

mBio

2010 INSTRUCTIONS TO AUTHORS*

SCOPE

mBio is a broad-scope open access journal edited by active research scientists. It strives to publish the best research in microbiology and allied fields. *mBio* publishes outstanding papers in all disciplines that address microbiological problems, including, but not limited to, biochemistry and molecular biology, genetics and genomics, environmental science, evolution, immunology, infectious disease, and physiology. Topics covered include bacteria, viruses, parasites, fungi, and simple eukaryotic organisms, as well as all types of host-microbe interactions.

We understand that there may be overlap in the scope statements of the ASM journals. Questions about these guidelines may be directed to the editor in chief of the journal being considered.

EDITORIAL POLICY

Use of Microbiological Information

The Council Policy Committee (CPC) of the American Society for Microbiology affirms the long-standing position of the Society that microbiologists will work for the proper and beneficent application of science and will call to the attention of the public or the appropriate authorities misuses of microbiology or of information derived from microbiology. ASM members are obligated to discourage any use of microbiology contrary to the welfare of humankind, including the use of microbes as biological weapons. Bioterrorism violates the fundamental principles expressed in the Code of Ethics of the Society and is abhorrent to ASM and its members.

ASM recognizes that there are valid concerns regarding the publication of information in scientific journals that could be put to inappropriate use as described in the CPC resolution mentioned above. Members of the ASM Publications Board will evaluate the rare manuscript that might raise such issues during the review process. However, as indicated elsewhere in these Instructions, research articles must contain sufficient detail, and material/information must be made available, to permit the work to be repeated by others. Supply of materials should be in accordance with laws and regulations governing the shipment, transfer, possession, and use of biological materials and must be for legitimate, bona fide research needs. Links to, and information regarding, these laws and regulations can be found at http://www.asm.org/index.php?option=com_content&view=article&id=10101&Itemid=342. We ask that authors pay particular attention to the NSAR Select Agent/Toxin list on the CDC website <http://www.selectagents.gov/index.html> and the NSABB criteria for identifying dual use research of concern in the report “Proposed Frame-

work for the Oversight of Dual Use Life Sciences Research: Strategies for Minimizing the Potential Misuse of Research Information” on the Office of Biotechnology Activities website <http://oba.od.nih.gov/biosecurity/> (pages 17–22).

Ethical Guidelines

Authors are expected to adhere to the highest ethical standards. The following sections of these Instructions include detailed information about ASM’s ethical standards. Failure to comply with the policies described in these Instructions may result in a letter of reprimand, a suspension of publishing privileges in ASM journals, and/or notification of the authors’ institutions. Authors employed by companies whose policies do not permit them to comply with ASM policies may be sanctioned as individuals and/or ASM may refuse to consider manuscripts having authors from such companies. The ASM Publications Board wishes to clarify the following in particular.

Plagiarism. Misappropriating another person’s intellectual property constitutes plagiarism. This includes copying sentences or paragraphs verbatim (or almost verbatim) from someone else’s work, even if the original work is cited in the references. The NIH ORI publication “Avoiding Plagiarism, Self-Plagiarism, and Other Questionable Writing Practices: a Guide to Ethical Writing” <http://ori.dhhs.gov/education/products/plagiarism/> can help authors identify questionable writing practices.

Plagiarism is not limited to the text; it can involve any part of the manuscript, including figures and tables, in which material is copied from another publication without permission and attribution. An author may not reuse his or her own previously published work without attribution; this is considered self-plagiarism.

Primary publication. Manuscripts submitted to the journal must represent reports of original research, and the original data must be available for review by the editor if necessary.

By submission of a manuscript to the journal, the authors guarantee that they have the authority to publish the work and that the manuscript, or one with substantially the same content, was not published previously, is not being considered or published elsewhere, and was not rejected on scientific grounds by another ASM journal. It is incumbent upon the author to acknowledge any prior publication, including his/her own articles, of the data contained in a manuscript submitted to an ASM journal. A copy of the relevant work should be submitted with the paper as supplemental material. Whether the material constitutes the substance of a paper and therefore renders the manuscript unacceptable for publication is an editorial decision.

*Instructions to Authors are updated throughout the year. A separate HTML version is maintained at the *mBio* website (<http://mbio.asm.org/>).

In brief, a paper is not acceptable for submission to an ASM journal if it, or its substance, has been published/posted in:

- A serial, periodical, or book
- A conference report or symposium proceedings
- A technical bulletin or company white paper
- A nonpersonal website
- Any other retrievable source

The following do not preclude submission to, or publication by, an ASM journal, as long as the posted data do not constitute the substance of a submission:

- Posting of a method/protocol on a nonpersonal website
- Posting of a limited amount of original data on a personal/university/corporate website or websites of small collaborative groups working on a problem
- Posting of unpublished sequence data on the Internet (the URL where the sequence is posted should be included in the text)
- Preliminary disclosures of research findings as meeting posters, webcast as meeting presentations, or published in abstract form as adjuncts to a meeting, e.g., part of a program
- Posting of theses and dissertations on a personal/university-hosted website

Availability of materials. By publishing in the journal, the authors agree that, subject to requirements or limitations imposed by laws or governmental regulations of the United States, any DNAs, viruses, microbial strains, mutant animal strains, cell lines, antibodies, and similar materials newly described in the article are available from a national collection or will be made available in a timely fashion, at reasonable cost, and in limited quantities to members of the scientific community for noncommercial purposes. The authors guarantee that they have the authority to comply with this policy either directly or by means of material transfer agreements through the owner.

Similarly, the authors agree to make available computer programs, originating in the authors' laboratory, that are the only means of confirming the conclusions reported in the article but that are not available commercially. The program(s) and suitable documentation regarding its (their) use may be provided by any of the following means: (i) as a program transmitted via the Internet, (ii) as an Internet server-based tool, or (iii) as a compiled or assembled form on a suitable medium (e.g., magnetic or optical). It is expected that the material will be provided in a timely fashion and at reasonable cost to members of the scientific community for noncommercial purposes. The authors guarantee that they have the authority to comply with this policy either directly or by means of material transfer agreements through the owner.

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An author is one who made a substantial contribution to the overall design and execution of the experiments; therefore, **ASM considers all authors responsible for the entire paper.** Individuals who provided assistance, e.g., supplied strains or reagents or critiqued the paper, need not be listed as authors but may be recognized in the Acknowledgments section.

A study group, surveillance team, working group, consortium, or the like (e.g., the Active Bacterial Core Surveillance Team) may be listed as a coauthor in the byline if its contributing members satisfy the requirements for authorship and accountability as described in these Instructions. The names and institutional affiliations of the contributing members only may be given in a separate paragraph in the Acknowledgments section.

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A change in authorship (order of listing, addition or deletion of a name, or corresponding author designation) after submission of the manuscript will be implemented only after receipt of signed statements of agreement from all parties involved.

Disputes about authorship may delay or prevent review and/or publication of the manuscript. Should the individuals involved be unable to reach an accord, review and/or publication of the manuscript can proceed only after the matter is investigated and resolved by the authors' institution(s) and an official report of such and signed statements of agreement are provided to ASM.

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ican Society for Microbiology, 1752 N St. NW, Washington, DC 20036.

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ASM recommends that when submitting an accepted manuscript to PMC or a similar public access site, the author specify that the **posting release date for the manuscript be no earlier than the date of publication on the *mBio* website**. Articles are published on the website as soon as they are processed, so delays should be minimal.

Use of Human Subjects or Animals in Research

The use of human subjects or animals for research purposes is regulated by the federal government and individual institutions. Manuscripts containing information related to human or animal use should clearly state that the research has complied with all relevant federal guidelines and institutional policies. Copies of these guidelines and policy statements must be available for review by the editor if necessary.

