“Regulation of Allergic Sensitization and Inflammation”

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Dr Maria A. Curotto de Lafaille joined SIgN in November 2009 to establish a research group on allergy. Her interest in allergic responses developed at the NYU School of Medicine, where she generated a new mouse model of hyper IgE and asthma. She received her PhD in Immunology from the University of São Paulo, Brazil, and did her postdoctoral training at the Harvard School of Public Health in Boston.

Research Focus: Allergic conditions now affect more than one in four people worldwide, and allergic inflammation underlies much of the pathology of these diseases. The Th2 subset of lymphocytes and IgE antibody production by B-cells are both key components in the development of allergy, and the focus of this group is to try and understand the regulation of these arms of immunity. We have already revealed that the development of IgE B-cells in mice follows a unique pathway, and we now wish to deepen our understanding of the biology of IgE cell differentiation and the mechanisms responsible for IgE cell memory. In the case of physiological Th2 responses, severe tissue damage is normally prevented by inducible T regulatory cells (iTregs) that establish a state of immune tolerance. During allergic sensitization the process of tolerance is subverted, so we are studying how this happens and what factors affect the progression of chronic inflammation.

Abstract

Th2 lymphocytes and IgE antibodies are major contributors to the pathology of allergic diseases. We studied mice with high IgE response and found that high-affinity IgE+ cells are generated through a unique differentiation pathway involving sequential switching from IgG1+ cells and swift differentiation into plasma cells. Using mice that had or lack the ability to form peripheral Foxp3+ regulatory T cells (iTregs), we determined that allergen-specific iTregs are essential to establish immune tolerance and to prevent severe lung inflammation. Our lab will use in vivo, cellular and molecular analysis to better understand the mechanisms involved in initiation and persistence of allergic inflammation, and in the determination of IgE cell memory.