ascenion Technology transfer for academic research
A company of the LifeScience Foundation

REFERENCE NUMBER TO 15-00601

Prophylactic Multi-Subunit Vaccine against *Chlamydia trachomatis*

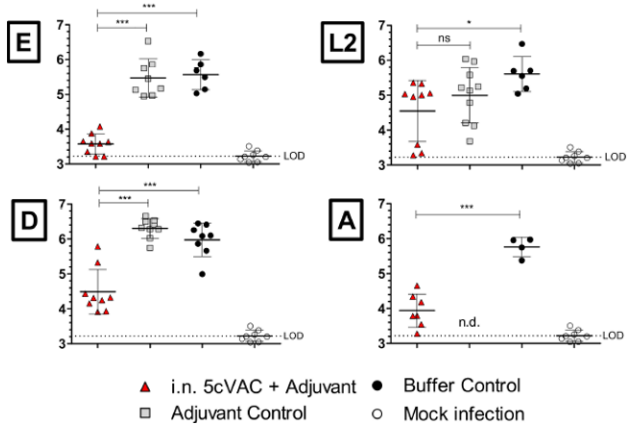
Keywords: Chlamydia trachomatis, adjuvant, c-di-AMP, sexually transmitted disease, Ctad1, polymorphic membrane protein, Pmp

INVENTION NOVELTY

Despite significant research efforts over the last seven decades to establish a vaccination strategy against *Chlamydia trachomatis*, most vaccine development programs have been unsuccessful. Scientists of Hannover Medical School, Helmholtz Centre for Infection Research, and Heinrich Heine University Düsseldorf in a novel approach now developed adjuvanted multi-component subunit vaccine 5cVAC against *C. trachomatis* that elicits a high level of protection after nasal application. Notably, in a mouse lung infection model 5cVAC established cross-serovar protection against *C. trachomatis* serovars E and D from the urogenital, L2 from the lymphogranuloma, and serovar A from the trachoma biovar. Moreover, long-lasting 5cVAC-specific antibodies and T cell responses have been found in the vaccinated animals.

VALUE PROPOSITION

C. trachomatis is a major cause of sexually transmitted disease in developed countries. According to WHO, there were 130 million new cases in 2015, and due to different serovars, *C. trachomatis* can repetitively infect the same person. Besides painful and difficult to treat pelvic inflammation, 1 out of 200 urogenital infections leads to permanent tubal infertility. A successful cross-serovar vaccination against *C. trachomatis* therefore is of great medical and societal need.



Bacterial load up to 100 fold lower in mouse lungs on day 7 of challenge infection with serovars E, D, L2, A after intranasal vaccination with adjuvanted 5cVAC (Lanfermann et al. modified)

TECHNOLOGY DESCRIPTION

Four recombinant Pmp family-members and Ctad1 from *C. trachomatis* serovar E, all of which participate in adhesion and binding of chlamydial elementary bodies to host cells, were combined with the mucosal adjuvant cyclic-di-adenosine monophosphate (c-di-AMP). Intranasal application led to a high degree of cross-serovar protection against urogenital and ocular strains of *C. trachomatis*, which lasted at least five months. Critical evaluated parameters were body weight, clinical score, chlamydial load, a granulocyte marker and the cytokines IFN-γ/TNF-α in lung homogenate. Vaccine antigen-specific antibodies and a mixed Th1/Th2/Th17 T cell response with multi-functional CD4+ and CD8+ T cells correlate with protection.

COMMERCIAL OPPORTUNITY

The technology is available for co-development or licensing.

DEVELOPMENT STATUS

Vaccine candidate 5cVAC has been successfully evaluated in a mouse vaccination-lung challenge infection model.

PATENT SITUATION

European application EP4032545A1 with priority of 2021 is pending.

FURTHER READING

Lanfermann et al. (2021) Prophylactic Multi-Subunit Vaccine against Chlamydia trachomatis: In Vivo Evaluation in Mice. Vaccines (Basel) 2021 Jun 6;9(6):609. doi: 10.3390/vaccines9060609.

Medizinische Hochschule Hannover

Ascenion GmbH
Herzogstraße 64
D-80803 München
info@ascenion.de
www.ascenion.de

Licensing Contact
Dr. Ralf Cordes
Technology Manager
T: +49 511-5328 921
cordes@ascenion.de

Last updated May 2023