LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

International Summer School Practice

Isolation and Characterisation of Bacteriophages Infecting Gram-Positive Skin Bacteria

Bacteriophages (phages) are viruses that infect bacteria and play important roles in microbial ecology, bacterial evolution, and horizontal gene transfer. Their ability to specifically infect bacterial hosts also makes them promising tools for biotechnology and the development of alternative antimicrobial strategies.

This project aims to isolate and characterise bacteriophages infecting Gram-positive skin-associated bacteria, including Staphylococcus aureus, Staphylococcus epidermidis, and Streptococcus pyogenes. Students will work with an established collection of bacterial strains and bacteriophages available within the research group, with opportunities to identify and isolate additional phages.

The internship will provide hands-on experience in fundamental microbiological and molecular biology techniques, including bacterial cultivation, phage isolation, propagation and purification, plaque assays, and phage titration. Students will also investigate phage host range, infection efficiency, and bacterial susceptibility using different bacterial isolates. Depending on experimental progress, selected phages may undergo further characterisation through DNA extraction, molecular methods, and introductory genomic analyses.

The two students will collaborate throughout the project while developing complementary experimental activities focused on phage isolation and phenotypic characterisation. They will gain practical experience in experimental design, data collection, interpretation of results, and scientific communication.

The project will contribute to expanding and characterising the research group's bacteriophage collection, providing a foundation for future investigations into phage–bacteria interactions, microbial evolution, and potential phage-based applications.