IISSN 00062979, Biochemistry (Moscow), 2014. © Pleiades Publishing, Ltd., 2014.
Published in Russian in Biokhimiya, 2014, Vol. 79, No. 1, pp. 99-110.

INSTRUCTIONS TO AUTHORS 2014

1. General Information

1.1. *Biochemistry (Moscow)* is a monthly international journal published by the Russian Academy of Sciences concurrently in Russian (by the Academician Publishing Center Nauka) and English (by MAIK Nauka/Interperiodika, Pleiades Publishing Inc. and Springer Science+Business Media Inc.).

1.2. *Biochemistry (Moscow)* publishes papers in all fields of biochemistry and related areas including molecular biology, bioorganic chemistry, microbiology, physiology, and medicinal biochemistry.

1.3. Regular papers may include final original results obtained experimentally, descriptions of new experimental methods of value for biochemistry, and theoretical material suggesting new principles and approaches to biochemical problems.

Manuscripts dealing with particularly significant and novel findings are published as "Short Communications" (publication time four months). The accompanying letter must give the reasons why the authors believe that the work justifies accelerated publication.

The journal also publishes "Reviews" on timely topics of biochemistry and related fields, which are solicited or suggested by the authors and approved by the Editors.

Short, vivid mini-reviews are published in the "Biochemistry News" section.

The "Discussions" section provides an opportunity to comment on or criticize work previously published in *Biochemistry (Moscow)*, or to present a new hypothesis (maximum four typewritten pages). Replies from other interested parties may be solicited by the Editors to polemic contributions presented in this section.

In addition, the journal publishes "Chronicles" of congresses, meetings, and conferences with short presentations of the most sensational and timely reports.

1.4. The English version of the journal is surveyed by Biochemistry and Biophysics Citation Index, Biological Abstracts, BIOSIS Database, Chemical Abstracts, Chemical Titles, Current Contents/Life Science, Excerpta Medica, Index Internacional de Cardiologia, Index Medicus (MEDLINE/Pubmed), International Abstracts of Biological Sciences, The ISI Alerting Service, Science Citation Index, Science Citation Index Expanded, SCOPUS, and Compendx.

1.5. From the year 1996, the journal has a constantly updated WEB site (http://protein.bio.msu.ru/biokhimiya/) providing the tables of contents for all journal issues together with summaries, key words, and authors' addresses. Free access is also provided for two or three complete papers (i.e. with full text, figures, tables, etc.) of each issue, those most highly ranked by the reviewers, and special journal issues published since 1996 and devoted to most timely problems of biochemistry are provided in full.

1.6. From the year 2003, the journal WEB site includes a section "Papers in Press" allowing prepublication access to manuscripts that were most highly ranked by reviewers.

2. Preparation of Manuscripts

2.1. Submitted manuscripts should be condensed to the utmost compatible with clarity, but should contain sufficient detail to understand and reproduce the work.

2.2. The manuscript is to be arranged in the following order: 1) title; 2) authors' initials and last names; 3) complete names of institutions with their addresses, fax numbers, and E-mail addresses; 4) abstract; 5) key words; 6) paper body; 7) list of references.

The *title* should be as short and informative as possible and should not contain abbreviations.

If the work was carried out at more than one institution, the *authors' names* should be followed by superscript numbers indicating authors' affiliations. Indicate by asterisk following the superscript number the author to whom to address correspondence.

Complete *names of institutions* with their postal addresses, fax numbers, and E-mail addresses should be given for each author.

The *Abstract* (no more than 250 words) should succinctly and clearly present the major significant results of the investigation and conclusions therefrom.

The list of *Key words* should contain no more than seven items.

A short *running title* should be given on a separate line after the key words.

The paper body should be divided into: 1) introductory part; 2) MATERIALS AND METHODS; 3)

RESULTS; 4) DISCUSSION (if discussion is short, the results and discussion may be combined in section RESULTS AND DISCUSSION); 5) REFERENCES.

The introductory part should state the purpose of the investigation with imperative references to relevant previous works. It should not repeat the abstract!

The MATERIALS AND METHODS section should be as short as possible but adequate for repetition of the work by a qualified investigator. This section should also contain the names of the suppliers of the main equipment and reagents (including country name, but do not repeat country name if the same supplier is repeated). Only new procedures should be described in detail; published procedures should merely be referred to by literature citation. If the procedure is not generally known, it is appropriate to mention the principle and the authors of the method, e.g. "nuclease was assayed by the method of Johnson et al. [7]".

The RESULTS section should present your data in figures and tables; some results that do not need such documentation can be given in the text. Extensive discussion should not be given in this section and should be limited to an explanation of the logical links between the described experiments.

The DISCUSSION should deal with interpretation and not with repetition of the results. Use of a simple and pictorial scheme to illustrate the major results is encouraged.

Acknowledgments of financial support and assistance by non-authors in performing experiments or in preparation of the manuscript should be given at the end of the DISCUSSION section.

The list of REFERENCES (see below for style) should be as brief as possible but should contain all relevant recent publications of fundamental importance. The references should be cited in the text by numbers in square brackets consecutively in the order of appearance in the manuscript. The REFERENCE list should not include citations of web sites. Instead, publications suggesting those electronic resources (software/databases) should be cited. If such publications do not exist, the citation should be done in the body of the text by analogy with other unpublished materials (e.g. database of bacterial carbohydrate structures csdb/glycoscience.ru/bacterial).

