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# INSTRUCTIONS TO AUTHORS

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3. Prepare large structural formulae and long mathematical equations in a form suitable for direct photographic reproduction and include them as a Diagram at the end of the paper.
4. **Isotopically Labeled Compounds**—The symbol for an isotope is shown in square brackets directly before the name (word), as in [<sup>14</sup>C]urea, [ $\alpha$ -<sup>14</sup>C]leucine, DL-[methyl-<sup>14</sup>C]methionine. When more than one position in a substance is labeled with the same isotope and the positions are not indicated, the number of labeled atoms should be indicated as a right-hand subscript; as in [<sup>14</sup>C<sub>2</sub>]glycolic acid. The symbol *U* indicates uniform, e.g. [<sup>14</sup>C]-glucose (where the <sup>14</sup>C is uniformly distributed among all six positions). The isotopic prefix precedes that part of the name to which it refers, as in sodium [<sup>14</sup>C]formate, thiamine [ $\beta$ -<sup>32</sup>P]-diphosphate. Terms such as <sup>125</sup>I-labeled albumin should not be contracted to [<sup>125</sup>I]albumin. When isotopes of more than one element are introduced, their symbols should be arranged in alphabetical order: e.g. L-[3-<sup>14</sup>C, 2,3-<sup>3</sup>H, <sup>15</sup>N]serine. The symbols <sup>2</sup>H and <sup>3</sup>H or D and T may be used for deuterium and tritium, respectively.

For simple molecules, the labeling is indicated by writing the chemical formulae with the prefix superscripts attached to the correct atomic symbols in the formulae: e.g. <sup>14</sup>CO<sub>2</sub>, H<sub>2</sub><sup>18</sup>O, <sup>2</sup>H<sub>2</sub>O. Square brackets should not be used for them, or when the isotopic symbol is attached to a word that is not a specific chemical name, abbreviation or symbol: e.g. <sup>125</sup>I-labeled, <sup>14</sup>C-sugar, <sup>14</sup>C-steroids,

<sup>32</sup>PO<sub>4</sub><sup>3-</sup>, but [<sup>32</sup>P]phosphate.

5. **Spectrophotometric Data**—Beer's law may be stated as

$$A = -\log T = \epsilon c l$$

Where *A* is the absorbance; *T*, the transmittance ( $= I/I_0$ );  $\epsilon$ , the molar absorption coefficient; *c*, the concentration of the absorbing substances in moles per liter; and *l*, the length of the optical path in centimeters. Under these conditions  $\epsilon$  has the dimensions liter·mol<sup>-1</sup>·cm<sup>-1</sup> or more briefly M<sup>-1</sup>·cm<sup>-1</sup> (not cm<sup>2</sup>·mol<sup>-1</sup>). Do not use "O.D." and "E."

### VIII. ETHICS

In scientific investigations involving human subjects, experiments should be performed in accordance with the ethical standards formulated in the Helsinki Declaration of 1964 (revised in 1989, cf. <http://helix.nih.gov:8001/ohsr/helsinki.phtml>). Similarly, animal experiments should follow the ethical standards formulated in the Helsinki Declaration, and measures taken to protect animals from pain or discomfort should be mentioned.

