

Bacteriophages: Genius viruses leading the future of Biotech**Amartya Nandi**

Indian Institute of Technology, India

Bacteriophages or phages are the most abundant organisms in the biosphere and are an omnipresent feature of prokaryotic existence. A bacteriophage is a virus which infects a bacterium and can be used for multiple perspectives in biological sciences. With the capability of better bio-film penetration, they are target-specific in nature, lyse bacteria at the site of infection and can be called as targeted antibiotics in the field of medical science. Phages can be used in agricultural industries, petroleum industries and as bio-control agents. With recent advancement of technologies and techniques, phages can be used as vehicles for vaccine delivery to humans and other mammals. In genetic engineering, they can be used as vectors for horizontal gene transfer. Phages possess good therapeutic and clinical values for cancer and HIV therapies. They are revolutionizing CRISPR-Cas9 resistance and extend the frontier for bio-control and bio-processing. Bacteriophages have the ability to reform modern medical science due to its uniqueness and specificity on pathogens. Many researchers and institutions have taken a step forward and are analyzing phage human interactions at genomic and proteomic levels. We can conclude that future era of biotechnology can be led by these genius viruses which possess a scientific uniqueness in them and leading biological research to new extents.

APPLICATIONS

Phage in Vaccines: With the help of Phage display technique bacteriophages are sequenced to a specific antigen and can further be used as Vehicles for delivery of vaccines, for e.g. PYO Bacteriophagum is used in the treatment and prophylaxis of purulent inflammatory and enteric infectious diseases. **Phage in Agriculture:** Bio control is a process that uses Bacteriophage that acts directly upon bacterial strains like *Xanthomonas pruni* and *Ralstonia solanacearum* to control infections of peaches and tobacco respectively. **Phage Display:** Phage display is a molecular technique used for synthesizing polypeptides with specific characteristics. The DNA that encodes the polypeptide is fused with phage coat protein genes, and the desired protein is expressed on the surface of the phage particle. Filamentous phage M13 of *E.coli* is extensively used in Phage Display. **Phage Typing:** Sensitive and specific detection of bacteria with the help of bacteriophages using sensitivity patterns to precisely identify the microbial strains. **Phage therapy:** Phage therapy is the therapeutic use of bacteriophages to treat pathogenic bacterial infections. **Phage in Food:** Phages can be incorporated in drinking water or food to control *Salmonella* and *Campylobacter* in poultry and by spray to target avian pathogens such as *E. coli*. It can also be taken orally or rectally to control *E. coli* in ruminants.

Biography

Amartya Nandi is affiliated to Indian Institute of Technology. He is a recipient of many awards and grants for his valuable contributions and discoveries in major area of Medical Biotechnology research. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. His research interests reflect in his wide range of publications in various national and international journals.