2.3. Manuscript format

2.3.1. Regular papers should not exceed 20 typewritten pages, including references, tables, and figures (three figures are equivalent to one page) and 8 figures and tables. The maximum size of short communications is 12 typewritten pages and 4 figures or tables; of mini-reviews, 16 pages and 5 figures; of reviews, 35 pages, including references, etc.; and that of contributions to the "Discussions" section, 4 pages. Be sure that the first mention of each table, figure, and reference is in numerical order in the main text file.

2.3.2. Manuscripts should be prepared in computer format for submission by email. We receive most submissions in Microsoft Word; the main file can be submitted in "doc" or "docx" format. If you use another word processor, "rtf" format is acceptable.

2.3.3. Times New Roman font of 12 point size should be used for the ENTIRE manuscript file, with the exception of Greek and other special characters that can be in 12 point Symbol font, and a 12 point font should be used where a fixed pitch font is required (i.e. in comparison of sequences). The text should be in one column, left justified, and without hyphenation of words. Use of italics, bold, and sub- and superscripts should adhere to journal style (see published papers on the web site). The typography and format should be as simple and consistent as possible, e.g. entirely in 12 point font, left justified, and without hyphenation of words spanning lines with the exception of compound words that also contain a hyphen.

2.3.4. Each table should have a title and should appear immediately after the paragraph where it is first mentioned in the text. The same data will not be published in two forms, e.g. a table and a figure or a table and in the text. All table columns should have brief headings. Avoid columns with data that are easily derived from other columns, e.g. by subtraction or taking percent.

2.3.5. Figures may be prepared with any editor, but the final files should meet the following requirements:

– diagrams and graphs without half-tone inserts: TIFF, JPG, WMF, PDF or DOC files with figures in Black-and-White (Line-art, Bitmap) mode;

– half-tone figures or figures with half-tone inserts: TIFF, JPG, WMF, PDF or DOC files with figures in Grayscale mode;

– color figures: TIFF, JPG, WMF, PDF or DOC files with figures in CMYK (not RGB) mode. Color figures are printed in the journal only when color is essential for understanding the results presented, and authors should pay for it.

Independently of the figure type, it should have high real resolution (pixelization of raster graphics should not be too rough). Lines (Outline) should be at least three points wide (when drawn in Photoshop). Too small elements (letters, numbers, symbols, etc.) should be avoided. Pixelized (raster) figures should not be pasted into a Word document or converted to PDF, because it can impair their graphic quality.

Scanned images from books or journals should not be used.

Graph axes and curves should be appropriately labeled. Axis labels should indicate measured quantities with units (Arial font should be used). If the graph contains more than one curve, they should be numbered in italics, and explanations should be provided for each number in the figure legend (not on the graph!). The preferred symbols for experimental points are filled and

empty circles, squares, triangles, and diamonds. Individual curves may be distinguished by using solid and dotted lines. All lines should be drawn clearly and of the width (usually 3 points) that allows for a required reduction or magnification on final printing.

Each figure should be supplemented with an informative title and legend that make its meaning comprehensible without reference to the text. Conditions specific to a particular experiment should be stated. References to the text are permissible to avoid repetitions and ambiguity.

Figure legends should be grouped in the order of their appearance in the manuscript in a separate section following list of *References*.

Presentation of amino acid, nucleotide, and other sequences often requires exact vertical positioning of the elements. To reduce the chance of error and avoid tedious proofreading, the authors should submit such material in a camera-ready form.

ChemWindows software is used to type chemical formulae in the text.

Long mathematical expressions should be submitted as figures without legends in DOC, WMF, PDF, TIFF or JPG format. Each expression is given as a separate file, whose name should contain expression number in the manuscript. These files should be prepared using the guidelines for graphics given above. One should keep in mind that mathematical expressions usually occupy one column length.

Equation Editor function in Word should be used only for long mathematical expressions (equations, etc.). Short expressions appearing directly in the text (such as ΔG, $T\Delta S$, K_m, etc.) should be typed as the rest of the text, using the main Word functions. Simple expressions requiring simultaneous use of both subscript and superscript should be typed using only the subscript and superscript functions of Word (for example, NH_3^+), without trying to locate subscript directly under superscript. This will be done during typesetting.

Mathematical expressions should not exceed 8.5 cm in width. Larger expressions should be divided into several lines. Only Times New Roman and Symbol fonts should be used in mathematical expressions. If formulae are submitted as pixelized (raster) images, they should be in Black-and-White (Line-art, Bitmap) mode. Such images should have very high actual resolution (pixelization should not be rough). Pixelized (raster) images should not be pasted into a Word document or converted to PDF, because it can impair their graphic quality.

Failure to follow these rules for preparing graphical material may require its sending back to the authors for modification and will result in a delay in manuscript publication.

