

INSTRUCTIONS TO AUTHORS

SCOPE

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MCB is edited by leading investigators in the field of molecular biology, and decisions are based solely on scientific merit. MCB recognizes that rigorous, in-depth extensions of prior observations contribute in an important way to the advancement of scientific knowledge. We welcome studies that build upon, clarify, or question previous work and thereby move the field forward.

Questions about these guidelines may be directed to the editor in chief.

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Analyses should specify the database, and the date of each analysis should be indicated as, e.g., 6 January 2018. 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/>; European Nucleotide Archive (ENA), <https://www.ebi.ac.uk/ena/>; and GenBank, National Center for Biotechnology Information, <https://www.ncbi.nlm.nih.gov/nucleotide>.

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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 the INSD, and new locus tag prefixes must be assigned in cooperation with the INSD to ensure that they conform to the agreed-upon criteria.

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SUBMISSION, REVIEW, AND PUBLICATION PROCESSES

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- A cover letter declaring the previous submission and requesting expedited review
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decision letter(s), all previous reviews, any manuscript correspondence, and your point-by-point response to the reviews, including page and line numbers where changes have been made

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To facilitate the review, copies of in-press and submitted manuscripts that are important for judgment of the present manuscript should be included as supplemental material not for publication.

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2. Bina XR, Taylor DL, Vikram A, Ante VM, Bina JE. 2013. *Vibrio cholerae* ToxR downregulates virulence factor production in response to cyclo(Phe-Pro). *mBio* 4:e00366-13.
3. Winnick S, Lucas DO, Hartman AL, Toll D. 2005. How do you improve compliance? *Pediatrics* 115:e718–e724.
4. Falagas ME, Kasiakou SK. 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.}
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7. da Costa MS, Nobre MF, Rainey FA. 2001. Genus I. *Thermus* Brock and Freeze 1969, 295, ^{AL} emend. Nobre, Trüper and da Costa 1996b, 605, p 404–414. *In* Boone DR, Castenholz RW, Garrity GM (ed), *Bergey’s manual of systematic bacteriology*, 2nd ed, vol 1. Springer, New York, NY.
8. Fitzgerald G, Shaw D. *In* Waters AE (ed), *Clinical microbiology*, in press. EFH Publishing Co, Boston, MA.* {Chapter title is optional.}
9. Green PN, Hood D, Dow CS. 1984. Taxonomic status of

- some methylotrophic bacteria, p 251–254. In Crawford RL, Hanson RS (ed), *Microbial growth on C₁ compounds*. Proceedings of the 4th International Symposium. American Society for Microbiology, Washington, DC.
10. Rotimi VO, Salako NO, Mohaddas EM, Philip LP. 2005. Abstr 45th Intersci Conf Antimicrob Agents Chemother, abstr D-1658. {*Abstract title is optional.*}
 11. Smith D, Johnson C, Maier M, Maurer JJ. 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.*}
 12. García CO, Paira S, Burgos R, Molina J, Molina JF, Calvo C, Vega L, Jara LJ, García-Kutzbach A, Cuellar ML, Espinoza LR. 1996. Detection of *Salmonella* DNA in synovial membrane and synovial fluid from Latin American patients using the polymerase chain reaction. *Arthritis Rheum* 39(Suppl 9):S185. {*Meeting abstract published in journal supplement.*}
 13. O'Malley DR. 1998. PhD thesis. University of California, Los Angeles, CA. {*Title is optional.*}
 14. 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.*}
 15. Odell JC. April 1970. Process for batch culturing. US patent 484,363,770. {*Include the name of the patented item/process if possible; the patent number is mandatory.*}
 16. Harrison F, Roberts AEL, Gabriliska R, Rumbaugh KP, Lee C, Diggle SP. 2015. A 1,000-year-old antimicrobial remedy with antistaphylococcal activity. *mBio* 6:e01129-15. {*Original article that describes how data submitted to a database were generated.*}
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- Websites

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

- ... similar results (R. B. Layton and C. C. Weathers, unpublished data).
- ... system was used (J. L. McInerney, A. F. Holden, and P. N. Brighton, submitted for publication).
- ... as described previously (M. G. Gordon and F. L. Rattner, presented at the Fourth Symposium on Food Microbiology, Overton, IL, 13 to 15 June 1989). {For nonpublished 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.}
- ... as suggested by the World Health Organization (<http://www.who.int/campaigns/immunization-week/2017/en/>).

