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Effects of Allergens: Beyond IgE

Trompette A, Divanovic S, Visintin A, et al.: Allergenicity resulting from functional mimicry of a Toll-like receptor complex protein. *Nature* 2009, 457:585–588.

Barrett NA, Maekawa A, Rahman OM, et al.: Dectin-2 recognition of house dust mite triggers cysteinyl leukotriene generation by dendritic cells. *J Immunol* 2009, 182:1119–1128.

Rating: •Of importance.

Introduction: Allergens can induce allergic inflammatory responses and facilitate IgE antibody responses through activation of innate and adaptive immunity.

Aims: In these two animal models, novel mechanisms of immune response to common environmental allergens from *Dermatophagoides farinae* (Df), *Dermatophagoides pteronyssinus* (Dp), and *Aspergillus fumigatus* (Asp) were examined.

Methods: In the study by Trompette et al., interactions between the house dust mite allergen Der p 2 and the Toll-like receptor (TLR4) signaling complex were examined. Barrett et al. studied the generation of cysteinyl leukotrienes by dendritic cells in response to Df, Dp, and Asp.

Results: Trompette et al. found that Der p 2 facilitates signaling via its interaction with the TLR4 complex and acts as an “auto-adjuvant.” Barrett et al. demonstrated that lung CD11c⁺ cells generate cysteinyl leukotrienes in response to Df extracts, and the response is mediated via the dectin-2 receptor.

Discussion: These studies demonstrate that allergens can act as auto-adjuvants to upregulate IgE synthesis. Some may also lead directly to inflammatory mediator generation in the absence of specific IgE.

Comments

Der p 2 is a lipid-binding protein with homology binding to MD-2 (LY96), the lipopolysaccharide component of the TLR4 complex. Trompette et al. showed that Der p 2 can replace the functionality of MD-2 and then act as an auto-adjuvant. Because many major allergens are thought to be lipid-binding proteins as well, this suggests that the intrinsic adjuvant activity of such proteins and their lipids may be a fundamental mechanism for their allergenicity.

Barrett et al. demonstrated that activation of dectin-2, a c-type lectin receptor, by extracts of Df results in innate immune cell products (cysteinyl leukotrienes) that promote allergic inflammation. The results of these interesting experiments enhance our understanding of the mechanisms involved in allergic responses and may ultimately lead to novel therapeutic approaches.

Acknowledgment

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Disclosure

No potential conflict of interest relevant to this article was reported.