Patient Identification

When isolates are derived from patients in clinical studies, do not identify them by using the patients' initials, even as part of a strain designation. Change the initials to numerals or use randomly chosen letters. Do not give hospital unit numbers; if a designation is needed, use only the last two digits of the unit. (Note: established designations of some viruses and cell lines, although they consist of initials, are acceptable [e.g., JC virus, BK virus, and HeLa cells].)

Nucleotide and Amino Acid Sequences

Newly determined nucleotide and/or amino acid sequence data must be deposited and GenBank/EMBL/DDJB accession

numbers must be included in the manuscript no later than the modification stage of the review process. It is expected that the sequence data will be released to the public no later than the publication (online posting) date of the accepted manuscript. As part of the publication process, accession numbers will be linked from the article to GenBank, which will prompt the release of any previously unreleased sequences.

The accession numbers should be included in a separate paragraph at the end of the Materials and Methods section for Research Articles or at the end of the text for other formats. If conclusions in a manuscript are based on the analysis of sequences and a GenBank/EMBL/DDBJ accession number is not provided at the time of the review, authors should provide the sequence data as supplemental material.

It is expected that, when previously published sequence accession numbers are cited in a manuscript, the original citations (e.g., journal articles) will be included in the References section when possible or reasonable.

Authors are also expected to do elementary searches and comparisons of nucleotide and amino acid sequences against the sequences in standard databases (e.g., GenBank) immediately before manuscripts are submitted and again at the proof stage.

Analyses should specify the database, and the date of each analysis should be indicated as, e.g., January 2010. If relevant, the version of the software used should be specified.

See “[Presentation of Nucleic Acid Sequences](#)” for nucleic acid sequence formatting instructions.

The URLs of the databases mentioned above are as follows: DNA Data Bank of Japan (DDBJ), <http://www.ddbj.nig.ac.jp/>; EMBL Nucleotide Sequence Database (EMBL), <http://www.ebi.ac.uk/embl/>; and GenBank, National Center for Biotechnology Information (GenBank), <http://www.ncbi.nlm.nih.gov/>.

Proper Use of Locus Tags as Systematic Identifiers for Genes

To comply with recommendations from the International Nucleotide Sequence Database (INSD) Collaborators and to avoid conflicts in gene identification, researchers should implement the following two fundamental guidelines as standards for utilization of locus tags in genome analysis, annotation, submission, reporting, and publication. (i) Locus tag prefixes are systematic gene identifiers for all of the replicons of a genome and as such should be associated with a single genome project submission. (ii) New genome projects must be registered with INSD, and new locus tag prefixes must be assigned in cooperation with INSD to ensure that they conform to the agreed-upon criteria. Locus tag prefixes that are currently in use may be searched at the NCBI locus tag database (<http://www.ncbi.nlm.nih.gov/genomes/ltp.cgi>).

Structural Determinations

Coordinates for new structures of macromolecules determined by X-ray crystallography or cryo-electron microscopy

must be deposited in the Protein Data Bank and assigned identification codes must be included in the manuscript no later than the modification stage of the review process. It is expected that the coordinates will be released to the public no later than the publication (online posting) date of the accepted manuscript.

Authors are encouraged to send coordinates with their original submission, so that reviewers can examine them along with the manuscript. The accession number(s) should be listed in a separate paragraph at the end of the Materials and Methods section for Research Articles or at the end of the text for other formats.

The URLs for coordinate deposition are <http://rcsb-deposit.rutgers.edu/> and <http://pdbdep.protein.osaka-u.ac.jp/top.html.en>.

Microarray Data

The entire set of supporting microarray data must be deposited in the appropriate public database (e.g., GEO, ArrayExpress, or CIBEX) and the assigned accession number(s) must be included in the manuscript no later than the modification stage of the review process. It is expected that the data will be released to the public no later than the publication (online posting) date of the accepted manuscript.

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The URLs of the databases mentioned above are as follows: Gene Expression Omnibus (GEO), <http://www.ncbi.nlm.nih.gov/projects/geo/>; ArrayExpress, <http://www.ebi.ac.uk/microarray-as/ae/>; and Center for Information Biology Gene Expression Database (CIBEX), <http://cibex.nig.ac.jp/index.jsp>.

MycoBank

New scientific names of fungi along with key nomenclatural and descriptive material must be deposited in MycoBank (<http://www.MycoBank.org>) and the assigned accession number(s) must be included in the manuscript no later than the modification stage of the review process. It is expected that the data will be released to the public no later than the publication (online posting) date of the accepted manuscript. Authors are encouraged to send the relevant data with their original submission, however, so that reviewers can examine them along with the manuscript. The accession number(s) should be listed in a separate paragraph at the end of the Materials and Methods section for Research Articles and at the end of the text for other formats.

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mBio expects authors to deposit strains used in therapeutic activity assessments and studies of mechanisms of action, re-

sistance, and cross-resistance in publicly accessible culture collections and to refer to the collections and strain numbers in the text. Since the authenticity of subcultures of culture collection specimens that are distributed by individuals cannot be ensured, authors should indicate laboratory strain designations and donor sources as well as original culture collection identification numbers.

Supplemental Material

Supplemental material intended for posting by ASM should be restricted primarily to large or complex data sets or results that cannot readily be displayed in the article. This material may include data from microarray, structural, biochemical, or video imaging analyses. In such cases, the manuscript submitted for review should include a distillation of the results such that the principal conclusions are fully supported without referral to the supplemental material.

Supplemental material will be reviewed along with the manuscript. The decision to post the supplemental material with the article will be made by the editor. It is possible that a manuscript will be accepted but that the supplemental material will not. Unlike the manuscript, supplemental material will not be edited by the ASM Journals staff, and proofs will not be made available. Supplemental material will always remain associated with the article and is not subject to any modifications after publication.

Material that has been published previously (in print or online) is not acceptable for posting as supplemental material. Instead, the appropriate reference(s) to the original publication should be made in the manuscript text.

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Supplemental material intended for posting by ASM must be uploaded as a separate Supplemental Material file(s) in the manuscript submission system. The maximum size permitted for an individual file is 3 MB (20 MB for movie files). If your file exceeds this size, you must use a file compression utility (e.g., WinZip or Stuffit) to reduce the size.

ASM will post no more than 10 individual supplemental items. Each item in the supplemental material should be submitted as a separate file, e.g., multiple figures should not be zipped together or combined in a single PDF. At the end of the manuscript text file, include a legend for each item of supplemental material, clearly labeled as such. If it is necessary to cite references that are relevant only to these supplemental legends, use the style described for “Citations in abstracts”; do not include these references in the References section of the manuscript. Supplemental material should be numbered with an “S” (e.g., Movie S1, Fig. S2, etc.), and each item should be cited at least once in the text.

To ensure broad access, we ask that supplemental files be submitted in the following standard formats.

- **Text:** Word, RTF, or PDF files.
- **Figures:** TIFF, EPS, high-resolution PDF, JPEG, or GIF format. Figures may not be embedded in the manuscript text. Do not save figure numbers, legends, or author names as part of the image. Composite figures must be preassembled. Images should not exceed 500 pixels per inch in width or height.
- **Tables:** Word, RTF, or PDF files. Include only 1 table per file. Do not use tabs or spaces to separate columns in Word tables.
- **Data sets:** Excel (.xls), RTF, TXT, or PDF files.
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SUBMISSION, REVIEW, AND PUBLICATION PROCESSES

Submission Process

All submissions to *mBio* must be made electronically via the *mBio* online submission and peer review system at <http://mbio.msubmit.net/>. First-time users must create an Author account.

Review Process

All manuscripts are considered to be confidential and are reviewed by members of the *mBio* Board of Editors, invited editors, or invited reviewers.

