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Title: Dermatophagoïdes Farinae 1 (Der f1) vaccine in a mice model of allergic asthma

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Body: Allergic asthma is a chronic, inflammatory, respiratory disease caused by an abnormal reactivity against allergens. Currently, treatments are based on specific immunotherapies, but may have potential deleterious side effects. Among new modalities of immunotherapy currently in development, DNA vaccination presents a promising approach. DNA vaccination enables specific immunotherapy in association with reduced allergenicity. The aim of this study was to investigate the immunological mechanisms involved in Dermatophagoides farinae 1 (Der f1) DNA vaccination in our murine model of allergic asthma due to house dust mites. For this purpose, mice have been vaccinated in a prophylactic mode with intramuscular administration of a Der f1-encoding plasmid formulated with the block copolymer 704. Then, allergic asthma was induced by sensitization and intra-nasal provocations with total extract of mite. Our data show that vaccination with Der f1 DNA does not improve respiratory function in our model of asthmatic mice. Pulmonary and broncho-alveolar infiltrate were more important in Der f1 vaccinated mice with a specific Th1 immune response characterized by 1) lymphocytes recruitment, 2) increased IFN γ secretion and 3) an increased IgG2a rate. However, vaccination with Der f1 also induces a Th2 immune response, marked by an increased of IL-4, IL-5 and IL-13 cytokines. Der f1 DNA vaccination with 704 vector induces in our asthma model, a specific humoral and cellular response unable to protect mice. These results could be explained by the vector itself, the amount of DNA administered and the particular immunological context of our model of asthma.