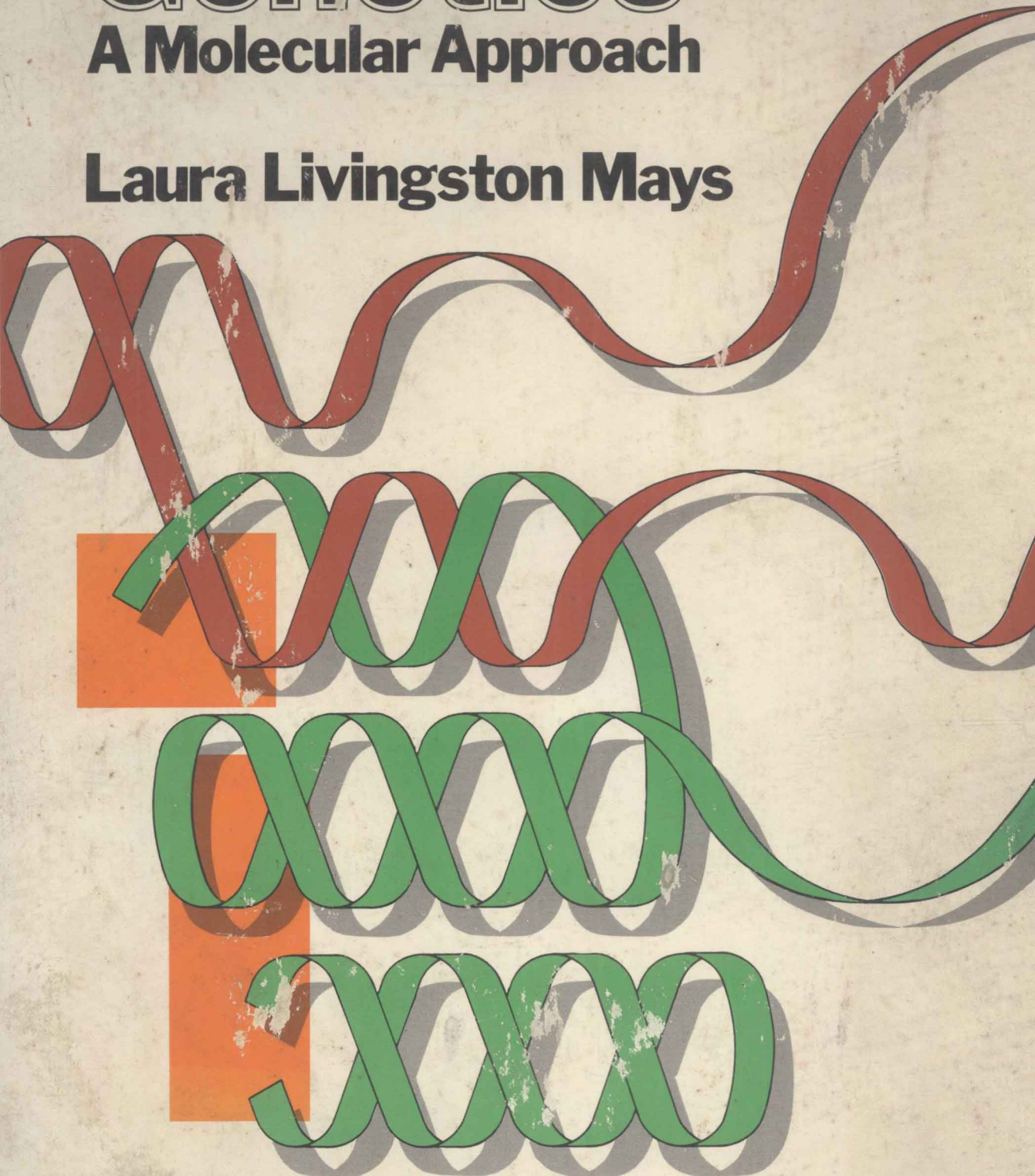


# Genetics

## A Molecular Approach

**Laura Livingston Mays**



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## **A MOLECULAR APPROACH**

**Laura Livingston Mays**

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# Genetics

**This book is dedicated to Lyle Mays  
and to the memory of Richard Mays.**



# 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.

L.L.M.