2.3.6. References containing the last names and initials of all authors should follow the style used for citation of journals, monographs, multi-author books as given in the following examples:

1. Gladysheva, I. P., Zamolodchikova, T. S., Sokolova, E. A., and Larionova, N. I. (1999) Interaction between duodenase, a proteinase with dual specificity, and soybean inhibitors of Bowman–Birk and Kunitz type, *Biochemistry (Moscow)*, **64**, 1244-1249.
2. Macedo, M. L. R., Freire, M. G. M., Cabrini, E. C., Toyama, M. H., Novello, J. C., and Marangoni, S. (2003) A trypsin inhibitor from *Peltophorum dubium* seeds active against pest protease and its effects on the survival of *Anagasta kuehniella* (Lepidoptera: Pyralidae), *Biochim. Biophys. Acta*, **1621**, 170-182.
3. Klesov, A. A., and Berezin, I. V. (1980) *Enzyme Catalysis* [in Russian], MGU Publishers, Moscow, pp. 111-164.
4. Ryan, C. A. (1981) in *The Biochemistry of Plants* (Marcus, A., ed.) Vol. 6, Academic Press, New York, pp. 351-370.
5. Gendrolis, A. A., Serebryannikov, N. V., and Gandel', V. G. (1978) in *Prostaglandins* (Azhgikhin, I. S., ed.) [in Russian], Meditsina, Moscow, pp. 332-347.
6. Walsh, M. P. (1985) in *Calcium and Cell Physiology* (Martel, D., ed.) Springer-Verlag, Berlin, pp. 170-203.
7. Gandelman, O. A. (1992) *Kinetics and Mechanism of Bioluminescent Oxidation of Fire-Fly Luciferin*: Author's abstract of Candidate's (doctoral) dissertation [in Russian], Moscow State University, Moscow.
8. Rosenkranz, A. A., Slastnikova, T. A., Durymanov, M. O., and Sobolev, A. S. (2013) Malignant melanoma and melanocortin 1 receptor, *Biochemistry* (Moscow), http://dx.doi.org/10.1134/S0006297913110035.

2.3.7. The International System of Physical Units (SI) is preferred.

2.3.8. Chemical, physical, mathematical symbols in the text, organic compound structures, and mathematical equations should be computer-printed. Letters of similar appearance in lower and upper cases (i.e. *P* and *p*, *C* and *c*, *K* and *k*), as well as those printed in italics should be clearly identified.

A product or quotient of two units should be written as in the example mol/sec (mol per second). In more complex groupings, the solidus should be combined with parenthesis to avoid ambiguity: a/(bc) but not a/b/c or a/bc; (a/b)c but not a/b·c. Use of powers is also recommended: $mol \cdot sec^{-1}$. Expressions of the type mA/gel and μmol/min·mg protein are not permitted and should be substituted by mA per gel and μmol/min per mg protein.

2.3.9. The recommendation of the Nomenclature Committee of the International Union of Biochemistry should be followed for abbreviations and symbols. The use of the abbreviations given below is mandatory, and they need not be defined in the text. Other abbreviations should be defined together in on the title page under the heading *Abbreviation(s)*.

Abbreviations are hindrances to readers, and their use should be restricted to a minimum. Clarity and lack of ambiguity are more important than brevity. On the other hand, it is sometimes convenient to use abbreviations for the names of substances, particularly in equations, tables, and figures.

Names of complex chemical compounds should be carefully verified. It may be better to use short formulae

instead of longer names, e.g. NaCl in place of sodium chloride, CH_3COOH or AcOH in place of acetic acid. When abbreviations for chemical compounds are needed, maximum use should be made of standard chemical symbols (C, H, O, P, S, Na, Cl, etc.), trivial names (e.g. folate), and symbols (e.g. Me, Pr, Ac for methyl, propyl, acetyl, respectively).

One-letter symbols are preferred over three-letter symbols for amino acid residues in polypeptides and proteins:

Alanine	Ala	A
Arginine	Arg	R
Asparagine	Asn	N
Aspartic acid	Asp	D
Aspartic acid or asparagine	Asx	B
Cysteine	Cys	C
Glutamine	Gln	Q
Glutamic acid	Glu	E
Glutamic acid or glutamate	Glx	Z
Glycine	Gly	G
Histidine	His	H
Isoleucine	Ile	I
Leucine	Leu	L
Lysine	Lys	K
Methionine	Met	M
Phenylalanine	Phe	F
Proline	Pro	P
Serine	Ser	S
Threonine	Thr	T
Tryptophan	Trp	W
Tyrosine	Tyr	Y
Valine	Val	V

Macromolecular compounds of repeated sequences may be represented by the prefix “poly” or the subscript *n*. Thus poly(Lys) or $(Lys)_n$ is polylysine, poly(Ala-Lys) or $(Ala\text{-}Lys)_n$ is a polymer consisting of alanine and lysine in regular alternating sequence, and poly(Ala,Lys) or $(Ala,Lys)_n$ is the irregular random polymer of these amino acids. The subscript *n* may be replaced by an average number (e.g. $(Lys)_{10}$) or a range (e.g. $(Lys)_{8\text{-}12}$).

Particular amino acid residues in proteins should be designated as Arg25, Pro49, Leu54, etc.

Three-letter designations of genes should follow international rules: italicized lower-case for bacterial and mutant yeast genes and italicized upper-case for dominant yeast genes. In procaryotes normal genes should be designated with lower-case letters with “plus” symbol in superscript (e.g. *proA*$^+$), and mutant genes also with lower-case letters with mutation number (e.g. *proA22*). In eucaryotes normal genes should be designated with upper-case letters (e.g. *LEU2*), and mutant genes with lower-case letters with mutation number if necessary (e.g. *leu2-3*).

