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Information for Authors

CLINICAL CHEMISTRY, issued monthly, is published under the direction of an Editorial Board appointed by the Board of Directors of the American Association of Clinical Chemists, Inc. The editors give equal consideration to original manuscripts in English from any country, whether or not the author is a member of the Association.

Excellent scientific work deserves excellent presentation—but frequently suffers a lack of it. The aim of these suggestions is to expedite publication by making it easier for the potential author to present his work in a form that will minimize editorial revision and delay. Copies are available on request.

Scope

CLINICAL CHEMISTRY welcomes contributions on the application of chemistry to the understanding of the human organism in health and disease. Articles submitted for publication should contain original information, experimental or theoretical, that advances the science of clinical chemistry. This includes basic materials or principles, analytical techniques, instrumentation, data processing, statistical analyses of data, clinical investigations in which chemistry has played a major role, and experimental (laboratory animal) investigations of chemically oriented problems of human disease.

Other appropriate contributions include reviews, scientific notes, and letters to the editor. Prospective contributors should consult recent issues of CLINICAL CHEMISTRY to determine the appropriate category for their contribution, as well as for examples of acceptable style.

Submission of Manuscripts

Manuscripts and other editorial correspondence should be addressed to J. Stanton King, Jr., Executive Editor, CLINICAL CHEMISTRY, P.O. Box 15053, Ardmore Station, Winston-Salem, N.C. 27103.

Manuscripts are considered for publication with the understanding that no paper presenting the same information—other than an abstract or preliminary report—has been or will be published elsewhere. CLINICAL CHEMISTRY is copyrighted by the Association. The Editorial Board's permission to reproduce copyrighted material for scholarly use can be arranged through the Executive Editor.

Two copies of the manuscript should be submitted, triple-spaced throughout (including abstract, references, tables, figure legends, and footnotes), on one side of paper (8 1/2 X 11 in.) with 1 1/2-in. margins. Each copy must include all figures and tables. An abstract precedes the body of the manuscript; a separate sheet should be used for the title page, with authors' names and affiliations. Abstract, references, tables, figure legends, and footnotes should be grouped on separate sheets, in that order. Every page, beginning with the title page, should be numbered. All sheets should carry the last name of the author(s) in the upper right corner.

If the current address of any author differs from that where the work was done, it will be included as a footnote; if reprints are to be requested from someone other than the first author, or from an address other than that where the work was done, the footnote should include this comment.

Review of Manuscripts

Manuscripts will be evaluated by two anonymous persons, who will be either members of the Editorial Board or qualified invited reviewers. Manuscripts are considered privileged information by the reviewers, who are also expected to disqualify themselves before reviewing papers where a possible conflict of interest may exist.

When reviewers clearly disagree on the merits of a manuscript, a third person will be asked to examine it. A résumé of the reviewers’ critiques will be sent to the author when he is notified of the disposition of the manuscript (usually not later than six weeks from receipt) by the Executive Editor. If the manuscript is rejected, the author may appeal in writing, giving his reasons why the manuscript should be reconsidered.

The principal desiderata for an acceptable paper are:
• subject matter that is original and significantly advances the state of knowledge of clinical chemistry
• conclusions that are justified from the design of the experiments and the data presented
• information that is sufficiently detailed to permit repetition of the work by a competent clinical chemist
• clear, concise, and grammatical writing.

Manuscript Preparation

The principal guides for the author should be the "ACS Handbook for Authors" (1), and the "Style Manual for Biological Journals" (2), with the former taking precedence where there is disagreement. Only
critical preparation of the manuscript can enable the
author to avoid obscure wording, neologisms, "labora-
tory slang," and unfamiliar (and undefined) terminol-
ogy.

Although no rigid mold exists for the organization of
texts acceptable for publication in CLINICAL CHEMIS-
try, manuscripts should be arranged generally into the
following sections: title, abstract, introduction, ma-
terials and methods, results, discussion, and references.

Title

The title should be specific, informative, and concise,
incorporating appropriate keywords to facilitate in-
dexing. Symbols, formulas, or arbitrary abbreviations
should not be included in the title, except chemical
symbols to indicate the structure of isotopically labeled
compounds.

Abstract

An abstract, intelligible by itself, should be included
in all contributions to CLINICAL CHEMISTRY except
letters to the editor. The abstract, not to exceed 150
words, summarizes the plan, procedures, results, and
conclusions of the investigation. Remember that the
abstract will be the most widely read portion of the
paper and is the main source of material for the various
abstracting services.

