

**Cover illustration**

A human epithelial cell infected with enteropathogenic *Escherichia coli*. (Courtesy of J. A. Guttman, A. W. Vogl and B. B. Finlay.)

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HOST-MICROBE INTERACTIONS

More than a century ago, Robert Koch established that infectious diseases are caused by microbes, a discovery that won him the Nobel Prize in Physiology or Medicine in 1905. At around the same time, Ilya Mechnikov, one of the pioneers of cellular immunology, was the first to recognize that microbes might also have beneficial effects on human health, when he proposed that 'lactic-acid bacteria' can prolong life.

Since then, a tremendous amount has been discovered about encounters between microbes and the animals they colonize — their hosts. Host-microbe interactions are as diverse as the organisms involved: they can be accidental or obligatory; they can result in temporary or persistent intimate associations; and they can involve subtle or intense molecular and cellular responses. But the outcome for the host is simple: health or disease.

In the quest to understand and combat infectious diseases and, more recently, to uncover the basis of non-pathogenic microbial colonization, microbes have been found to produce a multitude of factors that either confer virulence or promote colonization by other means. The actions of these factors are countered by the equally diverse responses of the host immune system. This Insight highlights advances in the study of this dynamic interplay between host and microbe, focusing on humans and bacteria. It also provides an overview of the current understanding of the ecology, evolution, immunology, cell biology and genomics of these interactions. We thank the authors and reviewers, who contributed their time, effort and enthusiasm to this collection.

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Claudia Lupp, Senior Editor

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