

Throughout our evolution, we have waged a battle with pathogenic microorganisms. Historical records as well as more recent literature clearly document the devastation that can be caused by infectious agents. In the second half of the century, we witnessed dramatic breakthroughs in the developed world. Public health and sanitation measures, vaccines, and antimicrobial agents have drastically reduced the impact of many microbial pathogens. However, the last two decades have seen optimism turn to caution and marked concern as devastating new infections have spread and well-known diseases have re-emerged. Many bacterial pathogens have become or will become increasingly resistant to antibiotic therapy. In addition, effective vaccine development has proven to be extremely difficult for certain agents such as HIV. Moreover, for a number of reasons, both economical and technical, the benefits of modern control, prevention, and treatment regimens often have not been available to large portions of the world's population. Clearly, new fundamental insights into the interactions between microbial pathogens and the host are needed in order to develop novel strategies for the prevention and therapy of infectious diseases.

Fortunately, advances in the fields of cell and molecular biology, immunology, and molecular genetics are facilitating an explosion of new knowledge in the area of infectious disease pathogenesis. A central development in this field is the realization that the host and the pathogen must be studied together, as an interactive unit. Both the pathogen and the host have significant effects on each other and microbial pathogens can undergo rapid evolutionary changes needed to circumvent host responses that have adverse effects on the pathogen. Pathogenic microorganisms respond to the host environment with a

variety of sensory and regulatory mechanisms leading to the expression of genes required for survival and growth. Certain microbial gene products target host cell signaling pathways, enhancing aspects of the infectious process but also triggering a host response. Advances in eukaryotic cell biology and our understanding of cell surface receptors and signal transduction have been applied to microbial pathogenesis to demonstrate that microorganisms can appropriate or subvert normal cellular processes to serve the needs of the pathogen. Recent developments in the understanding of immune and inflammatory processes have led to new insights into how the host becomes alerted to the presence of a pathogen and into the mechanisms that determine whether the host response will be beneficial or detrimental to the resolution of the infection.

Beginning with the next issue, *The Journal* will present a series of perspective articles (see box below) on recent developments in microbial pathogenesis that highlight selected aspects of "Host/Pathogen Interactions." These articles will focus on the interface between the microbial and host factors that are critical for infection and that modulate or control the resulting disease process. The purpose of these brief perspectives is to address recent findings in the context of the development of general principles and paradigms of microbial pathogenesis and to point to new directions for the prevention and treatment of infectious diseases. Most important, the articles will present major questions and future challenges in a format to stimulate the ideas and involvement of scientists from a variety of disciplines.

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Series Editors

#### "Host/Pathogen Interactions: Understanding the Strategies of Microbial Virulence and Host Defense"

Series Editors, Donald G. Guiney and Martin F. Kagnoff

February 1, 1997	Arthropod and host-specific <i>Borrelia burgdorferi</i> gene expression.....	Erol Fikrig
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