# Contents

## PART ONE

### Introductory Overview

# 1

## What Is a Gene?

5

### 1.1 Mendelian Genetics 5

1.1.1 Mendel's View of the Gene 5

1.1.2 Mendel's Law of Segregation of Alleles 6

1.1.3 Mendel's Law of Independent Assortment of Genes 8

1.1.4 Elaborations of Mendel's Gene View 11

### 1.2 A Gene Is a Chromosome Segment 14

1.2.1 Contrast Between the Two Types of Cell Division: Mitosis and Meiosis 14

1.2.2 Sex Chromosomes and their Genes 16

1.2.3 Crossing Over Detected Cytologically and Genetically 19

1.2.4 Salivary Gland Chromosome Bands and Genes 21

### 1.3 Biochemists' Gene View: One Gene—One Enzyme 22

1.3.1 Chemistry of Gene Action 22

1.3.2 Genetic Maps and Changes in Proteins 23

1.3.3 One Gene—One Polypeptide Chain 24

### 1.4 The Gene as Nucleic Acid 25

1.4.1 The Transforming Principle Is Deoxyribonucleic Acid (DNA) 26

1.4.2 Viral Genes Are Nucleic Acid 27



- 1.4.3 The Watson and Crick Model of DNA 29
- 1.4.4 The DNA Model Implies Self-replication 33
- 1.4.5 Semiconservative Replication of DNA 34
- 1.4.6 Origins and Directions of Replication 35
- 1.4.7 The Molecules Involved in Replication of DNA 38
- 1.5 The Regulated Gene 46**
  - 1.5.1 Start and Stop Signals for Gene Expression 46
  - 1.5.2 The Prokaryotic Operon 47
  - 1.5.3 The Steroid Hormones of Animals 47

## **PART TWO**

### **Gene Action: The Expression of Genes**

# **2**

## **Transcription and Translation of Genetic Information**

**57**

### **2.1 Comparison Between DNA and RNA 57**

### **2.2 Transcription 59**

- 2.2.1 Structure of Prokaryotic RNA Polymerase 59
- 2.2.2 Transcription in Prokaryotes 62
- 2.2.3 Eukaryotic RNA Polymerases 62
- 2.2.4 Transcription in Eukaryotes 64

### **2.3 RNA Structures, Processing, and Functions 65**

- 2.3.1 Messenger RNAs (mRNAs) 65
- 2.3.2 Transfer RNAs (tRNAs) 67
- 2.3.3 Ribosomal RNAs (rRNAs) 74

### **2.4 The Deciphering of the Genetic Code 78**

- 2.4.1 Copolymers as Synthetic mRNAs
- 2.4.2 Triplet Binding 84
- 2.4.3 The Structure of the Code 84

**2.5 Translation 88**

- 2.5.1 Overview of Information Flow During Protein Synthesis 90
- 2.5.2 Structure and Function of the Ribosome 98
- 2.5.3 Protein Synthesis in Prokaryotes 94
- 2.5.4 Protein Synthesis in Eukaryotes 104

**3****Phenotype: Gene Expression  
at the Genetic and  
Molecular Levels****113****3.1 Functions of Proteins 113****3.2 Examples of Gene Products and Related  
Phenotypes 114**

- 3.2.1 Pigments 114
- 3.2.2 Tay-Sachs Disease 116
- 3.2.3 Sickle Cell Hemoglobin 117
- 3.2.4 Bobbed Bristles 117
- 3.2.5 Petite 119
- 3.2.6 Hormone Receptor Mutations 119
- 3.2.7 Hormone Production Mutations 119