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.

Manuscript submissions that have appeared in preprint archives should cite the preprint in References, and the fact that it has appeared online before should be mentioned parenthetically at the end of the introductory section: (This article was submitted to an online preprint archive [1].) The reference should take the form noted above in reference 18.

(iii) Citations in abstracts. Because 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.

- (P. S. Satheshkumar, A. S. Weisberg, and B. Moss, J Virol 87:10700–10709, 2013, doi:10.1128/JVI.01258-13)
 (J. H. Coggin, Jr., p. 93–114, in D. O. Fleming and D. L. Hunt, ed., *Biological Safety. Principles and Practices*, 4th ed., 2006)
 “. . . in a recent report by D. A. Hopwood (mBio 4: e00612-13, 2013, doi:10.1128/mBio00612-13) . . .”

This style should also be used for Addenda in Proof.

(iv) References related to supplemental material. If references must be cited in the supplemental material, list them in a **separate** References section within the supplemental material and cite them by those numbers; do not simply include citations of numbers from the reference list of the associated article. If the same reference(s) is to be cited in both the article itself and the supplemental material, then that reference would be listed in both References sections.

Minireviews

Minireviews are brief (**limit of 6,000 words exclusive of references**) biographical profiles, historical perspectives, or summaries of developments in fast-moving areas. They must be based on published articles; they may address any subject within the scope of MCB.

Minireviews may be either solicited or proffered by authors responding to a recognized need. Irrespective of origin, Minireviews are subject to review and should be submitted via the eJP online manuscript submission and peer review system. The cover letter should state whether the article was solicited and by whom.

Minireviews must have abstracts. Limit the abstract to 200 words or fewer. The body of the Minireview may have section headings and/or paragraph lead-ins.

Author bios. At the editor’s invitation, corresponding authors of minireviews may submit a short biographical sketch and photo for each author for publication with the article. Biographical information should be submitted at the modification stage.

- The text limit is 150 words for each author and should include WHO you are (your name), WHERE you received your education, WHAT positions you have held and at WHICH institutions, WHERE you are now (your current institution), WHY you have this interest, and HOW LONG you have been in this field.
- The photo should be a black-and-white head shot of passport size. Photos will be reduced to approximately 1.125 inches wide by 1.375 inches high. Photos must meet the production criteria for regular figures and should be checked for production quality by using Rapid Inspector, provided at the following URL: <http://rapidinspector.cadmus.com/RapidInspector/zmw/index.jsp>.
- To submit, upload the text and photos with your modified manuscript in the eJP online manuscript submission and peer review system. Include the biographical

text after the References section of your manuscript, in the same file. Upload the head shots in the submission system as a “Minireview Bio Photo”; **include the author’s name or enough of it for identification in each photo’s file name.**

Contact the [scientific editor](#) if you have questions about what to write. Contact the [production editor](#) if you have questions about submitting your files.

Commentaries

Commentaries are communications written in response to invitations issued by the editors and concern topics of interest to the broad readership of MCB that are not necessarily covered by Minireviews. They should raise issues of interest to the scholarly community, initiate or focus discussion, or propose position or consensus statements for leadership groups in research and education. Reviews of the literature, methods and other how-to papers, and responses targeted at a specific published paper are not appropriate. Commentaries are subject to review.

The length may not exceed 4,000 words, and the format is like that of a Minireview (see above) except that the abstract is limited to 75 words.

Letters to the Editor

Letters to the Editor are intended only for comments on final, typeset articles published in the journal (not on accepted manuscripts posted online) 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.** Refer to a recently published Letter for correct formatting. Note that authors and affiliations are listed below the title.

