Intramuscular Priming and Intranasal Boosting Induce Strong Genital Immunity Through Secretory IgA in Minipigs Infected with Chlamydia trachomatis - DTU Orbit (27/04/2019)

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International efforts in developing a vaccine against Chlamydia trachomatis have highlighted the need for novel immunization strategies for the induction of genital immunity. In this study, we evaluated an intramuscular (IM) prime/intranasal boost vaccination strategy in a Göttingen Minipig model with a reproductive system very similar to humans. The vaccine was composed of C. trachomatis subunit antigens formulated in the Th1/Th17 promoting CAF01 adjuvant. IM priming immunizations with CAF01 induced a significant cell-mediated interferon gamma and interleukin 17A response and a significant systemic high-titered neutralizing IgG response. Following genital challenge, intranasally boosted groups mounted an accelerated, highly significant genital IgA response that correlated with enhanced bacterial clearance on day 3 post infection. By detecting antigen-specific secretory component (SC), we showed that the genital IgA was locally produced in the genital mucosa. The highly significant inverse correlation between the vaginal IgA SC response and the chlamydial load suggests that IgA in the minipig model is involved in protection against C. trachomatis. This is important both for our understanding of protective immunity and future vaccination strategies against C. trachomatis and genital pathogens in general.

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