To expedite the review process, authors must recommend three (3) members of the *mBio* Board of Editors (available at <http://mbio.asm.org/site/misc/edboard.xhtml>) who would be able to handle the review of their manuscript. Authors also must suggest at least three (3) reviewers (five are recommended) who have expertise in the field, who are not members of their institution(s), who have not been recently associated with their laboratory(ies), and who could not otherwise be considered to have a conflict of interest regarding the submitted manuscript.

Copies of in-press and submitted manuscripts that are important for judgment of the present manuscript should be included as supplemental material to facilitate the review.

When a manuscript is submitted to the journal, it is given a manuscript control number (e.g., mBio00001-10) and as-

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The corresponding author is notified, generally within 4 weeks after submission, of the decision to accept, reject, or require modification. When modification is requested, the corresponding author must either submit the modified version within 30 days or withdraw the manuscript. A point-by-point response to the reviews must be provided in a separate file, and a compare copy of the manuscript (without figures) should be included as supplemental material if the editor requested one.

Rejected Manuscripts

Authors who believe that their manuscript has been unfairly rejected because an important aspect was misunderstood or overlooked by the reviewers may submit an appeal. The appeal will be processed by the editor in chief, who may consult with the Editor and/or Invited Editor of the manuscript. Please note that while we are willing to entertain appeals, it is uncommon for editorial decisions to be reversed.

Manuscripts that have been rejected, or withdrawn after being returned for modification, may be resubmitted to *mBio* (once; see below) if the major criticisms have been addressed. Manuscripts rejected by *mBio* may be resubmitted to a more appropriate ASM journal without penalty.

For all resubmissions (to the same or a different ASM journal, irrespective of the extent of the revisions, and irrespective of the amount of time between rejection and resubmission), the cover letter must state that the manuscript is a resubmission, and the former manuscript control number must be provided in the appropriate field on the submission form. A point-by-point response to the review(s) must be included (the Response to Reviewer Comments section appears in the submission form only if the manuscript is a modification), and a compare copy of the revised manuscript showing the changes (as supplemental material) should be included as well. Manuscripts resubmitted to the same journal are normally handled by the original editor.

Rejected manuscripts may be resubmitted only once unless permission has been obtained from the original editor or from the editor in chief.

Notification of Acceptance

When an editor has decided that a manuscript is acceptable for publication on the basis of scientific merit, the author and the Journals Department are notified. The text files undergo an automated preediting, cleanup, and tagging process specific to the particular article type, and the illustrations are examined. If all files have been prepared according to the criteria set forth in these Instructions and those in the manuscript submission system, the acceptance procedure will be

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mBio Publication Schedule

mBio articles are released in an article-based workflow. Articles are not held until an issue is released. Instead, at the end of each month, the articles published over the preceding weeks are collected into an issue and moved into the *mBio* archive.

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Page proofs will be made available to the corresponding author electronically via a PDF file that can be accessed through a unique password. Included in the proofs will be the typeset pages of the article, a page showing the legends for any supplemental material (since these legends will appear in the HTML view of the published article), and an author query sheet.

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If the research was not supported by any of the means described above, a request to waive the fee may be made through the online submission form or submitted via e-mail to mBio@asmusa.org. The request must include the manuscript control number assigned by ASM and indicate how the work was supported.

Minireviews, Commentaries, Perspectives, Editorials, and Letters to the Editor are not subject to publication fees.

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Reprints. Authors of accepted manuscripts will be directed to the Author Billing System, where they (or any of their coauthors) can purchase reprints (in multiples of 100).

ORGANIZATION AND FORMAT

Editorial Style

The editorial style of ASM journals conforms to the *ASM Style Manual for Journals* (American Society for Microbiology, 2010, in-house document) and *How To Write and Publish a Scientific Paper*, 6th ed. (Greenwood Press, Westport, CT, 2006), as interpreted and modified by the editors and the ASM Journals Department.

The editors and the Journals Department reserve the privilege of editing manuscripts to conform with the stylistic conventions set forth in the aforesaid publications and in these Instructions.

On receipt at ASM, an accepted manuscript undergoes an

automated preediting, cleanup, and tagging process specific to the particular article type. To optimize this process, manuscripts must be supplied in the correct format and with the appropriate sections and headings.

Type every portion of the manuscript double-spaced (a minimum of 6 mm between lines), including figure legends, table footnotes, and References, and number all pages in sequence, including the abstract, figure legends, and tables. Place the last two items after the References section. Manuscript pages should have line numbers; manuscripts without line numbers may be editorially rejected by the editor, with a suggestion of resubmission after line numbers are added. The font size should be no smaller than 12 points. It is recommended that the following sets of characters be easily distinguishable in the manuscript: the numeral zero (0) and the letter "oh" (O); the numeral one (1), the letter "el" (l), and the letter "eye" (I); and a multiplication sign (\times) and the letter "ex" (x). Do not create symbols as graphics or use special fonts that are external to your word processing program; use the "insert symbol" function. Set the page size to 8½ by 11 inches (ca. 21.6 by 28 cm). Italicize any words that should appear in italics, and indicate paragraph lead-ins in boldface type.

Authors who are unsure of proper English usage should have their manuscripts checked by someone proficient in the English language.

Manuscripts may be editorially rejected, without review, on the basis of poor English or lack of conformity to the standards set forth in these Instructions.

Research Articles

Research Articles are limited to 8 journal pages and should report a major advance in any area of microbiology or allied fields. These articles should include the elements described in this section.

Title, running title, and byline. Each manuscript should present the results of an independent, cohesive study; thus, numbered series titles are not allowed. Avoid the main title/subtitle arrangement, complete sentences, and unnecessary articles. Indicate the specific organisms under study in the title or abstract as appropriate. On the title page, include the title, the running title (not to exceed 54 characters and spaces), the name of each author, the address(es) of the institution(s) at which the work was performed, each author's affiliation, and a footnote indicating the present address of any author no longer at the institution where the work was performed. Place an asterisk after the name of the author to whom inquiries regarding the paper should be addressed (see "Correspondent footnote").

Also include on the title page the word count for the abstract and the word count for the text (excluding the references, table footnotes, and figure legends).

Correspondent footnote. A single e-mail address for the corresponding author should be included on the title page of the manuscript. This information will be published with the article to facilitate communication, and the e-mail address

will be used to notify the corresponding author of the availability of proofs and, later, of the PDF file of the published article.

Structured abstract. *mBio* Research Articles have structured abstracts with two sections: “Abstract” and “Importance.” The Abstract section should be 250 words or fewer and should concisely summarize the basic content of the paper without presenting extensive experimental details. The Importance section should be 150 words or fewer and should provide a nontechnical explanation of why the work was undertaken. For a discussion of how to evaluate the importance of a piece of research, see the essay by A. Casadevall and F. C. Fang, Important Science—It’s All About the SPIN, *Infect. Immun.* 77:4177-4180 (<http://iai.asm.org/cgi/content/abstract/77/10/4177>). Avoid abbreviations and references, and do not include diagrams. When it is essential to include a reference, use the same format as shown for the References section but omit the article title. Because the abstract will be published separately by abstracting services, it must be complete and understandable without reference to the text. Authors should indicate the specific organisms under study in the title or abstract as appropriate.

Introduction. The introduction should supply sufficient background information to allow the reader to understand and evaluate the results of the present study without referring to previous publications on the topic. The introduction should also provide the hypothesis that was addressed or the rationale for the present study. Choose references carefully to provide the most salient background rather than an exhaustive review of the topic.

Results. In the Results section, include the rationale or design of the experiments as well as the results; reserve extensive interpretation of the results for the Discussion section. Present the results as concisely as possible in one of the following: text, table(s), or figure(s). Data in tables (e.g., cpm of radioactivity) should not contain more significant figures than the precision of the measurement allows. Illustrations (particularly photomicrographs and electron micrographs) should be limited to those that are absolutely necessary to show the experimental findings. Number figures and tables in the order in which they are cited in the text, and be sure to cite all figures and tables.

