



Kenneth J. Ryan / C. George Ray

Champoux • Drew • Neidhardt • Plorde

*Sherris*  
**MEDICAL  
MICROBIOLOGY**

An Introduction to Infectious Diseases



Fourth Edition

4TH EDITION

# SHERRIS *MEDICAL* *MICROBIOLOGY*

AN INTRODUCTION TO INFECTIOUS DISEASES

*KENNETH J. RYAN, MD*  
*C. GEORGE RAY, MD*

EDITORS

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# PREFACE

With this fourth edition, *Sherris Medical Microbiology*, which began almost two decades ago as *Medical Microbiology* (1984), retains the same team as the third edition with some redistribution in assignments. The most significant of these is the decision of George Ray to join Ken Ryan as editor. John Sherris continues to act as an advisor to all of us.

The goal of *Sherris Medical Microbiology* remains unchanged from that of the first edition. This book is intended to be the primary text for students of medicine and medical science who are encountering microbiology and infectious diseases for the first time. The organization is the same as the third edition with basic topics followed by chapters on the major bacterial, viral, fungal, and parasitic pathogens. We have tried to strengthen the pathogen presentation style introduced in the third edition. For each virus, bacterium, fungus, or parasite, the most important features of the organism (structure, metabolism, genetics), the disease (epidemiology, pathogenesis, immunity), and the clinical aspects (manifestations, diagnosis, treatment, prevention) are placed in distinct sections and in the same order. The opening to each of these sections is now marked by an icon for the

organism , disease , or clinical aspects . At the juncture between

the organism and disease sections, a new feature, the Clinical Capsule, has been introduced. This brief snapshot of the disease is intended to orient the first-time reader before they dive into discussions of pathogenic mechanisms. Fourteen brief chapters at the end summarize the relevant clinical, diagnostic, and therapeutic information into the most common clinical infectious syndromes without the addition of new material. It is hoped that these chapters will be of particular value when the student prepares for case discussions or sees patients.

In *Sherris Medical Microbiology*, the emphasis is on the text narrative, which is designed to be read comprehensively, not as a reference work. In this regard all the pathogenic microorganisms we feel are important are included at a level of detail relevant for medical students. Any added detail in tables and figures is for example or explanation and not intended to be learned. Marginal notations throughout the text have been revised to capsule major points as an aid for the student during review. A student scanning the red marginal notes will encounter all the major points in a chapter. If a note looks unfamiliar, the relevant text is immediately adjacent.

An overview chapter on the immune response to infection is included for continuity, but it is assumed this subject will be covered by one of the many excellent immunology

texts available. The chapter on dental microbiology has been updated to serve the needs of dental students.

Much new material has been included, but in order to keep the student from being overwhelmed, older or less important information has been deleted to keep the size of this book approximately the same as the previous edition. As a rule of thumb, material on classic microbial structures, toxins, and the like has been trimmed unless its role in disease will be explained in the following sections. At the same time, we have tried not to eliminate detail to the point of becoming synoptic and uninteresting. For example, adequate explanation of the pathogenesis of an infectious disease may require discussion of the roles played by multiple proteins, genes, and regulators. Where these features form a coherent picture we have tried to tell the complete story, particularly if it is instructive as a general principle. When details such as the names of proteins and genes have been placed in parentheses, it is a sign the authors feel they need not be memorized.

A saving grace is that our topic is important, dynamic, and fascinating. Who could have predicted that AIDS, which occupied less than a page in the first edition, would in the 1990s become the leading cause of death in young American men and, with this edition, enter a period of drug suppression and hope? Gastritis and ulcers attributed to stress in the past are now being cured by antimicrobial therapy directed against *Helicobacter pylori*, but this bacterium has now been officially declared a carcinogen due to additional links with gastric cancer. Just as we were about to hit the presses, an apparently new infectious disease emerged from the Far East in the form of the severe acute respiratory syndrome (SARS). Never a dull moment! These and many other infectious agents and diseases old and new are described and explained in these pages. The student is invited to read them and begin a lifetime of learning in microbiology, infectious diseases, and medicine.

**Kenneth J. Ryan**

**C. George Ray**

Editors

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New illustrations for this edition were prepared under the direction of Becky Hainz-Baxter and Alexander Teshin Associates, whose skill and ability to respond creatively to the diverse needs of this text are gratefully acknowledged. Illustrations prepared by Sam Eng for the mycology and parasitology sections in the first edition have been carried over to this edition, as have many of the illustrations prepared for the second edition by Marilyn Pollack-Senura, and for the third edition by Cindy Tinnes.

Finally, we wish to acknowledge our students, past and present, who provide the stimulation for continuation of this work, and our families who provide the encouragement and support that make it possible.