All Letters to the Editor must be submitted electronically, and the manuscript type (Comment Letter) must be selected from the choices in the submission form. The cover letter should state the volume and issue in which the article was published, the title of the article, and the last name of the first author. In the Abstract section of the submission form, put “Not Applicable.” Letters to the Editor do not have abstracts. The Letter must have a 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

Errata provide 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 eJP online manuscript submission and peer review system (see “[Submission, Review, and Publica-](#)

[tion Processes](#)”). 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. Please see a recent issue for correct formatting.

Author Corrections

Author Corrections provide 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 Correction via the eJP online manuscript submission and peer review system (see “[Submission, Review, and Publication Processes](#)”). Select Author Correction as the manuscript type. In the Abstract section of the submission form (a required field), put “Not Applicable.” Upload the text of your Author Correction as a Microsoft Word file. Please see a recent issue for correct formatting. Signed letters of agreement must be supplied as supplemental material not for publication (scanned 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. Submit Retractions via the eJP online manuscript submission and peer review system (see “[Submission, Review, and Publication Processes](#)”). In the Abstract section of the submission form (a required field), put “Not Applicable.” Upload the text of your Retraction as a Microsoft Word file. Letters of agreement signed by all of the authors must be supplied as supplemental material not for publication (scanned PDF files). The Retraction will be assigned to the editor in chief of the journal, and the editor who handled the paper and the chairperson of the ASM Journals Committee will be consulted. If all parties agree to the publication and content of the Retraction, it will be sent to the Journals Department for publication.

CrossMark

ASM has implemented CrossMark. CrossMark is a multi-publisher initiative to provide a standard way for readers to locate the current version of an article. Clicking on the CrossMark logo will indicate whether an article is current or whether updates have been published. Additional information about CrossMark can be found on CrossMark’s [website](#) and on ASM’s CrossMark [policy page](#).

ILLUSTRATIONS AND TABLES

Illustrations

Image manipulation. Digital images submitted for publication may be inspected by ASM production specialists for any manipulations or electronic enhancements that may be considered to be the result of scientific misconduct based on the guidelines provided below. Any images/data found to contain manipulations of concern will be referred to the editor in chief, and authors may then be requested to provide their primary data for comparison with the submitted image file. Investigation of the concerns may delay publication and may result in revocation of acceptance and/or additional action by ASM.

Linear adjustments to contrast, brightness, and/or color are generally acceptable, as long as the measures taken are necessary to view elements that are already present in the data and the adjustments are applied to the entire image and not just specific areas. Unacceptable adjustments to images include, but are not limited to, the removal or deletion, concealment, duplication (copying and pasting), addition, selective enhancement, or repositioning of elements within the image.

Nonlinear adjustments made to images, such as changes to gamma settings, should be fully disclosed in the figure legends at the time of submission. In addition, images created by compiling multiple files, including noncontiguous portions of the same image, should clearly convey that these multiple files are not a single image. This can be done by “tooling,” or inserting **thin lines**, between the individual images.

File types and formats. Illustrations may be continuous-tone images, line drawings, or composites. Color graphics may be submitted. Suggestions about how to ensure accurate color reproduction are given below.

On initial submission, figures may be uploaded as individual PDF files or combined and uploaded as a single PDF file. Place each legend in the text file, as well as on the same page with the corresponding figure to assist review. At the modification stage, production-quality digital files must be provided. Because the legends will be copyedited and typeset for final publication, they should appear within the main text, after the References section, and should not be included as part of the figure itself at this stage. All graphics submitted with modified manuscripts must be bitmap, grayscale, or in the RGB (preferred) or CMYK color mode. See “**Color illustrations.**” Halftone images (those with various densities or shades) must be grayscale, not bitmap. MCB accepts TIFF or EPS files but discourages PowerPoint for either black-and-white or color images.