Discussion. The Discussion should provide an interpretation of the results in relation to previously published work and to the experimental system at hand and should not contain extensive repetition of the Results section or reiteration of the introduction. In short papers, the Results and Discussion sections may be combined.

Materials and Methods. The Materials and Methods section should include sufficient technical information to allow the experiments to be repeated. When centrifugation conditions are critical, give enough information to enable another investigator to repeat the procedure: make of centrifuge, model of rotor, temperature, time at maximum speed, and

centrifugal force ($\times g$ rather than revolutions per minute). For commonly used materials and methods (e.g., media and protein concentration determinations), a simple reference is sufficient. If several alternative methods are commonly used, it is helpful to identify the method briefly as well as to cite the reference. For example, it is preferable to state “cells were broken by ultrasonic treatment as previously described (9)” rather than to state “cells were broken as previously described (9).” This allows the reader to assess the method without constant reference to previous publications. Describe new methods completely and give sources of unusual chemicals, equipment, or microbial strains. When large numbers of microbial strains or mutants are used in a study, include tables identifying the immediate sources (i.e., sources from whom the strains were obtained) and properties of the strains, mutants, bacteriophages, and plasmids, etc.

A method or strain, etc., used in only one of several experiments reported in the paper may be described in the Results section or very briefly (one or two sentences) in a table footnote or figure legend. It is expected that the sources from whom the strains were obtained will be identified.

Acknowledgments. The source of any financial support received for the work being published must be indicated in the Acknowledgments section. (It will be assumed that the absence of such an acknowledgment is a statement by the authors that no support was received.) The usual format is as follows: “This work was supported by Public Health Service grant CA-01234 from the National Cancer Institute.”

Recognition of personal assistance should be given as a separate paragraph, as should any statements disclaiming endorsement or approval of the views reflected in the paper or of a product mentioned therein.

References. (i) References listed in the References section. The following types of references must be listed in the References section:

- Journal articles (both print and online)
- Books (both print and online)
- Book chapters (publication title is required)
- Patents
- Theses and dissertations
- Published conference proceedings
- Meeting abstracts (from published abstract books or journal supplements)
- Letters (to the editor)
- Company publications
- In-press journal articles, books, and book chapters

***mBio* uses the numbered citation (citation-sequence) reference method.** List and number references in the References section in the order in which they are cited in the text. Citations in the text should be indicated by the reference number(s) in parentheses. When practical, provide the names of all the authors for each reference; long bylines may be abbreviated with “et al.” All listed references must be cited in the text. Abbreviate journal names according to the PubMed Journals Database (National Library of Medicine,

National Institutes of Health; available at <http://www.ncbi.nlm.nih.gov/sites/entrez?db=journals>), the primary source for ASM style.

mBio follows ASM style for reference entries:

- Alexander, T. W., L. J. Yanke, E. Topp, M. E. Olson, R. R. Read, D. W. Morck, and T. A. McAllister.** 2008. Effect of subtherapeutic administration of antibiotics on the prevalence of antibiotic-resistant *Escherichia coli* bacteria in feedlot cattle. *Appl. Environ. Microbiol.* **74**:4405–4416.
- Falagas, M. E., and S. K. Kasiakou.** 2006. Use of international units when dosing colistin will help decrease confusion related to various formulations of the drug around the world. *Antimicrob. Agents Chemother.* **50**: 2274–2275. (Letter.) {"Letter" or "Letter to the editor" is allowed but not required at the end of such an entry.}
- Cox, C. S., B. R. Brown, and J. C. Smith.** *J. Gen. Genet.*, in press.* {Article title is optional; journal title is mandatory.}
- Forman, M. S., and A. Valsamakis.** 2003. Specimen collection, transport, and processing: virology, p. 1227–1241. In P. R. Murray, E. J. Baron, M. A. Pfaller, J. H. Tenover, and R. H. Tenover (ed.), *Manual of clinical microbiology*, 8th ed. ASM Press, Washington, DC.
- da Costa, M. S., M. F. Nobre, and F. A. Rainey.** 2001. Genus I. *Thermus* Brock and Freeze 1969, 295, ^{AL} emend. Nobre, Trüper and da Costa 1996b, 605, p. 404–414. In D. R. Boone, R. W. Castenholz, and G. M. Garrity (ed.), *Bergey's manual of systematic bacteriology*, 2nd ed., vol. 1. Springer, New York, NY.
- Fitzgerald, G., and D. Shaw.** In A. E. Waters (ed.), *Clinical microbiology*, in press. EFH Publishing Co., Boston, MA.* {Chapter title is optional.}
- Green, P. N., D. Hood, and C. S. Dow.** 1984. Taxonomic status of some methylotrophic bacteria, p. 251–254. In R. L. Crawford and R. S. Hanson (ed.), *Microbial growth on C₁ compounds*. Proceedings of the 4th International Symposium. American Society for Microbiology, Washington, DC.
- Rotimi, V. O., N. O. Salako, E. M. Mohaddas, and L. P. Philip.** 2005. Abstr. 45th Intersci. Conf. Antimicrob. Agents Chemother., abstr. D-1658. {Abstract title is optional.}
- Smith, D., C. Johnson, M. Maier, and J. J. Maurer.** 2005. Distribution of fimbrial, phage and plasmid associated virulence genes among poultry *Salmonella enterica* serovars, abstr. P-038, p. 445. Abstr. 105th Gen. Meet. Am. Soc. Microbiol. American Society for Microbiology, Washington, DC. {Abstract title is optional.}
- Garcia, C. O., S. Paira, R. Burgos, J. Molina, J. F. Molina, and C. Calvo.** 1996. Detection of salmonella DNA in synovial membrane and synovial fluid from Latin American patients. *Arthritis Rheum.* **39**(Suppl.):S185. {Meeting abstract published in journal supplement.}
- O'Malley, D. R.** 1998. Ph.D. thesis. University of California, Los Angeles, CA. {Title is optional.}
- Stratagene.** 2006. Yeast DNA isolation system: instruction manual. Stratagene, La Jolla, CA. {Use the company name as the author if none is provided for a company publication.}
- Odell, J. C.** April 1970. Process for batch culturing. U.S. patent 484,363,770. {Include the name of the patented item/process if possible; the patent number is mandatory.}
- Elder, B. L., and S. E. Sharp.** 2003. Cumitech 39, Competency assessment in the clinical laboratory. Coordinating ed., S. E. Sharp. ASM Press, Washington, DC.

*A reference to an in-press ASM publication should state the control number (e.g., mBio00001-10) if it is a journal article or the name of the publication if it is a book.

Online references must provide essentially the same information that print references do. For online journal articles, posting or revision dates may replace the year of publication, and a DOI or URL may be provided in addition to or in lieu of volume and page numbers. Some examples follow.

- Johnson, J., and V. R. Robinson.** 2010. Cleavage of JPS-1 in cells infected with human rhinovirus. *mBio* **1**:e00001-10. doi:10.1128/mBio.00001-10.
- Dionne, M. S., and D. S. Schneider.** 2002. Screening the fruitfly immune system. *Genome Biol.* **3**:REVIEWS1010. <http://genomebiology.com/2002/3/4/reviews/1010>.
- Smith, F. X., H. J. Merianos, A. T. Brunger, and D. M. Engelman.** 2001. Polar residues drive association of polyoleucine transmembrane helices. *Proc. Natl. Acad. Sci. U. S. A.* **98**:2250-2255. doi:10.1073/pnas.041593698.
- Charlier, D., and N. Glansdorff.** September 2004, posting date. Chapter 3.6.1.10, Biosynthesis of arginine and polyamines. In R. Curtiss III et al. (ed.), *EcoSal—Escherichia coli and Salmonella: cellular and molecular biology*. ASM Press, Washington, DC. <http://www.ecosal.org/>. {Note that each chapter has its own posting date.}
- Winnick, S., D. O. Lucas, A. L. Hartman, and D. Toll.** 2005. How do you improve compliance? *Pediatrics* **115**: e718–e724.