### IX. TERMINOLOGY AND ABBREVIATIONS

1. Abbreviations with specific meanings may be used for convenience for complex chemical substances, particularly in equations, tables, or figures. Avoid using abbreviations in titles and summaries except the standard ones listed in Table II of Section VIII-8.
2. Use abbreviations and symbols sparingly in the text. In chemical equations, which traditionally depend upon symbols, an abbreviation or symbol may be used for a term that appears in full in the neighboring text. Trivial names are usually sufficiently short not to require abbreviations.
3. An abbreviated name or symbol in a column heading in a table, figure, or photograph must either be taken from the "accepted" list given in Section VIII-8 or formulated in accordance with the principles of Section VIII-6.
4. For spelling of chemical names consult current issues of the Journal. For chemical terms follow essentially the usages and rules recommended by International Scientific Union, especially Nomenclature Committee of IUBMB (NC-IUBMB, IUBMB: International Union of Biochemistry and Molecular Biology) and IUPAC-IUBMB Joint Commission on Biochemical Nomenclature (JCBN, IUPAC: International Union of Pure and Applied Chemistry): see the recommendations listed below.\* The recommendations published before 1992 may also be found in *Biochemical Nomenclature and Related Documents* (1978), available from The Biochemical Society, 7 Warwick Court, London WC1R 5DP, U.K. and in *Biochemical Nomenclature and Related Documents. A Compendium*, 2nd edn (Liébecq, C., ed.), Portland Press Ltd, London (1992). (see *Eur. J. Biochem.* 213, 1-3 (1993)).

Refer also to <http://www.chem.qmw.ac.uk/iupac/jcbn/>

- A. Recommendations published before 1978

#### General

Nomenclature of organic chemistry. Section E: Stereochemistry (1974), *Eur. J. Biochem.* 18, 151-170 (1971)—The definitive rules may be found in *Pure Appl. Chem.* 45, 11-30 (1976).

Nomenclature of organic chemistry. Section F: Natural products and related compounds (1976), *Eur. J. Biochem.* 86, 1-8 (1978).

Nomenclature of organic chemistry. Section H: Isotopically modified compounds (1977), *Eur. J. Biochem.* 86, 9-25 (1978)—Amendments in *Eur. J. Biochem.* 102, 315-316 (1979) and the final version in *Pure Appl. Chem.* 51, 353-380 (1979).

Recommendations for measurement and presentation of biochemical equilibrium data (1976), *Eur. J. Biochem.* 72, 1-7 (1977).

Abbreviations and symbols for chemical names of special interest in biological chemistry (1965), *J. Biol. Chem.* 241, 527-533 (1966).

Abbreviations and symbols: a compilation (1976), *Eur. J. Biochem.* 74, 1-6 (1977).

\*In this list mainly *Eur. J. Biochem.* is cited, but most of these documents have also been published in other journals, e.g. *J. Biol. Chem.*, *Biochemistry*, *Biochem. J.*, *Biochim. Biophys. Acta*, *Arch. Biochem. Biophys.*, etc.