For instructions on creating acceptable EPS and TIFF files, refer to the Cadmus digital art website, <http://art.cadmus.com/da/index.jsp>. PowerPoint requires users to pay close attention to the fonts used in their images (see the [section on fonts](#) below). If instructions for fonts are not followed exactly, images prepared for publication are subject to missing characters, improperly converted characters, or shifting/obscuring of elements or text in the figure. For proper font use in PowerPoint images, refer to the Cadmus digital art website, http://art.cadmus.com/da/instructions/ppt_disclaimer.jsp. Note that, due to page composition system requirements, you must verify that

your PowerPoint files can be converted to PDF without any errors.

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. Please note when using Rapid Inspector to check PowerPoint files that there is a known bug in the application that can occasionally fail PowerPoint Presentation (.pptx) files, even though the files meet all required production criteria. If you experience this bug, the issue can be corrected by saving the PowerPoint files as an older version, PowerPoint 97-2004 Presentation (.ppt), during the Save As process (use the drop-down format menu and select this format). Once you save your files as .ppt, they will pass Rapid Inspector if all required production criteria have been met.

If you have additional questions about using the Rapid Inspector preflighting tool, please send an e-mail inquiry to helpdesk.digitalartsupport@cenveo.com.

Minimum resolution. It is extremely important that a high enough file resolution is used. All separate images that you import into a figure file must be at the correct resolution before they are placed. (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, however, that the higher the resolution, the larger the file and the longer the upload time. Publication quality will not be improved by using a resolution higher than the minimum. Minimum resolutions are as follows:

- 300 dpi for grayscale and color
- 600 dpi for combination art (lettering and images)
- 1,200 dpi for line art

Size. All graphics **should be submitted at their intended publication size**; that is, the image uploaded should be 100% of its print 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 figure width: 6.875 inches (ca. 17.4 cm)
- Maximum figure height: 9.0625 inches (23.0 cm)

Contrast. Illustrations must contain sufficient contrast to be viewed easily on a monitor or on the printed page.

Labeling and assembly. All final lettering and labeling must be incorporated into the figures. On initial submission, illustrations should be provided as PDF files, with the legends in the text file and with a legend beneath each image to assist review. At the modification stage, production-quality digital figure files (without legends) must be provided. 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 uploaded 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 non-proportional (monospace) font is required. All fonts other than these must be converted to paths (or outlines) in the application with which they were created.

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.

The final online version is considered the version of record for MCB and all other ASM journals. To maximize online reproduction, 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). CMYK files are also accepted. Other than in color space, CMYK files must meet the same production criteria as RGB files. The RGB color space is the native color space of computer monitors and of most of the equipment and software used to capture scientific data, and it can display a wider range of colors (especially bright fluorescent hues) than the CMYK (cyan, magenta, yellow, black) color space used by print devices that put ink (or toner) on paper. 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 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. For additional information on RGB versus CMYK color, refer to the Cadmus digital art site, http://art.cadmus.com/da/guidelines_rgb.jsp.

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](#)” above.

(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 fill 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 less.

(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) Use type that is no 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 appropriate *Système International d'Unités* (SI) symbols (μ for 10^{-6} , m for 10^{-3} , k for 10^3 , and M for 10^6 , etc.). Thus, representation of 20,000 cpm on a figure ordinate should be made by the number 20 accompanied by the label kcpm. 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*, 3rd ed. (RSC Publishing, Cambridge, United Kingdom, 2007), and at <https://www.nist.gov/physical-measurement-laboratory/special-publication-811>.

Where 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 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,

TABLE 1 Distribution of protein and ATPase in fractions of dialyzed membranes^a

Membrane	Fraction	ATPase	
		U/mg of protein	Total U
Control	Depleted membrane	0.036	2.3
	Concentrated supernatant	0.134	4.82
E1 treated	Depleted membrane	0.034	1.98
	Concentrated supernatant	0.11	4.6

^a Specific activities of ATPase of nondepleted membranes from control and treated bacteria were 0.21 and 0.20, respectively.

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, each legend should be placed in the text file *and* be incorporated into the image file beneath the figure to assist review.

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.

