

BOOK REVIEW

A Review of *Molecular Diagnostics: Fundamentals, Methods, & Clinical Applications*

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Authors: Lela Buckingham PhD and Maribeth L Flaws PhD

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As stated in the preface, the audience for this textbook is primarily clinical laboratory science students at all levels. However, it also would be well-suited for pathology residents, infectious disease personnel, and other health-related disciplinarians who have a need to understand the purpose, principle, and interpretation of molecular diagnostic testing. Molecular diagnostic laboratory practitioners will find the book to be an excellent reference resource.

The book is composed of three sections and sixteen chapters. Section I, "Fundamentals of Nucleic Acid Biochemistry: An Overview", contains three chapters devoted to 'DNA', 'RNA', and 'Proteins'. Section II, "Common Techniques in Molecular Biology", contains six chapters devoted to 'Nucleic Acid Extraction Methods', 'Resolution and Detection of Nucleic Acids', 'Analysis and Characterization of Nucleic Acids and Proteins', 'Nucleic Acid Amplification', 'Chromosomal Structure and Chromosomal Mutations', 'Gene Mutations', and 'DNA Sequencing'. Section III, "Techniques in the Clinical Lab", contains six chapters devoted to 'DNA Polymorphism and Human Identification', 'Detection and Identification of Microorganisms', 'Molecular Detection of Inherited Diseases', 'Molecular Oncology', 'DNA-based Tissue Typing', and 'Quality Assurance, and Quality Control in the Molecular Laboratory'. Thus, the content represents the service offered by a comprehensive molecular diagnostic laboratory.

Each chapter contains a brief outline of its content, learning objectives, well-suited content, study questions, and references. Answers to study questions are provided in an

appendix. Topical subheadings in each chapter are printed in bold black letters, highlighted green; diagrams are in green and gray. There is a total of 312 illustrations. Key terms are in bold and defined where they first appear. An added benefit to each chapter is separate entries in blocks termed "Historical Highlights" and "Advanced Concepts". The latter should prove to be challenges for those who desire advanced learning and is a bonus for a prospective textbook. In the clinical chapters, case studies with real world applications are provided. If the book is adopted as a text, an instructor's resource package, which contains test generator, image bank, and PowerPoint presentation is available on CD-ROM and the website.

To enhance the book, I would suggest that the number of review questions per chapter be expanded. Perhaps some objective questions could be added. The inclusion of formative assessments, sometimes referred to as concept checks, throughout each chapter would greatly facilitate comprehension of the material. Additionally, the use of concept maps would simplify the complex information.

Students using this textbook should have an adequate background in cell biology, as presented in general biology courses, and chemistry, as presented in general and organic chemistry courses. Thus, a course in molecular diagnostics for CLS students using the book could be best scheduled during the senior year.

The authors have coupled their expertise, both in molecular diagnostics and education strategies, in presenting this first text of its kind. It is gratifying that the need for such a text has finally been fulfilled by such competent professionals.

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