New gene sequences should be deposited into GenBank or other freely available data base before submission.

The symbols for sugars are as follows:

Arabinose	Ara
2-Deoxyribose	dRib
Fructose	Fru
Fucose	Fuc
Galactose	Gal
Glucose	Glc
Mannose	Man
Ribose	Rib
Xylose	Xyl
Glucosamine	GlcN
N-Acetylglucosamine	GlcNAc
Galactosamine	GalN
N-Acetylgalactosamine	GalNAc
Neuraminic acid	Neu
N-Acetylneuraminic acid	NeuAc

When it is necessary to indicate furanose or pyranose, the saccharide symbol should be followed by the letter *f* or *p*: e.g. Rib*f* for ribofuranose.

The symbols for nucleosides, nucleotides, and polynucleotides are as follows:

Adenine	A
Guanosine	G
Inosine	I
Ribosylthymine	T
Uridine	U
Xanthosine	X
Adenosine-5′-mono-, di-, and triphosphates	AMP, ADP, ATP
Cytidine-5′-mono-, di-, and triphosphates	CMP, CDP, CTP
Guanosine-5′-mono-, di-, and triphosphates	GMP, GDP, GTP
Orotidine-5′-mono-, di-, and triphosphates	OMP, ODP, OTP
Ribothymidine-5′-mono-, di-, and triphosphates	rTMP, rTDP, rTTP
Uridine-5′-mono-, di-, and triphosphates	UMP, UDP, UTP

The corresponding deoxyribonucleotides are designated by the same symbol preceded by the low-case letter “d”, e.g. dATP, dGTP, etc.

AMP isomers are designated as 2′-AMP, 3′-AMP, 5′-AMP, 3′:5′-AMP (adenosine-3′:5′-monophosphate, cAMP).

The following symbols are used for specific preparations of nucleic acids:

Deoxyribonucleic acid	DNA
Complementary DNA	cDNA
Mitochondrial DNA	mtDNA
Ribonucleic acid	RNA
Mitochondrial RNA	mtRNA
Messenger RNA	mRNA
Ribosomal RNA	rRNA
Transfer RNA	tRNA
Specific tRNA	$tRNA^{Ala}$, $tRNA^{Glu}$, etc.
Isoacceptor tRNA	$tRNA_1^{Ala}$, $tRNA_2^{Ala}$, etc.
Aminoacylated tRNA	Ala-tRNA, Glu-tRNA, etc.

Polyphosphoinositides and their hydrolysis products should be designated in the following way:

Phosphatidyl	Ptd
Inositol	Ins
Phosphate	P

Thus, PtdIns(4,5)P_2 stands for phosphatidylinositol 4,5-bisphosphate.

Names of enzymes may be abbreviated, e.g. G6PDG (glucose-6-phosphate dehydrogenase). The abbreviation should be defined in the *Abbreviations* paragraph on the title page. Substrate name used as part of the trivial enzyme name may be abbreviated, e.g. ATPase, Glu-decarboxylase.

The following abbreviations may be used without definition:

acyl-CoA	acyl derivative of coenzyme A
BSA	bovine serum albumin
CM-cellulose	carboxymethyl cellulose
CoA, CoASH	coenzyme A
DEAE-cellulose	diethylaminoethyl cellulose
EDTA	ethylenediaminetetraacetate
EGTA	ethylene glycol-bis(β-aminoethyl ether) N,N,N′,N′-tetraacetate
FAD, $FADH_2$	flavin-adenine dinucleotide and its reduced form
FMN, $FMNH_2$	riboflavin-5′-phosphate and its reduced form
G-protein	guanine-nucleotide-binding regulatory protein
GSH, GSSG	reduced and oxidized glutathione
IgG	immunoglobulin G
NAD, NAD^+, NADH	nicotinamide-adenine dinucleotide and its oxidized and reduced forms
NADP, $NADP^+$, NADPH	nicotinamide-adenine dinucleotide phosphate and its oxidized and reduced forms
PAGE	polyacrylamide gel electrophoresis
P_i	orthophosphate
PP_i	pyrophosphate
POPOP	1,4-bis(5-phenyl-2-oxazolyl)benzene
PPO	2,5-diphenyloxazol
Q, QH_2	ubiquinone, ubiquinol
SDS	sodium dodecyl sulfate
TCA	trichloroacetic acid

Class names (fatty acids, protein, virus, etc.) and short names (folate, furan, etc.) are not abbreviated. Abbreviations should not be used for terms such as “central nervous system”, “red blood cells”, or “extracellular fluid” and for names of tissue preparations, buffers, and suspension media.

The following abbreviations may be used for common physicochemical methods and related terms: CD, circular dichroism; EPR, electron paramagnetic resonance; ESR, electron spin resonance; GLC, gas-liquid chromatography; HPLC, high-pressure liquid chromatography; IR- and UV-spectroscopy, infrared and ultraviolet spectroscopy; NMR, nuclear magnetic resonance; ORD, optical rotary dispersion; SDS-PAGE, polyacrylamide gel electrophoresis in the presence of sodium dodecyl sulfate; TLC, thin-layer chromatography.