Note: a posting or accession date is required for any online reference that is periodically updated or changed.

(ii) **References cited in the text.** References that should be cited in the text include:

- Unpublished data
- Manuscripts submitted for publication
- Unpublished conference presentations (e.g., a report or poster that has not appeared in published conference proceedings)
- Personal communications
- Patent applications and patents pending
- Computer software, databases, and websites (home pages)

These references should be cited parenthetically in the text as follows:

... similar results (R. B. Layton and C. C. Weathers, unpublished data).

... system was used (J. L. McNerney, A. F. Holden, and P. N. Brighton, submitted for publication).

... as described previously (M. G. Gordon and F. L. Ratner, presented at the Fourth Symposium on Food Microbiology, Overton, IL, 13 to 15 June 1989). {*For non-published abstracts and posters, etc.*}

... this new process (V. R. Smoll, 20 June 1999, Australian Patent Office). {*For non-U.S. patent applications, give the date of publication of the application.*}

... available in the GenBank database (<http://www.ncbi.nlm.nih.gov/Genbank/index.html>).

... using ABC software (version 2.2; Department of Microbiology, State University [<http://www.state.micro.edu>]).

URLs for companies that produce any of the products mentioned in your study or for products being sold may not be included in the article. However, company URLs that permit access to scientific data related to the study or to shareware used in the study are permitted.

(iii) Referencing publish-ahead-of-print manuscripts.

Citations of ASM Accepts manuscripts (articles from other, issue-based ASM journals that are published ahead of the issue) should look like the following example.

Wang, G. G., M. P. Pasillas, and M. P. Kamps. 15 May 2006. Persistent transactivation by Meis1 replaces Hox function in myeloid leukemogenesis models: evidence for co-occupancy of Meis1-Pbx and Hox-Pbx complexes on promoters of leukemia-associated genes. *Mol. Cell. Biol.* doi:10.1128/MCB.00586-06.

Other journals may use different styles for their publish-ahead-of-print manuscripts, but citation entries must include the following information: author name(s), posting date, title, journal title, and volume and page numbers and/or DOI. The following is an example:

Zhou, F. X., H. J. Merianos, A. T. Brunger, and D. M. Engelman. 13 February 2001, posting date. Polar residues drive association of polyleucine transmembrane helices. *Proc. Natl. Acad. Sci. U. S. A.* doi:10.1073/pnas.041593698.

(iv) **Citations in abstracts.** Since the abstract must be able to stand apart from the article, references cited in it should be clear without recourse to the References section. Use an abbreviated form of citation, omitting the article title, as follows.

(M. J. Fraser, G. E. Smith, and M. D. Summers, *J. Virol.* **47**:287–300, 1983)

(J. Scholefield, R. Manson, R. J. Johnston, R. Scott, and M. Spinell, p. 179–183, in R. C. Tilton, ed., *Rapid Methods and Automation in Microbiology*, 1981)

“... the recent report of A. K. Datta and J. S. Pagano (*Antimicrob. Agents Chemother.* **24**:10–14, 1983) . . .”

When necessary, this style should also be used for references cited in legends for supplemental material and in Addenda in Proof.

Observations

Observations are short descriptions (4 journal pages with a maximum of 2 figures and 25 references) of research results of exceptional importance and unusual interest to the broad microbiology community, e.g., reports of a new type of organism, a new organelle, a new association of microbes and disease, etc.

The body of an Observation may have paragraph lead-ins. As with Research Articles, authors should include an abstract of 250 words or fewer as well as an Importance section of 150 words or fewer, providing a nontechnical explanation of why the work was undertaken.

Minireviews

Minireviews are brief (maximum of 6 journal pages) summaries of important developments in microbiology research. They must be based on published articles and may address any subject within the scope of the journal.

Minireviews must have abstracts. Limit the abstract to 250 words or fewer. The body of the Minireview may have section headings and/or paragraph lead-ins.

Opinions and Hypotheses

Opinions and Hypotheses are short articles (4 journal pages with a maximum of 25 references) that present original and well-developed insights without complete supporting data. Although microbiology and allied fields are primarily experimental sciences, this article type places equal importance on new thought that is formulated in a manner that summarizes a problem, provides a new synthesis, and/or is suitable for subsequent experimental testing.

In this category, the journal provides a highly visible venue for the publication of ideas that have the potential to move fields and to challenge the status quo.

Authors should provide an abstract of 150 words or fewer. The body of an Opinions and Hypotheses article may have section headings and/or paragraph lead-ins.

Commentaries

Commentaries are short invited articles (1 to 2 journal pages) that discuss *mBio* papers of special interest. These are solicited by editors from reviewers or experts in the field.

Authors should provide an abstract of 150 words or fewer. The body of a Commentary may have section headings and/or paragraph lead-ins.

Perspectives

Perspectives are brief reviews (limited to 4 journal pages) that offer a succinct overview of a specific topic with an emphasis on opinion and synthesis.

Authors should provide an abstract of 150 words or fewer. The body of a Perspectives article may have section headings and/or paragraph lead-ins.

Editorials

Editorials communicated by members of the *mBio* Board of Editors address issues of science, politics, or policy.

Editorials should include an abstract of 150 words or fewer.

Letters to the Editor

Letters to the Editor are intended for comments on articles published in the journal and must cite published references to support the writer's argument.

Letters may be **no more than 500 words long and must be typed double-spaced**. Note that authors and affiliations are listed at the foot of the Letter. Provide only the primary affiliation for each author.

All Letters to the Editor must be submitted electronically. The cover letter should refer to the article in question by its title and the last name of the first author. In addition, the volume and issue and/or DOI should be indicated. In the Abstract section of the submission form, put "Not Applicable." Letters to the Editor do not have abstracts. The Letter must have a distinct title, which must appear on the manuscript and on the submission form. Figures and tables should be kept to a minimum.

The Letter will be sent to the editor who handled the article in question. If the editor believes that publication is warranted, he/she will solicit a reply from the corresponding author of the article and make a recommendation to the editor in chief. Final approval for publication rests with the editor in chief.

Please note that some indexing/abstracting services do not include Letters to the Editor in their databases.

Errata

The Erratum section provides a means of correcting errors that occurred during the writing, typing, editing, or publication (e.g., a misspelling, a dropped word or line, or mislabeling in a figure) of a published article. Submit Errata via the *mBio* online submission and peer review system at <http://mbio.msubmit.net/>. In the Abstract section of the submission form (a required field), put "Not Applicable." Upload the text of your Erratum as a Microsoft Word file.

Authors' Corrections

The Author's Correction section provides a means of correcting errors of omission (e.g., author names or citations) and errors of a scientific nature that do not alter the overall basic results or conclusions of a published article (e.g., an incorrect unit of measurement or order of magnitude used throughout, contamination of one of numerous cultures, or misidentification of a mutant strain, causing erroneous data for only a [noncritical] portion of the study). Note that the addition of new data is not permitted.

For corrections of a scientific nature or issues involving authorship, including contributions and use or ownership of data and/or materials, all disputing parties must agree, in writing, to publication of the Correction. For omission of an author's name, letters must be signed by the authors of the article and the author whose name was omitted. The editor who handled the article will be consulted if necessary.

