

## **My Journey in RNA Research: The Intersection with Bacteriophage and Laying the Groundwork for Future RNA Studies**

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**Abstract:** The Ganga River sparked my interest in bacteriophages and their function in preserving water cleanliness, which led me to go on a path into the study. I studied the isolation and characterization of these phages from chicken fecal matter with an emphasis on phage treatment for poultry, to address antibiotic resistance. Knowing the potential significance of our work, together with the encouragement of colleagues and supervisors, kept me motivated in the face of obstacles like contamination.

### **The Beginning**

My journey began in front of the Ganga River in Howrah, West Bengal. My curiosity was piqued by the Ganga's continued purity and untainted state, which is revered by Hindus as sacred water. My curiosity about bacteriophages was piqued when I discovered that they are the unsung heroes responsible for this enduring purity. Later, as part of the coursework for my dissertation, during my master's program. This allowed me to go deeper into the area of phages and concentrate on treating multidrug-resistant (MDR) bacteria in the poultry industry—an issue made worse by the misuse of antibiotics. The emergence of phage treatment as a viable substitute opened up fascinating new directions for the study.

### **The Poultry Project**

The turning point in my journey started when I initiated an effort in aiming to identify and characterize bacteriophages from poultry feces. The final objective was ambitious to create phage therapy as an alternative to antibiotics for treating bacterial illnesses in poultry. This study provided the ideal combination of practical science and basic research, offering a fertile environment for investigating the roles of phage.

### **The Thrill of Isolation and Characterization**

Isolating bacteriophages from poultry feces proved both tough and thrilling. Each sample had a wealth of novel phages. The procedure of enhancing the phage against bacteria whose activity has been seen, filtering out the bacteria, and isolating the phage against a specific strain of bacteria. Each successful isolation seems like a small victory.

We focused on defining these phages to assess their stability under a variety of conditions, including temperature, pH, phage adsorption test, and one-step growth curve. Our goal was to guarantee that the phages could withstand stress while maintaining their capacity to target and kill certain bacteria. Although we did not have enough time to sequence the phages and investigate how they control bacterial machinery, we have included this in our future research plans to reveal the hidden secrets of these interactions. To examine the genetic diversity of the isolated phages, we used RAPD PCR to identify differences between them.

## The Challenges

The journey has been anything but straightforward, with obstacles seemingly playing hide and seek throughout the research process. Working with DNA posed significant challenges, especially in the isolation process from phage-infected bacteria. Contamination remained a persistent adversary, consuming time and depleting valuable resources. Despite these difficulties, what kept me motivated was the potential significance of our findings and the unwavering support from our supervisor and the PhD scholars. While our current focus was on DNA isolation, the complexities of RNA, known for its notorious instability, await us in future endeavours, adding a new dimension to our research.

## Summary

Beginning my research journey by the sacred Ganga River in Howrah, West Bengal, I was captivated by the purity it represents and the role bacteriophages play in preserving it. Moving on to my master's project, I researched phage treatment for treating multidrug-resistant bacteria in the poultry sector, which had been exacerbated by antibiotic abuse. The project aimed to isolate and characterize the phages from poultry excrement, which was both tough and exciting. Despite challenges such as contamination, we concentrated on analyzing phage stability and genetic diversity. Although I have worked with DNA within bacteriophages, I look forward to expanding my exploration into RNA in the future. The skills and insights gained from my work with DNA will provide a valuable foundation as I transition to addressing the unique challenges posed by RNA research. Despite the difficulties, we were inspired by our mentor's encouragement and the potential significance of our study.

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