- Citation of bibliographic references in biochemical journals (1971), *Eur. J. Biochem.* **37**, 201-202 (1973).
- Amino acids, peptides, and proteins**
- Nomenclature of  $\alpha$ -amino acids (1974), *Eur. J. Biochem.* **53**, 1-14 (1975)—Corrections in *Eur. J. Biochem.* **58**, 1 (1975).
- Symbols for amino-acid derivatives and peptides (1971), *Eur. J. Biochem.* **27**, 201-207 (1972).
- Rules for naming synthetic modifications of natural peptides (1966), *Eur. J. Biochem.* **1**, 379-381 (1967).
- Abbreviated nomenclature of synthetic polypeptides (polymerized amino acids) (1971), *Eur. J. Biochem.* **26**, 301-304 (1972).
- A one-letter notation for amino-acid sequences (1968), *Eur. J. Biochem.* **5**, 151-153 (1968).
- Abbreviations and symbols for the description of the conformation of polypeptide chains (1969), *Eur. J. Biochem.* **17**, 193-201 (1970).
- Nomenclature of peptide hormones (1974), *Eur. J. Biochem.* **55**, 485-486 (1975).
- Recommendations for the nomenclature of human immunoglobulins, *Eur. J. Biochem.* **45**, 5-6 (1974).
- Protein data bank. A computer-based archival file for macromolecular structures (1977), *Eur. J. Biochem.* **80**, 319-324 (1977).
- Nucleotides and nucleic acids**
- Abbreviations and symbols for nucleic acids, polynucleotides and their constituents (1970), *Eur. J. Biochem.* **15**, 203-208 (1970)—Corrections in *Eur. J. Biochem.* **25**, 1 (1972).
- Lipids and related compounds**
- Nomenclature of lipids (1976), *Eur. J. Biochem.* **79**, 11-21 (1971).
- Nomenclature of steroid (1967), *Eur. J. Biochem.* **10**, 1-19 (1969)—Amendments (1971) and corrections in *Eur. J. Biochem.* **25**, 1-3 (1972), and definitive rules in *Pure Appl. Chem.* **31**, 285-322 (1972).
- Nomenclature of quinones with isoprenoid side chains (1973), *Eur. J. Biochem.* **53**, 15-18 (1975).
- Tentative rules for the nomenclature of carotenoids (1970), *Eur. J. Biochem.* **25**, 397-408 (1972)—Amendments (1974) in *Eur. J. Biochem.* **57**, 317-318 (1975) and definitive rules in *Pure Appl. Chem.* **41**, 407-431 (1975).
- Nomenclature of tocopherols and related compounds (1973), *Eur. J. Biochem.* **46**, 217-219 (1974).
- Carbohydrates and related compounds**
- Tentative rules for carbohydrate nomenclature. Part 1 (1969), *Eur. J. Biochem.* **21**, 455-477 (1971)—Correction in *Eur. J. Biochem.* **25**, 4 (1972).
- Nomenclature of cyclitols (1973), *Eur. J. Biochem.* **57**, 1-7 (1975).
- Phosphorus-containing compounds**
- Nomenclature of phosphorus-containing compounds of biochemical importance (1976), *Eur. J. Biochem.* **79**, 1-9 (1977).
- Miscellaneous**
- Trivial names of miscellaneous compounds of importance in biochemistry (vitamins, coenzymes, and related compounds) (1965), *Eur. J. Biochem.* **2**, 1-2 (1967).
- Nomenclature and symbols for folic acids and related compounds (1965), *Eur. J. Biochem.* **2**, 5-6 (1967).
- Nomenclature for vitamins B-6 and related compounds (1973), *Eur. J. Biochem.* **40**, 325-327 (1973).
- Nomenclature of corrinoids (1973), *Eur. J. Biochem.* **45**, 7-12 (1974).
- B. Recommendations and reports published after 1978
- Newsletters from NC-IUBMB and JCBN**
- Newsletter 1980, *Eur. J. Biochem.* **104**, 321-322 (1980).
- Newsletter 1981, *Eur. J. Biochem.* **114**, 1-4 (1981).
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- Newsletter 1983, *Eur. J. Biochem.* **131**, 1-3 (1983).
- Newsletter 1984, *Eur. J. Biochem.* **138**, 5-7 (1984).
- Newsletter 1985, *Eur. J. Biochem.* **146**, 237-239 (1985).
- Newsletter 1986, *Eur. J. Biochem.* **154**, 485-487 (1986).
- Newsletter 1988, *Eur. J. Biochem.* **170**, 7-9 (1987).
- Newsletter 1989, *Eur. J. Biochem.* **183**, 1-4 (1989).