The Executive Editor will select "Additional Key-
phrases" not found in the title.

Introduction

This should indicate the importance of the work, its
relation to previous work, and (if it is a method) reasons
why it is preferable to older methods.

Materials and Methods

The material to be presented dictates the way in
which this section is written. Whatever the arrange-
ment, the following topics are usually present:

Apparatus. All apparatus should be identified, in-
cluding manufacturer's name and address (city, zip
code), and specific model number where various ver-
sions exist. Further details are necessary only when
the equipment is not standard. Where standard
apparatus has been modified or new apparatus built,
lists of components and their sources should be provided
along with directions from which the equipment can be
duplicated.

Special considerations for mechanized (automated)
equipment are discussed below in a special section.

Reagents. While all reagents used may be listed, only
special or unusual ones need be described in detail, and
their source mentioned. If purity or stability of re-
agents is critical, particulars about the source, degree of
purity, and preservation should be included. Only
novel details of preparation or purification of reagents
need be described.

The pH and composition of buffers should be unam-
biguous; a standard reference can often be cited. The
temperature at which critical pH measurements are
made should be stated. It must be made clear whether
the concentrations in a reaction mixture represent final
concentrations or the original concentration of the solu-
tions added.

Procedures. Use of the imperative mood here is both
clearer and more succinct. Standard procedures should
be cited but not described, except where a brief résumé
of the principle of a method is appropriate. Only modi-
fications of an accepted procedure need be described.
Adequate details of critical steps (e.g., collection and
storage of samples, standardization, calibration, and
calculation of results) are necessary to permit the work
to be repeated by a competent clinical chemist. Any
potential hazards in the procedure should be men-
tioned.

Results

These should be presented in concise and simple
language, with the use of tables or graphs for clarifica-
tion if necessary. Accuracy and precision of a new tech-
nique should be included here. Other material appro-
riate for this section is suggested elsewhere (3).

Discussion

This section should discuss significance of results,
and lead to a valid conclusion. Results and conclusions
should be compared and contrasted with those of pre-
vious studies. Interpret the results here but do not
recapitulate them. Such matters as special problems,
interferences, effect of order of reagent addition, and
color stability are appropriate to this section. Papers
concerned with analytical methods are expected to
discuss sensitivity, specificity, precision (day-to-day
and within-run), and accuracy in relation to other
methods. Sometimes clarity is improved if discussion is
intermingled with results in a single section, but if this
is done the author should clearly distinguish speculation
and fact.

Acknowledgments

Acknowledgments of financial support, gifts, tech-
nical help, or other assistance are made in a brief para-
graph preceding the References.

References

References to the literature should be listed by num-
ber in the order of their appearance in the text. The
appropriate positions in the text should be indicated
by italicized Arabic numerals in parentheses. Biblio-
graphic references should be patterned on the following
examples:

Journal

1. Woolf, L. I., and Goodwin, B. L., Determination of
phenylalanine in blood and urine. CLIN. CHEM. 10,
146 (1964).

Books and monographs (except serial review
volumes, which are treated as journals)

2. Henry, R. J., Clinical Chemistry: Principles and

3. Holman, R. T., and Bergstrom, S., The thyroid
hormones. In The Enzymes 2, part 2; Sumner, J. B.,

2 CLINICAL CHEMISTRY, Vol. 17, No. 1, 1971

It is the author's responsibility to verify the accuracy and adequacy of reference information. This is where most errors appear—and persist, since the editorial office does not routinely check references. Only essential references should be cited; include review articles when appropriate.

Avoid textual references to unpublished work, manuscripts in preparation, verbal reports given at meetings, and personal communications. This type of information should either be placed in footnotes or mentioned parenthetically in the text. References to papers in press may be included among the References; it is advisable to send copies of such papers to the Editor, to assist in the evaluation of the manuscript. Published abstracts, if cited, must appear as text footnotes, but should be avoided whenever possible.

**Abbreviations**

Authors should avoid the creation of new abbreviations, such as acronyms. A few such abbreviations may aid readability; a profusion of them does not. If more than two are used, all nonstandard abbreviations must be defined in a single footnote in the text at the point where the first is used. Abbreviations, if previously defined, may be used in formulas and diagrams. Letter combinations which form words or which are already in current use as conventional abbreviations must be avoided. Abbreviations listed in the recommended references (1, 2) may be used without definition. It is a good rule to define when in doubt.

