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Title: Recombinant human pulmonary surfactant protein-D (rhSP-D) modulates Th2 responses and suppresses IgE-facilitated allergen binding to B cells

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Body: Background: Recombinant fragment of human surfactant protein-D (rhSP-D) has been shown to suppress allergic inflammation in murine models. We hypothesized that rhSP-D suppresses ex-vivo grass pollen induced PBMC proliferation and suppresses CD23-mediated IgE-facilitated allergen binding (FAB) by B cells to Th2 cells. Method: PBMCs and sera were obtained from grass pollen allergic individuals (n=6). Ex-vivo Phleum pratense (5µg/mL)-driven PBMC proliferative response was measured by 3H-thymidine incorporation assay. Binding of rhSP-D to Phleum pratense extract was examined by indirect ELISA and Western blotting. Allergen-IgE complexes binding to CD23-enriched B cells pre-treated with rhSP-D was assessed by IgE-FAB assay. Results: Grass pollen-driven PBMC proliferative response was significantly increased following ex-vivo allergen-stimulation (5µg /mL). This proliferative response was suppressed in the presence of 5µg /mL rhSP-D. Interestingly, rhSP-D was shown to bind Phleum pratense in a dose-dependent manner. This binding was calcium-dependent and was inhibited in the presence of 5mM EDTA. Western blot analysis indicated 3 binding sites of rhSP-D to Phleum pratense extract. The binding of allergen-IgE complexes to B cells was reduced by 44%, when CD23-enriched B cells were pre-treated with rhSP-D. This decrease in allergen-IgE binding to B cells was associated with reduction in CD23 expression of B cells. Conclusion: rhSP-D supresses ex-vivo allergen induced proliferative response and interferes with the co-operative binding of allergen-IgE complex to B cells.