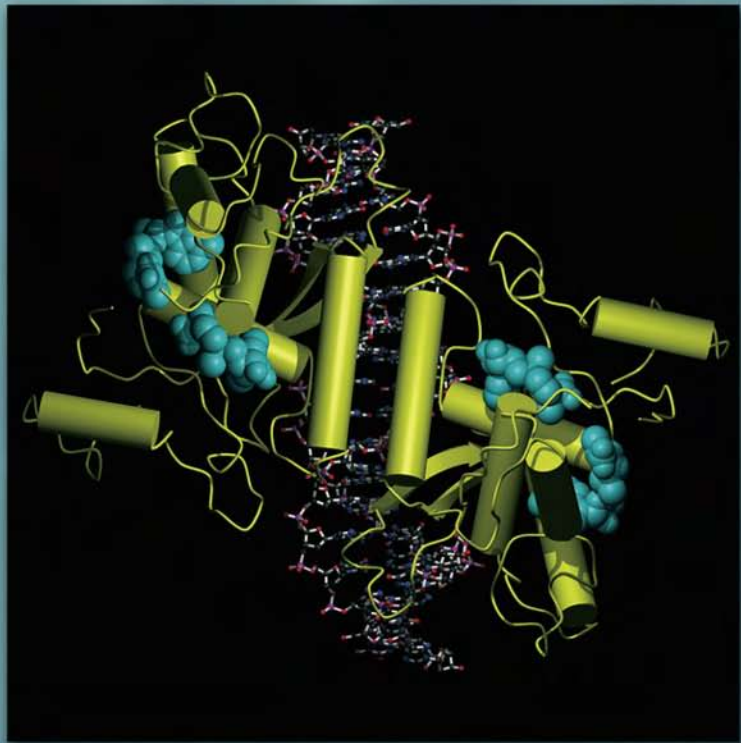


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Instant Notes

THIRD
EDITION

Biochemistry



David Hames & Nigel Hooper

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Third Edition

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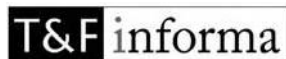
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ABBREVIATIONS

A	adenine	DNase	deoxyribonuclease
ACAT	acyl-CoA cholesterol acyltransferase	DNP	2,4-dinitrophenol
ACP	acyl carrier protein	dTTP	deoxythymidine 5'-triphosphate
ADP	adenosine diphosphate	<i>E</i>	redox potential
AIDS	acquired immune deficiency syndrome	EC	Enzyme Commission
Ala	alanine	EF	elongation factor
ALA	aminolaevulinic acid	eIF	eukaryotic initiation factor
AMP	adenosine monophosphate	ELISA	enzyme-linked immunosorbent assay
Arg	arginine	ER	endoplasmic reticulum
Asn	asparagine	ETS	external transcribed spacer
Asp	aspartic acid	F-2,6-BP	fructose 2,6-bisphosphate
ATCase	aspartate transcarbamoylase	FAB-MS	fast atom bombardment mass spectrometry
ATP	adenosine 5'-triphosphate	FACS	fluorescence-activated cell sorter
ATPase	adenosine triphosphatase	FAD	flavin adenine dinucleotide (oxidized)
bp	base pairs	FADH ₂	flavin adenine dinucleotide (reduced)
C	cytosine	FBPase	fructose bisphosphatase
cAMP	3', 5' cyclic AMP	<i>N</i> -fMet	<i>N</i> -formylmethionine
CAP	catabolite activator protein	FMNH ₂	flavin mononucleotide (reduced)
cDNA	complementary DNA	FMN	flavin mononucleotide (oxidized)
CDP	cytidine diphosphate	FRET	fluorescence resonance energy transfer
cGMP	cyclic GMP	GalNAc	<i>N</i> -acetylgalactosamine
CM	carboxymethyl	GDP	guanosine diphosphate
CMP	cytidine monophosphate	GFP	green fluorescent protein
CNBr	cyanogen bromide	GlcNAc	<i>N</i> -acetylglucosamine
CoA	coenzyme A	Gln	glutamine
CoQ	coenzyme Q (ubiquinone)	Glu	glutamic acid
CoQH ₂	reduced coenzyme Q (ubiquinol)	Gly	glycine
CRP	cAMP receptor protein	GMP	guanosine monophosphate
CTL	cytotoxic T lymphocyte	GPI	glycosyl phosphatidylinositol
CTP	cytosine triphosphate	GPCRs	G protein-coupled receptors
Cys	cysteine	GTP	guanosine 5'-triphosphate
$\Delta E_0'$	change in redox potential under standard conditions	Hb	hemoglobin
ΔG	Gibbs free energy	HbA	adult hemoglobin
ΔG^\ddagger	Gibbs free energy of activation	HbF	fetal hemoglobin
$\Delta G^0'$	Gibbs free energy under standard conditions	HbS	sickle cell hemoglobin
DAG	1,2-diacylglycerol	HDL	high density lipoprotein
dATP	deoxyadenosine 5'-triphosphate	His	histidine
dCTP	deoxycytidine 5'-triphosphate	HIV	human immunodeficiency virus
ddNTP	dideoxynucleoside triphosphate	HMG	3-hydroxy-3-methylglutaryl
DEAE	diethylaminoethyl	HMM	heavy meromyosin
dGTP	deoxyguanosine 5'-triphosphate	hnRNA	heterogeneous nuclear RNA
DIPF	diisopropylphosphofluoridate		
DNA	deoxyribonucleic acid		

