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Communication between cells of the immune system ensures an effective immune response is coordinated. Cells can communicate by releasing soluble factors and through molecular interactions at points of cell–cell contact. Some of the diverse mechanisms of immune-cell communication are highlighted in the articles in this special issue and Web Focus (http://www.nature.com/nri/focus/communication).

An immune response is initiated when T cells and antigen-presenting cells (APCs) communicate through the immunological synapse, which is the name given to the region of cell–cell contact. However, as Peter Friedl and colleagues discuss on page 532, T-cell–APC interactions comprise a diverse range of contact modes and distinct molecular arrangements, which determine the type and amount of information that is exchanged between the cells and therefore the response of the T cell.

Integrins regulate cellular adhesiveness and are one of the molecular components of the immunological synapse. Integrin avidity, and therefore cellular adhesiveness, is increased after cellular activation by chemokines or antigen. The signalling cascades that control this increase in avidity (known as inside-out signalling pathways) are reviewed by Tatsuo Kinashi on page 546.

In contrast to cellular interactions, soluble factors provide information about the environment in both an autocrine and a paracrine manner. On page 521, Chris Hunter discusses recent findings that indicate that the cytokines interleukin-23 (IL-23) and IL-27, which are related to IL-12 and were initially thought to have similar properties to IL-12, have distinct functions. In addition, on page 560, Hugh Rosen and Edward Goetzl review the role of the lipid mediator sphingosine 1-phosphate in regulating lymphocyte trafficking and other immune functions, such as the release of inflammatory mediators during allergic reactions.


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