Chlamydia trachomatis infection remains the most common sexually transmitted disease and is a significant public health concern due to its asymptomatic presentation and potentially serious long-term consequences at the tissue and organ level. Understanding the control and spread of disease would be of great benefit for the development of an effective prophylactic vaccine.

The ideal vaccine would be comprised of Chlamydia antigens that can stimulate both Th1 and Th2 cytokine responses. Several B cell antigens have been shown to be protective in vivo, yet Th1 vaccine success may be improved through the identification and inclusion of additional T cell antigens. A screening approach was developed to identify novel T cell antigens in Chlamydia. Preliminary immunogenicity studies were conducted with purified recombinant CT111, CT144, CT242, CT823 and CT327 combined with the SEVAC® adjuvant AS01B. Antigen specific T cell immunogenicity was determined by IFN-γ ELISPOT and as assessed for antigen specific IgG and IgG2c to T cell responses with a T cell antigen present in human Chlamydia patients.

Methods

Protein expression and purification. Cells were grown in 75 cm² flasks and transferred into 20 mL cell culture bottles (50 mL 90% YSC, 10% NCM. 1% glutamine). Cells were induced at an OD of 0.5 and harvested at 18 hr after induction. The supernatants were harvested from each flask by centrifugation at 4°C and then washed with PBS and centrifuged at 4°C and 1,000×g for 10 min. The supernatants were then collected and 10% glycerol was added to the solution. The proteins were stored at -80°C until use. The proteins were thawed and concentrated using Centricon concentrators (Millipore) and then purified by Ni²⁺-NTA agarose chromatography. The proteins were then dialyzed into PBS. The concentration was determined using Nanodrop (Thermo Scientific) and stored at -80°C until use. The concentration was determined using Nanodrop (Thermo Scientific) and stored at -80°C until use.

Conclusions

The results of these studies provide the basis for further work in identifying the protective T cell antigens present in human Chlamydia patients.