Tables

Tables that contain artwork, chemical structures, or complex 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 (below) 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 six pieces of data will be incorporated into the text by the copy editor. Table 1 is an example of a well-constructed table.

Cover Photographs and Drawings

MCB publishes photographs and drawings on the front cover. Invitations to submit an illustration for consideration as cover art are issued to authors whose manuscripts are returned for modifi-

cation or whose manuscripts have been accepted for publication in MCB; material should be related to the work presented in the manuscript. Unsolicited photos will also be considered. No material submitted for consideration will be returned to the author. Authors will be notified only if their cover art is selected. Copyright for the chosen material must be transferred to ASM. A short description of the cover material will be included at the end of the table of contents. Technical specifications and comments on potential illustrations can be obtained from the cover editor, Peter Tontonoz (MCB_Tontonoz@mednet.ucla.edu).

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 Online* (<https://www.rsc.org/merck-index>) is also an excellent source. For guidelines to the use of biochemical terminology, consult *Biochemical Nomenclature and Related Documents* (Portland Press, London, United Kingdom, 1992), available at <http://www.sbcs.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*.

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.sbcs.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.beilstein-institut.de/en/projects/strenda/guidelines>).

Nomenclature of 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 Informatics 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).

Nomenclature of Microorganisms

Binary names, consisting of a generic name and a specific epithet (e.g., *Escherichia coli*), must be used for all microorganisms. 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 bacterial taxa (kingdoms, phyla, classes, orders, families, genera, species, and subspecies) are printed in italics and should be italicized in the manuscript; strain designations and numbers are not.

The spelling of bacterial names should follow the *Approved Lists of Bacterial Names (Amended) & Index of the Bacterial and Yeast Nomenclatural Changes* (V. B. D. Skerman et al., ed., American Society for Microbiology, Washington, DC, 1989) and the validation lists and notification lists published in the *International Journal of Systematic and Evolutionary Microbiology* (formerly the *International Journal of Systematic Bacteriology*) since January 1989. In addition, two sites on the World Wide Web list current approved bacterial names: Prokaryotic Nomenclature Up-to-Date (<https://www.dsmz.de/bacterial-diversity/prokaryotic-nomenclature-up-to-date.html>) and List of Prokaryotic Names with Standing in Nomenclature (<http://www.bacterio.net/>).

Since the classification of fungi is far from 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*, 5th ed. (C. P. Kurtzman, J. W. Fell, and T. Boekhout, ed., Elsevier Science, Amsterdam, Netherlands, 2011), and *Dictionary of the Fungi*, 10th ed. (P. M. Kirk, P. F. Cannon, D. W. Minter, and J. A. Stalpers, ed., CABI International, Wallingford, Oxfordshire, United Kingdom, 2008); see also <http://www.speciesfungorum.org/Names/Fundic.asp>.

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://talk.ictvonline.org/>). 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.

Microorganisms, viruses, and plasmids should be given designations consisting of letters and serial numbers. It is generally advisable to include a worker's initials or a descriptive symbol of locale or laboratory, etc., in the designation. Each new strain, mutant, isolate, or derivative should be given a new (serial) designation. This designation should be distinct from those of the genotype and phenotype, and genotypic and phenotypic symbols should not be included.

Genetic Nomenclature

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 non-

standard nomenclature may be delayed by the editor or the Journals Department so that they may be reviewed.

Prokaryotes. The genetic properties of prokaryotes are described in terms of phenotypes and genotypes. The phenotype describes the observable properties of an organism. The genotype refers to the genetic constitution of an organism, usually in reference to some standard wild type. In preparing a manuscript, follow the recommendations of Demerec et al. (*Genetics* 54:61–76, 1966) and the practices currently in use in the *Journal of Bacteriology* and described in its Instructions to Authors. A brief description follows.

