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## **Mechanisms in the induction of airway inflammation mediated by invariant natural killer T cells**

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### **Abstract**

Invariant natural killer T (iNKT) cells are innate-like T cells that recognize glycolipid ligands instead of peptides. They rapidly produce a broad range of T helper (Th)1, Th2, and Th17 cytokines after activation, leading to mediate their effector functions resulting in bridging innate and acquired immunity. Even though various allergic and pathogenic conditions are known to be controlled by distinct subtypes of iNKT cells, their phenotypes and functions are not completely understood. We previously identified IL-17 receptor B (IL-17RB), a receptor for IL-25, preferentially expressed on a fraction of iNKT cells. IL-25 is known to be a key factor in Th2 immunity, including allergic reactions and airway hyperreactivity (AHR). The IL-17RB<sup>+</sup> iNKT cell subtypes are abundantly present in the lung in the steady state and produce robust IL-13 but little IFN- $\gamma$  in response to IL-25, mediating a key role in allergen/IL-25-driven AHR. We then investigated the role of IL-17RB<sup>+</sup> iNKT cells in the pathogenesis of virus-induced AHR, which is known to be different from allergen-induced AHR. Certain viruses, such as respiratory syncytial virus (RSV), Sendai virus, metapneumovirus and parainfluenza virus, cause childhood asthma and COPD-like symptoms, which include AHR, airway inflammation and mucus hypersecretion. However, it has been difficult to understand how such symptoms develop, even long after the apparent clearance of viruses. The IL-17RB<sup>+</sup> iNKT cells also contribute to the induction of RSV and viral antigen-induced AHR independent of IL-25. The molecular and cellular cascades which play important roles in the pathogenesis of airway diseases will be discussed.