

Biomehealth Newsletter

Catch up on the latest research, fieldwork, and innovations from the BiomeHealth Project!

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Welcome to the first edition of the **BiomeHealth Newsletter!**

BiomeHealth is a project founded by the EU dedicated to strengthening research and innovation on **plant pathogen detection and control** under the challenges of **climate change**. Through the collaboration between **Requimte/University of Porto (Portugal)**, **Wageningen University & Research (Netherlands)**, and the **University of Bologna (Italy)**, BiomeHealth promotes scientific excellence, technology transfer, and training in sustainable plant health solutions.

This first newsletter marks the beginning of our journey to share the project's progress, results, and people behind the research. In each edition, we'll bring you updates on our latest scientific findings, training activities, events, and collaborations — as well as interviews with our PhD, postdoctoral and fellowship researchers who are helping shape the future of plant health in Europe.

We invite you to follow our work, participate in our initiatives, and join us in building a more **resilient and sustainable agro-food system**.

Welcome Message

Project Updates



1st Staff Visit at WUR

The first **BiomeHealth staff visit** took place from **29 to 31 July 2025** at **Wageningen University & Research (WUR)** in the Netherlands. The meeting gathered researchers from **Requimte/University of Porto (Portugal)**, **University of Bologna (Italy)**, and **WUR** to strengthen collaboration and exchange expertise.

The three-day program combined **coordination meetings, technical demonstrations, and field and laboratory visits**. Participants shared project progress, discussed experimental coordination, and explored new opportunities for joint proposals under future EU calls.

The visit also included a **tour of WUR's laboratories, greenhouses, and the Randwijk experimental orchards**, where researchers observed ongoing work on plant pathogen detection and biocontrol under real environmental conditions. The event concluded with a **hands-on demonstration of the LAMP diagnostic technique**, showcasing BiomeHealth's commitment to innovative and practical tools for plant health management.

This first in-person meeting marked an important milestone for BiomeHealth, reinforcing team connections and setting the foundation for productive scientific collaboration across Europe.

Fieldwork in Portugal – Advancing Research on Pear Tree Pathogens



Researchers from **REQUIMTE/University of Porto** involved in the **BiomeHealth project** carried out fieldwork in **August 2025** in the **Oeste region of Portugal**, visiting pear orchards to collect fruit, plant, and soil samples.

This campaign marks an important step forward in the **characterization and control of the pathogens *Erwinia amylovora* (fire blight) and *Stemphylium vesicarium* (brown spot of pear)**. The collected samples will help deepen the understanding of interactions between the pathogen, plant, and soil, contributing to the development of **innovative prevention, monitoring, and control strategies**.

Through these actions, BiomeHealth continues to **strengthen the link between science and agricultural production**, supporting the sustainability and quality of **Portuguese Rocha pear**, one of the country's most valuable crops.

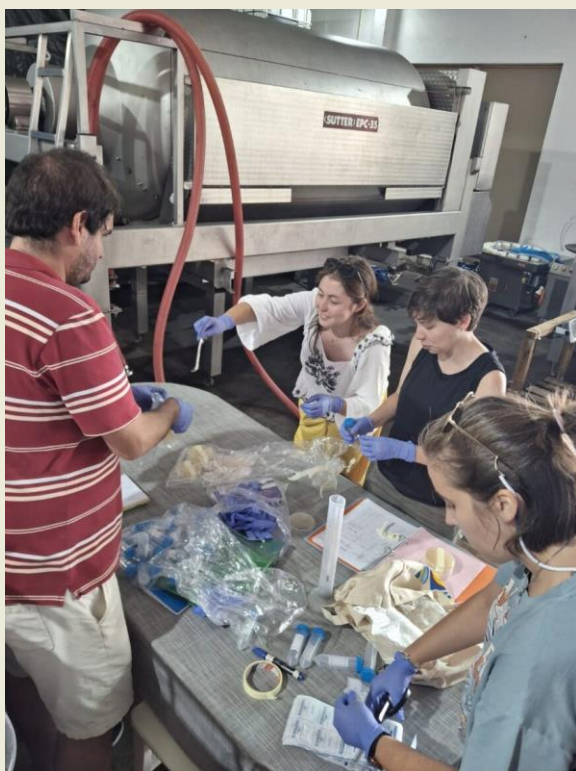
Project Updates

Seeking Innovative Solutions to Combat Pear Pathogens!

