

NCCS scientists get new insights into how immune system works

By Sunderarajan Padmanabhan

New Delhi, February 17: The immune system of the body is a well-regulated system, comprising several components. This includes various T helper (Th) cells, such as Th1, Th2, regulatory T (Treg) cells, etc., which help to regulate immune responses by releasing cytokines.

Cytokines are biological signaling molecules that facilitate communication between cells of the immune system, and stimulate the movement of these cells towards sites of infection, inflammation or trauma. Interleukin-3 (IL-3) is one such cytokine secreted by T cells. Dr. Mohan Wani and his research group at NCCS in Pune, have previously demonstrated that IL-3 has anti-inflammatory and immunomodulatory properties; and that IL-3 protects bone and cartilage loss in vivo in arthritic mice by upregulating regulatory T (Treg) cells.

These results suggest that IL-3 has a regulatory role in T-helper (Th) cells. It was also demonstrated by them that mice Treg cells express IL-3 receptor (IL-3R), and IL-3 enhances the differentiation of naive Th cells into induced Treg cells. All these observations were made in mice, and there are no reports on the role of IL-3 in development and functions of human Th cells.

In the study reported by Dr. Wani and his group in the Journal of Immunology, they investigated the regulation of IL-3R expression on human Th cells and also examined the role of IL-3 in the effector functions of Th cells.

They found that resting human Th cells constitutively express IL-3R at transcript and intracellular protein levels but not on the surface. The surface expression of IL-3R was detected only after antigenic stimulation, which was significantly increased by IL-4. Thus, this study provides the first evidence that the expression of IL-3R on activated human Th cells is modulated mainly by IL-4, and that IL-3 regulates the effector functions of Th2 cells. These results collectively suggest that IL-3 may play an important role in regulating allergic immune responses.

Dr. Mohan Wani and his group have published a report in the Journal of Immunology titled 'IL-3 Receptor Expression on Activated Human Th Cells Is Regulated by IL-4, and IL-3 Synergizes with IL-4 to Enhance Th2 Cell Differentiation'. The study team included Anil Kumar, Lekha Rani, Suhas T. Mhaske, Satish T. Pote, Shubhanath Behera, Gyan C. Mishra, and Mohan R. Wani.

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