(i) Phenotype designations must be employed when mutant loci have not been identified or mapped. They can also be used to identify the protein product of a gene, e.g., the OmpA protein. Phenotype designations generally consist of three-letter symbols; these are not italicized, and the first letter of the symbol is capitalized (e.g., Pol). Wild-type characteristics can be designated with a superscript plus (Pol⁺), and, when necessary for clarity, negative superscripts (Pol⁻) can be used to designate mutant characteristics. Lowercase superscript letters may be used to further delineate phenotypes (e.g., Str^r for streptomycin resistance). Phenotype designations should be defined.

(ii) Genotype designations are also indicated by a three-letter symbol. In contrast to phenotype designations, genotype designations are lowercase italic (e.g., *ara his rps*). If several loci govern related functions, these are distinguished by an italicized capital letter following the locus symbol (e.g., *araA araB*). Mutation sites are distinguished by placing serial isolation numbers (allele numbers) after the locus symbol (e.g., *ara-1 hisB5*). Promoter, terminator, and operator sites should be indicated as described by Bachmann and Low (*Microbiol Rev* 44:1–56, 1980): e.g., *lacZp*, *lacAt*, and *lacZo*. It is essential in papers reporting the isolation of new mutants that allele numbers be given to the mutations. For *Escherichia coli*, there is a registry of such numbers: *E. coli* Genetic Stock Center (<http://cgsc2.biology.yale.edu/>). For the genus *Salmonella*, the registry is *Salmonella* Genetic Stock Center (<http://people.ucalgary.ca/~kesander/>).

(iii) Wild-type alleles are indicated with a superscript plus (*ara⁺ his⁺*). A superscript minus is not used to indicate a mutant locus; thus, one refers to an *ara* mutant rather than an *ara⁻* strain.

(iv) The use of superscripts with genotypes (other than + to indicate wild-type alleles) should be avoided. Designations indicating amber mutations (Am), temperature-sensitive mutations (Ts), constitutive mutations (Con), cold-sensitive mutations (Cs), and production of a hybrid protein (Hyb) should follow the allele number [e.g., *araA230(Am) hisD21(Ts)*]. All other such designations of phenotype must be defined at the first occurrence. If superscripts must be used, they must be approved by the editor and defined at the first occurrence in the text.

Subscripts may be used in two situations. Subscripts may be used to distinguish between genes (having the same name) from different organisms or strains; e.g., *his_{E. coli}* or *his_{K-12}* for the *his* gene of *E. coli* or strain K-12, respectively, may be used to distinguish this gene from the *his* gene in another species or strain. An abbreviation may also be used if it is explained. Similarly, a subscript can also be used to distinguish between genetic elements

that have the same name. For example, the promoters of the *gln* operon can be designated *glnAp₁* and *glnAp₂*.

(v) Avoid the use of a genotype as a name (e.g., “subsequent use of *leuC6* for transduction”). If a strain designation has not been chosen, select an appropriate word combination (e.g., “either strain PA3092 or another strain containing the *leuC6* mutation”).

Locus tags. Locus tags are systematic, unique identifiers that are assigned to each gene in GenBank. All genes mentioned in a manuscript should be traceable to their sequences by the reader, and locus tags may be used for this purpose in manuscripts to identify uncharacterized genes. In addition, authors should check GenBank to make sure that they are using the correct, up-to-date format for locus tags (e.g., uppercase versus lowercase letters and the presence or absence of an underscore, etc.). Locus tag formats vary between different organisms and also may be updated for a given organism, so it is important to check GenBank at the time of manuscript preparation.

Viruses. In most cases, viruses have no phenotype, since they have no metabolism outside host cells. Therefore, distinctions between phenotype and genotype are not made. Superscripts are used to indicate hybrid genomes. Genetic symbols may be one, two, or three letters. For example, a mutant strain of lambda may be designated λ c1857 *inf2 red114* Aam11; this strain carries mutations in genes *c1*, *inf2*, and *red* and an amber-suppressible (Am) mutation in gene *A*. Host DNA insertions into viruses should be delineated by square brackets, and the genetic symbols and designations for such inserted DNA should conform to those used for the host genome.