The Association has officially accepted (4) the recommendations of the Commission on Clinical Chemistry of IUPAC and the IFCC on a standard international system of units. The following examples include abbreviations appearing most commonly in the journal; others can be found elsewhere (5). Examples of abbreviations that are no longer acceptable are also given. Save time by consistent use of the proper units in text, figures, and tables. Notice that periods do not follow the abbreviations.

**Prefixes for decimal factors:**

\[
\begin{align*}
10^1 & \text{ kilo-} & 10^{-2} & \text{ centi-} \\
10^2 & \text{ hecto-} & 10^{-1} & \text{ milli-} \\
10^3 & \text{ deca-} & 10^0 & \text{ micro-} \\
10^{-1} & \text{ deci-} & 10^{-2} & \text{ nano-} \\
10^{-2} & \text{ pico-} & \\
\end{align*}
\]

*Length:* m, cm, mm, μm, nm (not acceptable: in., ft., yd., A, μm).

*Area:* m², cm², mm², μm² (not acceptable: sq. in., in.², u²).

*Volume:* liter, ml, μl, nl, pl (not acceptable: pint, gallon cc, ccm, λ, μl). Where the word "liter" is used in the text, it should be written out in full to avoid confusion with the numeral 1; it will usually be desirable to do so in tables and figures as well.

*Mass:* kg, g, mg, μg, ng, pg (not acceptable: oz., lb., Kg, gr, gm, gms, mgm, mgms, mgs).

*Mass concentration:* kg/liter, g/liter, mg/liter, μg/liter (not acceptable: %, g/ml, ppm, mg%). Because the values for the common clinical determinations are more familiarly expressed in mg/100 ml or μg/100 ml (e.g.), it is best to avoid confusion by allowing these for the present.

*Molar concentration:* mol/liter, mmol/liter, μmol/liter, nmol/liter (not acceptable: M, N, mEq/l).

*Temperature:* °C (not acceptable: °, K).

*Time:* s, min, h (but d and a are so unfamiliar that day and year should be retained for the present).

*Density:* kg/liter.

*Relative density:* This term replaces "specific gravity."

*Clearance:* liter/s, ml/s (not acceptable: l/sec., l/min).

*Electric current:* A.

*Radioactivity:* Ci, mCi, μCi.

*International units of enzymic activity:* U.

*Coefficient of variation:* cv.

**Illustrations**

Use figures only when they have real utility. Mathematical formulas or a statement of numerical values may often substitute for a figure.

All line drawings and halftones should be submitted as camera-ready copy on glossy paper. Illustrations should not be mounted or attached in any way to sheets of paper. Photographs on glossy prints should be of good quality, with sharp contrast. They should not be larger than \(8\frac{1}{4} \times 11\) in. or smaller than \(2 \times 3\) in. If it is, nevertheless, necessary to submit original figures rather than the preferred glossy prints, they should be drawn with India ink on white drawing paper, blue tracing paper, or coordinate paper ruled in blue only. Gridlines that are to show in the final engraving should be inked in black. Letters, numerals, data points, and other marks should be made neatly and of such size that the smallest will be readable when the figure is reduced to one- or two-column size. Wasted space in illustrations should be avoided; several curves may often be shown clearly on the same graph, for example. The word "top," the figure number, and the author's name should be lightly written in pencil on the back of each illustration. Do not paper-clip illustrations together.

A reasonable financial allowance is made to each paper for line drawings, halftones, and tabular composition. If this allowance is exceeded or if illustrations in color are required, special arrangements must be made with the Executive Editor. Current issues of CLINICAL CHEMISTRY illustrate acceptable figures. Each illustration must have a caption that makes it intelligible by itself. Illustrations are numbered in Arabic numerals.

**Tables**

Each table should be on a separate page and numbered consecutively with Arabic numerals in order of mention in the text. Each table should have a descriptive heading that makes it intelligible without reference to the text; footnotes to the table should appear on the same sheet as the table. Each column should have a heading with clearly defined units. Lengthy tabulations are expensive to set; unless essential, they should be avoided and replaced by statistical statements. Figures
and tables should not be used to illustrate the same data; use whichever is clearer, or omit entirely if the information can be stated concisely in the text.

