Therapeutics & Vaccines

Safer Influenza Vaccine from Replication-Knock Out Virus

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WARF: P110003US02

Inventors: Yoshihiro Kawaoka, Gabriele Neumann, Makoto Ozawa

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods for generating live, attenuated influenza vaccines that elicit strong immune response without causing disease symptoms.

Overview

Influenza viruses instigate annual global epidemics. The first influenza pandemic in 40 years occurred during the 2009-2010 season, when a novel H1N1 strain emerged and spread worldwide. The United States alone witnessed an estimated 61 million cases and more than 12,000 deaths. Influenza can resist drugs and bodily defenses because it is prone to mutate.

Vaccination is one of the most effective countermeasures. Two types are currently available. The 'flu shot' is an inactivated (killed) vaccine. It is considered safe but confers short-term protection with limited efficacy, especially in young children and the elderly. Nasal sprays are live, attenuated influenza vaccines (LAIVs). They are more potent and updated annually, featuring genetic segments derived from several mutated strains.

However, LAIVs are approved in a limited number of countries and solely for individuals aged two through 49 who lack chronic conditions, are not pregnant and do not have compromised immunity. LAIVs are considered less safe because they may cause some disease symptoms and carry the very small risk of reverting back to a fully infectious form. New vaccines need to address these issues.

The Invention

UW–Madison researchers have developed methods for generating novel influenza vaccines that can elicit robust immune response without the risk of symptoms or genetic reversion.

The recombinant influenza A virus is made to lack the genetic sequence necessary for replication in normal host cells. Specifically, the coding region of PB2 viral RNA can be deleted, disrupted or replaced with a harmless reporter gene useful for tracing during cell culture preparation. With the mutant gene segment, the virus is 'biologically contained'—capable of replicating only in specially developed PB2-expressing cells.

Applications

- New influenza vaccines
- Basic and applied virology research

Key Benefits

- More effective than inactivated vaccines
- Addresses safety concerns
- Low risk of symptoms or genetic reversion

- Unlike virus-like proteins (VLPs), PB2-knock-out contains RNA and enhances immune response.

Additional Information

Related Technologies

- For more information about recombinant influenza viruses for vaccines and gene therapy, see WARF reference number P99264US.

Related Intellectual Property

- View Continuation Patent in PDF format.

Tech Fields

- Drug Discovery & Development : Drug production & design
- Therapeutics & Vaccines : Vaccines

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854