**3.3 Interaction of Alleles and Genes in  
Phenotype Production 120**

- 3.3.1 Dominance 120
- 3.3.2 Epistatic Interactions 125
- 3.3.3 Complementation Tests 126

**3.4 Deciphering Biochemical Pathways by  
Genetic Means 129**

- 3.4.1 Genetic Blocks 129
- 3.4.2 Analysis of the Tryptophan Biosynthetic Pathway 131

**3.5 Meaning of Multiple Alleles 133**

- 3.5.1 *Drosophila* Eye Color Mutants 133
- 3.5.2 Tryptophan Synthetase A Protein and the Colinearity of  
Prokaryotic Gene and Protein 133
- 3.5.3 Overlapping Genes 134

## **PART THREE**

### **Genetic Variation: Mutations**

<b>4</b>	<b>Mutagenesis and Defenses Against Mutation</b>	<b>147</b>
4.1	Classification of Mutations	147
4.2	Mutagens and Their Effects on DNA	148
4.2.1	Base Analogs	148
4.2.2	Base-Modifying Chemical Mutagens	151
4.2.3	Base-Deletion and Base-Addition Chemical Mutagens	154
4.2.4	Ultraviolet Light and Ionizing Radiation	156
4.2.5	Heat Mutagenesis	158
4.2.6	Insertion Sequences of DNA	159
4.2.7	Error Rates of Polymerases	159
4.3	Consequences of Mutations	162
4.3.1	Selective Techniques	162
4.3.2	Polypeptide Changes of Different Degrees of Severity	166
4.3.3	Genetic Effects of Mutation	172
4.3.4	Position Effects	175
4.3.5	Possible Role in Cancer	176
4.3.6	Possible Role in Aging	177
4.4	Repair Mechanisms	178
4.4.1	Repair Systems in Prokaryotes	178
4.4.2	Repair Systems in Eukaryotes	182
4.4.3	Degradation as a Form of Repair	182
4.5	Protective Mechanisms	183
4.5.1	Structure of the Code	183
4.5.2	Suppression	183
4.5.3	Isolation of Germ Cells	183
4.5.4	Lethality and Selection	184
4.5.5	Diploidy (and Higher Ploidy)	184