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- Newsletter 1996, *Eur. J. Biochem.* **247**, 733-739 (1997).
- General**
- Biochemical Nomenclature and Related Documents. A Compendium* 2nd edn. Portland Press Ltd, see also *Eur. J. Biochem.* **213**, 1-3 (1993).
- Recommendations for the presentation of thermodynamic and related data in biology (1985), *Eur. J. Biochem.* **153**, 429-434 (1985).
- Recommendations for nomenclature and tables in biochemical thermodynamics (1994), *Eur. J. Biochem.* **240**, 1-14 (1996).
- Recommendations for nomenclature and tables in biochemical thermodynamics (1994), *Eur. J. Biochem.* **242**, 433 (1996).
- Amino acids, peptides, and proteins**
- Nomenclature of iron-sulfur proteins (1978), *Eur. J. Biochem.* **93**, 427-430 (1979)—Erratum in *Eur. J. Biochem.* **102**, 315 (1979).
- Nomenclature and symbolism for amino acids and peptides (1983), *Eur. J. Biochem.* **138**, 9-37 (1984)—In this version, (8), (9), (10), and (12) above are combined and revised. Erratum in *Eur. J. Biochem.* **152**, 1 (1985).
- Nucleotides and nucleic acids**
- Abbreviations and symbols for the description of conformations of polynucleotide chains (1982), *Eur. J. Biochem.* **131**, 9-15 (1983).
- Nomenclature for incompletely specified bases in nucleic acid sequences (1984), *Eur. J. Biochem.* **150**, 1-5 (1985).
- A nomenclature of junctions and branchpoints in nucleic acids. Recommendations 1994. *Eur. J. Biochem.* **230**, 1-2 (1995).
- Lipids and related compounds**
- Nomenclature of tocopherols and related compounds (1981), *Eur. J. Biochem.* **123**, 473-475 (1982).
- Nomenclature of vitamin D (1981), *Eur. J. Biochem.* **124**, 223-227 (1982).
- Nomenclature of retinoids (1981), *Eur. J. Biochem.* **129**, 1-6 (1982).
- Nomenclature of glycolipids (1997), *Eur. J. Biochem.* **257**, 1-6 (1998).
- Carbohydrates and related compounds**
- Conformational nomenclature for five and six-membered ring forms of monosaccharides and their derivatives (1980), *Eur. J. Biochem.* **111**, 295-298 (1980).
- Nomenclature of unsaturated monosaccharides (1980), *Eur. J. Biochem.* **119**, 1-3 (1981)—Corrections in *Eur. J. Biochem.* **125**, 1 (1982).
- Nomenclature of branched-chain monosaccharides (1980), *Eur. J. Biochem.* **119**, 5-8 (1981)—Corrections in *Eur. J. Biochem.* **125**, 1 (1982).
- Abbreviated terminology of oligosaccharide chains (1980), *Eur. J. Biochem.* **126**, 433-437 (1982).
- Polysaccharide nomenclature (1980), *Eur. J. Biochem.* **126**, 439-441 (1982).
- Symbols for specifying the conformation of polysaccharide chains (1981), *Eur. J. Biochem.* **131**, 5-7 (1983).
- Nomenclature of carbohydrates (1996), *Eur. J. Biochem.* **243**, 9 (1997).
- Miscellaneous**
- Nomenclature of tetrapyrroles (1978), *Eur. J. Biochem.* **108**, 1-30 (1980).
5. **Enzymes**—Where one or more enzymes figure prominently in a manuscript, authors should use the recommended (trivial) name or systematic name given by Nomenclature Committee of IUBMB and IUPAC-IUBMB Commission on Biochemical Nomenclature: see the recommendations listed below.
- Enzyme Nomenclature, Recommendations (1984)*, Academic Press, New York.
- Enzyme Nomenclature, Recommendations (1992)*, Academic Press, Inc., see also *Eur. J. Biochem.* **213**, 1-3 (1993).
- Supplement *Eur. J. Biochem.* **223**, 1-5 (1994).
- Supplement 2 *Eur. J. Biochem.* **232**, 1-6 (1995).
- Supplement 3 *Eur. J. Biochem.* **237**, 1-5 (1996).
- Nomenclature of multiple forms of enzymes, *Eur. J. Biochem.* **82**, 1-3 (1978).
- Units of enzyme activity (1978), *Eur. J. Biochem.* **97**, 319-320 (1979)—Erratum in *Eur. J. Biochem.* **104**, 1 (1980).
- Symbolism and terminology in enzyme kinetics (1981), *Eur. J.*



