



EUROPEAN
COMMISSION

Community Research

EU-FUNDED RESEARCH PROJECT

Live attenuated replication-defective influenza vaccine (FLUVACC)

Time of action: FLUVACC started in September 2005 and is scheduled to end in August 2009

EU budget (funding): €9.2 million

Abstract

Industrial production of influenza vaccine still relies on 18th century techniques. Essentially, chicken eggs are used as mini vaccine factories. They are injected with live influenza virus and incubated for several days so the virus can multiply. The egg is then opened, the virus harvested, purified and inactivated. Unfortunately, highly pathogenic avian viruses do not grow well in eggs as they tend to kill the cells instead.

There are many other problems associated with egg-based production. The whole process is time intensive and hard to scale up so that during a pandemic it may be difficult for supply to meet demand. In addition, the combination of vaccine with egg proteins can also lead to allergic reactions in some people.

The FLUVACC aims to shift vaccine production away from the traditional methods by generation of live attenuated-replication deficient vaccines that can be produced in cell culture. Instead of using egg-produced, viral proteins, live attenuated vaccines contain whole replication deficient viruses that generate a strong immune response, but are non-pathogenic.

FLUVACC has improved the core technology for live attenuated vaccine production, using a technique called reverse genetics. One of the project partners, Green Hills Biotechnology, has already developed a 'master strain' that is missing a gene which is essential for viral replication. Candidate vaccines for emerging influenza subtypes can be quickly produced by inserting their genes into this vector so that they express the immunogenic surface proteins, but remain replication-deficient. This strain grows in tissue culture, rather than chicken eggs, making it possible to scale up production easily during an emergency.

With this process in place, the FLUVACC partners have put it to the test, using the technology to develop an intranasal vaccine against pandemic influenza. The resulting vaccine candidates were evaluated in chickens and ferrets, cell culture production of the most promising candidate was scaled up, and the live attenuated virus harvested and purified. After toxicological evaluation, clinical studies will be performed in healthy volunteers.

The FLUVACC project involves four SMEs and four research organisations.

Status (January 2006)

Clinical trials of the candidate vaccine are expected to begin in Spring 2006.

Project coordinator

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AT – Green Hills Biotechnology Research Development Trade GmbH, Vienna
DE – GPC Biotech AG, Munich
SI – Bia Separations d.o.o., Ljubljana, Slovenia
CZ – Biotest s.r.o., Konarovice
RU – Institute of Influenza
AT – Medical University of Vienna
DE – Robert Koch Institute, Berlin
AT – Weikom & Network, Vienna

Website

http://www.greenhillsbiotech.com/products_fluvacc.html