

# Preface

Therapeutic Interventions in the Complement System focuses on the manipulation of complement-system activity in a therapeutic setting. Many basic texts discuss complement and a number of reviews have been published that address specific disease areas; however, no other source offers the comprehensive reviews of therapeutic applications presented here.

We envision that someone who has little if any current knowledge of complement will be able to read our text and come away with substantial insights derived from some of the leading authorities in the area today. This is particularly relevant and timely because there are many investigators with a rudimentary knowledge of complement who are considering entering this area. Through our interactions with scientists from outside the complement field, it is clear that there is a great deal of misinformation regarding this system. Because there are relatively few active experts in the area of complement biology, the ability of an investigator to obtain accurate and timely information from a wide array of research and clinical settings is very limited.

Each chapter in *Therapeutic Interventions in the Complement System* focuses on a specific area of basic and/or applied complement biology. One focus is on critical mediators, such as C5a and C3a, that are generated in the complement pathway. New information on receptors for these important inflammatory mediators is also presented. Other exciting new studies in *Therapeutic Interventions in the Complement System* demonstrate that the membrane attack complex, itself, can activate cells and act as a proinflammatory mediator. Informative animal models are discussed in detail, including the relative values of each and the large potential for important interspecies differences that have obvious relevance to the interpretation of preclinical studies.

In addition to a comprehensive discussion of the activation pathway and complement receptors, *Therapeutic Interventions in the Complement System* presents an up-to-date discussion of the natural complement inhibitors as well as small-molecular-weight complement inhibitors such as compstatin that regulate the activation of this pathway. Recombinant forms of many natural inhibitors are being developed as therapeutics, and pros and cons for the use of each in specific disease settings is discussed.

We believe one particular strength of *Therapeutic Interventions in the Complement System* is its disease-oriented focus. The clinical evidence for the role of complement in ischemia-reperfusion injury is addressed in addition to systemic and organ-specific inflammatory and autoimmune diseases. Here, emerging knowledge about specific complement inhibitors and discussions of the use of such inhibitors in each disease are integrated. Important caveats about infection risk, immune complex alterations, and untoward effects on autoimmunity are also explored.

We have also included a comprehensive section on the major current techniques used in measuring complement. Many methods have previously been utilized, most commonly hemolytic assays, but with the development of new ELISA methods, the potential for high-throughput assay has greatly increased. However, there are many issues regarding the sensitivity and specificity of assays that must be considered, and we review these issues in some detail.

We envision that *Therapeutic Interventions in the Complement System* will be of interest to biotechnologists and scientists—at both large pharmaceutical firms and smaller research laboratories—who have specific interests in pursuing a complement-related project. In addition, clinical investigators will be able to find information pertinent to the use of inhibitors in disease processes and gain insight into measuring complement in various types of clinical trials.

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