hnRNP	heterogeneous nuclear ribonucleoprotein	pK	dissociation constant
HPLC	high-performance liquid chromatography	PKA	protein kinase A
hsp	heat shock protein	PP _i	inorganic pyrophosphate
Hyl	5-hydroxylysine	Pro	proline
Hyp	4-hydroxyproline	PQ	plastoquinone
IDL	intermediate density lipoprotein	PSI	photosystem I
IF	initiation factor	PSII	photosystem II
Ig	immunoglobulin	PTH	phenylthiohydantoin
IgG	immunoglobulin G	Q	ubiquinone (coenzyme Q)
Ile	isoleucine	QH ₂	ubiquinol (CoQH ₂)
IP ₃	inositol 1,4,5-trisphosphate	RER	rough endoplasmic reticulum
IPTG	isopropyl-β-D-thiogalactopyranoside	RF	release factor
IRES	internal ribosome entry sites	RFLP	restriction fragment length polymorphism
ITS	internal transcribed spacer	RNA	ribonucleic acid
K	equilibrium constant	RNase	ribonuclease
K _m	Michaelis constant	rRNA	ribosomal RNA
LCAT	lecithin-cholesterol acyltransferase	rubisco	ribulose biphosphate carboxylase
LDH	lactate dehydrogenase	SDS	sodium dodecyl sulfate
LDL	low density lipoprotein	Ser	serine
Leu	leucine	SER	smooth endoplasmic reticulum
LMM	light meromyosin	snoRNA	small nucleolar RNA
Lys	lysine	snoRNP	small nucleolar ribonucleoprotein
Met	methionine	snRNA	small nuclear RNA
MS	mass spectrometry	snRNP	small nuclear ribonucleoprotein
mV	millivolt	SRP	signal recognition particle
mRNA	messenger RNA	SSB	single-stranded DNA-binding (protein)
NAD ⁺	nicotinamide adenine dinucleotide (oxidized)	TBP	TATA box-binding protein
NADH	nicotinamide adenine dinucleotide (reduced)	TFII	transcription factor for RNA polymerase II
NADP ⁺	nicotinamide adenine dinucleotide phosphate (oxidized)	TFIIIA	transcription factor IIIA
NADPH	nicotinamide adenine dinucleotide phosphate (reduced)	Thr	threonine
NAM	N-acetylmuramic acid	T _m	melting point
NHP	nonhistone protein	Tris	Tris(hydroxymethyl)aminomethane
NMR	nuclear magnetic resonance	tRNA	transfer RNA
ORF	open reading frame	Trp	tryptophan
PAGE	polyacrylamide gel electrophoresis	Tyr	tyrosine
PC	plastocyanin	UDP	uridine diphosphate
PCR	polymerase chain reaction	UMP	uridine monophosphate
PEP	phosphoenolpyruvate	URE	upstream regulatory element
PFK	phosphofructokinase	UTP	uridine 5'-triphosphate
Phe	phenylalanine	UV	ultraviolet
P _i	inorganic phosphate	Val	valine
pI	isoelectric point	V ₀	initial rate of reaction
		VLDL	very low density lipoprotein
		V _{max}	maximum rate of reaction

PREFACE

It was perhaps a mark of how successful the second edition of *Instant Notes in Biochemistry* was that we recall seeing a final year student avidly reading it even as he waited to have his viva with the External Examiner. Although we would strongly recommend to any student not to leave revision to such a very late stage, this experience alone proved the value of a concise book that focused on essential biochemical information in an easily accessible format!

Let us be clear. This is not a book to replace the superb all-embracing and highly detailed Biochemistry textbooks that take the reader to the cutting edge of this science. Rather, its goal is to allow the reader to cut to the heart of the matter, to see what the core information is and readily to assimilate it. For mainstream Biochemistry students, it may be seen as complementary to the large detailed textbooks, whereas for students taking Biochemistry as an optional or elective module, it should be welcome as a fast way to become acquainted with the main facts and concepts.

This book is aimed at supporting students primarily in the first and second years of their degree, although, as we recount above, it can also serve as a welcome friend when faced with certain adverse situations even in the final year! The third edition has taken on board all of the many comments and advice that we have gratefully received from readers and academic colleagues alike, and we have corrected a number of errors, omissions and ambiguities. No doubt we have still missed a few; do let us know of any that you spot. This revision has necessarily reflected the many new directions that Biochemistry has taken since the last edition, whilst also preserving coverage of the core of the subject. The book now also includes expanded coverage of cell structure and imaging, proteomics, microarrays, signal transduction, etc. As with earlier editions, we have been careful to include only the information that we believe is essential for good student understanding of the subject – and for rapid revision when exams appear on the horizon. Do use the book not only to get to grips with the subject but also as a ready source of elusive information. We hope and believe that you will find it as useful as past students told us they found the earlier editions.

*David Hames
Nigel Hooper*

