SALMONELLA-BASED GENE DELIVERY VECTORS AND THEIR PREPARATION

Tech ID: 25612 / UC Case 2011-096-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,394,541	07/19/2016	2011-096

BRIEF DESCRIPTION

Nucleic acid-based gene interference technologies, including ribozymes and small interfering RNAs (siRNAs), represent promising gene-targeting strategies for specific inhibition of mRNA sequences of choice. A fundamental challenge to use nucleic acid-based gene interfering approaches for gene therapy is to deliver the gene interfering agents to appropriate cells in a way that is tissue/cell specific, efficient and safe. Many of the currently used vectors are based on attenuated or modified viruses, or synthetic vectors in which complexes of DNA, proteins, and/or lipids are formed in particles, and tissue-specific vectors have been only partially obtained by using carriers that specifically target certain cell types. As such, efficient and targeted delivery of M1GS sequences to specific cell types and tissues in vivo is central to developing this technology for gene targeting applications.

Invasive bacteria, such as Salmonella, possess the ability to enter and transfer genetic material to human cells, leading to the efficient expression of transferred genes. Attenuated Salmonella strains have earlier been shown to function as a carrier system for delivery of nucleic acid-based vaccines and anti-tumor transgenes. Salmonella-based vectors are low cost and easy to prepare. Furthermore, they can be administrated orally in vivo, a non-invasive delivery route with significant advantage. Thus, Salmonella may represent a promising gene delivery agent for gene therapy.

Scientists at UC Berkeley have developed a novel attenuated strain of Salmonella, SL101, which exhibited high gene transfer activity and low cytotoxicity/pathogenicity while efficiently delivering ribozymes, for expression in animals. Using MCMV infection of mice as the model, they demonstrated that oral inoculation of SL101 in animals efficiently delivered RNase P-based ribozyme sequence into specific organs, leading to substantial expression of ribozyme and effective inhibition of viral infection and pathogenesis. This strategy could easily be adopted deliver other gene targeting technologies.

SUGGESTED USES

- In vitro and in vivo delivery of gene interference agents
- Delivery to spleen, liver and lungs
- Develop gene based anti-viral and anti-cancer drugs
- Vaccine development

ADVANTAGES

- Low Virulence and pathogenicity
- High delivery efficiency
- Oral delivery
- SL101 can be easily modified to develop other non-immunogenic strains

CONTACT

Terri Sale
terri.sale@berkeley.edu
tel: 510-643-4219.

INVENTORS

» Liu, Fenyong

OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
» Genomics
» Industrial/ Energy
» **Materials & Chemicals**
» Biological
» Chemicals
» **Medical**
» Delivery Systems
» Devices
» Gene Therapy
» Screening
» Therapeutics
» Vaccines

RELATED CASES

2011-096-0

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Kaposi Sarcoma Associated Herpesvirus Gene Function and Methods for Developing Antivirals, Anti-KSHV Vaccines, and KSHV Based Vectors

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University of California, Berkeley Office of Technology Licensing
2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
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