

Preface

The way that a molecular geneticist thinks and works is influenced by his or her knowledge of events on two levels: the biochemical level and the transmission genetics (or mathematical) level. In this book, I have tried to make the uses of these different approaches clear, but to show them as interconnected parts of a whole rather than as distinct disciplines. In order to emphasize this wholeness and to provide a context for both genetical analysis and molecular biological analysis, I have written a broad view of the whole field into the first chapter. The scope of this introduction, which is both historical and theoretical, solves the traditional problem of molecular genetics: molecules make better sense if genes are presented first (as a rationale for studying the molecules), but genes make better sense if they are understood as molecules. The subsequent chapters are then fitted into the context supplied by the introduction.

The core of *Genetics: A Molecular Approach* is a set of eleven chapters suitable for an intensive one-term course for undergraduate biology majors. The student should have had introductory biology and organic chemistry in order to get the most from this text. An additional set of five chapters is included, which could be used either to supplement a one-term course, to make the length of the book appropriate for a semester course, or to facilitate a student's independent study in related areas. These chapters are focused on the interfaces between molecular genetics and other biological fields.

In the examples chosen to illustrate general principles, I have tried to select whichever system illustrates the principle most clearly. Wherever several equivalent examples exist, I have chosen a higher eukaryote for the detailed exposition. It seems to me that molecular genetics is moving more and more toward explorations of eukaryotic organisms, and I would like the examples to make these systems familiar and accessible to students entering the field. Parasexual mapping, DNA sequencing, and animal virus genetics, major efforts in current research, have been made vital parts of this book rather than optional afterthoughts.

The references are intended to serve as sources for further information, particularly for students beginning research or writing papers in areas related to the

chapters. Thus, both classic treatments and up-to-date research papers are listed. The problems, many of which have been especially written for this book, are an intrinsic part of the learning experience.

I hope that *Genetics: A Molecular Approach* will give the students a sense of the excitement as well as the analytical power of molecular genetics, and that he or she will want to do some related experiments as a result.

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