## **PART FOUR**

### **Arrangement of Genes**

# **5**

## **Physical Arrangement of Genes: Packaging**

**195**

### **5.1 Viruses 196**

### **5.2 Prokaryotic Packaging 200**

### **5.3 Eukaryotic Chromosomes During Interphase 203**

#### **5.3.1 Cell Cycle 203**

#### **5.3.2 Unineme Chromosomes 204**

#### **5.3.3 Nucleosomes 206**

#### **5.3.4 Locations and States of Histones and Nonhistone Proteins 209**

#### **5.3.5 Nucleoli 215**

#### **5.3.6 Special Chromosomes and Special Chromatin States in Interphase 217**

### **5.4 Eukaryotic Chromosomes During Cell Division 221**

#### **5.4.1 Coiling, Chromomeres, and Banding 221**

#### **5.4.2 Centromeres and Kinetochores 224**

#### **5.4.3 Synapsis 224**

#### **5.4.4 Special Chromosomes and Chromatin Regions in Cell Division 226**

# **6**

## **Transmission Genetic Analysis of Viral and Prokaryotic Gene Arrangement**

**233**

### **6.1 Virus Genetics 233**

#### **6.1.1 Phage Life Cycles 233**

#### **6.1.2 Phage Crosses 235**

#### **6.1.3 Phage Recombination Models and Joint Molecules 241**

#### **6.1.4 Arrangement of T4 Phage Genes in General Terms 244**

#### **6.1.5 Animal Virus Genetics 244**

<b>6.2 Bacterial Mutants</b>	<b>250</b>
6.2.1 Fluctuation Test	251
6.2.2 Replica Plating	252
<b>6.3 Bacterial Conjugation</b>	<b>255</b>
6.3.1 The F <sup>-</sup> , F <sup>+</sup> and Hfr States of <i>E. coli</i> and Their Consequences	255
6.3.2 The Waring Blender Experiment	259
6.3.3 The Gradient of Transmission	261
6.3.4 The F' State and its Use in Complementation Tests	264
<b>6.4 Bacterial Transduction</b>	<b>267</b>
6.4.1 The Generalized Transducing Phages	267
6.4.2 Abortive Transduction and Complementation	268
6.4.3 The Specialized Transducing Phages	268
6.4.4 Mapping via Transduction	269
<b>6.5 Bacterial Transformation</b>	<b>271</b>
6.5.1 Uptake of DNA	274
6.5.2 Competence	275
6.5.3 Fate of the DNA	276
6.5.4 Linkage	277
6.5.5 Transfection	277
6.5.6 Uptake of Nonbacterial DNA and Genetic Engineering	278
<b>6.6 Bacterial Recombination Models</b>	<b>278</b>
<b>6.7 Arrangement of <i>E. coli</i> Genes in General Terms</b>	<b>280</b>
6.7.1 Clustering	280
6.7.2 Origin and Terminus of Replication	281
<b>6.8 DNA Length and Map Length in Viruses and Bacteria</b>	<b>284</b>

<b>7</b>	<b>Transmission Genetic Analysis of Eukaryotic Gene Arrangement</b>	<b>293</b>
	7.1 Behavior of Unlinked Genes: Independent Assortment	293

<b>7.2 Behavior of Linked Genes</b>	<b>296</b>
7.2.1 Mapping Using Populations of Progeny	296
7.2.2 Interference	300
7.2.3 Tetrad Analysis	302
7.2.4 Gene Conversion	307
<b>7.3 Fine Structure Analysis by Genetic Means</b>	<b>310</b>
<b>7.4 Recombination Models for Eukaryotic Cells</b>	<b>311</b>
<b>7.5 Cytoplasmic Inheritance</b>	<b>313</b>
<b>7.6 Parasexual Mapping Techniques</b>	<b>321</b>
<b>7.7 DNA Length, Chromosome Length, and Map Length in Eukaryotes</b>	<b>326</b>
<b>7.8 Genome Arrangement in Selected Eukaryotes</b>	<b>329</b>
<b>Appendix to Chapter 7. <math>\chi^2</math> (Chi-Square) Statistical Test of a Hypothesis</b>	<b>338</b>

# 8

## **Analysis of Gene Arrangement by Molecular Techniques** **349**

<b>8.1 Replication of Genes or Genetic Regions for Molecular Analysis</b>	<b>349</b>
<b>8.2 Identifying Genes or DNA Regions at the Molecular Level</b>	<b>353</b>
8.2.1 Heteroduplex Analysis and Partial Denaturation Mapping	353
8.2.2 Restriction Site Mapping	357
8.2.3 Use of RNA Hybridization	359
8.2.4 Use of cDNA Probes	360
8.2.5 Molecular Cloning and Screening of Cloned Populations	361
<b>8.3 Analysis of DNA Base Sequences</b>	<b>364</b>
8.3.1 Wandering Spot Analysis	364



