



EUROPEAN
COMMISSION

Community Research

EU-FUNDED RESEARCH PROJECT

Designing a nasally administered universal influenza vaccine (Universal Vaccine)

Time of action: UNIVERSAL VACCINE started in June 2005

EU budget (funding): €1.2 million

Abstract

One of the biggest challenges concerning influenza vaccination is trying to keep up with the virus' mutational variation. The currently approved vaccines work by stimulating the body's immunity against the haemagglutinin and neuraminidase proteins on the virus' surface. As these proteins are prone to mutation, vaccines only induce immunity against specific subtypes of the virus.

However, the influenza virus has a third protein in its outer coat, M2, and the extracellular domain of this protein, M2e, has been remarkably conserved in the amino acid sequence since human influenza virus was first isolated in 1933. If this protein could stimulate an adequate immune response it might be possible to develop a broad-spectrum vaccine against all influenza A subtypes.

Previous research has shown that when the extracellular domain of M2 (M2e) is linked to appropriate carrier particles, such as the hepatitis B virus core, it becomes highly immunogenic, inducing antibodies that fully protect mice against a potentially lethal influenza infection.

Swedish biotech company Arexis AB has teamed up with researchers at the Flanders Interuniversity Institute for Biotechnology in Ghent (BE), who initially worked on the M2 protein, and a number of European SMEs and the University of Goteburg to develop what could become the first universal vaccine for influenza. It could provide life-long immunity against the virus and thus provide far greater protection in the event of a pandemic. It may even help to eradicate the disease in humans.

Another feature of this vaccine is its nasal administration. For respiratory diseases like influenza it is beneficial to bring the vaccine to where it is most needed to stimulate a local immune response and nasal vaccination may help to induce stronger or more lasting immunity in recipients. Furthermore, needle-free nasal sprays are safer and easier to administer, reduce the risk of contamination – and are far less likely to deter people from participating in vaccination programmes.

The unique combination of the three SMEs for the rational design of a mucosal influenza vaccine is unprecedented in European vaccine research. If the universal vaccine proves successful in clinical trials it will not only help to diminish the social and economic costs of influenza, but also secure the growth and development of the European vaccine industry in the global market.

Status (January 2006)

The project has only just started so is in a preliminary stage.

Project coordinator

Dr Björn Löwenadler
Arexis AB

List of partners (listed countrywise). Coordinator will only give out names and other contacts upon request

SE – Arexis AB, Göteborg
NL – Pepscan Systems BV, Lelystad
UK – Proxima Concepts Ltd, London
BE – Eurogentec SA, Seraing
BE - Flanders Interuniversity Institute for Biotechnology (VIB), Ghent
SE – Göteborg University, Göteborg

Website

www.universolvaccine.org