The identification of ILC2 has changed the concept of type 2 immune diseases

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Group 2 innate lymphoid cells (ILC2s), which we identified in 2010, play an important role in type 2 immune system such as allergies, parasitic infections, and fibrosis. ILC2 are tissue-resident cells, and derived from common lymphoid progenitor, similar to other lymphocytes such as T cells and B cells. While T cells are activated by antigen, ILC2s are activated by cytokines, lipids, and hormones, and produce variety of type 2 cytokines. IL-5 and Eotaxin production from ILC2s induces eosinophilia and production of IL-13 induces secretion of mucin as well as airway hyperreactivity. GM-CSF from ILC2s involves in bone homeostasis, and IL-4 induces unique IgE production from B1 cells and increases allergic sensitivity. Over the past ten years, many research groups have joined this research field and identified new immune responses that are regulated by ILC2s. In particular, the importance of ILC2s in allergic diseases has received a fair amount of attention and new evidence indicates that allergic disorders occur not only from allergen-specific pathways but are also induced by allergen non-specific pathways due to ILC2 activation. Since it has become clear that ILC2s cause various type 2 immune diseases, research to suppress ILC2s and development of drugs targeting ILC2s have been actively conducted. In this talk, I would like to introduce the latest research on ILC2 and also talk about how we identified ILC2s.