Text Footnotes

Footnotes are used sparingly for auxiliary or explanatory material that cannot be incorporated into the text without seriously disrupting the train of thought. The position of a footnote in the text is indicated by superscript Arabic numerals. Footnotes should be typed on a separate sheet of paper, with the appropriate number and page number for each. On the first page of each published article, the following information will be printed routinely as footnotes: laboratory affiliation(s) of the author(s) and the dates on which the manuscript was received and accepted for publication. Footnotes to tables are independent of other footnotes, and should be indicated by superscript lower-case italic letters in alphabetical order, reading across the table.

Miscellaneous General Topics

*Animals.* Mention species, strain, sex, age, weight, and source if possible. Composition of diet should be mentioned if relevant.

*Chromatograms.* These are not published unless they show novel features that cannot be described in the text. The method for preparing sample and plates or columns, media, or adsorbent binders should be presented, as well as indicators, activation conditions, duration of migration, and drying and spraying conditions. Migration should be expressed in terms of Rf (or retention times for columns). Temperature conditions should be stated. Solvents or carriers and their order of use should be described in detail. Similar information should be included for electrophoresis.

*Enzymic methods.* The effects of a number of factors are customarily described in methods where catalytic activity is measured: temperature, pH, substrate concentration, enzyme concentration, order of reaction, inhibitors, activators, buffers, chelators, and the like. Representative calculations deriving the results must usually be shown, since pure enzymes are seldom obtained for standardization of the method. Enzymes must be identified by their Enzyme Commission name and number (6) when first mentioned; the common name may be used thereafter.

*Automated methods.* The same several considerations that have already been mentioned apply to descriptions of mechanized (automated) methods, but certain separate or additional details are usually required. Cite manufacturer's literature when it adequately describes procedures, equipment, or components. Special thought should be given to providing critical details such as calibration of instruments, the measured rate of delivery of fluid through pump tubing, temperature of heating baths, volume (at nominal operating temperature) of heating-bath coils, the type of dialysis membrane used, light path of colorimeter cuvets, baseline drift, and instrumental settings—e.g., linear or normal mode of the recorder.

Precision within a run should be determined for high, low, and normal concentrations of sample, with at least 20 samples at each concentration. All the samples at each concentration should be run successively, then in mixed order, and differences in precision as a function of order of samples should be recorded. Inter-run and day-to-day precision should be similarly estimated. Samples should be from specimens of the body fluid or other biological material actually to be used in practice, not simply aqueous solutions. Accuracy is assessed by analysis of aqueous standard solutions as well as of sera (e.g.) in which the constituent has been independently measured, preferably by a nonautomated version of the same procedure and by an acknowledged procedure based on different principles. Interaction between successive samples should be evaluated and expressed as the percentage of the concentration of any given sample by which the result of the following sample is raised.

The "normal range" should be included for a proposed method, with a summary of its method of derivation and the effect of sex, age, and other demographic influences. The method should be shown to be specific and suitable for samples giving values throughout the full abnormal range.

**MANIFOLD OR STEP-SEQUENCE DIAGRAMS.** Illustrations of the instrumental arrangement should use standard symbols (see current issues of *Clinical Chemistry*), and incorporate the inside diameter of pump tubes, nominal flow rate, the company's identifying number for glass fittings, temperature of baths, light path of cuvets, and wavelength and half-band width of filters.

**CALIBRATION CURVE.** A calibration curve should show the number of determinations and the spread (± 2 SD) of the results at each concentration.

**STRIP-CHART RECORDING.** A photograph of a typical unretouched strip chart should include curves for standard solutions, illustrate their degree of interaction, and show a steady-state tracing both at baseline and with continuous input of a moderate sized sample.

More detailed suggestions for describing automated methods are to be found elsewhere (7–9).

References

AMERICAN ASSOCIATION OF CLINICAL CHEMISTS

. . . It is the aim and object of this Association to raise the level at which chemistry is practiced in the clinical laboratory; to stimulate the development of new chemical methods . . . ; to encourage highly trained chemists to enter the field . . . ; to encourage those engaged in the field to pursue advanced studies . . . ; and to create and maintain a forum where chemists engaged in applying the science of clinical chemistry may exchange ideas and information . . . .—From Article II, Revised Constitution.

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For information concerning the Association, membership application blanks, etc., write: American Association of Clinical Chemists, P.O. Box 18083, Ardmore Station, Winston-Salem, N.C. 27103

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