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# Therapeutic Phage Cocktails

Sandia National Laboratories

## Engineered viruses and phages capable of targeting pathogenic bacterium

**US Patent 11,066, 691**

Technology Readiness Level 4

Pathogenic bacteria have been gradually developing resistance to known antibiotics, which could thwart the effort of preventing catastrophic bacterial outbreak infections.

To control this resistance, certain phages have been evolved to infect each problematic bacterial group. Use of multi-phage cocktails can ensure that no target pathogen cell can escape through development of resistance to any one phage. Sandia researchers have developed bioinformatic algorithms, namely Islander and Comparator/TIGER, that can detect large numbers of phages/viruses integrated silently into bacterial genomes. Both these tools provide precise genomic mapping which allows high retrieval of effective phages/viruses through the unbiased Basic Local Alignment Search Tool (BLAST) search of DNA integrases from the close relatives of targeted bacteria genome. It also includes the ability to prevent phage genome integration into the targeted bacteria genome, yet allows the phage to kill bacteria upon infection due to the genetic deletion of the integrase genes. The generation of diverse phages to combine into a cocktail can effectively eliminate those bacteria.

### Features & Technical Benefits

- Unique approach to target pathogenic bacteria
- Computer-generated models can detect large numbers of bacterial eliminating agents (phages)
- Multi-step strategies to mitigate the risk of bacteria becoming resistant to antibiotics
- Development of phages for therapeutic use

### Industries & Applications

- Bioscience Research Facilities
- Pharmaceutical Industries
- Academic/Medical Research Facilities
- National Health Organizations
- National Security

### Next Steps

Sandia is seeking partners to develop and commercialize this technology. To learn more, contact Sandia National Laboratories' Licensing and Technology Transfer office.

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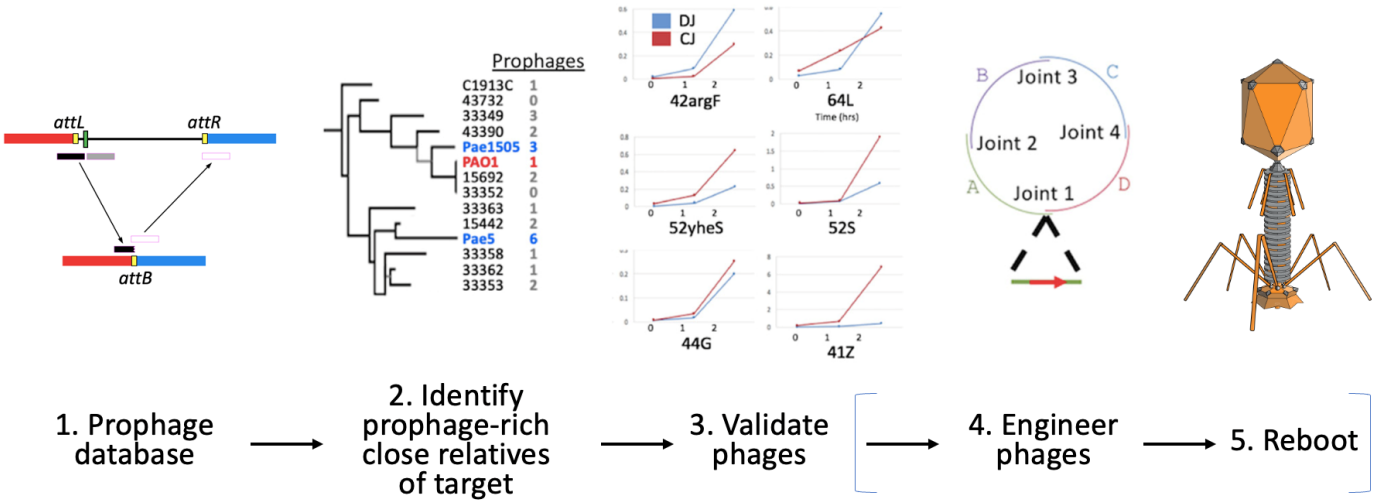
## Technical Figures




*Above: Sandia's phage factory technology can find phages active against any target bacterial strain. Prophages are found in the genomes of close relatives of the target, validated for activity, then engineered to better favor the application.*

## Contact Us SD# 14412

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U.S. DEPARTMENT OF ENERGY NNSA National Nuclear Security Administration

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