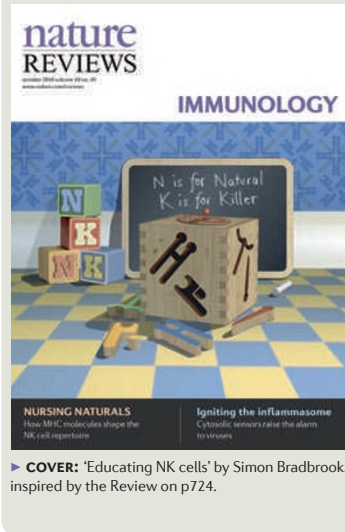




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The mucous membranes of the body directly interface with the external environment and therefore are a point of weakness in the body's physical barrier against external insults. As such, specific innate and adaptive immune mechanisms have evolved to protect mucosal surfaces from infection.

The most commonly studied mucosal surface is the gut, which is constantly exposed to billions of ingested bacteria. However, rather than inhibiting infection with these bacteria, the gut mucosal immune system actively accommodates infection with symbiotic bacteria. The opinion article on p735 describes how the intestinal microbiota can influence the host immune system with both local and systemic consequences.

Less is known about the immune adaptations of the male and female genital tracts and, as Akiko Iwasaki points out on p699, there are many differences between genital and intestinal mucosal immune responses. A greater understanding of innate and adaptive immune mechanisms in the genital mucosae will be essential for the rational design of vaccines against sexually transmitted viral infections, such as HIV, human papilloma viruses and herpes simplex viruses, for which there is currently no cure.

The recent characterization of a specialized subset of T helper cells, known as T<sub>H</sub>9 cells, has led to renewed interest in the functions of their main product, interleukin-9 (IL-9), and the other cell types that produce this cytokine. As discussed on p683, IL-9 has important roles in regulating immune responses at mucosal surfaces by driving mast cell-mediated responses in the lungs and gut. In the gut, IL-9 has beneficial effects in terms of promoting parasite expulsion, but also has a harmful role in autoimmune and allergic responses, which highlights the immune balance that is an essential feature of all mucosal immune responses.

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