This is a repository copy of *Recombinant polymorphic membrane protein D in combination with a novel, second-generation lipid adjuvant protects against intra-vaginal Chlamydia trachomatis infection in mice.*

White Rose Research Online URL for this paper: http://eprints.whiterose.ac.uk/102465/

Version: Accepted Version

Article:
Kaye, Paul orcid.org/0000-0002-8796-4755, Lacey, Charles John Nash orcid.org/0000-0001-9250-2638, Paes, William Neville Wayne et al. (6 more authors) (2016) Recombinant polymorphic membrane protein D in combination with a novel, second-generation lipid adjuvant protects against intra-vaginal Chlamydia trachomatis infection in mice. Vaccine. ISSN 0264-410X

Reuse
This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here: https://creativecommons.org/licenses/

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.
Figure 1. rPmpD-specific cytokine responses following immunization with different vaccine formulations in C57BL/6 mice. Splenocytes were harvested and stimulated with rPmpD two weeks after the final immunization (A, C, E) or six weeks post-challenge (B, D, F), and assessed for IFNγ, IL-5 or IL-10 secretion. SLA formulation-specific differences in cytokine profiles are observed. The results are expressed as the mean ± the standard deviation for groups of 5 mice measured in triplicate from two experiments (*P ≤ 0.05, **P ≤ 0.01, ***P ≤ 0.001 relative to PBS-immunized mice).
Figure 2. rPmpD-specific IgG1 and IgG2c responses following immunization with different rPmpD vaccine formulations in C57BL/6 mice. Anti-rPmpD serum IgG1 and IgG2c titres were measured two weeks following penultimate and final immunisations (A, C) or six weeks post-challenge (B, D). Results are expressed as the geometric mean ± the standard deviation for groups of 5 mice measured in triplicate, and are representative of two separate experiments. (* P≤0.05, **P≤0.01).
Figure 3. Immunization with rPmpD elicits robust cervico-vaginal antigen-specific IgG titres. C57BL/6 mice were immunized with all rPmpD formulations and mucosal anti-rPmpD IgG1 (A) and IgG2c (B) titres were measured at the indicated time points prior to Ct challenge. Results are expressed as the geometric mean ± the standard deviation for groups of 5 mice measured in triplicate, and are representative of two separate experiments. (C) Data are also shown as IgG2c:IgG1 titre ratios two weeks following final immunization, and are representative of two separate experiments (*P≤0.05). Data shown are for the same animals as in Fig.2.
Figure 4. Reactivity of anti-rPmpD and anti-UVEB serum. Serum from mice immunized with rPmpD (A) or UVEBs (B) was tested for reactivity against each antigen in western blots. (C) Anti-rPmpD serum reacts with UVEBs in an indirect ELISA (inset shows reactivity against rPmpD). (D) Anti-UVEB serum failed to react with rPmpD (inset shows reactivity against UVEBs). Dotted lines represent the OD\textsubscript{450} cut-off value equivalent to the mean plus two standard deviations of control pre-immune serum.
Figure 5. Infection curves showing bacterial shedding following challenge of vaccinated mice. C57BL/6 mice were infected intra-vaginally with Ct serovar D/UW3/Cx three weeks post final immunization with either rPmpD or Ct serovar E/Bour UVEBs (positive control). Individuals were swabbed on days 1, 3, 7, 14 and 22 post infection, and recoverable cervico-vaginal IFU assessed on Hak cell monolayers. Culture-negative mice were assigned a cut-off value of <10 IFU. Formulation- and antigen-specific differences in time to complete resolution of infection are observed. Results are expressed as the mean ± the standard deviation for groups of 5 mice.
Figure 6. Quantification of vaccine elicited protection against Ct challenge. (A) Resistance to infection was assessed by swabbing individuals on day 1 and determining recoverable IFU on Hak cell monolayers. (B) Total bacterial load over the 22 day time period was quantified by integrating the area under the shedding curves (depicted in Fig.5) for individual mice. Data were analysed using a one-way analysis of variance (ANOVA) for groups of five mice. Significance values displayed are relative to PBS-immunized mice (*P ≤ 0.05, **P ≤ 0.01, ***P ≤ 0.001).