Eukaryotes. The nomenclature used for the genetics of lower eukaryotic microorganisms has not been as well formalized as that for bacteria and bacteriophages. Generally, authors should conform to current practices in identifying mutants and their genotypes. For organisms not mentioned below, it is advisable to consult the *Handbook of Microbiology*, 2nd ed. (A. I. Laskin and H. A. Lechevalier, ed., CRC Press, Boca Raton, FL, 1988) or the *Handbook of Genetics*, vol. 1, *Bacteria, Bacteriophages, and Fungi* (R. C. King, ed., Plenum Publishing Corp., New York, NY, 1974).

Gene names may begin with prefixes to indicate the genus and species from which the gene is derived only when needed for clarity when discussing genes with the same name from two different organisms (e.g., *ScURA3* versus *CaURA3*); the prefixes are not considered part of the gene name proper and are not italicized.

The genetic nomenclature of *Dictyostelium* is summarized in the *Trends in Genetics* “Genetic Nomenclature Guide” (p. S.5–S.6; Elsevier Science Ltd., Cambridge, United Kingdom, 1998; out of print). The most recent modifications can be found at <http://dictybase.org/>.

For *Saccharomyces cerevisiae*, a gene name should always be indicated in italics and, for the wild-type locus (or dominant alleles), capital letters (e.g., *URA3*). Loss-of-function (hypomorphic) or altered-function (neomorphic) alleles of the same locus should always be indicated in italics and lowercase letters (e.g., *ura3Δ*). The product of a gene (i.e., a protein) should be

indicated in roman type with an initial capital letter (e.g., Ura3). There is generally no need to add the suffix “p” to the symbol for a protein; however, in rare instances where it may be deemed necessary to indicate unambiguously that the symbol refers to a protein, the “p” suffix may be added (e.g., Ura3p). For the most recent information on *S. cerevisiae* gene names, consult the *Saccharomyces* Genome Database (SGD) at <https://www.yeastgenome.org/>. Details on the format of *S. cerevisiae* locus and allele designations are provided in the SGD and are also described by Cherry (*Trends Genet* March:11–12, 1995). **Authors should use standard *S. cerevisiae* gene names, as listed in the SGD, in their submitted manuscripts and register new gene names with the SGD no later than the modification stage.**

The most recent information for *Neurospora crassa* can be found in *The Neurospora Compendium: Chromosomal Loci* (D. R. Perkins et al., Academic Press, San Diego, CA, 2001). When naming genes for *Aspergillus* species, the nomenclature guidelines posted at <http://www.aspergillusgenome.org/Nomenclature.shtml> should be followed, and the *Aspergillus* Genome Database (<http://www.aspgd.org/>) should be searched to ensure that any new name is not already in use. The 1998 *Trends in Genetics* “Genetic Nomenclature Guide” (Elsevier Science Ltd., Cambridge, United Kingdom; out of print) contains nomenclature guidelines for several eukaryotic microbes: *Schizosaccharomyces pombe* (p. S.7–S.9), *Chlamydomonas reinhardtii* (p. S.18–S.19), *Neurospora crassa* (p. S.14–S.15), and *Aspergillus nidulans* (p. S.12–S.13). In addition, for *S. pombe*, the websites <https://www.pombase.org/submit-data/gene-naming-guidelines> and <http://www-bcf.usc.edu/~forsburg/plasmids.html> may be helpful, and for *C. reinhardtii*, use <https://www.chlamycollection.org/resources/tools/gene-nomenclature/>.

For *Trypanosoma* and *Leishmania*, consult the article by Clayton et al. (*Mol Biochem Parasitol* 97:221–224, 1998).

For the most recent information on *Candida albicans*, consult the *Candida* Genome Database (CGD) at <http://www.candidagenome.org/>. Details on the format of *C. albicans* gene nomenclature are described at <http://www.candidagenome.org/Nomenclature.shtml>. **Authors should use standard *C. albicans* gene names, as listed in the CGD, in their submitted manuscripts and should register new gene names with the CGD no later than the modification stage.**

Symbols for *Drosophila* mutations and chromosome aberrations are italicized; they should not contain Greek letters, subscripts, or spaces. The symbol for a mutant type is usually an abbreviation of its name and usually begins with the first letter of that name. Dominant and recessive mutations are indicated by initial capital and lowercase letters, respectively (e.g., *R* for roughened and *r* for rudimentary). FlyBase (<http://flybase.org/>) is the genetic nomenclature authority for *Drosophila melanogaster*.