2.3.10. Nomenclature of isotopically labeled compounds. The isotope symbol is placed in square brackets directly attached to the front of the name: [^{14}C]urea, [α-^{14}C]leucine, L-[methyl-^{14}C]methionine. When more than one position in a substance is labeled and the positions are not indicated, the number of labeled atoms is shown by the subscript on the right-hand side of the symbol: [$^{14}C_2$]glycolic acid. The symbol “U” indicates uniform labeling (in [U-^{14}C]glucose each molecule has ^{14}C at all six positions), and symbol “G” indicates general labeling (in [G-^{14}C]glucose ^{14}C may be present at any, but not necessarily all, of the six positions). In the latter case, [^{14}C]glucose will suffice.

The isotope prefix precedes the part of the compound name to which it refers: iodo[^{14}C]acetic acid, 1-

amino-[^{14}C]methylcyclopentanol ($H_2N^{14}CH_2C_5H_8OH$), fructose 1,6-[1-^{32}P]bisphosphate. Terms such as "^{131}I-labeled albumin" should not be contracted to "[^{131}I]albumin" since native albumin does not contain iodine; however, "[^{131}I]iodoalbumin" is acceptable.

When a compound contains isotopes of more than one element, their symbols are arranged alphabetically [3-^{14}C, 2,3-D^{15}N]serine. Deuterium may be designated by ^{2}H or D, tritium by ^{3}H or T.

The positions of isotope labeling are indicated by Arabic numerals, Greek letters, or prefixes placed within the square brackets before the element symbol to which they are attached by a hyphen: [1-^{3}H]ethanol, L-[α-^{14}C]leucine, [carboxyl-^{14}C]leucine, [3,4-^{14}C,^{35}S]methionine, L-[methyl-^{14}C]methionine.

The above rules also apply when the labeled compounds are designated by standard abbreviations or symbols: [α-^{32}P]ATP, [^{32}P]CMP (not CM^{32}P!). Labeled orthophosphate and pyrophosphate may be designated by $^{32}P_i$ and $^{32}PP_i$, respectively.

Square brackets may be omitted for simple molecules by writing their chemical formulae: $^{14}CO_2$, $H_2{}^{18}O$, D_2O, $H_2{}^{35}SO_4$, $^{32}PO_4^{3-}$ (but [^{32}P]phosphate). The square brackets are not to be used when the isotopic symbol is attached to a word that is not a chemical name or refers to a class name of compounds: ^{131}I-labeled, ^{3}H-ligand, ^{14}C-steroids, ^{14}C-amino acids.

When describing experiments with labeled compounds, absolute values of the radioactivity should be given, wherever possible, in curies (Ci), becquerels (Bq), disintegrations per minute (dpm), or counts per minute (cpm).

2.3.11. Recommendations on specific topics common for biochemical literature are given below (see also *Biochem. J.*, **289**, 1-15 (1993)).

Animals, plants, microorganisms. The full binomial names should be included for all experimental animals (other than common laboratory animals) and plants. The strain, the variety, and, if possible, the source of the material should be given. Reports describing effects of changes in feeding should contain the compositions of the feeding material (growing media).

In the title, the summary, and at first mention in the text, full binomial Latin names, italicized, should be given for microorganisms. Elsewhere in the text, single-letter abbreviation may be given for the generic name along with full species name. The number of the organism in the collection from which the organism was obtained should be stated. Alternatively, a strain number (not italicized) should be given. If two genera with the same initial letters are studied, abbreviations such as *Strep.* and *Staph.* may be used. Ranks higher than genus (e.g. Eubacteriales, Lactobacilleae) and generic names used adjectively (e.g. staphylococcal) are not italicized.

Centrifugation. When conditions for centrifugation are critical, sufficient information should be provided for the experiment to be repeated: the centrifuge rotor, the quantitative composition of the suspension medium, operation temperature, the time of rotor operation at constant velocity (ignoring acceleration and deceleration periods), the centrifugal field based on the average radius of rotation of the liquid. For example: "The centrifugation was performed for 15 min at 2°C and 10,000*g* (r_{av} 8 cm)".

For density-gradient centrifugation, centrifuge and rotor manufacturer(s), temperature, and gradient composition should be stated. Results should preferably be presented as a function of distance from rotor center rather than fraction number; it is then unnecessary to indicate top and bottom of the gradient. If fraction numbers are used, the top and bottom of the gradient should be indicated.

For ultracentrifugation, the following parameters are used: sedimentation coefficient (not constant), s; sedimentation coefficient at zero concentration at 20°C in water, $s^0_{20,w}$; Svedberg unit (10^{-13} s), S; partial specific volume, v; diffusion coefficient, D; $D^0_{20,w}$, as for the sedimentation coefficient. The temperature at which the sedimentation and diffusion measurements were made should be stated.

Chromatography. Use of photographs or schemes of paper and thin-layer chromatography should be restricted to cases when it is difficult to give corresponding information in the text, e.g. when homology is demonstrated.

The rate of movement of a substance relative to the solvent front in paper or thin-layer chromatography is characterized by R_f value. Solvent composition is best described in the form butan-1-ol–CH_3COOH–H_2O (4 : 4 : 1 v/v).

