# Composition and Methods for Small Pox Treatment

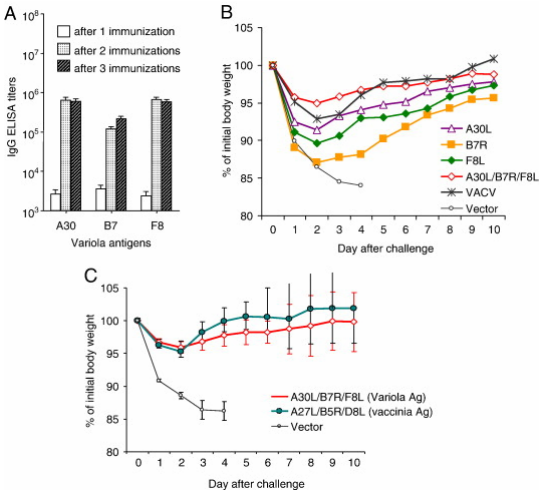
**Keywords:** Small pox, Vaccinia, Virus, Vaccine, Proteins, Plasmid

## Background

The CDC classifies smallpox as a Category A agent, a designation given to diseases believed to pose the greatest threat to public health. Vaccines are the only means of effective protection against small pox infection. Current vaccines are made with live vaccinia viruses, closely related to Small pox virus. There are serious side effects and risks associated with the live vaccines in general and pox vaccine in particular. In addition, Smallpox vaccination provides high level immunity for 3 to 5 years and decreasing immunity thereafter (CDC). Hence, there is immediate need to develop and maintain a stockpile of an effective vaccine with minimal side effects.

## Technology

Developed by UMass Medical School Professor Dr Shan Lu and colleagues, the technology is comprised of codon-optimized DNA vaccines expressing three Vaccinia virus (VARV) antigens (A30, B7 and F8) and their recombinant protein counterparts. The vaccine elicited high-titer, cross-reactive, VACV neutralizing antibody responses in mice. Vaccinated mice were protected from intraperitoneal and intranasal challenges with VACV. The experimental data provide proof of concept for developing a subunit smallpox vaccine based on VARV antigen sequences to induce immunity against poxvirus
infection.




***Reference:*** **Sakhatskyy *et al Virology*** (2007) 350, 34

## Application

Microbial vaccine against Small Pox Virus

## Salient Features and Competitive Advantages

- ***Robust and Specific Immune Response***: Like live vaccine DNA vaccines generate Cell based (MHC class 1) and Antibody (MHC II) responses without the risk associated with live viral vaccines
- ***Safety.*** Contain no viral components that may cause unwanted immune responses, infections, or malignant and permanent changes in the targeted cells' genetic makeup,
- ***Repeat Administration.*** DNA vaccines contain no viral components that may preclude multiple dosing with a single product or use in multiple products,
- ***Longer Shelf Life.*** DNA is more *thermo-stable* compared to *live/attenuated* viral vaccines
- ***Broad Applicability*****.** DNA vaccines may be useful in developing vaccines for infectious diseases, novel therapies for cancer, and therapeutic protein delivery,
- ***Cost-Effectiveness.*** DNA will be cheaper to manufacture in a shorter time period as compared to current vaccines.
- ***Market Potential***: The global vaccine market is expected to top $10 billion this year and $23.8 billion by 2012

## Business Opportunity

UMass OTM is seeking statements of interest from parties interested in licensing and/or sponsoring collaborative research to further develop, evaluate, or commercialize this technology.

.

## Address

Kevin Lehman, PhD
Licensing Officer
UMass Medical School
Phone: (508) 856-5494;Fax: (508) 856-1482
E-mail: Kevin.Lehman@umassmed.edu