*Biochem.* 128, 281-291 (1982).

For P450 superfamily, authors should use the nomenclature system recommended by the following literature.

P450 superfamily: update on new sequences, gene mapping, accession numbers and nomenclature, *Pharmacogenetics* 6, 1-42 (1996).

When an enzyme is the main subject of a paper, its source, trivial name, systematic name (or the reaction that it catalyzes) and code number (preceded by "EC") should be included.

6. **Non-Standard Abbreviations**—Use of abbreviations other than the standard ones listed in VIII-7 and VIII-8 should be kept to a minimum. Such abbreviations should be introduced only when absolutely necessary, as in tables, figures, and other illustrations where space is particularly limited. Abbreviations are usually not needed in the text of a paper where repeated use of long names can be avoided by judicious use of pronouns, or by paraphrasing with words such as "the substrate," "the inhibitor," "the methyl derivative," *etc.* All non-standard abbreviations used in the text should be defined in alphabetical order in a single footnote on the title page.

7. **Abbreviations of Units of Measurement and Physical and Chemical Quantities**—These abbreviations listed in Table I may be used without definition.

TABLE I

(1) Prefixes to the names of units					
tera	10 <sup>12</sup>	T	milli	10 <sup>-3</sup>	m
giga	10 <sup>9</sup>	G	micro	10 <sup>-6</sup>	μ
mega	10 <sup>6</sup>	M	nano	10 <sup>-9</sup>	n
kilo	10 <sup>3</sup>	k	pico	10 <sup>-12</sup>	p
deci	10 <sup>-1</sup>	deci (not d)	femto	10 <sup>-16</sup>	f
centi	10 <sup>-2</sup>	c <sup>1)</sup>	atto	10 <sup>-18</sup>	a
(2) Units of Concentration <sup>2)</sup>					
molar (moles/liter)			M		
millimolar (millimoles/liter)			mM (not 10 <sup>-3</sup> M)		
micromolar (micromoles/liter)			μM (or 10 <sup>-6</sup> M)		
nanomolar (nanomoles/liter)			nM (or ×10 <sup>-9</sup> M)		
picomolar (picomoles/liter)			pM (or ×10 <sup>-12</sup> M)		
(3) Units of Length					
meter			m		
centimeter			cm		
millimeter			mm		
micrometer (not micron)			μm (not μ)		
nanometer			nm (not mμ)		
Ångström (0.1 nm)			Å		
(4) Units of Area and Volume					
square centimeter			cm <sup>2</sup>		
cubic centimeter			cm <sup>3</sup>		
liter			l (in tables only)		
milliliter			ml		
microliter			μl (not λ)		
(5) Units of Mass					
gram			g (kg, mg, μg [not γ], ng, pg)		
			Da		
(6) Units of Time					
hour	h	year	yr		
minute	min	month	mo		
second	s	week	wk		
		day	d		
(7) Units of Radioactivity					
becquerel		Bq (= 1 dps or 60 dpm)			
counts per minute		cpm			
curie(s)		Ci (= 3.7 × 10 <sup>10</sup> Bq)			
disintegrations per minute		dpm			
(8) Other Units					
mole		mol (mmol, μmol, nmol, pmol)			
degree Celsius		°C			
degree absolute (kelvin)		K			
joule		J			
kilojoule		kJ			
calorie		cal			
kilocalorie		kcal			

parts per billion	ppb
parts per million	ppm
cycles per second (hertz)	Hz (not cps)
equivalent	eq
ampere	A (mA)
ohm	Ω
volt	V
gauss	G
pascal	Pa
revolutions per minute	rpm
Svedberg unit of sedimentation coefficient (10 <sup>-13</sup> s)	S
(9) Physical and Chemical Quantities	
absorbance	A
equilibrium constant	K
rate constant	k
maximum velocity	V <sub>max</sub>
Michaelis constant	K <sub>m</sub>
equilibrium dissociation constant	K <sub>d</sub>
isoelectric point	pI
molecular weight <sup>3)</sup>	M <sub>r</sub>
retardation factor	R <sub>f</sub>
acceleration of gravity	g
specific rotation	[α] <sub>D</sub> <sup>20</sup>
partial specific volume	v̄
diffusion constant	D
sedimentation coefficient	s
density	ρ
sedimentation coefficient in water at 20°C, extrapolated to zero concentration	s <sub>20,w</sub> <sup>0</sup>
Gibbs energy change	ΔG
entropy change	ΔS
enthalpy change	ΔH
melting temperature	T <sub>m</sub>
(10) Other Terms	
logarithm	log
logarithm (natural)	ln
standard deviation of a series	SD
standard error of mean of series	SE

