



Bacteriophage Genomics Services Section Home

History

The discovery of bacteriophages can be traced back to the early 20th century when Félix d Hérelle and Frederick Twort independently observed viruses capable of infecting bacteria. These observations sparked interest in harnessing bacteriophages for treating bacterial infections, a concept known as phage therapy. However, the advent of antibiotics overshadowed this approach for a time. In recent years, as antibiotic resistance has emerged as a global crisis, the potential of bacteriophages as alternatives to antibiotics has regained attention.

Evolution till Date

The study of bacteriophage genomics has evolved in tandem with advancements in DNA sequencing technology. Early isolation and characterization of individual phages have given way to high-throughput sequencing methods, enabling the exploration of entire phage genomes and their diversity. Comparative genomics has revealed the intricate relationships between different phages and their hosts, shedding light on the coevolutionary dynamics that shape microbial ecosystems.

Phage Therapy

Phages are being explored as a potential solution to antibiotic-resistant bacterial infections, offering a targeted and adaptable approach.

2.

Food Safety

Phages are employed to control pathogens like Salmonella and E. coli in food processing environments.

4.

Bioremediation

Phages can target and eliminate specific bacteria, making them valuable agents for environmental cleanup.

6.

Phage Therapy in Agriculture

Bacteriophages are studied for controlling plant pathogens and enhancing crop yield.
8.

Disease Research

Phages are instrumental in studying bacterial virulence factors and pathogenic mechanisms.
10.

Future Prospects

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Phage Engineering

Designing synthetic phages with tailored properties for various applications, including therapy and diagnostics.

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Microbiome Research

Studying phage-host interactions in complex microbial communities to better understand their impact on human health and the environment.

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Phage Therapy Regulation

Developing guidelines and regulations for safe and effective clinical use of phage therapy.

Bacteriophage genomics, a realm once obscured by limited technology and overshadowed by antibiotics, has emerged as a powerful tool with far-reaching implications. From its historical beginnings to modern advances in sequencing and engineering, it promises to revolutionize medicine, industry, and our understanding of microbial ecosystems. As we look ahead, the multifaceted potential of bacteriophage genomics to combat antibiotic resistance, drive personalized medicine, and reshape biotechnology underscores its central role in addressing some of the most pressing challenges of our time.