Bacterial–Epithelial Cell Cross-Talk
Molecular mechanisms in pathogenesis

An emerging theme in molecular and cellular microbiology has been the ability of many pathogens to usurp the host cell and eventually colonize the host. Microbial pathogens have evolved different ways of interacting with their hosts and possess virulence factors that interfere with or stimulate a variety of host-cell physiological responses. This interaction between bacteria and host is not unidirectional – both pathogens and host cells engage in a signaling cross-talk. Research focused on this cross-talk reveals not only novel aspects of bacterial pathogenesis but also key information about epithelial biology, with broader implications in the prevention and treatment of infectious diseases. Written by leading researchers in the field, this book provides a valuable overview for graduate students and researchers. It details these remarkable host–pathogen interactions, uniquely providing a comprehensive understanding of the host–bacterial interactions that occur at mucosal surfaces, including the gastrointestinal, respiratory, and urogenital tracts.

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Over the past decade, the rapid development of an array of techniques in the fields of cellular and molecular biology have transformed whole areas of research across the biological sciences. Microbiology has perhaps been influenced most of all. Our understanding of microbial diversity and evolutionary biology, and of how pathogenic bacteria and viruses interact with their animal and plant hosts at the molecular level, for example, has been revolutionized. Perhaps the most exciting recent advance in microbiology has been the development of the interface discipline of cellular microbiology, a fusion of classic microbiology, microbial molecular biology, and eukaryotic cellular and molecular biology. Cellular microbiology is revealing how pathogenic bacteria interact with host cells in what is turning out to be a complex evolutionary battle of competing gene products. Molecular and cellular biology are no longer discrete subject areas but vital tools and an integrated part of current microbiological research. As part of this revolution in molecular biology, the genomes of a growing number of pathogenic and model bacteria have been fully sequenced, with immense implications for our future understanding of microorganisms at the molecular level.

Advances in Molecular and Cellular Microbiology is a series edited by researchers active in these exciting and rapidly expanding fields. Each volume focuses on a particular aspect of cellular or molecular microbiology and provides an overview of the area, as well as examines current research. This series will enable graduate students and researchers to keep up with the rapidly diversifying literature in current microbiological research.

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