<sup>1)</sup> to be avoided where possible (except for cm).

<sup>2)</sup> Terms such as milligram percent (mg%) should not be used. Weight concentrations should be given as g/ml, g/100 ml, *etc.*

<sup>3)</sup> Molecular weight is dimensionless. Only molecular mass is expressed by daltons.

8. **Accepted Abbreviations and Symbols**—Authors may use, without definition, the abbreviations given in Table II and the symbols and abbreviations for amino acid or nucleotide residues in polymers or sequences. Define other abbreviations in a single footnote on the title page.

TABLE II

(1) General	
Adenosine 3':5'-cyclic monophosphate	cAMP
Adenosine 5'-mono-, di-, and triphosphates <sup>1)</sup>	AMP, ADP, and ATP
Adenosine triphosphatase	ATPase
Base pair(s)	bp
Bovine serum albumin	BSA
O-(Carboxymethyl)	CM-
Circular dichroism	CD
Coenzyme A and its acyl derivatives	CoA (or CoASH) and acyl-CoA
Complementary DNA	cDNA
Cyclic AMP	cAMP
Cyclic GMP	cGMP
Cytidine diphosphate choline, <i>etc.</i>	CDP-choline, <i>etc.</i>
Cytidine 5'-mono-, di-, and triphosphates	CMP, CDP, and CTP
Deoxyribonuclease	DNase
Deoxyribonucleic acid	DNA
O-(Diethylaminoethyl)	DEAE-

