

Preface

In the First Edition of *Microbiology: An Evolving Science*, we set out to write the defining core text of our generation—the book that would inspire undergraduate science majors to embrace the microbial world. The First Edition's emphasis on genetics and ecology, its use of case histories in the medical section, and the balanced depiction of women and minority scientists, including young researchers, drew enthusiastic responses from our more than one hundred adopters.

In this Second Edition, we have maintained that balance between cutting-edge ecology and medicine, while adding new research topics and emerging pathogens, from cold-seep archaeal-bacterial consortia to emerging *E. coli* pathogens and viral gene therapy. We listened to our adopters and have added topics that they requested, such as the molecular biology of chemotaxis (Chapter 10, Molecular Regulation) and an upgraded treatment of immunology (Chapter 24, The Adaptive Immune Response). We have also made a point to relate topics and discussions to current research and current events to keep students interested and informed on the role of microbiology in the world today. One example is connecting the discussion of catabolism to microbe remediation in relation to the Deepwater Horizon spill of 2010 (Chapter 13, Energetics and Catabolism, and Chapter 22, Microbes and the Global Environment).

We have found that writing this textbook is an ongoing, never-ending process requiring the daily harvesting of new, exciting papers from the literature. For microbiology, as the subtitle of this book states, truly is a rapidly evolving science and we have thoroughly embraced this evolving nature in our writing in order to make this Second Edition even more relevant to today's student.

While we have expanded and developed new topics, we also recognized the need to keep the length and “core” of the book to a size reasonable enough for the undergraduate student. So, we committed ourselves to maintaining the same overall page length as the First Edition. But to contain length while adding new material required an innovative solution, so certain topics, considered less central by adopters, have been transferred online as “eTopics.” The eTopics (available on the StudySpace website at microbiology2.com) are called out in the text, hyperlinked to the ebook, and their key terms are fully indexed in the printed book. Therefore, returning adopters can be confident of still having access to all of the material they taught from the First Edition, but now they also have new sections on infectious biofilms and horizontal transfer of virulence genes (Chapter 25, Microbial Pathogenesis), new concepts of defining bacterial species, such as the pangenome (Chapter 17, Origins and Evolution), and much more to introduce their students to. A complete list of the eTopics can be found at the end of this preface.

In the Second Edition, we continue to present the story of molecular microbiology and microbial ecology in the tradition of its classical history, from Koch and Pasteur to Winogradsky and Beijerinck. But we have also drawn on all of our experience as researchers and educators (and on the input of hundreds of colleagues) to create a microbiology text for the twenty-first century. This Second Edition includes many refinements recommended by colleagues from around the world, at institutions such as Washington University, University of California-Davis, University of Wisconsin-Madison, Florida State University, University of Toronto, University of Edinburgh, University of Antwerp, Seoul National University, Chinese University of Hong Kong, and many more. We are grateful to you all.