

OMV vaccine platform for plague, anthrax and *Pseudomonas*

Improving treatment and protection for drug resistant pathogens

Background:

The global burden of infectious diseases remains a significant challenge, with the plague, anthrax, and *Pseudomonas aeruginosa* infections continuing to pose serious public health threats. The plague still occurs in certain regions, with outbreaks leading to high mortality if left untreated. Anthrax is a persistent concern, both as a naturally occurring disease in livestock and a potential bioterrorism threat. *Pseudomonas* causes chronic infections in immunocompromised patients and those with cystic fibrosis, complicated by its antibiotic resistance. While vaccines exist for plague and anthrax, they are

limited in availability, effectiveness, and breadth of protection, with gaps in coverage for high-risk groups and limited efficacy against emerging strains, sometimes only used in emergency situations. Moreover, there are no effective vaccines for *Pseudomonas*, which demands a broad-spectrum prevention strategies to reduce morbidity and mortality, especially in vulnerable populations.



<https://www.fda.gov/vaccines-blood-biologics/vaccines>

Technology:

Scientists at Albany Medical College have developed a promising vaccine platform using a *Yersinia pestis* platform. By synthesizing monophosphoryl lipid A (MPLA) to enhance the viability of bacterial outer membrane vesicles (OMVs), they created a new vaccine platform. A balanced-lethal host-vector system was designed to overproduce a *Y. pestis* antigen, increase its presence in OMVs via the Type II secretion system, and remove harmful factors, improving efficacy. Vaccines with MPLA-enriched OMVs and higher antigen levels showed reduced toxicity, providing complete protection in mice against subcutaneous and intranasal challenges, and outperformed current vaccines in mice models.

Intellectual Property

US20220280628A1, US11167019, US12214030

Technology Readiness

Available for Licensing

Ready for stage 1 clinical trials

Advantages:

- Improved efficacy
- Less toxic
- Effective against recent mutant strains
- Lower reactogenicity

Applications:

- Vaccine against, the plague, anthrax, *Pseudomonas aeruginosa*, drug resistant pathogens

For inquiries please contact
techtransfer@amc.edu
Office for Translational Research
Albany Medical College, Albany,
NY

