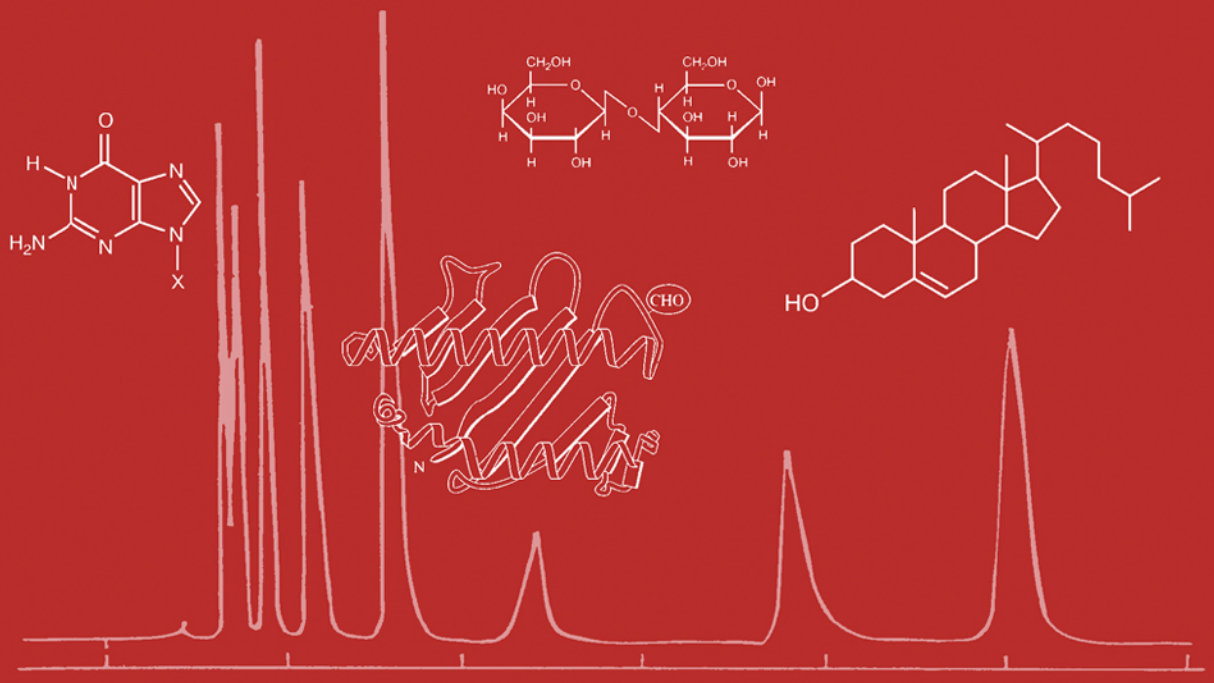
BIOCHEMISTRY

LABFAX

EDITED BY
J.A.A. CHAMBERS & D. RICKWOOD



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BIOCHEMISTRY

LABFAX

The LABFAX series

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PREFACE

Biochemistry continues to be one of the most important areas of research in the life sciences. Indeed, with the need to characterize the diverse range of gene products generated as a result of genetic engineering techniques, there has been a resurgence of interest in biochemistry as molecular biologists examine the changing properties of modified proteins.

There have been handbooks on biochemistry, both encyclopedic and selective. However, the former type of book tests physical fitness and patience and the selection of topics for the latter often does not reflect the current biochemical practices and techniques because the books were published some time ago. We, as editors, have attempted to assemble the most important facts in a way that reflects current biochemical techniques to provide data that biochemists will need to use in their work on an almost daily basis. The length restriction of this book has required us to be very selective in terms of which topics to include and which to exclude. We have tried to emphasize those aspects of the subject that have not been included in previous books. We hope that this will prove to be a useful data book for everyone working in the area of biochemistry.

