



DEVELOPMENT OF FLUBLOK, A RECOMBINANT INFLUENZA VACCINE PRODUCED IN INSECT CELLS

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Introduction. There is a need for a reliable, rapidly available supply of seasonal and pandemic influenza vaccine. Flublok®, a recombinant hemagglutinin (HA) vaccine produced in insect cell culture using the baculovirus expression vector system (BEVS) provides an attractive and viable alternative to the egg-based influenza vaccine manufacturing process and was approved by the US FDA in January, 2013.

Methods. The HA genes from the annual WHO recommended and US FDA ratified influenza strains are rapidly cloned into our baculovirus vector using modern molecular biology methods. The recombinant baculovirus vectors are used to infect our *expresSF+* cells, and the recombinant HA is expressed, purified, and formulated into the vaccine. The process does not require live influenza virus or adaptation of the influenza virus for growth in eggs or other cell substrates

Results. Because no adaption to influenza virus growth in eggs is required, the cloned rHA can be an exact match to circulating influenza viruses. BEVS technology is a flexible and scalable technology and is a modern solution for rapid viral antigen production. An overview of influenza vaccine and the BEVS production system will be provided. Regulatory challenges surrounding the licensure of a novel vaccine produced in a new cell substrate will be discussed. These challenges include the qualification of a novel cell substrate, pre-approval inspection by regulatory authorities, the inherent challenges in producing a seasonal vaccine, process validation, and analytics and stability.

Conclusions. As a pandemic solution for manufacturing viral antigens, the BEVS system allows for rapid production and scale up as well as transfer to facilities worldwide. This technology is particularly suitable for influenza where annual adjustment of the seasonal vaccine and rapid response to pandemic influenza are required

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