



TECHNOLOGY

System to Assemble Influenza Virus and Other Pathogens Inside Host Cells for Vaccine Applications

OVERVIEW

Background

According to the CDC, “over a period of 30 years between 1976 and 2006, estimates of flu-associated deaths in the United States range from a low of about 3,000 to a high of about 49,000 people”. The unpredictable nature and severity of influenza viral infections necessitates the use of vaccines every season to receive comprehensive coverage. Flu Vaccines can be in the form of either inactivated or Live Attenuated forms. Live Attenuated Influenza Virus (LAIV) Vaccines offer the advantage of efficient and effective immunization compared to the inactivated form. However, according to WHO, “if an influenza pandemic were to occur, the potential vaccine supply would fall several billion doses short of the amount needed to provide protection to the global population, an estimated 6.7 billion”. Given these time and manufacturing constraints involved in generating vaccines, there is need for a technology that can produce flu vaccines at a large scale and in a timely manner.

Innovative Technology

Researchers at the University of Maryland have developed a strategy for influenza vaccination that exploits in vivo reverse genetics to produce flu vaccines with improved immunogenic capacity. The novelty of this technology lies in the unique delivery mechanism and the in vivo generation of flu virus. The Baculovirus/Bacmid vector allows for streamlining influenza vaccine seed stock preparation by reverse genetics in vitro. In addition, the Baculovirus has the potential for delivery and generation of a live attenuated influenza virus in vivo in the host, obviating the need for amplification and production of influenza vaccines in either eggs or tissue culture. This strategy is suitable not only for orthomyxoviruses (family of flu viruses) but also for other viral or bacterial pathogens.

APPLICATIONS

- If used in vitro, it reduces number of DNA units required for production of influenza vaccine strains by reverse genetics
- Intranasal and/or oral delivery of a recombinant baculovirus carrying a reverse genetics competent LAIV
- Applicable to the delivery of other live attenuated vaccines against other pathogens

ADVANTAGES

- Highly immunogenic compared to currently available vaccines with inactivated or attenuated viruses.
- Generates a neutralizing immune response against influenza.

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive or non-exclusive license

CATEGORIES

- Vaccines

EXTERNAL RESOURCES

LS-2013-024