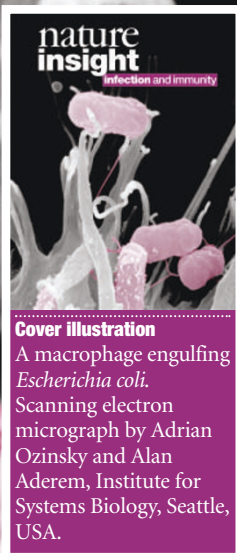


# nature insight

## infection and immunity



Infectious diseases remain a serious medical burden in both developing and industrialized countries. The emergence of new diseases such as HIV/AIDS and severe acute respiratory syndrome (SARS), the resurgence of known diseases such as West Nile disease and multidrug-resistant tuberculosis, and the threat of deliberately developed man-made infections are cause for concern. When vaccines or effective treatments are not available, we rely on the immune system to clear the host of infectious agents and disease. A better understanding of the tactics used by pathogens and of the immune system's defensive armoury is needed to pave the way for improved strategies of prevention and therapy.

The four articles in this Insight provide a snapshot of the issue, addressing in turn the nature and spread of emerging and re-emerging infectious diseases, the assault strategies used by major pathogens, the immediate innate immune response, and the antigen-specific acquired (or adaptive) immune response, which is the host's second line of defence.

David Morens, Gregory Folkers and Anthony Fauci review new and old infectious diseases that pose challenges for public health in the twenty-first century. Scott Merrell and Stanley Falkow discuss the strategies that pathogens use to evade the host's defences and secure their own survival. Bruce Beutler reviews the role of Toll-like receptors (TLRs) in early detection of and defence against pathogens in relation to clinical applications, and discusses how TLRs may contribute to autoimmunity and sterile inflammation. And Marianne Boes and Hidde Ploegh review successive stages of T-cell activation from a cell-biological perspective, discussing how functional data obtained *in vitro* may translate to an *in vivo* setting.

These articles provide an overview of the current status of each field, and consider directions for future research. We are indebted to the authors who contributed to this Insight, and we hope that you will find the reviews informative and stimulating.

**Ursula Weiss** Senior Editor

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