Project Partner Search Form

CALL INFORMATION

Funder: *Horizon Europe -Cluster 2- Health*

Deadline(s): *16 Sep 2025*

Tentative project budget: *EUR 45.00 million*

Call: *HORIZON-HLTH-2025-01-DISEASE-01: Testing safety and efficacy of phage therapy for the treatment of antibiotic-resistant bacterial infections*

Expected outcomes: *This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination "Tackling diseases and reducing disease burden". To that end, proposals under this topic should aim to deliver results that are directed, tailored towards and contributing to most of the following expected outcomes:*

- *Researchers and developers make the best use of the state-of-the-art knowledge and resources for an effective development of new treatment options for patients suffering from difficult-to-treat infections.*
- *Healthcare professionals and people living with difficult-to-treat infections are ultimately provided with the availability of clinically useful phage therapies.*
- *Regulators are provided with quantifiable, verifiable and replicable data on safety and efficacy of phage therapy for human use and move faster towards market approval of novel phage-based therapies against antimicrobial resistant infections.*
- *Citizens are engaged and informed on innovative phage-based treatments as alternative therapeutic options complementary to antibiotics.*

HOGENT University of Applied Sciences and Arts, Research Centre Health and Water Technology (https://hogent.be/en/research/health-and-water-technology/) is offering the following expertise as partner within this call:

HOGENT developed an innovative droplet-based technology for rapid and automated phage quantification. The system generates microdroplets containing both phages and host bacteria. Time-lapse imaging and automated analysis allow accurate and rapid quantification of phage concentrations.

This can be relevant for the call for the following reasons:

Promoting quantifiable, verifiable and replicable data on the concentration of phages enables clinical mainstreaming of phage therapy, eventually causing novel phage-based therapeutic products to move faster towards market approval. By focusing on clinically relevant pathogens as listed in the WHO Bacterial Priority Pathogens List, the technology answers to the clinical need of patients.

An automated technology for phage quantification also benefits clinical trials to set up an optimal study design. As learned from previous clinical trials such as PhagoBurn, proper phage production, treatment protocols (including dosage), robust quantification methods for assessing the amount and effectiveness of phages are essential. Automated phage quantification can reduce experimental variation and bias, generating reliable scientific evidence demonstrating the safety and efficacy of phage-based therapies for regulators. Additionally, it enables pre-clinical selection of phages (based on efficacy).

Faster market approval of phage-based therapeutic products together with more standardized phage based methods for clinical trials eventually improves the availability of clinically useful phage therapies for patients in need.

The innovative phage quantification technology is developed using state-of-the-art knowledge and resources on microfluidics, and uses phage and host specific computational modelling and artificial intelligence (AI) to speed up and optimize the analysis of large data regarding the quantification of phages.

The aim is to strengthen the scientific and technological foundations of the technology in order to explore the possibility of commercial exploitation in the form of a start-up and to engage citizens and inform them of innovative phage-based treatments.

Innovative dimensions of the system:

Compared to the current gold standard double agar overlay method or spot test the method is:

10-fold more precise,

Has a 100-fold broader dynamic range,

Is 12–36 times faster,

Produces 28-fold less waste,

Is automated and cost-effective, minimizing manual handling and variability.

Has no need for microfluidic expertise

The abovementioned innovative dimensions positions the approach as a key enabler for the clinical mainstreaming of phage therapy, where rapid, accurate, and reproducible potency testing is essential.

Furthermore it may enable a onehealth bacteriophage platform technology

Application potential & impact:

The technology is highly applicable to:

Clinical trials and therapeutic manufacturing of phages,

Academic and industrial research focused on phage discovery and characterization,

Regulatory bodies establishing phage potency standards.

By streamlining potency testing, the project will significantly enhance the feasibility and reliability of phage therapy in combating antibiotic-resistant infections. It will also lower barriers for phage approval and deployment, aligning with EU health and WHO priorities and AMR strategies.

Research aspect for HOGENT:

The precise scope of research activities will be coordinated in collaboration with the project coordinator and research partners. HOGENT anticipates leading the refinement and expansion of its droplet-based phage quantification technology, focusing on adapting the method for a broader range of clinically relevant pathogens and phages. Key research tasks will include optimization of microfluidic protocols, software enhancement, validation against existing quantification standards (DAO/manual methods), and the development of standardized testing procedures. This research will support broader standardization efforts and integration into clinical workflows.

Expanding testing to multiple clinically relevant phage-host pairs (e.g., Salmonella, Klebsiella, Staphylococcus, Acinetobacter), validation of phage-host combinations across key ESKAPE pathogens and others can be performed.

Envisioned results:

A validated benchtop instrument for automated phage quantification with integrated imaging and analysis software.

Standardized reproducible protocols and reference data for potency testing of phages across bacterial species.

Demonstration of system robustness, accuracy, and reproducibility through multi-site testing.

Reference data for therapeutic-grade phages

Evidence supporting regulatory pathways and industrial scale-up

Description of Research Centre Health and Water Technology

The **Health and Water Technology (HWT)** research center focuses on **biochemical technology** and operates within two primary domains:

1. **Phage Therapy & Biomedical Research**
   HWT develops innovative biomedical and biotechnological methods within clinical diagnostics and laboratory medicine. A key focus is understanding and combating antimicrobial resistance, including the development of alternative and complementary therapies such as phage therapy to support sustainable public health solutions.
2. **Biological Water Treatment & Monitoring**
   The center conducts research on water quality monitoring and optimization of wastewater treatment processes. Special attention is given to water reuse, recovery of valuable resources from waste streams, and climate-resilient, circular solutions.

HWT is equipped with advanced laboratories located on the Vesalius and Schoonmeersen campuses in Ghent. Additionally, it manages the **Move-it Lab**, a mobile laboratory designed for on-site water quality analysis, supporting companies and farmers with real-time environmental diagnostics and process optimization.

The multidisciplinary HWT team includes experts in chemistry, biochemistry, environmental technology, nursing, and biomedical laboratory sciences.

Multiple IOF funding rounds have been obtained together with PWO funding and VLOHRA funding.

For more information or collaborations: hwt@hogent.be
Website: HOGENT - HWT

Expertise of Researcher Stefan Vermeulen

Dr. Stefan Vermeulen (Promoter)

SV is a doctor in Medical sciences and has over 30 years of research experience in molecular biology. SV has created the concept of the ¨PMD4U method and has led the development of the technology since the very beginning, which is why SV will act as project coordinator. By virtue of longstanding collaborations with both academic and industry players in the phage field, the team of SV is ideally positioned to successfully complete this project. As a steering member of P.H.A.G.E. he has an extensive network in phage research in Europ and abroad.

Researchgate

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