Antibiotic resistance is one of the greatest threats to modern medicine, turning common infections into life-threatening conditions caused by "superbugs." One of the most dangerous is *Acinetobacter baumannii*. For this reason, we urgently need new ways to fight bacteria. Nature offers a promising solution: bacteriophages (or phages), which are viruses that act as natural assassins of bacteria.

However, using whole phages as therapy can be risky, as they can sometimes accidentally transfer antibiotic resistance genes between bacteria, making the problem worse. Our project proposes a smarter approach: instead of using the entire virus, we want to learn from it. We will treat phages as a treasure trove of undiscovered molecular weapons and study their attack strategies in detail.

The goal of our project is to identify and understand the molecular tools that phages use to take over and destroy the *A. baumannii* superbug. We will investigate how phages sabotage the bacterium's internal "command center" - its system of genetic instructions (RNA). We will focus on special proteins that act as molecular saboteurs. Specifically, we will study a newly discovered phage protein that we suspect is a key part of its attack, as well as a critical bacterial protein that the host uses to defend itself. Using cutting-edge genetic techniques, we will watch this molecular battle unfold in real-time, mapping every move made by both the attacker and the defender.

The most important expected outcome of this project is not a ready-to-use drug, but something even more fundamental: **a detailed map of the molecular battle between the phage and the bacterium.** This map will highlight the bacterium's weakest points and the phage's most effective weapons. This knowledge will provide a blueprint for future research, paving the way for the design of a new generation of targeted therapies, such as smart drugs that mimic the phage's attack strategy without the risks of using the whole virus.