Elution diagrams for column chromatography should be shown with the effluent volume increasing from left to right. Units of concentration and volume should be shown clearly. Column dimensions and, if possible, column void volume (V_0) should also be stated. Elution peak maximum may be characterized by elution volume (V_e) or, preferably, by partition coefficient (α or K_D). Calibration curves (e.g. plots of molecular mass versus V_e or K_D) for columns will not be published.

Electrophoresis. Photographs of gel electrophoregrams will be published provided that they bear some important information; drawings or densitograms may be more informative in certain cases. The composition of the electrophoretic medium, pH, temperature, electrophoretic mobilities (m), and operative voltage should be quoted. The symbol pI should be used for isoelectric point.

Enzymes. For nomenclature, the recommendations of the latest edition of Enzyme Nomenclature (1992, Academic Press, San Diego-New York) should be followed. Units of enzyme amount should be defined in each paper in terms of the rate of the reaction catalyzed under specified conditions. The SI unit for the rate is 1 mol of substrate transformed per sec (or 1 mol of product formed per sec). This gives the unit of enzyme amount called katal (symbol: kat). Units of enzyme amount may

be also expressed in terms of the amounts that catalyze other rates, e.g. 1 μmol of substrate transformed per min.

Concentrations of protein solutions are often measured versus a solution of a standard protein (e.g. BSA). The standard protein used, its source, and, if possible, water content should be quoted.

The rate constants for the forward and backward reactions at the *n*th step of a multistep enzyme-catalyzed reaction should be represented by k_n and k_{-n}, respectively. The Michaelis constant (K_m) is defined as substrate concentration ([S]) which corresponds to $v = V/2$, where V (or V_{max}) is the initial rate of product appearance or substrate disappearance when the enzyme is saturated with the substrate, and v is the initial rate at a given substrate concentration. For reactions involving two substrates (A and B), K_m^A = [A] when $v = V/2$ and [B] is extrapolated to infinity; a value of [A] at which $v = V/2$ at a finite concentration (which should be specified) of B should be referred to as an apparent Michaelis constant for A ($K_{m,app}^A$). Other parameters used in enzyme kinetics include: K_s, dissociation constant for enzyme–substrate complex; K_i, dissociation constant for enzyme–inhibitor complex; $[I]_{50}$, inhibitor concentration at which rate is decreased by half; h, Hill coefficient (parameter in Hill equation used to describe sigmoidal v versus substrate or inhibitor concentration curves) (see also "Recommendations on Symbolism and Terminology in Enzyme Kinetics" published in *Arch. Biochem. Biophys.*, **224**, 732-740 (1983)).

Amount of substance, molecular mass, daltons, and molar concentration. The SI unit of the amount (n) of substance is mole (abbreviated mol), i.e. the amount of substance containing the same number of structural units (molecules, atoms, ions, electrons, etc.) as the number of carbon atoms contained in 0.012 kg of ^{12}C. Avogadro's number, $N_A = 6.02 \cdot 10^{23}$ per mol, gives the number of structural units in a mole of any substance. Molar mass (M) is the mass of 1 mol of the substance (m/n), and its dimension is g/mol or kg/mol. Mass (m, g), amount (n, mol), and molar mass (M, g/mol) are different terms which are linked to one another with the relationship $m = nM$. There are two preferred ways of specifying the mass of a biochemical entity. Relative molecular mass (M_r, formerly "molecular weight") is the ratio of the mass of a molecule to 1/12 of the mass of the atom ^{12}C. Hence, it is dimensionless. Molecular mass is the mass of one molecule of a substance expressed in daltons; the dalton is defined as 1/12 of the mass of the atom ^{12}C or M/N_A. Thus, a protein may be said to have a relative molecular mass of 50,000 (M_r = 50,000) or a molecular mass of 50,000 daltons (better, 50 kDa), and may be referred to as the 50,000-M_r protein or the 50-kDa protein. It is not correct to express M_r in daltons. Either M_r or molecular mass (kDa) should be used throughout the paper.

Solutions should be described in terms of **molarity** (M, mM, μM, etc.), i.e. the number of moles of substance contained in 1 liter of the solution, not **normality** (N). The decimal system should be used, e.g. 0.25 M HCl. The term% must be defined as w/w, w/v, or v/v, e.g. 5% (w/v) means 5 g/100 ml. For aqueous solutions of less than 1%, w/v need not be stated since it is obvious that the concentration is given in terms of mass of solute. For solutions of salts, expressed in %, it should be made clear whether the compounds are hydrated or anhydrous.

Nucleotide sequences. Authors should remember that nucleotide sequence should be determined in both DNA chains. A clear description of the determination and complete sequence data will suffice.

Powers in tables and figures. Authors must exercise care in the use of powers to avoid numbers with too many digits in table headings and in figures. This is illustrated by the following examples: 1) a concentration 0.00015 M may be expressed as $15 \cdot 10^{-5}$ M but it is preferable to give it using a prefix, as 0.15 mM or 150 μM; listing of 0.15 under the heading "Concentration, mM" or 150 under "Concentration, μM", or 15 under "Concentration × 10^5, M" are all appropriate (but not 15 under the heading "Concentration, M × 10^{-5}"!); 2) listing of 2 under the heading "10^3k" means $k = 0.002$, and 2 under the heading "$10^{-3}k$" means $k = 2000$; 3) complex quantities are treated similarly; a value of 200 M^{-1} for 1/[S] would appear as "2" under the heading "10^{-2}/[S], M^{-1}" or as "0.2" under the heading "1/[S], mM^{-1}". Concentrations may conveniently be indicated by square brackets.