WormBase (<http://www.wormbase.org/#01-23-6>) is the genetic nomenclature authority for *Caenorhabditis elegans*. *Xenopus* gene nomenclature guidelines can be found at <http://www.xenbase.org/gene/static/geneNomenclature.jsp>.

“Mutant” versus “mutation.” Keep in mind the distinction between a mutation (an alteration of the primary sequence of the genetic material) and a mutant (a strain carrying one or more mutations). One may speak about the mapping of

a mutation, but one cannot map a mutant. Likewise, a mutant has no genetic locus, only a phenotype.

“Homology” versus “similarity.” For use of terms that describe relationships between genes, consult the articles by Theissen (Nature 415:741, 2002) and Fitch (Trends Genet 16: 227–231, 2000). “Homology” implies a relationship between genes that have a common evolutionary origin; partial homology is not recognized. When sequence comparisons are discussed, it is more appropriate to use the term “percent sequence similarity” or “percent sequence identity,” as appropriate.

Transposable elements, plasmids, and restriction enzymes. Nomenclature of transposable elements (insertion sequences, transposons, and phage Mu, etc.) should follow the recommendations of Campbell et al. (Gene 5:197–206, 1979), with the modifications referred to in the Instructions to Authors in the *Journal of Bacteriology*. The Internet site where insertion sequences of eubacteria and archaea are described and new sequences can be recorded is <https://www-is.biotoul.fr>.

The system of designating transposon insertions at sites where there are no known loci, e.g., *zef-123::Tn5*, has been described by Chumley et al. (Genetics 91:639–655, 1979). Use the nomenclature recommendations of Novick et al. (Bacteriol Rev 40:168–189, 1976) for plasmids and plasmid-specified activities, of Low (Bacteriol Rev 36:587–607, 1972) for F' factors, and of Roberts et al. (Nucleic Acids Res 31:1805–1812, 2003) for restriction enzymes, DNA methyltransferases, homing endonucleases, and their genes. The nomenclature for recombinant DNA molecules constructed *in vitro* follows the nomenclature for insertions in general. DNA inserted into recombinant DNA molecules should be described by using the gene symbols and conventions for the organism from which the DNA was obtained.

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 *How To Write and Publish a Scientific Paper*, 7th ed.

Abbreviations

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

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

The following abbreviations should be used without definition in tables:

amt (amount)	mo (month)
approx (approximately)	mol wt (molecular weight)
avg (average)	no. (number)
concn (concentration)	prepn (preparation)
diam (diameter)	SD (standard deviation)
expt (experiment)	SE (standard error)
exptl (experimental)	SEM (standard error of the mean)
ht (height)	sp act (specific activity)

sp gr (specific gravity)	wk (week)
temp (temperature)	wt (weight)
vol (volume)	yr (year)
vs (versus)	

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 prefix k for 10^3 . Avoid compound prefixes such as m μ or $\mu\mu$. Use $\mu\text{g/ml}$ or $\mu\text{g/g}$ 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 articles by Olsen (Infect Immun 71:6689–6692, 2003; Infect Immun 82:916–920, 2014).

For a review of basic statistical considerations for virology experiments, see the article by Richardson and Overbaugh (J Virol 79:669–676, 2005).

Isotopically Labeled Compounds

For simple molecules, isotopic 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}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	$[\gamma\text{-}^{32}\text{P}]$ ATP
L-[methyl- ^{14}C]methionine	UDP-[U- ^{14}C]glucose
[2,3- ^3H]serine	<i>E. coli</i> [^{32}P]DNA
$[\alpha\text{-}^{14}\text{C}]$ lysine	fructose 1,6-[1- ^{32}P]bisphosphate