

Integrated Molecular Evolution, Second Edition

By Scott Orland Rogers

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Evolutionary biology has increasingly relied upon tools developed in molecular biology that allow for the structure and function of macromolecules to be used as data for exploring the patterns and processes of evolutionary change. **Integrated Molecular Evolution, Second Edition** is a textbook intended to expansively and comprehensive review evolutionary studies now routinely using molecular data. This new edition has been thoroughly updated and expanded, and provides a basic summary of evolutionary biology as well as a review of current phylogenetics and phylogenomics.

Reflecting a burgeoning pedagogical landscape, this new edition includes nearly double the number of chapters, including a new section on molecular and bioinformatic methods. Dedicated chapters were added on:

- Evolution of the genetic code
- Mendelian genetics and population genetics
- Natural selection
- Horizontal gene transfers
- Animal development and plant development
- Cancer
- Extraction of biological molecules
- Analytical methods
- Sequencing methods and sequencing analyses
- Omics
- Phylogenetics and phylogenetic networks
- Protein trafficking
- Human genomics

More than 400 illustrations appear in this edition, doubling the number included in the first edition, and over 100 of these diagrams are now in color.

The second edition combines and integrates extensive summaries of genetics and evolutionary biology in a manner that is accessible for students at either the graduate or undergraduate level. It also provides both the basic foundations of molecular evolution, such as the structure and function of DNA, RNA and

proteins, as well as more advanced chapters reviewing analytical techniques for obtaining sequences, and interpreting and archiving molecular and genomic data.

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Editorial Review

Review

Rogers (molecular biology and evolution, Bowling Green State Univ.) has created an engaging, readable, accessible introduction to the field of molecular evolution. The book is organized in sections that follow a logical progression. A brief discussion of life and the basic features of evolutionary theory is followed by sections on basic macromolecules and cellular processes, Mendelian and population genetics, gene families, means of gene transfer, the developmental processes in multicellular organisms, and methods of molecular analysis and omics. The work ends with chapters devoted to the genomes of various organisms and agents, from viruses through humans. In each chapter, the discussion is tied to how the topic affects or is affected by the process of evolution. Each chapter ends with a summary of key points and contains a list of additional sources. The illustrations are effective and enhance the text. The book will be most useful to readers with a basic knowledge of molecular biology and development, as the background topics are covered in an appropriately succinct fashion.

--M. S. Kainz, Ripon College

Summing Up: Highly recommended. Upper-division undergraduates through faculty. CHOICE

About the Author

Scott Orland Rogers is a professor of molecular biology and evolution at Bowling Green State University, Bowling Green, Ohio. He received his PhD in plant molecular biology from the University of Washington, Seattle. He was an assistant professor and associate professor at the State University of New York College of Environmental Science and Forestry before moving to BGSU. He has taught courses in biology, botany, cell physiology, molecular biology, molecular genetics, bioinformatics, and molecular evolution. Research in his lab includes studies of microbes and nucleic acids preserved in ice, life in extreme environments, group I introns, molecular microbial phylogenetics, microbial metagenomics/metatranscriptomics, ancient DNA, and plant development.

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