PURDUE INNOVATES | Office of Technology Commercialization

Bacteriophage formulations

A novel bacteriophage formulation leverages a unique combination of excipients to achieve superior stability and aerosol performance for potent infection treatment, including against antibiotic-resistant bacteria.

Antibiotic resistance is rapidly becoming a global threat to human health and modern medicine. In 2019, antibiotic resistance was linked to an estimated 1.2 million deaths worldwide (Murray et al., 2022). This problem has been exacerbated by reduced interest of industries in antibiotic development and a decline in the number of new approved antibiotics in recent decades (Ventola, 2015). Bacteriophages are potent antibacterial agents that can replace or complement antibiotics. Researchers at Purdue University have invented a bacteriophage formulation for the treatment of infections. Normally Bacteriophage is unstable during manufacturing and storage; however, this formulation and manufacturing technology achieved superior stability and aerosol performance. By using a unique combination of two excipients, this phage formulation is able to improve both stability and aerosol performance compared to traditional formulation that has a relatively poor stability.

Technology Validation:

Titer loss of Pa 95 phage due to spray drying was determined for single-excipient phage formulations. The Purdue bacteriophage forumulations were good stabilizers of phage, showing less than 1.0 log reduction of Pa 95 phage titer relative to their feed solutions. On the other hand, mannitol and leucine showed > 3.5 log loss of phage titer due to spray drying. Powder X-ray diffraction analysis showed that spray dried of the Purdue formulations showed negligible crystallization while those of mannitol and leucine were highly crystalline.

Advantages:

-Effective against both treatable and antibiotic-resistant bacteria.

-Superior stability

-Superior aerosol performance

Technology ID

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Category

Pharmaceuticals/Pharmaceutical Packaging & Delivery Systems
Pharmaceuticals/Computational Drug Delivery & Nanomedicine
Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies
Pharmaceuticals/Drug Delivery & Formulations
Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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Applications:

-Phage therapy

-Infection treatment

TRL: 4

Intellectual Property:

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