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Galectins, glycans and their role in allergic inflammation

Airway allergic inflammation in asthma is characterized by the presence of large numbers of eosinophils in the lungs and airways. Eosinophils can rapidly release inflammatory mediators such as cytokines, chemokines, growth factors and cytotoxic granule proteins upon stimulation, and play a critical role in the pathogenesis of allergic asthma. Identifying key players and understanding the molecular mechanisms that regulate eosinophil trafficking and recruitment to inflamed airways is a key to developing therapeutic strategies to limit their influx and ameliorating allergic asthma. Recent studies have brought to light the important role of glycans and glycan binding proteins in the recruitment of eosinophils. In addition to the role of previously identified eosinophil- and endothelial-expressed adhesion molecules in mediating eosinophil trafficking and recruitment to the inflamed airways, studies have also indicated a role for galectins in this process. Galectins are mammalian lectins expressed by various cell types including eosinophils that interact with β-galactosidase on the cell surface-expressed glycans to regulate cellular responses like production of inflammatory mediators, cell adhesion, migration and apoptosis. Depending on the type (galectin-1, -3, -9 etc.) and location (extracellular or intracellular, endogenous or exogenously delivered), galectins can differentially regulate eosinophil recruitment, activation and apoptosis and exert a pro- or anti-inflammatory outcome. In this presentation, I will discuss the physiologic role of galectins (galectin-1, -3 and -9) in the regulation of eosinophil recruitment and the pro- and anti-inflammatory function of these proteins in the context of allergic asthma.

Biography

P Sriramarao has received his PhD in allergy and immunology from the Indian Institute of Science in Bangalore, India, in 1989. He currently works as a Professor and Associate Dean for Research at the University of Minnesota. His research focuses on understanding the pathophysiology of allergic inflammation including asthma. Using techniques of intravital microscopy and other molecular and cellular approaches, his lab examines the role of glycans and glycan binding proteins, cytokines, chemokines and intracellular signaling events in regulating leukocyte trafficking and allergic inflammation.

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