Researchers from **REQUIMTE/University of Porto** involved in the **BiomeHealth project** conducted experimental work in the **Azores**, aiming to isolate *Saccharomyces cerevisiae* and its associated “killer” virus.

This line of research explores the potential of **natural microbial toxins** as a **biocontrol strategy** against two major pear pathogens — *Erwinia amylovora*, the bacterium responsible for fire blight, and *Stemphylium vesicarium*, the fungus causing brown spot disease.

These efforts represent an exciting step toward **developing novel, environmentally friendly solutions** to protect pear orchards and enhance sustainable crop management. **New toxin-based discoveries are expected soon!**



LAQV Webinar – Biological Control Agents in Agrifood Systems

As part of the **LAQV Webinar Series**, **Professor Conceição Santos** (REQUIMTE/University of Porto, BiomeHealth coordinator) presented a talk titled “**Biological Control Agents in Agrifood Systems to Face Climate Change and New/Recurrent Pathogens**” on **22 October 2025**.

In her presentation, Professor Santos highlighted how **innovative biological control agents (BCA)** are being developed to combat major phytopathogens such as *Erwinia amylovora*, *Pseudomonas syringae* pathovars, and *Stemphylium vesicarium*. The talk emphasized the **importance of understanding the plant holobiont**, the evolution of **microbiome dysbiosis**, and the role of **abiotic and biotic factors** in maintaining crop health.

The webinar also featured presentations by **Lúcia Melo** and **Daniela Malafaia** (University of Aveiro), covering research on molecular probes and theranostics for Alzheimer's disease, respectively.

The LAQV Webinars are open-to-all events organized by the **Chemistry and Bioactivity Research Group**, coordinated by **Professor Conceição Santos**, aiming to strengthen connections and promote discussion within the **Green Chemistry and Biotechnology** communities.

Meet the Researchers Behind BiomeHealth

BiomeHealth



Catarina da
Cunha Maia Leal

I'm **Catarina Leal**, a postdoctoral researcher at REQUIMTE - University of Porto, working within the **BiomeHealth project**. My research focuses on the functional and molecular characterization of **biological control agents (BCAs)** against important plant pathogens such as *Erwinia amylovora* and *Stemphylium vesicarium*. These pathogens cause major economic losses in fruit production, and understanding how to manage them sustainably is a key challenge for the future of agriculture.

Within BiomeHealth, my work is mainly dedicated to **biocontrol and microbiome studies**, I study beneficial microorganisms that have shown strong potential to protect plants from disease and promote overall plant health. Using microbiological, molecular, and omics approaches, I aim to uncover how these microorganisms interact with pathogens and host plants at the molecular level.

I believe that BiomeHealth's results will make a significant contribution to **healthier and more sustainable agriculture**. By exploring natural microbial-based solutions, the project supports the development of environmentally friendly alternatives to chemical pesticides. These strategies can reduce agriculture's ecological footprint while maintaining productivity and improving soil and plant health. In the long term, BiomeHealth's work will help create more resilient and balanced agroecosystems, capable of adapting to climate change and emerging plant diseases.

Being part of BiomeHealth has been a **highly enriching experience**, both professionally and personally. It has given me the opportunity to expand my research beyond viticulture to a broader context of plant health and microbiome science. Collaborating with an international network of researchers with diverse expertise has enhanced my technical, analytical, and communication skills. It has also helped me shape my career goals toward establishing an independent research line focused on microbiome-based and sustainable plant protection strategies. What I enjoy most about BiomeHealth is its **collaborative and inspiring atmosphere**. Working in a project where science, innovation, and sustainability meet is truly motivating. I am inspired by the growing recognition of microbes as key allies in agriculture, and I am confident that the knowledge generated through BiomeHealth will drive new solutions for resilient and sustainable food systems in the future.

