Bacteriophage Based-Vaccine System

Summary
Scientists at the National Cancer Institute (NCI) have developed an engineered bacteriophage lambda (λ) vector for displaying antigens to be used as a vaccine in treatment of cancers and infectious diseases. The NCI seeks licensing and/or co-development research collaborations for further development of the Bacteriophage based-vaccine system.

NIH Reference Number
E-113-2021

Product Type
• Vaccines

Keywords
• Vaccine, Cancer Vaccine, Infectious Diseases, Bacteriophage Engineering, Bacteriophage Genetics, Lambda Vector, Phage Therapy, Recombineering, Adhya

Collaboration Opportunity
This invention is available for licensing and co-development.

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Description of Technology
Vaccines have become one of the most important tools in the fight against cancers and infectious diseases. However, some vaccines have shown limitations due to their high cost and low immune responses. To overcome these limitations, bacteriophages were proposed for the development of more cost-effective, immunogenic vaccines. Phages have shown a strong ability to activate innate and adaptive immune systems. The genome of these viral particles can be engineered, and their surface proteins can be exploited for antigen display.

Researchers at National Cancer Institute (NCI) developed an engineered bacteriophage lambda (λ) vector for displaying antigens as a vaccine in the treatment of cancer and infectious diseases. In this technology, a nucleic acid sequence encoding a fusion protein linked to a heterologous antigen is inserted into a native gene D locus adjacent to gene E in the bacteriophage lambda genome. The researchers have also constructed several
phages in the λ prophage vector system to display different fusion proteins as candidate vaccines representing several human diseases like human Chronic Lymphocyte Leukemia disease and malaria.

Researchers at NCI seek licensing and/or co-development research collaborations for further development of the Bacteriophage based-vaccine system

**Potential Commercial Applications**

- Vaccine in the treatment of cancer and other infectious diseases
- Method for rapid production of bioengineered bacteriophage lambda for vaccine development

**Competitive Advantages**

- Novel way to generate multivalent vaccine antigens against various cancers and infectious diseases
- Inexpensive to produce compared with competing technologies
- Can stimulate innate immune and therefore potentially act as a natural adjuvant
- Can be stored and shipped at ambient temperatures

**Inventor(s)**

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**Development Stage**

- Prototype

**Patent Status**

- **U.S. Provisional:** U.S. Provisional Patent Application Number 63/289,018, Filed 13 Dec 2021

**Therapeutic Area**

- Cancer/Neoplasm
- Infectious Diseases

**Updated**

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