Submit an Author's Correction via the *mBio* online submission and peer review system at <http://mbio.msubmit.net/>. In the submission form, select Erratum as the manuscript type; there is no separate selection in the submission system for an Author's Correction, but your Correction will be published as such if appropriate. In the Abstract section of the submission form (a required field), put "Not Applicable." Upload the text of your Author's Correction as a Microsoft Word file. Signed letters of agreement from all authors must be included as supplemental material (scanned and submitted as PDF files).

Retractions

Retractions are reserved for major errors or breaches of ethics that, for example, may call into question the source of the data or the validity of the results and conclusions of an article. If you feel that a Retraction may be necessary for an article that you have authored, you should contact the *mBio* staff at mBio@asmusa.org. The *mBio* staff will submit a Retraction on your behalf. The Retraction will be assigned to the editor in chief of the journal, and the editor who handled the paper and the chairman of the ASM Publications Board will be consulted. If the Retraction is approved, all authors will be asked to sign a letter of agreement before the Retraction is processed for publication.

ILLUSTRATIONS AND TABLES

Illustrations

Image manipulation. Computer-generated images may be processed only minimally. Processing (e.g., changing contrast, brightness, or color balance) is acceptable only if applied to all parts of the image, as well as to the controls, equally, and descriptions of all such adjustments and the tools used (both hardware and software) must be provided in the manuscript. Unprocessed data and files must be retained by the authors and be provided to the editor on request.

File types and formats. Illustrations may be continuous-tone images, line drawings, or composites. On initial submission, illustrations may be supplied as PDF files, with the legend on the same page, to assist review. At the modification stage, production quality digital files must be provided, along with text files for the legends. The legends are copyedited and typeset for final publication, not included as part of the figure itself. All graphics submitted with modified manuscripts should be grayscale or in the RGB color mode. See "[Color illustrations](#)." Halftone images (those with various densities or shades) must be grayscale, not bitmap. *mBio* accepts only

TIFF or EPS files; PowerPoint files will not be accepted. Instructions for converting PowerPoint files may be found at http://art.cadmus.com/da/howto/creating_ai_eps_excell.jsp. General instructions for creating acceptable EPS and TIFF files may be found at <http://art.cadmus.com/da/index.jsp>. **We strongly recommend that before returning their modified manuscripts, authors check the acceptability of their digital images for production by running their files through Rapid Inspector**, a tool provided at the following URL: <http://rapidinspector.cadmus.com/RapidInspector/zmw/index.jsp>. Rapid Inspector is an easy-to-use, Web-based application that identifies file characteristics that may render the image unusable for production. If you require additional information, please send an e-mail inquiry to digitalart@cadmus.com.

Minimum resolution. Minimum resolution is 300 dpi for all file types. All images imported into a figure file must be at the correct resolution before they are placed in the file. (For instance, placing a 72-dpi image in a 300-dpi EPS file will not result in the placed image meeting the minimum requirements for file resolution.) Note that publication quality will not be improved by using a resolution higher than the minimum.

Size. All graphics **should be submitted at their intended publication size**; that is, the image uploaded should be 100% of its final dimensions so that no reduction or enlargement is necessary. Resolution must be at the required level at the submitted size. Include only the significant portion of an illustration. White space must be cropped from the image, and excess space between panel labels and the image must be eliminated.

Maximum width for a 1-column figure: $3\frac{5}{16}$ inches (ca. 8.4 cm)

Maximum width for a 2-column figure: $6\frac{7}{8}$ inches (ca. 17.4 cm)

Minimum width for a 2-column figure: $4\frac{1}{4}$ inches (10.8 cm)

Maximum height: $9\frac{1}{16}$ inches (23.0 cm)

Contrast. Illustrations should contain sufficient contrast to be viewed easily on a monitor or on the printed page (for reprints).

Labeling and assembly. All final lettering and labeling must be incorporated into the figures. Put the figure number well outside the boundaries of the image itself. (Numbering may need to be changed at the copyediting stage.) Each figure must be supplied as a separate file, and any multipanel figures must be assembled into one file; i.e., rather than uploading a separate file for each panel in a figure, assemble all panels in one piece and supply them as one file.

Fonts. To avoid font problems, set all type in one of the following fonts: Arial, Helvetica, Times Roman, European PI, Mathematical PI, or Symbol. Courier may be used but should be limited to nucleotide or amino acid sequences, where a

nonproportional (monospace) font is required. All fonts other than these must be converted to paths (or outlines) in the application with which they were created.

Compression. Images created with Macintosh applications may be compressed with Stuffit. Images created with Windows applications may be compressed with WinZip or PKZIP.

Color illustrations. All figures submitted in color will be processed as color. Adherence to the following guidelines will help to ensure color reproduction that is as accurate as possible.

Color illustrations should be supplied in the RGB color mode, as either (i) RGB TIFF images with a resolution of at least 300 pixels per inch (raster files, consisting of pixels) or (ii) Illustrator-compatible EPS files with RGB color elements (vector files, consisting of lines, fonts, fills, and images). For reprints, ASM's print provider will automatically create CMYK versions of color illustrations from the supplied RGB versions. Color in the reprints may not exactly match that in the online journal of record because of the smaller range of colors capable of being reproduced by CMYK inks on a printing press.

Drawings

Submit graphs, charts, complicated chemical or mathematical formulas, diagrams, and other drawings as finished products not requiring additional artwork or typesetting. All elements, including letters, numbers, and symbols, must be easily readable, and both axes of a graph must be labeled.

When creating line art, please use the following guidelines:

(i) **All art must be submitted at its intended publication size.** For acceptable dimensions, see "Size."

(ii) **Avoid using screens (i.e., shading) in line art.** It can be difficult and time-consuming to reproduce these images without moiré patterns. Various pattern backgrounds are preferable to screens as long as the patterns are not imported from another application. If you must use images containing screens,

(a) Generate the image at line screens of 85 lines per inch or lower.

(b) When applying multiple shades of gray, differentiate the gray levels by at least 20%.

(c) Never use levels of gray below 5% or above 95%, as they are likely to fade out or become totally black when output.

(iii) Use thick, solid lines that are no finer than 1 point in thickness.

(iv) No type should be smaller than 6 points at the final publication size.

(v) Avoid layering type directly over shaded or textured areas.

(vi) Avoid the use of reversed type (white lettering on a black background).

(vii) Avoid heavy letters, which tend to close up, and unusual symbols, which the printer may not be able to reproduce in the legend.

(viii) If colors are used, avoid using similar shades of the same color and avoid very light colors.

In figure ordinate and abscissa scales (as well as table column headings), avoid the ambiguous use of numbers with exponents. Usually, it is preferable to use the *Système International d'Unités* (SI) symbols (μ for 10^{-6} , m for 10^{-3} , k for 10^3 , and M for 10^6 , etc.). A complete listing of SI symbols can be found in the International Union of Pure and Applied Chemistry (IUPAC) publication *Quantities, Units and Symbols in Physical Chemistry* (RSC Publishing, Cambridge, United Kingdom, 2007); an abbreviated list is available at <http://old.iupac.org/reports/1993/homann/index.html>. Thus, a representation of 20,000 cpm on a figure ordinate is to be made by the number 20 accompanied by the label kcpm.

When powers of 10 must be used, the journal requires that the exponent power be associated with the number shown. In representing 20,000 cells per ml, the numeral on the ordinate should be “2” and the label should be “ 10^4 cells per ml” (not “cells per ml $\times 10^{-4}$ ”). Likewise, an enzyme activity of 0.06 U/ml might be shown as 6 accompanied by the label 10^{-2} U/ml. The preferred designation is 60 mU/ml (milliunits per milliliter).

