf Koebnik, Institut de Recherche pour le développement, France

## About COST

COST is the longest-running European framework supporting transnational cooperation among researchers, engineers and scholars across Europe. It is a unique means to jointly develop own ideas and new initiatives across all fields in science and technology, including social science and humanities, through pan-European networking of nationally funded research activities. Based on a European intergovernmental framework for cooperation in science and technology, COST has been contributing – since its creation in 1971 – to closing the gap between science, policy makers and society throughout Europe and beyond.