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Biomarkers of T cell responses in allergic diseases

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A llergic diseases are complex immunological disorders with multiple cellular and molecular alterations in pathways involving both activation and effector function. To rationally evaluate the mechanistic impact of candidate therapies in these diseases, it is essential to illuminate stages of pathogenesis with the help of informative biomarkers. Specific opportunities to develop correlates of immune mediated disease outcome include inappropriate expansion of pro-inflammatory cells and alterations in gene expression pathways reflecting defective homeostasis. There is now extensive support for the concept that allergen-specific TH2 lymphocytes initiate and drive allergic sensitization. However, a major impediment to the use of allergic disease–causing T cells as both therapeutic targets and clinically useful biomarkers is the lack of an accepted methodology to identify and differentiate these cells from overall nonpathogenic TH2 cell types. We have recently described a proinflammatory human TH2 cell subpopulation that includes all allergen-specific TH2 cells. These cells are terminally differentiated CD4+ T cells characterized by coexpression of CR TH2, CD49d, and CD161 and exhibit numerous functional attributes distinct from conventional TH2 cells. In addition, we demonstrated that these cells are confined to allergic individuals and their disappearance is indicative of clinical responses induced by allergen-specific immunotherapy. Hence, we have denoted these cells with this stable allergic disease–related phenotype as the TH2A cell subset. Further detailed studies focusing on the TH2A cell subset may prove useful in the diagnosis, molecular characterization, or the discovery of novel therapeutic targets to enhance the power of allergen vaccines.

Biography

Erik Wambre received his PhD in Immunology from the University Paris-6 and his Master's degree in Business Engineering (MBE) from the Ecole de Biologie Industrielle (Cergy). He joined the Benaroya Research Institute in 2009 and completed his Postdoctoral fellowship, subsequently became an Associate Member. The projects in his laboratory are focused on understanding cellular and molecular mechanisms contributing to pathogenesis, regulation and functions of the adaptive immune system in disease pathways. The overarching aim of his lab is to generate the knowledge necessary to inform better vaccine design and to develop clinically meaningful biomarkers.

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