Presentation of Nucleic Acid Sequences

Long nucleic acid sequences must be presented as figures in the following format to conserve space. Print the sequence in lines of approximately 100 to 120 nucleotides in a nonproportional (monospace) font (e.g., Courier) that is easily legible when published with a line length of 6 inches (ca. 15.2 cm). If possible, lines of nucleic acid sequence should be further subdivided into blocks of 10 or 20 nucleotides by spaces within the sequence or by marks above it. Uppercase and lowercase letters may be used to designate the exon-intron structure or transcribed regions, etc., if the lowercase letters remain legible at a 6-inch (ca. 15.2-cm) line length. Number the sequence line by line; place numerals representing the first base of each line to the left of the lines. Minimize spacing between lines of sequence, leaving room only for annotation of the sequence. Annotation may include boldface, underlining, brackets, and boxes, etc. Encoded amino acid sequences may be presented, if necessary, immediately above or below the first nucleotide of each codon, by using the single-letter amino acid symbols. Comparisons of multiple nucleic acid sequences should conform as nearly as possible to the same format.

Figure Legends

On initial submission, to assist review, figure legends may be incorporated in the image files and appear beneath the figures. At the modification stage, figure legends must be provided as text files separate from the image file.

Legends should provide enough information so that the figure is understandable without frequent reference to the text. However, detailed experimental methods must be described in the Materials and Methods section, not in a figure legend. A method that is unique to one of several experiments may be reported in a legend only if the discussion is very brief (one or two sentences). Define all symbols used in the figure and define all abbreviations that are not used in the text.

The main text file should also contain a legend for each item in the supplemental material (see “[Supplemental Material](#)”).

Tables

Tables that contain artwork, chemical structures, or shading must be submitted as illustrations in an acceptable format at the modification stage. The preferred format for regular tables is Microsoft Word; however, WordPerfect and Acrobat PDF are also acceptable. Note that a straight Excel file is not currently an acceptable format. Excel files must be either embedded in a Word or WordPerfect document or converted to PDF before being uploaded.

Tables should be formatted as follows. Arrange the data so that **columns of like material read down, not across**. The headings should be sufficiently clear so that the meaning of the data is understandable without reference to the text. See the “[Abbreviations](#)” section of these Instructions for those that should be used in tables. Explanatory footnotes are acceptable, but more-extensive table “legends” are not. Footnotes should not include detailed descriptions of the experiment. Tables must include enough information to warrant table format; those with fewer than four pieces of data will be incorporated into the text by the copy editor. [Table 1](#) is an example of a well-constructed table.

Featured Image

Each collected monthly issue of *mBio* is represented by a featured image, derived from an article in the issue. These featured images are used to represent the issues in the online archives.

Invitations to submit a featured image are issued to authors whose manuscripts are returned for modification or whose manuscripts have been accepted for publication in *mBio*; material should be related to the work presented in the manuscript. Unsolicited art will also be considered. No material submitted for consideration will be returned to the author. Authors will be notified only if their image is selected. A license for the chosen material must be granted to ASM. Questions or suggestions regarding the featured image can be sent to the editor in chief, Arturo Casadevall (mBioEditorInChief@asmusa.org).

NOMENCLATURE

Chemical and Biochemical Nomenclature

The recognized authority for the names of chemical compounds is *Chemical Abstracts* (CAS; <http://www.cas.org/>) and its indexes. *The Merck Index*, 14th ed. (Merck & Co., Inc., Whitehouse Station, NJ, 2006), is also an excellent source. For biochemical terminology, including abbreviations and symbols, consult *Biochemical Nomenclature and Related Documents* (Portland Press, London, United Kingdom, 1992), available at <http://www.chem.qmul.ac.uk/iupac/bibliog/white.html>, and the instructions to authors of the *Journal of Biological Chemistry* and the *Archives of Biochemistry and Biophysics* (first issues of each year).

Do not express molecular weight in daltons; molecular weight is a unitless ratio. Molecular mass is expressed in daltons.

For enzymes, use the recommended (trivial) name assigned by the Nomenclature Committee of the International Union of Biochemistry (IUB) as described in *Enzyme Nomenclature* (Academic Press, Inc., New York, NY, 1992) and its supplements and at <http://www.chem.qmul.ac.uk/iubmb/enzyme/>. If a nonrecommended name is used, place the proper (trivial) name in parentheses at first use in the abstract and text. Use the EC number when one has been assigned. Authors of papers describing enzymological studies should review the standards of the STRENDA Commission for information required for adequate description of experimental conditions and for reporting enzyme activity data (<http://www.strenda.org/documents.html>).

For nomenclature of restriction enzymes, DNA methyltransferases, homing endonucleases, and their genes, refer to the article by Roberts et al. (*Nucleic Acids Res.* **31**:1805–1812, 2003).

Drug Nomenclature

Chemical or generic names of drugs should be used; the use of code numbers or trade names is generally not permitted. When code names or corporate proprietary numbers are to be used, either the chemical structure of the compound or a published literature reference illustrating the chemical structure, if known, must be provided at the first occurrence of the code name or number. For compounds not identified by generic nomenclature, all previous or concurrent identification numbers or appellations should be listed in the manuscript.

Nomenclature of Organisms

Mice. For mouse strain and genetic nomenclature, ASM encourages authors to refer to the guidelines set forth by the International Committee on Standardized Genetic Nomenclature for Mice, available on the Mouse Genome Database home page at <http://www.informatics.jax.org/> and in *Genetic Variants and Strains of the Laboratory Mouse*, 3rd ed. (M. F. Lyon et al., ed., Oxford University Press, Oxford, England, 1996).

Viruses. Names used for viruses should be those approved by the International Committee on Taxonomy of Viruses (ICTV) and reported on the ICTV Virus Taxonomy website (<http://www.ictvonline.org/index.asp>). In addition, the recommendations of the ICTV regarding the use of species names should generally be followed: when the entire species is discussed as a taxonomic entity, the species name, as with other taxa, is italic and has the first letter and any proper nouns capitalized (e.g., *Tobacco mosaic virus*, *Murray Valley encephalitis virus*). When the behavior or manipulation of individual viruses is discussed, the vernacular (e.g., tobacco mosaic virus, Murray Valley encephalitis virus) should be used. If desired, synonyms may be added parenthetically when the name is first mentioned. Approved generic (or group) and family names may also be used.

Bacteria. Binary names, consisting of a generic name and a specific epithet (e.g., *Escherichia coli*), should be used for all bacteria. Names of categories at or above the genus level may be used alone, but specific and subspecific epithets may not. A specific epithet must be preceded by a generic name, written out in full the first time it is used in a paper. Thereafter, the generic name should be abbreviated to the initial capital letter (e.g., *E. coli*), provided there can be no confusion with other genera used in the paper. Names of all taxa (kingdoms, phyla, classes, orders, families, genera, species, and subspecies) are printed in italics; strain designations and numbers are not. Two sites on the World Wide Web list current approved bacterial names: Bacterial Nomenclature Up-to-Date (http://www.dsmz.de/microorganisms/main.php?contentleft_id=14) and List of Prokaryotic Names with Standing in Nomenclature (<http://www.bacterio.cict.fr/>). For guidelines regarding new names and descriptions of new genera and species, see the articles by Tindall (*Int. J. Syst. Bacteriol.* **49**:1309–1312, 1999) and Stackebrandt et al. (*Int. J. Syst. Evol. Microbiol.* **52**:1043–1047, 2002).

Fungi. Since the classification of fungi is not complete, it is the responsibility of the author to determine the accepted binomial for a given organism. Sources for these names include *The Yeasts: a Taxonomic Study*, 4th ed. (C. P. Kurtzman and J. W. Fell, ed., Elsevier Science Publishers B.V., Amsterdam, the Netherlands, 1998), and *Ainsworth and Bisby's Dictionary of the Fungi*, 9th ed. (P. M. Kirk, P. F. Cannon, J. C. David, and J. A. Stalpers, ed., CABI Publishing, Wallingford, Oxfordshire, United Kingdom, 2001); see also <http://www.speciesfungorum.org/Names/Fundic.asp>.