The following prefixes and symbols should be used for multiples and subdivisions of units:

Multiple	Prefix	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^2	hecto	h*
10	deca	da*
10^{-1}	deci	d*
10^{-2}	centi	c*
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

* To be avoided whenever possible (except for cm).

A combination of a prefix and a unit is treated as one symbol and may be raised to a power without using brackets, e.g. mM^{-1} and cm^2.

Buffer solutions. These must be specified in a way allowing readers to reproduce the experimental conditions. It is useful to give complete composition of each buffer solution in the "Materials and Methods" section or at the first mention, e.g. 0.09 M CH_3COONa/0.01 M CH_3COOH, pH 5.6 (which means that the buffer solution has these concentrations of these substances). A short designation "0.1 M sodium acetate buffer, pH 5.6" may be used thereafter throughout the paper. If a buffer contains two or more ionizable substances, e.g. pyridine and CH_3COOH, the concentration of each component must be specified.

Trivial names of the following common buffers may be used without definition:

Aces	2-[(Amino-2-oxoethyl)amino]ethanesulfonic acid
Ada	(N-[2-Acetamido]-2-iminodiacetic acid
Bes	2-[Bis(2-hydroxyethyl)amino]ethanesulfonic acid
Bicine	N,N-Bis-(2-hydroxyethyl)glycine
Bistris	2-[Bis-(2-hydroxyethyl)amino]-2-(hydroxymethyl)propane-1,3-diol
Hepes	4-(2-Hydroxyethyl)-1-piperazine-ethanesulfonic acid
Hepps	4-(2-Hydroxyethyl)-1-piperazine-propanesulfonic acid
Mes	4-Morpholine-ethanesulfonic acid
Mops	4-Morpholine-propanesulfonic acid
Pipes	1,4-Piperazinediethanesulfonic acid
Taps	3-{[2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]amino}-1-propanesulfonic acid
Tes	3-{[2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]amino}ethanesulfonic acid
Tricine	N-[2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]glycine
Tris	2-Amino-2-(hydroxymethyl)-1,3-propanediol

Incubation media such as Krebs–Ringer solution, Eagle's medium, or Waymouth's medium should be defined by citing the reference or by giving their compositions.

Spectra and spectroscopic data. Full spectra should be published only if they demonstrate novel or important information. The spectra for UV or visible absorption, fluorescence, circular dichroism, and optical rotation should have a wavelength scale (nm or μm). Where possible, molar terms should be used when describing absorption, optical rotation, and circular dichroism. As stated above, commonly used abbreviations of methods (ORD, CD, EPR, ESR, and NMR) need not be defined.

Visible and ultraviolet absorption spectroscopy. The value of $\log(I_0/I)$ is called attenuance, and this reduces to absorbance when scattering and reflection are negligible. If scattering is significant, e.g. when culture cell density is estimated, the more general term attenuance should be used. Otherwise, the term **absorbance** should be used, but not **extinction** or **optical density**. The symbols used: A, absorbance ($\log(I/I_0)$); a, specific absorption coefficient ($liter \cdot g^{-1} \cdot cm^{-1}$) (alternatively used $A^{1\%}_{1cm}$); ε, molar absorption coefficient (absorbance of a 1 M solution in a 1 cm light-path) ($liter \cdot mol^{-1} \cdot cm^{-1}$ or $M^{-1} \cdot cm^{-1}$ but not $cm^2 \cdot mol^{-1}$). Wavelength (nm) at which measurements are done are given without units (e.g. $A^{1\%}_{1cm,420}$). No equals sign is placed between ε or A and its numerical value.

IR spectra are reported as percentage transmittance (T) versus wavelength (μm) or frequency (cm^{-1}).

Optical rotation is reported as the specific rotation ($[\alpha]^t_\lambda$), which is numerically equal to the rotation in degrees of a 1 g/ml solution in a 1 dm (10 cm) light-path at wavelength λ and temperature t. Solution concentration (g/100 ml) and solvent should be stated, e.g. $[\alpha]^{20}_{420}$ 27.5° (2 g/100 ml methanol). Molar expressions (molar rotation) may be also used: $[M] = [\alpha] \cdot M_r$ and $[m] = [\alpha] \cdot M_r/100$.

For biopolymers, optical rotatory dispersion ($[m]_{m.r.w)}$ is reported for the mean residue (monomer) M_r; the dimension of $[m]_{m.r.w}$ is $deg \cdot cm^2 \cdot dmol^{-1}$.

Optical rotatory dispersion is reported as the variation of [α] or [m] with wavelength or frequency.