J.A.A. Chambers

D. Rickwood

HAZARD WARNING

Some of the chemicals and procedures described in this book may be associated with chemical and biological hazards. In addition, the reader should be aware of the hazards associated with the handling of animal tissue samples. While efforts have been made to indicate the hazards associated with the different reagents and procedures covered in this book, it is the ultimate responsibility of the reader to ensure that safe working practises are used.

In several chapters Chemical Abstracts Service Registry numbers have been supplied for the reagents discussed. These numbers, found in square brackets and of the general formula XXXXX-YY-Z, are assigned to a unique chemical structure regardless of name and are of particular use in the literature searches and in the recovery of information from a number of chemical and biological databases. We decided to include these numbers when it became obvious that the number of names for some of the substances listed were in the hundreds and that the numbers provided another way to help the researcher find further information.

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ABBREVIATIONS

AA	amino acid
Aces	*N*-(2-acetamido)-2-aminoethanesulfonic acid
ADP	adenosine diphosphate
AMP	adenosine monophosphate
APMSF	amidino-phenylmethylsulfonyl fluoride
APS	adenosine phosphosulfate
Asn	asparagine
ATP	adenosine triphosphate
ATPase	adenosine triphosphatase
Bes	*N,N*-bis(2-hydroxyethyl)-2-aminoethanesulfonic acid
Bicine	*N,N*-bis(2-hydroxyethyl)glycine
Bis-Tris	bis(2-hydroxyethyl)imino-tris(hydroxymethyl)methane
butyl PBD	2-(4′-*t*-butylphenyl)-5-(4″-biphenylyl)-1,3,4-oxadiazole
cAMP	cyclic adenosine 3′,5′-monophosphate
Caps	3-(cyclohexylamino)-1-propanesulfonic acid
CAT	chloramphenicol acetyl transferase
CDP	cytosine diphosphate
Cer-gal	monogalactosylcerebroside
Cer-glu	glucosyl cerebroside
CHAPS	3-[(3-cholamidopropyl)-dimethylammonio]-1-propanesulfonate
CHAPSO	3-[(3-cholamidopropyl)-dimethylammonio]-2-hydroxy-1-propanesulfonate
Ches	2-(cyclohexylamino)-ethanesulfonic acid
CMC	critical micellar concentration
CMP	cytosine monophosphate
CPB	cetylpyridinium bromide
CPI	carboxypeptidase inhibitor
CTAB	cetyltrimethylammonium bromide
CTP	cytosine triphosphate
DABA	diaminobenzoic acid
DAGs	diacylglycerols
DAPI	4,6,diamidino-2-phenylindole
DGDG	digalactosyldiacylglycerol
DHA	docosahexaenoic acid
DHFA	dihydrofolate
DMAPN	3,dimethylaminopropionitrile
DMF	dimethylformamide
DMSO	dimethylsulfoxide
DNA	deoxyribonucleic acid
Dol	dolichol
DOPA	3,4-dihydroxyphenylalanine
DPG	diphosphatidylglycerol (cardiolipin)
DTNB	5,5′-dithiobis (2-nitrobenzoic acid)

