been identified in the airway epithelium and BAL in human and murine allergic airway inflammation. While its effector function is incompletely understood, our preliminary experiments lead us to propose that IL-16 is a naturally occurring modulator of Th2 cell-mediated airway inflammation.

Prior experiments have demonstrated that IL-16 interferes with antigen recognition and Th2 cytokine production by CD4+ cells. We tested the hypothesis that IL-16 down-regulates Th2-mediated immune responses in the murine ovalbumin sensitization and challenge model. T cells isolated from ovalbumin-sensitized mice that had been treated systemically with IL-16 had markedly diminished antigen-induced IL-5 release (Fig 1). IL-16 had a similarly inhibitory effect on the response to aerosol allergen challenge. There was lower BAL eosinophilia (mean 14 x 10^3 vs 163 x 10^3 per sample) and airway inflammation from mice treated intratracheally with IL-16 prior to each ovalbumin challenge. In order to correlate physiologic with inflammatory responses, we measured airway reactivity to methacholine in ovalbumin-sensitized and challenged mice treated with IL-16 or vehicle. Ovalbumin-induced airway hyperresponsiveness (AHR) was diminished by intratracheal IL-16 treatment (Fig 2). These results were corroborated with the finding of augmented AHR in ovalbumin-sensitized and challenged IL-16 knockout mice compared to wt littermate control mice.

We conclude that there are corresponding immunomodulatory effects of IL-16 on allergic airway inflammation in vivo to those seen on CD4+ T cells in vitro. These observations suggest that IL-16 and related compounds may offer a novel therapeutic approach to allergic airway inflammation and AHR seen in asthma.

Learning Occurs With Repetitions of Inspiratory Loading*

Stasia Jastrzembski-Wieber, MD, FCCP; Marc Lavietes, MD, FCCP; Art Bitter, PhD; Tom C. Banwell, MD; John Ricci, PhD; and Neil S. Cherniack, MD

*From the University of Medicine and Dentistry of New Jersey, Newark, NJ.
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Correspondence to: Stasia Jastrzembski-Wieber, MD, FCCP, 150 Bergen St, UHI334, Newark, NJ 07103; e-mail: jastrzsa@umdnj.edu

Learning Occurs With Repetitions of Inspiratory Loading*

The goal of this study was to determine whether sensations of dyspnea would change when inspiratory resistive loads were applied on several consecutive days in healthy subjects. We hypothesized that learning occurs with repetitions of inspiratory loading and would cause dyspnea to attenuate with repeated exposure to the same load.

We recruited four study groups, each with five subjects. All subjects underwent normal spirometry. Subjects breathed through a snugly fit facemask, and a one-way valve separated inspiratory and expiratory airflow. Airflow, frequency, and volume were measured continuously. Each

Figure 1. Effect of intratracheal IL-16 treatment on AHR. Penh = enhanced pause.

Figure 2. Effect of intratracheal IL-16 treatment on AHR. Penh = enhanced pause.
Identification of Birch Pollen Respirable Particles*

Philip E. Taylor, PhD; Richard Flagan, PhD; Ann G. Miguel, PhD; Rudolf Valenta, MD; and M. Michael Glovsky, MD

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Trees in the birch family, including alder, hazel, and birch, have wind-pollinated flowers that produce copious amounts of pollen and are a major cause of allergic rhinitis. How their pollen allergens cause asthma has been a mystery because pollen grains are too large to be inhaled into the airways where asthma occurs. Over the past 20 years, studies showed that episodes of pollen-induced asthma occurred during the flowering season, especially after periods of rainfall or thunderstorm. Immunologic studies revealed that abundant quantities of micronic respirable allergens were released into the air remained unknown. Recently, we have shown that for flowering grasses, pollen remains on the open anthers in the absence of wind or other disturbances. If wetted, pollen can rupture within minutes.1 Fragmented cytoplasm is emitted through the pore region of the pollen grain. Drying winds release this cytoplasmic debris as a respirable allergen-loaded aerosol.

A similar mechanism results in the release of respirable allergen-loaded aerosol from birch flowers. However, birch pollen requires at least 3 h of wetting, and may germinate within the anther, prior to rupture. Other submicronic particles, such as orbicules and interorbicular structures, are also released from the anther surface; however, immunoblots show that they are not loaded with birch pollen allergens. Less than 5% of particles released in the size range of 30 to 500 nm are interorbicular structures. Particles of fragmented cytoplasm in the size range of 30 nm to 4.5 μm are released from birch pollen grains and emitted into the air. The small size of these particles suggests that they can readily deposit in the lower airways.

REFERENCE


Regulation of Phospholipase A2 by Interleukin-1 in Human Airway Smooth Muscle*

Rudolfo M. Pascual, MD; Bharat K. Amsare, MD; Stephen A. Farber, PhD; Reynold A. Faninetti, Jr, MD; Stephen P. Peters, MD, FCCP; and Raymond B. Penn, PhD

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Abbreviations: COX = cyclooxygenase; cPLA2 = cytosolic phospholipase A2; HASM = human airway smooth muscle; IL = interleukin; PLA2 = phospholipase A2

Treatment of human airway smooth muscle (HASM) with interleukin (IL)-1β alone or in combination with serum or growth factors is known to induce cyclooxygenase (COX)-2 and prostaglandin E2 synthesis, an effect presumably under-

*From the Department of Medicine, Jefferson Medical College, and Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, PA.

Correspondence to: Rudolfo M. Pascual, MD, Thomas Jefferson University, Division of Critical Care, Pulmonary Medicine, Allergic and Immunologic Diseases, Suite 805 College Bldg, 1025 Walnut St, Philadelphia, PA 19107; e-mail: Rudolfo.Pascual@mail.tju.edu