



Technische  
Universität  
Braunschweig

## Masterarbeit

# Research, optimization and implementation of a new phage susceptibility testing protocol with transversal application



### Background

As antibiotic resistance continues to spread among bacteria increasing the complexity of bacterial infections and creating a challenge faced by patients and physicians alike. Bacteriophages, or phages, are viruses that specifically target and kill bacteria. Harnessing phages towards the management of complex infections caused by difficult to treat bacteria, such as *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* or *Enterobacteriaceae*, namely *Escherichia coli*, as replacing or adjuvant therapeutic options has become of great interest. One of the first steps towards this objective is the implementation of an adequate methodology to select for the best phage candidates, and this needs to be tested, optimized and standardized. The European Committee on Antimicrobial Susceptibility Testing (EUCAST) deals with all technical aspects of phenotypic *in vitro* antimicrobial susceptibility testing and aims at extending the application also to phages.

### Objectives

The main goal of this project is to investigate, optimize and implement the most adequate phage susceptibility testing methodology to be standardized and performed *in vitro* using lytic phages initially against key *E. coli* strains with epidemiological relevance. As the project progresses, there is the possibility to extend to other clinically important bacterial species.

### Main methodology

Minimum inhibitory concentration (MIC) technique and variations thereof; Selection of adequate phage candidates (Host range); Selection of adequate target bacteria; Methods required for quantification and efficiency of plating (Spot assay; Plaque assay); Bioinformatic analysis (Sequence alignment and genomic comparison); Basic statistics analysis (ideally using R).

### The group

The Phage group is located at the Leibniz-Institute DSMZ in Braunschweig, Science Campus Braunschweig-Süd. Within the group research focus lies on the investigation of phage diversity and potential therapeutic application.

**Start:** As soon as possible

**Contact:** Dr. Christine Rohde  
Dr. Filipa Martins

**Tel:** 0531-2616-220  
**Tel:** 0531-2616-201

**email:** christine.rohde@dsmz.de  
**email:** ana.filipa.moreira.martins@dsmz.de