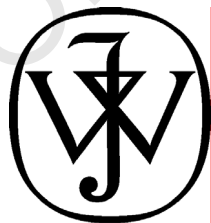


# MOLECULES AND MEDICINE

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## PREFACE

This book is intended for a broad readership, starting with curious and thoughtful college undergraduates and, reaching beyond, to professionals and researchers in the life sciences and medicine. It is hoped that it will also be useful to the educated lay person with an interest in health and medicine.

An effort has been made to integrate chemistry, biology, drug discovery and medicine in a way that is clear and self-explanatory. Heavy use has been made of chemical structures, since they provide a fundamental key to the language of life and the human activities that flow from it. Our age has seen the rapid evolution of molecular medicine as a critical part of the broader fields of health care and biochemical bases of human disease. The understanding of human illness at the molecular level has brought and will bring great benefit to mankind.

There is a price to be paid in any attempt to understand molecular medicine, because that comprehension is greatly aided by the ability to decipher chemical structures which many have regarded as too onerous a challenge. One purpose of this book is to demonstrate that an adequate understanding of chemical structures is within the reach of most educated people, and well worth the effort. The first two parts of this book aim to provide the insights and background required to appreciate the architecture of therapeutic molecules and their target proteins, as they parade though the subsequent pages of this book.

"*Molecules and Medicine*" delves into the discovery, application and mode of action of more than one hundred of the most significant molecules now in use in modern medicine. It is limited to *centamolecules*, i.e. molecules with molecular weights in the hundreds (several hundred times more than a hydrogen atom). The important and rapidly developing area of macromolecular therapy, which involves *much larger molecules* (macromolecules), such as biologically active proteins and monoclonal antibodies, is a different story, and another book.

We have tried to minimize the amount of prior knowledge required of the reader by providing much background information, both chemical and biomedical. An effort has also been made to be concise as well as clear. A large amount of material has been compressed into a small space for each therapeutic agent. Generally, each medicine is allotted just one page. One advantage of this modular arrangement is that it facilitates the reading of the book in small installments and also its use as a reference work. The therapeutic agents in this book are arranged in sections according to the type of medical condition they treat.

There are also numerous sections in the book that provide biomedical background. For instance, there are two-page to eight-page summaries of topics such as inflammation, metabolic syndrome, immunology, drug resistance, cancer and neurotransmission. These are placed at strategic locations throughout the book.

The structural representations of proteins in this book are in the public domain and may be downloaded from <http://www.pdb.org>.

In the process of writing this book we have come to appreciate ever more keenly the enormous amount of human talent and effort that has enabled the extraordinary advances in molecular medicine since its advent several decades ago. To the countless chemists, physicians, biologists, educators and other professionals who have participated in this venture we extend our gratitude and thanks. This book is a tribute to them all.

The writing of this work has also been motivated by the realization that the advance of molecular medicine can be even more remarkable during the coming decades of this century, if a steady flow of dedicated and able young people into all the key areas of research in the life sciences can be maintained. If this book plays just a minor part in enhancing progress in molecular medicine and human well-being, our small effort will have been amply rewarded.