

**Introduction to  
Molecular Medicine**

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Second Edition

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Dennis W. Ross

# **Introduction to Molecular Medicine**

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Second Edition

With 60 Illustrations



**Springer**

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# Preface to the Second Edition

In the four years since the first edition of this book was published, the molecular revolution has continued. DNA has been named by *Time* magazine as the Molecule of the Year, a Nobel Prize has been awarded to a young man for the invention of the polymerase chain reaction, and television viewers have learned of the DNA fingerprint. Molecular technology in medicine is increasing. The availability of DNA probes for cancer susceptibility is stressing our system of insurance, testing our ideas about medical ethics, and teaching us new things about cancer. In this edition, I have added a number of new sections, as well as a new chapter. New examples of molecular medicine have been added to demonstrate current applications of this technology. The basic concepts of molecular biology remain the basis for the first three chapters of the book. The excitement surrounding molecular medicine that I mentioned in the preface to the first edition continues. It is now tinged with a touch of awe and a little bit of fear at the changes that recombinant DNA technology has brought to our society.

# Preface to the First Edition

This book describes the discoveries that have created a field called molecular medicine. The use of recombinant DNA technology in medical research and most recently in medical practice constitutes a revolutionary tool in our study of disease. Probing the human genome is rapidly becoming as routine as looking at cells under a microscope. The cloning of a new gene is now a common occurrence, newspapers report. Recombinant DNA technology, like the invention of the microscope, shows us a world of detail richer than we might have imagined.

This book presents the discoveries, basic scientific concepts, and sense of excitement that surround the revolution in molecular medicine. The scientific basis of molecular medicine is explained in a simple and direct way. The level of technical detail, however, is sufficient for the reader to appreciate the power of recombinant DNA technology. This book is clinically oriented throughout. All of the examples and applications are related to medical discoveries and new methods of diagnosis and therapy. A few subjects within molecular medicine are examined in more detail to allow the reader to become aware of the strengths and shortcomings of a molecular approach to disease. I do not hide the incomplete understanding that still surrounds many of the recent discoveries in molecular medicine.

I intend to demonstrate the concepts of molecular medicine in this book by showing examples from all branches of medicine. I include, for instance, infectious diseases, genetic disorders, and cancer. However, I am not trying to be comprehensive in examining all areas of molecular medicine. So many discoveries are made each week in this field that it is not yet possible to draw them together in a comprehensive volume. My goal is to help the reader understand what the future may hold as well as the most important current applications.

This book is not a treatise, but an informal guide to a new field. As a guide, I try to communicate excitement, because this is the predominant feeling among people working in the field of molecular medicine.

Winston-Salem, NC

D.W.R.

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Short summaries of some of the material in this book have appeared previously in my column "Advances in Science and Pathology," which appears in the *Archives of Pathology and Laboratory Medicine*. I would like to thank the editorial staff of the *Archives* and the American Medical Association for giving me the opportunity to develop my skills in science writing. A number of people have given me valuable suggestions after reviewing draft chapters of this book. I wish to thank them for their time and thought: Susan Atwater, Lanier Ayscue, Phil Carl, Joseph Dudley, Margaret Gulley, Charles Hassell, Edward Highsmith, Roy Hopfer, and William Kaufmann. I must also especially thank Daniel Sinclair, my research technician, for his considerable help on many features of the manuscript including preparing the computer graphics used as illustrations. I also want to thank Sarah Kielar, my secretary, for careful attention to the preparation of the typescript. I also wish to acknowledge most gratefully funding from The Blood Cell Fund, which has supported my work in cancer research and education.

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