Circular dichroism is reported as the molar absorption coefficient ($\Delta\varepsilon = \varepsilon_L - \varepsilon_R$, where ε_L and ε_R are absorption coefficients for the light polarized to the left and to the right) or as molar ellipticity $[\theta]_M$. For biopolymers, molar concentrations in terms of the mean residue M_r are generally used. Units of Δε are $liter \cdot mol^{-1} \cdot cm^{-1}$ or $M^{-1} \cdot cm^{-1}$; units of $[\theta]_M$ are as for [m] in terms of the mean residue. The relationship between Δε and $[\theta]_M$ is $[\theta]_M = 3300\ \Delta\varepsilon$.

Fluorescence spectroscopy. In reporting fluorescence (F) excitation and emission spectra, it should be stated whether they are normalized or corrected, and what is the nature of the correction. Fluorescence-polarization data and spectra are reported as polarization ratio (P) or anisotropy ratio (A); both are dimensionless.

Statistical treatment of results. Data from a large number of independent experiments should be reported in a way permitting evaluation of their reproducibility and significance. When the goal is to determine quantitative or statistical characteristics of a population, the information is adequately given by: 1) the number of independent experiments (replicate measurements in one animal, results from pooled tissues, etc. represent only one independent estimate); 2) the mean value; 3) the standard deviation, the coefficient of variation, or the standard error of the estimate of the mean value. It should be clearly stated whether the standard deviation or the standard

error is used. A convenient form for inclusion in a table is, for example, 263 ± 2.5 (10), where the number in parentheses represents the number of values used in calculating the mean.

If the results are claimed significant, a significance test should be performed and probability estimated.

Normal-distribution statistics should be used unless otherwise established.

Authors are encouraged to provide data that are impossible or impractical to include in the printed journal (such as large data sets of identified proteins in proteomic research) as supplemental material, which is made available to readers only on-line, on the internet site of the journal. The supplemental material should be referred to in the manuscript at an appropriate place in the text.

3. Submission of Manuscripts

3.1. Manuscripts should be submitted in electronic form by E-mail to either of the following addresses: biochem@naukaran.com or ozrina@bio.chem.msu.ru.

A separate file should provide the names of all authors and their postal addresses, telephone and fax numbers, and E-mail addresses, and indicate the corresponding author.

3.2. The submission should include one text file with the entire text including authors, their affiliations, abstract, main text, references, figure legends, tables, etc. and separate figure files. Please name files as follows:

– for the main text file, *firstauthorname*-text.*ext*, where *ext* is doc, docx, or rtf;

– for figure files, *firstauthorname*-Fig*n*.*ext*, where *n* is the figure number and *ext* is the appropriate figure file type;

– please combine all files into an archive named *firstauthorname*.*ext*, where *ext* is arj or zip.

3.3. Manuscripts may be submitted via E-mail as attachments to either of the following addresses: biochem@naukaran.com and ozrina@bio.chem.msu.ru. The files should be prepared as described above. Large files should be archived.

3.4. Regardless the way of submission, the manuscripts should be accompanied by a covering letter, stating that the submitted material has not been published or submitted elsewhere.

4. Editorial Handling (Reviewing, Editing, Proofs)

4.1. The Editorial Office acknowledges the receipt of manuscripts by sending the authors an E-mail message giving the manuscript registration number and submission date. Manuscripts that do not follow the recommended journal style are returned to the authors without review.

4.2. The authors are urged to recommend two qualified reviewers (by providing their full names and E-mail addresses) and may also request that certain reviewers not be chosen.

4.3. The submitted manuscript is sent to two reviewers competent in the field of the study; in certain cases, the opinion of other independent reviewers may be requested. The Editorial Board uses the reviews to decide whether to accept the manuscript, return it to the authors for revision, or decline.

Manuscripts which receive the highest score from two reviewers are published as *Accelerated publications* (publication time 3-4 months).

Papers judged to be basically acceptable but requiring revisions are sent to the authors together with the reviewers' and editor's reports. The revised manuscript undergoes a second reviewing cycle, and, based on the new reviews, the Editorial Board makes a final decision. In case of acceptance, both the initial submission date and the date when the final revised manuscript was received by the Editorial Office are indicated in the published paper.

The revised manuscript should be returned to the Editorial Office within 3 months. A revised manuscript received beyond the 3-month period will be considered as a new submission.

If, in the judgments of two reviewers, the paper does not fall within the scope of the journal or is unsatisfactory scientifically, it is declined.

4.4. From 2003, the Journal began preliminary publication of articles (Papers in Press) on the Internet site of Biochemistry (Moscow) (http://protein.bio.msu.ru/biokhimiya/) before the printed version appears. In agreement with authors, experimental papers submitted in English language, which obtained a high score during reviewing and were accepted for publication, are posted on the site.

4.5. The Editorial Office uses E-mail for correspondence; therefore, the authors should carefully check their E-mail address shown in the submitted manuscript and promptly report on its changes.

4.6. Galley proofs together with necessary instructions are sent to the corresponding author via E-mail as PDF files for correction.

At this stage, substantive changes in the text or any changes in the figures or tables will require prior editorial approval and are done only in exceptional cases.

5. Russian-Language Version of the Journal

5.1. The journal is published concurrently in Russian and English. Submitted papers should be written in Russian or English or both. Translations, when required, will be done in Moscow by qualified biochemists.

5.2. Upon publication, the authors receive PDF files of both English-and Russian-language versions.