Dithiothreitol	DTT	Histidine	His	(H)
Electron paramagnetic resonance	EPR	Isoleucine	Ile	(I)
Electron spin resonance	ESR	Leucine	Leu	(L)
Ethylendiaminetetraacetic acid	EDTA	Lysine	Lys	(K)
[Ethylenebis(oxyethylenenitrilo)]-tetraacetic acid	EGTA	Methionine	Met	(M)
Flavin-adenine dinucleotide and its fully reduced form	FAD and FADH <sub>2</sub>	Phenylalanine	Phe	(F)
Flavin mononucleotide and its fully reduced form	FMN and FMNH <sub>2</sub>	Proline	Pro	(P)
Fourier transform	FT	Serine	Ser	(S)
Gas chromatography-mass spectrometry	GC-MS	Threonine	Thr	(T)
Gas liquid chromatography	GLC	Tryptophan	Trp	(W)
Glutathione and its oxidized form	GSH and GSSG	Tyrosine	Tyr	(Y)
Guanosine 3':5'-cyclic monophosphate	cGMP	Valine	Val	(V)
Guanosine 5'-mono-, di-, and triphosphates	GMP, GDP, and GTP	(3) Nucleic acids		
Guanosine triphosphatase	GTPase	Adenosine		A
Hemoglobin	Hb	Bromouridine	BrUrd or B	
Heterogenous nuclear RNA	hnRNA	Cytidine		C
High performance (pressure) liquid chromatography	HPLC	Dihydrouridine		D or hU
4-(2-Hydroxyethyl)-1-piperazineethane-sulfonic acid	HEPES	Guanosine		G
Immunoglobulin	Ig (IgG, IgM, etc.)	Inosine		I
Infrared	IR	6-Mercaptopurine ribonucleoside (6-thioinosine)		M or sI
Inorganic orthophosphate	P <sub>i</sub>	'a nucleoside'	Nuc or	N
Inorganic pyrophosphate	PP <sub>i</sub>	Pseudouridine		ψ or Q <sup>a</sup>
Inosine 5'-mono-, di-, and triphosphates	IMP, IDP, and ITP	'a purine nucleoside'		R
Kilobases	kb	'a pyrimidine nucleoside'		Y
Kilobase pairs	kbp	Thiouridine		S or sU
Lethal dose, 50%	LD <sub>50</sub>	Thymidine (2'-deoxyribosylthymine)		dT
Messenger RNA	mRNA	Uridine		U
Nicotinamide adenine dinucleotide and its reduced form	NAD <sup>+</sup> and NADH <sup>2)</sup>	Xanthosine		X
Nicotinamide adenine dinucleotide phosphate and its reduced form	NADP <sup>+</sup> and NADPH <sup>2)</sup>	Phosphoric residue	-P or	p
Nuclear magnetic resonance	NMR			
Nuclear RNA	nRNA			
Optical rotatory dispersion	ORD			
Phosphoric acid residue	P- or -P			
Pseudouridine and pseudouridine mononucleotide	ψ and ψMP			
Polyacrylamide gel electrophoresis	PAGE			
Poly(adenylic acid), polyadenylate <sup>3)</sup>	Poly(A) <sup>3)</sup>			
Polymerase chain reaction	PCR			
Restriction fragment length polymorphism	RFLP			
Ribonuclease	RNase			
Ribonucleic acid	RNA			
Ribosomal RNA	rRNA			
Ribosylthymine 5'-mono-, di-, and triphosphates	TMP, TDP, and TTP			
Sodium dodecyl sulfate	SDS			
Thin layer chromatography	TLC			
Thymidine (2'-deoxyribosylthymine) 5'-mono-, di-, and triphosphates	dTMP, dTDP, and dTTP <sup>4)</sup>			
Transfer RNA	tRNA			
Tris(hydroxymethyl)aminomethane	Tris			
Ultraviolet	UV			
Uridine diphosphate glucose, etc.	UDP-glucose, etc.			
Uridine 5'-mono-, di-, and triphosphates	UMP, UDP, and UTP			
(2) Amino acids				
Alanine	Ala	(A)		
Arginine	Arg	(R)		
Asparagine	Asn	(N)		
Aspartic acid	Asp	(D)		
Aspartic acid or asparagine	Asx	(B)		
Cysteine	Cys	(C)		
Glutamic acid	Glu	(E)		
Glutamine	Gln	(Q)		
Glutamic acid or glutamine	Glx	(Z)		
Glycine	Gly	(G)		

<sup>1)</sup> The various isomers of adenosine monophosphate may be written 2'-AMP, 3'-AMP, or 5'-AMP (in case of possible ambiguity). A similar procedure may be applied to other nucleoside or deoxyribonucleoside monophosphates.

<sup>2)</sup> NAD(P)<sup>+</sup> and NAD(P)H indicate either NAD<sup>+</sup> or NADP<sup>+</sup> and either NADH or NADPH, respectively.

<sup>3)</sup> Similarly abbreviate oligo- and polynucleotides composed of repeating sequences or of unknown sequence of given purine or pyrimidine bases, e.g. oligothymidylate, oligo(dT); alternating copolymer of A and U, poly(A-U); random copolymer of A and U, poly(A,U).

<sup>4)</sup> The d prefix may be used to represent the corresponding deoxyribonucleoside phosphates, e.g. dADP.

9. **Names of Animals, Plants, and Microorganisms**—The scientific names are Latin binomials and should be given in full in the title and summary and on first mention in the text (e.g. *Escherichia coli*). Subsequently, the generic name may be contracted (usually to the first letter), e.g., *E. coli*. The strain of laboratory animals and if possible the source should be stated.
10. The cytochromes should be designated by a small italicized letter, e.g. cytochrome *a*, *b*<sub>2</sub>, *c*<sub>1</sub>, etc.

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