DTT	dithiothreitol
ε_{max}	extinction coefficient (molar)
EACA	ε-amino caproic acid
EDTA	ethylenediaminetetraacetic acid
EFA	essential fatty acid
EGF	epidermal growth factor
EGTA	ethyleneglycol-bis(β-aminoethylether)*N,N,N′,N′*-tetraacetic acid
EPA	eicosapentaenoic acid
EtOH	ethanol
FAD	flavin adenine dinucleotide
FMN	flavin mononucleotide
FMPI	N_2-(*N*-phosphono-L-phenylalanyl)-L-arginine
Fuc	fructose
GABA	γ-aminobutyric acid
Gal	D-galactose
GalNAc	*N*-acetyl-D-galactosamine
GDP	guanosine diphosphate
GLA	γ-linolenic acid
Glc	D-glucose
GlcN	D-glucosamine
GlcNAc	*N*-acetyl-D-glucosamine
GlcUA	D-glucuronic acid
GM-CSF	granulocyte–macrophage colony-stimulating factor
GMP	guanosine monophosphate
GPI	glycosyl phosphatidylinositol
GSH	glutathione
GTP	guanosine triphosphate
HDL	high-density lipoprotein
Hepes	4-(2-hydroxyethyl)piperazine-1-ethanesulfonic acid
Hepps	4-(2-hydroxyethyl)piperazine-1-propanesulfonic acid
HETEs	hydroxyeicosatetraenoic acids
HiPIP	high-potential iron–sulfur protein
HIV	human immunodeficiency virus
HLB	hydrophile-lipophile balance
HMG	high-mobility group proteins
HMG-CoA	hydroxymethylglutarate-CoA
HPLC	high-pressure liquid chromatography
Hyl	hydroxy-L-lysine
ICAMs	intercellular adhesion molecules
IDL	intermediate-density lipoproteins
IdUA	L-iduronic acid
IEF	isoelectric focusing
Il	interleukin
Ins	1D-myo-inositol
λ_{max}	maximum wavelength
LDL	low-density lipoprotein
LiDS	lithium dodecyl sulfate
LT	leukotriene
LXA	5,6,15-L-trihydroxy 7,9,11,13-eicosateraenoic acid
MAGs	monoacylglycerols
Man	D-mannose
ManNAc	*N*-acetyl-D-mannosamine

MAP	microtubule-associated protein
MeOH	methanol
Mes	2-morpholinoethanesulfonic acid monohydrate
MGDG	monogalactosyldiacylglycerol
MGP	matrix γ-carboxyl glutamic acid protein
Mops	3-morpholinopropanesulfonic acid
NAD	nicotinamide adenine dinucleotide
NADP	nicotinamide adenine dinucleotide phosphate
NANA	*N*-acetylneuraminic acid (NeuAc)
NDP	nucleotide diphosphate
NEFA	non-esterified fatty acid
NeuAc	*N*-acetylneuraminic acid (NANA)
Neu5Gc	*N*-glycolylneuraminic acid
NHS	*N*-hydroxysuccinimidyl
P	phosphate
PA	phosphatidic acid
PAF	platelet activating factor
PAGE	polyacrylamide gel electrophoresis
PAPS	adenosine-3′-phospho-5′-phosphosulfate
PAS	*p*-aminosalicylic acid
PBD	2-phenyl-5-(4-biphenylyl)-1,3,4-oxadiazole
PC	phosphatidylcholine
PCA	perchloric acid
PCMB	*p*-chloromercuribenzoate
PCNA	proliferating cell nuclear antigen
PE	phosphatidylethanolamine
PG	phosphatidylglycerol
PGs	prostaglandins
PI	phosphatidylinositol
Pipes	piperazine-1,4-bis(2-ethanesulfonic acid)
PKC	protein kinase C
PKI	protein kinase inhibitor
PMA	phorbol myristate acetate
PMSF	phenylmethylsulfonylfluoride
POPOP	1,4-di-(2-(5-phenyloxazolyl))-benzene
PPO	2,5-diphenyloxazole
PS	phosphatidylserine
psi	lb/in^2
PtdIns	phosphatidylinositol
PtdIns(4)P	phosphatidyl-*myo*-inositol 4-phosphate
PtdIns(4,5)P_2	phosphatidyl-*myo*-inositol 4,5-bisphosphate
PUFA	polyunsaturated fatty acid
RNA	ribonucleic acid
SAM	*S*-adenosylmethionine
SDS	sodium dodecyl sulfate
Ser	L-serine
SLS	sodium lauryl sulfate (SDS)
SM	sphingomyelin
SQDG	sulfoquinovosyldiacylglycerol
SRS-A	slow release substances of anaphylaxis
TAGs	triacylglycerols
Taps	*N*-[tris(hydroxymethyl)methyl]-3-aminopropanesulfonic acid