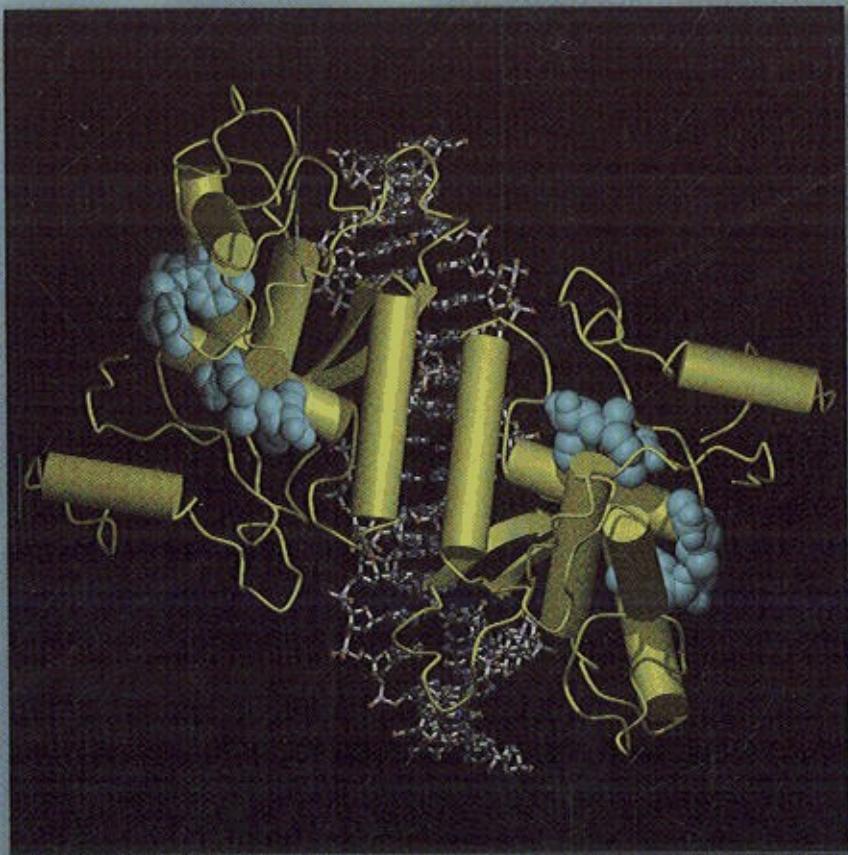


BIOS

*Instant Notes*

THIRD  
EDITION

# Biochemistry



David Hames & Nigel Hooper

# CONTENTS

Abbreviations	vii
Preface	ix
<b>Section A – Cell structure and imaging</b>	<b>1</b>
A1 Prokaryote cell structure	1
A2 Eukaryote cell structure	4
A3 Cytoskeleton and molecular motors	9
A4 Bioimaging	18
A5 Cellular fractionation	24
<b>Section B – Amino acids and proteins</b>	<b>29</b>
B1 Amino acids	29
B2 Acids and bases	33
B3 Protein structure	37
B4 Myoglobin and hemoglobin	48
B5 Collagen	56
B6 Protein purification	62
B7 Electrophoresis of proteins	69
B8 Protein sequencing and peptide synthesis	75
<b>Section C – Enzymes</b>	<b>83</b>
C1 Introduction to enzymes	83
C2 Thermodynamics	91
C3 Enzyme kinetics	96
C4 Enzyme inhibition	102
C5 Regulation of enzyme activity	105
<b>Section D – Antibodies</b>	<b>113</b>
D1 The immune system	113
D2 Antibodies: an overview	117
D3 Antibody synthesis	122
D4 Antibodies as tools	127
<b>Section E – Biomembranes and cell signaling</b>	<b>131</b>
E1 Membrane lipids	131
E2 Membrane proteins and carbohydrate	138
E3 Transport of small molecules	145
E4 Transport of macromolecules	151
E5 Signal transduction	156
E6 Nerve function	167
<b>Section F – DNA structure and replication</b>	<b>173</b>
F1 DNA structure	173
F2 Genes and chromosomes	178
F3 DNA replication in bacteria	183
F4 DNA replication in eukaryotes	188

---

<b>Section G – RNA synthesis and processing</b>	193
G1 RNA structure	193
G2 Transcription in prokaryotes	195
G3 Operons	199
G4 Transcription in eukaryotes: an overview	206
G5 Transcription of protein-coding genes in eukaryotes	208
G6 Regulation of transcription by RNA Pol II	212
G7 Processing of eukaryotic pre-mRNA	220
G8 Ribosomal RNA	228
G9 Transfer RNA	235
<b>Section H – Protein synthesis</b>	241
H1 The genetic code	241
H2 Translation in prokaryotes	245
H3 Translation in eukaryotes	254
H4 Protein targeting	257
H5 Protein glycosylation	265
<b>Section I – Recombinant DNA technology</b>	269
I1 The DNA revolution	269
I2 Restriction enzymes	271
I3 Nucleic acid hybridization	276
I4 DNA cloning	281
I5 DNA sequencing	286
I6 Polymerase chain reaction	289
<b>Section J – Carbohydrate metabolism</b>	293
J1 Monosaccharides and disaccharides	293
J2 Polysaccharides and oligosaccharides	300
J3 Glycolysis	304
J4 Gluconeogenesis	315
J5 Pentose phosphate pathway	323
J6 Glycogen metabolism	327
J7 Control of glycogen metabolism	330
<b>Section K – Lipid metabolism</b>	335
K1 Structures and roles of fatty acids	335
K2 Fatty acid breakdown	339
K3 Fatty acid synthesis	346
K4 Triacylglycerols	352
K5 Cholesterol	357
K6 Lipoproteins	363
<b>Section L – Respiration and energy</b>	367
L1 Citric acid cycle	367
L2 Electron transport and oxidative phosphorylation	372
L3 Photosynthesis	384
<b>Section M – Nitrogen metabolism</b>	395
M1 Nitrogen fixation and assimilation	395
M2 Amino acid metabolism	399
M3 The urea cycle	407
M4 Hemes and chlorophylls	413
<b>Further Reading</b>	419
<b>Index</b>	425