I'm **Laura Regalado**, and I am a **PhD student** in Biology at the University of Porto, Portugal. My research focuses on ***Erwinia amylovora***, the etiological agent of fire blight. Working with a collection of Portuguese isolates, I am exploring the routes of invasion of this pathogen in Portugal. Additionally, I am using **genomics** to explore the puzzle between phenotype and genotype in *E. amylovora*. Despite being a highly homogenous species worldwide, it displays notable phenotypic differences in virulence levels and metabolic profiles, which I aim to understand. Another key aspect of my work is the **development of innovative detection strategies** for *E. amylovora*, seeking to overcome the limitations of the methods available and provide more reliable tools for disease management.

I find **BiomeHealth** to be a really interesting project, not only because it focuses on developing new detection and control methods for both *E. amylovora* and *Stemphylium vesicarium*, which will be an important contribution to a **healthier management** of pear and apple tree orchards worldwide, but also because its impact is immediately translated in the community through training programs, advanced courses, and summer schools. This ensures a broad dissemination of knowledge and contributes to the training of young researchers and technicians, which I consider essential for the future of plant health research.

Being part of this project has been a **great opportunity** for my professional growth. It has allowed me to collaborate with an **international network** of researchers with complementary expertise, and I have gained a better understanding of the importance of **multidisciplinary approaches** in plant disease management. This is a real motivation that inspires me in my research and about the future of plant health. I'm particularly optimistic about the development of detection tools for pathogens, as I strongly believe that **prevention** is the most effective approach to **disease management**.

Laura Silva
Ferreira Regalado



Future events

Upcoming Advanced Course on Molecular Detection Techniques

The **BiomeHealth project** will host an **Advanced Course on Molecular Detection Techniques** from **24 to 27 November 2025** at the **Wageningen University & Research campus (The Netherlands)**.

This course provides a comprehensive overview of molecular and microscopic tools for **pathogen detection and identification** across diverse biological matrices. The program combines **theoretical lectures, computer practicals, and laboratory sessions**, offering participants a deep understanding of cutting-edge diagnostic approaches.

Topics will include **LAMP, Luminex, RT-PCR, NGS, DAS-ELISA**, and **fluorescence/confocal laser microscopy**. Participants will gain hands-on experience in **primer design, sequence alignment, in silico evaluation, spore counting, and fungicide resistance testing**.

This advanced training aims to strengthen technical capacity within the BiomeHealth network and beyond, fostering innovation and excellence in plant pathogen diagnostics.



Training Course: Genetic and Phenotypic Analysis on Phytopathogens

The **BiomeHealth project** invites participants to the upcoming **Training Course on Genetic and Phenotypic Analysis on Phytopathogens**, taking place in **December 2025 and January 2026**.

Participants will explore modern diagnostic tools and genomic approaches that support early detection and effective disease management. Practical sessions will cover **molecular diagnostics** (e.g., *LAMP*, *TaqMan* assays), as well as **phenotypic characterization** through virulence tests (e.g., hypersensitive response) and biochemical profiling (e.g., *BIOLOG* assays).

Course dates:

- 🕒 Online sessions (10 hours): 5, 10, and 11 December 2025
- 🕒 Laboratory sessions (14 hours): 15–16 January 2026, FCUP – Porto (Portugal)

Scientific team:

Bart Fraaije (WUR), Conceição Santos (REQUIMTE/FCUP), Iris Bergervoet (WUR), João Pedro Marques (CIBIO/FCUP), Laura Regalado (REQUIMTE/FCUP), Nuno Mariz-Ponte (REQUIMTE/FCUP), and Viola Kurm (WUR).

📄 Applications are open: <https://forms.gle/5VYWwEyYPjn4tbXy7>