Genetic Nomenclature

Genetic nomenclature should essentially follow the recommendations of Demerec et al. (*Genetics* **54**:61–76, 1966) and those given in the instructions to authors of the *Journal of Bacteriology*, *Molecular and Cellular Biology*, and *Eukaryotic Cell* (January issues). To facilitate accurate communication, **it is important that standard genetic nomenclature be used whenever possible and that deviations or proposals for new naming systems be endorsed**

by an appropriate authoritative body. Review and/or publication of submitted manuscripts that contain new or nonstandard nomenclature may be delayed by the editor or the Journals Department so that they may be reviewed by the Genetics and Genomics Committee of the ASM Publications Board. **Before submission of manuscripts, authors may direct questions on genetic nomenclature to the committee's chairperson: Maria Costanzo** (maria@genome.stanford.edu). Such a consultation should be mentioned in the manuscript submission letter.

ABBREVIATIONS AND CONVENTIONS

Verb Tense

ASM strongly recommends that for clarity you use the past tense to narrate particular events in the past, including the procedures, observations, and data of the study that you are reporting. Use the present tense for your own general conclusions, the conclusions of previous researchers, and generally accepted facts. Thus, most of the abstract, Materials and Methods, and Results will be in the past tense, and most of the introduction and some of the Discussion will be in the present tense.

Be aware that it may be necessary to vary the tense in a single sentence. For example, it is correct to say "White (30) demonstrated that XYZ cells *grow* at pH 6.8," "Figure 2 shows that ABC cells *failed* to grow at room temperature," and "Air *was* removed from the chamber and the mice *died*, which *proves* that mice *require* air." In reporting statistics and calculations, it is correct to say "The values for the ABC cells *are* statistically significant, indicating that the drug inhibited . . ."

For an in-depth discussion of tense in scientific writing, see p. 191–193 in *How To Write and Publish a Scientific Paper*, 6th ed.

Abbreviations

General. Abbreviations should be used as an aid to the reader, rather than as a convenience to the author, and therefore their **use should be limited**. Abbreviations other than those recommended by the IUPAC-IUB (*Biochemical Nomenclature and Related Documents*, 1992) should be used only when a case can be made for necessity, such as in tables and figures.

It is often possible to use pronouns or to paraphrase a long word after its first use (e.g., "the drug" or "the substrate"). Standard chemical symbols and trivial names or their symbols (folate, Ala, and Leu, etc.) may also be used.

Define each abbreviation and introduce it in parentheses the first time it is used; e.g., "cultures were grown in Eagle minimal essential medium (MEM)." Generally, eliminate abbreviations that are not used at least three times in the text (including tables and figure legends).

Not requiring introduction. In addition to abbreviations

for Système International d'Unités (SI) units of measurement, other common units (e.g., bp, kb, and Da), and chemical symbols for the elements, the following should be used without definition in the title, abstract, text, figure legends, and tables:

DNA (deoxyribonucleic acid)	NADP ⁺ (nicotinamide adenine dinucleotide phosphate, oxidized)
cDNA (complementary DNA)	poly(A), poly(dT), etc.
RNA (ribonucleic acid)	(polyadenylic acid and polydeoxythymidylic acid, etc.)
cRNA (complementary RNA)	oligo(dT), etc.
RNase (ribonuclease)	(oligodeoxythymidylic acid, etc.)
DNase (deoxyribonuclease)	UV (ultraviolet)
rRNA (ribosomal RNA)	PFU (plaque-forming units)
mRNA (messenger RNA)	CFU (colony-forming units)
tRNA (transfer RNA)	MIC (minimal inhibitory concentration)
AMP, ADP, ATP, dAMP, ddATP, GTP, etc. (for the respective 5' phosphates of adenosine and other nucleosides) (add 2', 3', or 5' - when needed for contrast)	Tris [tris(hydroxymethyl)aminomethane]
ATPase, dGTPase, etc. (adenosine triphosphatase and deoxyguanosine triphosphatase, etc.)	DEAE (diethylaminoethyl)
NAD (nicotinamide adenine dinucleotide)	EDTA
NAD ⁺ (nicotinamide adenine dinucleotide, oxidized)	(ethylenediaminetetraacetic acid)
NADH (nicotinamide adenine dinucleotide, reduced)	EGTA [ethylene glycol-bis(β-aminoethyl ether)-N,N,N',N'-tetraacetic acid]
NADP (nicotinamide adenine dinucleotide phosphate)	HEPES (N-2-hydroxyethylpiperazine-N'-2-ethanesulfonic acid)
NADPH (nicotinamide adenine dinucleotide phosphate, reduced)	PCR (polymerase chain reaction)
	AIDS (acquired immunodeficiency syndrome)

Abbreviations for cell lines (e.g., HeLa) also need not be defined.

The following abbreviations should be used without definition in tables:

amt (amount)	SE (standard error)
approx (approximately)	SEM (standard error of the mean)
avg (average)	sp act (specific activity)
concn (concentration)	sp gr (specific gravity)
diam (diameter)	temp (temperature)
expt (experiment)	tr (trace)
exptl (experimental)	vol (volume)
ht (height)	vs (versus)
mo (month)	wk (week)
mol wt (molecular weight)	wt (weight)
no. (number)	yr (year)
prepn (preparation)	
SD (standard deviation)	

Reporting Numerical Data

Standard metric units are used for reporting length, weight, and volume. For these units and for molarity, use the prefixes m, μ, n, and p for 10⁻³, 10⁻⁶, 10⁻⁹, and 10⁻¹², respectively. Likewise, use the prefixes c for 10⁻² and k for 10³. Avoid compound prefixes such as mμ or μμ. Use μg/ml or μg/g in place of the ambiguous ppm. Units of temperature are presented as follows: 37°C or 324 K.

When fractions are used to express units such as enzymatic activities, it is preferable to use whole units, such as g or min, in the denominator instead of fractional or multiple units, such as μg or 10 min. For example, “pmol/min” is preferable to “nmol/10 min,” and “ $\mu\text{mol/g}$ ” is preferable to “nmol/ μg .” It is also preferable that an unambiguous form such as exponential notation be used; for example, “ $\mu\text{mol g}^{-1} \text{min}^{-1}$ ” is preferable to “ $\mu\text{mol/g/min}$.” Always report numerical data in the appropriate SI units.

For a review of some common errors associated with statistical analyses and reports, plus guidelines on how to avoid them, see the article by Olsen (*Infect. Immun.* **71**:6689–6692, 2003).

Isotopically Labeled Compounds

For simple molecules, labeling is indicated in the chemical formula (e.g., $^{14}\text{CO}_2$, $^3\text{H}_2\text{O}$, and $\text{H}_2^{35}\text{SO}_4$). Brackets are not

used when the isotopic symbol is attached to the name of a compound that in its natural state does not contain the element (e.g., $^{32}\text{S-ATP}$) or to a word that is not a specific chemical name (e.g., ^{131}I -labeled protein, ^{14}C -amino acids, and ^3H -ligands).

For specific chemicals, the symbol for the isotope introduced is placed in square brackets directly preceding the part of the name that describes the labeled entity. Note that configuration symbols and modifiers precede the isotopic symbol. The following examples illustrate correct usage:

^{14}C urea	$[\gamma\text{-}^{32}\text{P}]\text{ATP}$
L-[methyl- ^{14}C]methionine	UDP-[U- ^{14}C]glucose
[2,3- ^3H]serine	SV40 [^{32}P]DNA
$[\alpha\text{-}^{14}\text{C}]$ lysine	fructose 1,6-[1- ^{32}P]bisphosphate

mBio follows the same conventions for isotopic labeling as the *Journal of Biological Chemistry*, and more-detailed information can be found in the instructions to authors of that journal (first issue of each year).