8.3.2 Plus- and Minus- Sequencing 370

8.3.3 Dimethylsulfate-Hydrazine Chemical Sequencing 374

## **8.4 Use of $C_{ot}$ Analysis in DNA Characterization 379**

8.4.1 Arrangement of Highly Repetitive DNAs Shown Using *in situ* Hybridization 386

8.4.2 Arrangement of Middle Repetitive DNAs 387

8.4.3 Arrangement of Unique DNAs 389

# **PART FIVE**

## **Regulation of Genes and Their Products**



## **Prokaryotic Regulation 403**

### **9.1 General Features of Prokaryotic Control Systems 403**

### **9.2 Transcriptional Control in Prokaryotes 404**

9.2.1 Negative Transcriptional Control 405

9.2.2 Positive Transcriptional Control Systems 412

9.2.3 Complexities of Transcriptional Regulation in Prokaryotes 416

### **9.3 Transcriptional Termination Control via mRNA Alternative Conformation 418**

9.3.1 General Transcriptional Termination Hypothesis 418

9.3.2 The *Histidine* Operon Control 420

### **9.4 Post-Translational Control via Non-covalent Bonding of Signal Molecules 423**

9.4.1 Regulated Steps of a Biochemical Pathway 423

9.4.2 Effects of Non-covalent Interactions with Signal Molecules 427

### **9.5 Post-Translational Control via Covalent Modification 430**

9.5.1 Glutamate Synthetase of *E. coli* 430

9.5.2 Chemotaxis in *E. coli* 431

# 10

## Eukaryotic Regulation

441

### 10.1 Differentiation as a Regulatory Process 442

### 10.2 Control by Means of Packaging of Genes 444

10.2.1 Nucleosomes in Active Chromatin 444

10.2.2 Looser Nucleosomes in Active Chromatin 445

10.2.3 Changes in Packaging of the Globin Gene 447

10.2.4 X Inactivation 447

### 10.3 Control by Means of RNA Processing 448

10.3.1 Specific Release of Parts of the hnRNA as Message 449

10.3.2 Prevalence Classes of mRNAs 449

10.3.3 Comparison of Nuclear and Cytoplasmic Prevalence of RNAs 450

10.3.4 Davidson-Britten RNA Processing Regulation Model 451

10.3.5 Processing of hnRNAs to Remove the Introns 453

### 10.4 Control of Specific Gene Expression by Steroid Hormones 455

10.4.1 RNA Transcription in Response to Steroids 455

10.4.2 Ovalbumin Response to Estrogen 456

10.4.3 Inhibitors of Transcription and Translation 457

10.4.4 Ecdysone and Insect Molting 458

10.4.5 Cortisone and Liver Amino Acid Catabolism 459

10.4.6 Regulation of Plant Gene Expression by Auxin 460

10.4.7 Possible Role of mRNA Conformation in Translation 460

### 10.5 Post-Translational Control by Covalent Modification 463

10.5.1 Glycogen Breakdown 463

10.5.2 Phosphorylation of Histone as a Trigger for Chromosome Condensation 465

10.5.3 Control of Hemoglobin mRNA Translation by eIF-2 Phosphorylation 466

10.5.4 Protein Activation by Means of Proteases 467

<b>10.6 Post-Translational Control via Noncovalent Signals</b>	<b>468</b>
10.6.1 Structure of Glycolysis and Gluconeogenesis	468
10.6.2 Unique Enzyme Control Points	468
10.6.3 Phosphofructokinase and Fructose-1,6-diphosphatase	469
<b>10.7 Ionic Regulation Systems in Eukaryotes</b>	<b>471</b>
<b>10.8 Light Regulation in Eukaryotes</b>	<b>471</b>
<b>10.9 Biological Rhythms and Their Control</b>	<b>475</b>

## **PART SIX**

### **Genes in Populations**

<b>11</b>	<b>Genetic Equilibrium and Disequilibrium</b>	<b>495</b>
11.1	Gene Frequencies	495
11.2	The Hardy-Weinberg Law of Genetic Equilibrium	496
11.2.1	Equilibrium at One Gene (One Locus)	497
11.2.2	Equilibrium at More Than One Genetic Locus	500
11.2.3	Sex Linked Genes and Equilibrium	503
11.3	Changing Gene Frequencies	505
11.3.1	Selection	505
11.3.2	Genetic Drift	511
11.3.3	Migration	515
11.3.4	Mutation	516
11.4	Fisher's Fundamental Theorem of Natural Selection	518
11.5	Genetic Load	518
11.6	Are There Neutral Mutations?	519