The role of flame retardants in indoor dust in potentiating/facilitating allergic responses to inhaled allergens ESR12

At UvA in collaboration with VU, this project will test the hypothesis that FRs present in indoor air and/or dust can act as an adjuvant for the induction of immune responses against indoor allergens. This hypothesis is based on the observation that both indoor exposure to FR and the prevalence of asthma have increased tremendously over the last decades. In atopic asthma, allergens, like house dust mite, provoke an aberrant immune response. The ESR will investigate the potential immunomodulatory role of flame retardants to facilitate or aggravate the immune response to inhaled allergens in a murine asthma model. A set of FRs representing different chemical classes (e.g. brominated, organophosphorous) will be selected based on their relevance for human exposure. Underlying mechanisms of FR-related immune responses will be elucidated using transgenic and knockout mice, flow cytometry, ELISA, histology and in vitro co-cultures of immune cells. Allergenic markers for exposure to flame retardants will be identified and their prognostic value for allergenic potencies of individual compounds will be studied in vitro. Finally, the potency to induce an allergic response will not only be determined for pure compounds, but also for allergen-free extracts from house-dust samples or reconstituted mixtures reflecting FR-profiles in real-life house-dust samples. There will be substantial collaboration with ESRs 10 and 11.