The T Cell Response to Major Grass Allergens Is Regulated and Includes IL-10 Production in Atopic but Not in Non-Atopic Subjects

Background: The incidence of allergic diseases is increasing in industrialized countries and the immunological mechanisms leading to tolerance or allergy are poorly understood. Cytokines with suppressive abilities and CD4(+)CD25(+) regulatory T cells have been suggested to play a central role in allergen-specific responses. The aim was to determine whether major grass allergens induce production of suppressive cytokines in allergic and healthy subjects and to examine the inhibitory effect of these cytokines on allergic responses. Methods: Peripheral blood mononuclear cells (PBMCs) were isolated from healthy and grass-allergic donors and stimulated with the major grass allergens Phl p 1 or Phl p 5. The effects of endogenous IL-10 and/or TGF-beta on proliferation and cytokine production were determined by use of blocking antibodies. In addition, the number of CD4(+)CD25(+) T cells and their expression of chemokine receptors were investigated by flow cytometry. Results: Phl p 1 and Phl p 5 induced IL-10 production, which down-regulated proliferation and cytokine production, in PBMC cultures from atopic but not from non-atopic donors. Comparable frequencies of CD4(+)CD25(+) T cells were present in PBMCs in the two groups, but fewer cells from atopic donors were CD4(+)CD25(+)CCR4(+) and more cells were CD4(+)CD25(+)CLA(+) compared to healthy donors. Conclusion: Allergen-specific responses of grass allergic patients but not in non-atopic subjects are influenced by regulatory cytokines produced in response to the important allergens. Differences in CD4(+)CD25(+) T cell expression of chemokine receptors in allergic compared to non-atopic donors could suggest that the homing of CD4(+)CD25(+) T cells is important for the regulation of allergen-specific responses.