

Preface

Cytokines and chemokines are an important class of effector molecules that play a fundamental role in orchestrating the innate and acquired immune responses needed to eliminate or wall off invading pathogens. In vitro and in vivo studies have been instrumental in revealing the complexity of the cytokine network and the many facets of cytokine biology, such as pleiotropism (i.e., the capacity for a given cytokine to stimulate several cell types) and redundancy (i.e., the ability of different cytokines to exert similar effects). However, the development of sensitive reagents to detect and measure human cytokines and chemokines has provided opportunities to investigate the role of these important mediators in human inflammatory and infectious diseases. Despite many similarities, important differences in cytokine responses and mode of action between human and animal models became evident. A shift in focus from animal to clinical studies was, therefore, inevitable.

In recent years, we have witnessed an outpouring of information on the role of cytokines and chemokines in human infectious diseases. These studies have led to a deeper understanding of the pathogenesis of infectious diseases, an appreciation for differences of cytokine and chemokine production profiles in response to various pathogens, and a realization that genetic host factors influence the type and magnitude of cytokine and chemokine responses to a given microorganism. Our understanding of the immunopathogenesis of specific infections has become much more profound and thorough, and has thus contributed to the design of better and more effective therapeutic interventions for the management of patients with infectious diseases.

While playing a pivotal role in host defense against infection, cytokines also contribute to pathology when released in excessive amounts. Much work, both in academic institutions and in the biotechnology and pharmaceutical industries, has been devoted to the development of cytokine or anticytokine treatment strategies in infectious diseases. Although some strategies have failed, there have been numerous successes that have led to effective interventions for inflammatory and infectious diseases. One reason for the failure of cytokine-based therapies in infectious diseases may have stemmed from a lack of understanding of important differences in cytokine biology in infections caused by different pathogens.

Cytokines and Chemokines in Infectious Diseases Handbook is meant to provide a unique and up-to-date reference on the role of cytokines and chemokines in a variety of human infectious diseases. International leaders in the field present a comprehensive overview of cytokine and chemokine responses in bacterial, viral, fungal, and parasitic infections. Readers will gain a better appreciation for the differences in cytokine profiles in distinct infectious diseases and will see how this knowledge has led to a deeper understanding of host–pathogen interactions, as well as the pathogenetic basis of infectious diseases. In addition, *Handbook of Cytokines and Chemokines in Infectious Diseases* is intended to provide a critical evaluation of the use of cytokines and anticytokines in the treatment of infectious diseases and to demonstrate how knowledge of cytokine pleiotropic effects, redundancy, and the complexity of the cytokine network has impacted the use of cytokines as therapeutic tools.

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