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Editorial Overview

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This volume of *Current Opinion in Immunology: Lymphocyte Effector Functions* highlights lymphocytes or lymphocyte functions that often fall outside the mainstream of immunological research. First, although CD4+ regulatory T cells (Tregs) have been studied extensively, CD8 + cells having similar functions have also been noted [1,2]. As reviewed in the first article in this volume by Jerry Niederkorn, these cells can prove critical in maintaining tolerance in certain organs and under particular conditions, including the normal eye, patients with multiple sclerosis, and in mice, in certain lung tumors and perhaps in chemically induced carcinomas as well. In the second article, Frances Lund has reviewed results from many studies pointing to the importance of B cells as producers of cytokines [3], apart from their role as the source of immunoglobulin. B cells producing type 1 (Be-1 cells), type 2 (Be-2 cells), and suppressive cytokines (Bregs) have been noted, most of which appear to arise from follicular B cells. The appreciation of such “effector B cells” is particularly timely in that B cell depletion as a therapy for various autoimmune disorders has now become common. In the third article, reports on the development of cytolytic T cells expressing CD4 rather than CD8 are reviewed for the human system by Rene van Lier. Though such cells have been noted in both mice and humans, Dr. van Lier summarizes evidence that in humans, the role of cytomegalovirus in promoting the development of CD4+ cytolytic T cells appears to be critical [4]. In the fourth article, recent findings concerning NK cells as lymphocyte effectors in the human system are reviewed by Yenan Bryceson and Eric Long. Activating and inhibitory receptors that have been identified thus far are tabulated, and recent findings examined for how these various signals are integrated within a given NK cell [5]. The fifth article focuses on a flurry of reports published in the last 2–3 years from different sources, showing that in various disease models in which T cells producing IL-17 appear to be of particular importance, the IL-17+ T cells are in large part represented by $\gamma\delta$ T cells, rather than the CD4+ Th-17 cells that have been fairly extensively studied [e.g. [6]]. As summarized here in a review by Christina Roark et al., several different $\gamma\delta$ T cell subsets have been found to produce IL-17. Moreover, differences between IL-17-producing $\gamma\delta$ T cells and Th17 cells suggest that the two cell types are likely elicited via different mechanisms, and that the $\gamma\delta$ T cells provide an early source of IL-17. Finally, the many functions that have been attributed to iNKT cells, as likened to the many functions of a Swiss army knife, are summarized in a sixth review by Laurent Gajon et al. This comprehensive article includes a succinct overview of the characteristics of iNKT cells, and outlines new findings concerning their development [e.g. [7]]. Plausible mechanisms for how a given cell type could have so many different functions are also put forth.

In addition to the roles of more conventional lymphocytes, potential roles of unconventional lymphocytes should also be assessed in the study of any given immune response or disorder. The reviews in this volume will be helpful in suggesting other cell types that, though less-appreciated, may also be potential players in a particular disease or condition.

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Biography

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