

Last updated: September 17, 2024 [View the latest guidelines online](#)

## Manuscript Submission Requirements Checklist

Correspondence should be addressed to the Editor-in-Chief at [EIC@estlett.acs.org](mailto:EIC@estlett.acs.org).

- Cover letter
- Title: Titles should be clear and concise; they must match between manuscript file and electronic submission.
- Author list with affiliations: must match between electronic entry and manuscript file
- Abstract
- Keywords and Synopsis
- Manuscript File: Clean with no highlighting or comments and all changes accepted.
- (Highly encouraged) Have a colleague in another field read as test for accessibility.
- Tables/Schemes/Figures: Text should be clear and legible, with fonts no smaller than 8 pt.
- Figures: must be labeled sequentially and match numbered references in article (manuscript and Supporting Information). Where appropriate, label all subsections by letter.
- Supporting Information (if any) must be included in the electronic submission.
- Table of Contents Graphic ([TOC Graphic](#))
- References: no specific format is required, but it must be sufficient to aid referees in their reviewing duties

## Scope of the Journal

[Environmental Science & Technology Letters](#) (*ES&T Letters*) is a cutting-edge journal for the rapid disclosure of urgent and impactful research results where immediate availability is of importance to the environmental science, engineering, and health community. It publishes papers that describe significant scientific advances or novel technologies in the broad field of environmental science and technology. The journal invites brief communications (Letters) of experimental or theoretical results in all aspects of environmental science, both pure and applied. The journal also publishes Reviews, highlighting urgent, timely and new and emerging themes in environmental research that may not yet have an extensive literature base but are gathering momentum and warrant greater exposure with the identification of further research needs. Global Perspectives is a unique article type providing rapid exposure, insights, critiques, syntheses and recommendations on urgent, timely and new global strategic directions, topics and ambitions in environmental science and technology. Finally, Highlight is a new article type opportunity to publish a short opinion or news piece capturing information of pressing importance to the wider environmental science and technology community. For all article types, authors should provide enough background information to place their work in context and to justify the rapid publication format. The editors place strong emphasis on the urgency, originality, and quality of the work.

The scope of *ES&T Letters* is broad, covering all areas of environmental science and technology including characterization of natural and affected environments, environmental processes, fate, transport and transformation in natural and engineered systems, environmental measurement methods, environmental aspects of nanotechnology, novel remediation and control technology, biogeochemical cycling, ecotoxicology and human environmental health, sustainability and energy and the environment. *ES&T Letters* focuses particularly on the chemistry of processes in the

environment, including those affected by human activities. This includes biological and physical phenomena that are specifically relevant to the understanding and management of the environment. *ES&T Letters* also publishes papers that describe significant scientific advances or novel technologies for remediation, control, and pollution prevention. The journal appeals to a multidisciplinary and diverse audience of scientists, policy makers and the broad environmental community.

Prospective authors are encouraged to review [recent issues of \*ES&T Letters\*](#) to gain an understanding of the topics that are of greatest interest to the journal's readers, and they are expected to establish in their cover letters the relevance of their submissions to the community.

Note: Due to the volume of manuscripts received, *ES&T Letters* is unable to respond to pre-submission inquiries.

## Thematic Section Headings

Current *ES&T Letters* topical categories are as follows:

- Biogeochemical Cycling
- Bioremediation and Biotechnology
- Data Science
- Ecotoxicology and Public Health
- Energy and Climate
- Occurrence, Fate, and Transport of Aquatic and Terrestrial Contaminants
- Occurrence, Fate, and Behavior of Contaminants in Indoor Air and Atmosphere
- Physico-Chemical Treatment and Resource Recovery
- Sustainable Systems

These categories are periodically reviewed and may be changed.

## Manuscript Types

*ES&T Letters* accepts the following manuscript types: Letters, Reviews, Global Perspectives, Highlight, and Correspondence/Rebuttals. A full description of each manuscript type is shown below:

### Letters

The length of a Letter can be up to 3,000 word equivalents and this includes 200 words for each graphic element such as a table or figure. For example, a document with two figures and one table (for a total of 600 word equivalents) could have 2,400 written words in the manuscript and meet the 3,000 word equivalent requirement. The abstract, figure captions, TOC graphic, acknowledgments, and references are not included in the word count. Manuscripts should not contain large tables of data or more than a few plots or schematics in a single figure.

### ***ES&T Letters Expectations***

*ES&T Letters* strives to publish Letters reporting only original research of broad scientific significance and environmental importance that is expected to have a definable impact on the

advancement of environmental chemistry, science, technology, health, and policy. Originality is defined as new experimental data, new interpretations of existing data, or new theoretical analyses of environmental phenomena. Significance will be judged with respect to the breadth of impact of the reported findings. Manuscripts that report data of a routine nature will not be accepted. For example, studies that describe only the outcomes of standard laboratory tests, or field tests of limited scope, are not appropriate. Letters must state the relevance of the research to natural and/or engineered environmental systems and technologies, and papers that fail to demonstrate their environmental relevance will be rejected without external review. For example, it is not sufficient that the paper describe work on a compound that may occur in the environment if the study does not provide information that is clearly related to that compound's fate, transport, transformation, or effects in the environment. Manuscripts that emphasize analytical chemistry research must provide a meaningful yet concise argument that the method represents a significant advance in the environmental field. Manuscripts that do not include results from the application of the method either to real environmental samples or to samples that simulate environmental samples in a meaningful manner will be declined. Authors should show that a new analytical method has been thoroughly developed and its quality ensured.

Letters that describe advances in environmental technologies may include works on remediation and control processes and on new processes for sustainability. These manuscripts should include evaluations performed under environmentally realistic conditions. Letters that describe laboratory-scale studies should make meaningful and unbiased comparisons to existing approaches but should not make claims about the economics or relative advantages of the technology without pilot- or full-scale validation studies or properly validated models. Papers describing advances in treatment technologies for remediation of contaminated environments or control of emissions should go beyond kinetics and treatability studies by exploring the mechanisms of the technology or developing process models to describe the technique. Routine treatability studies will not be considered for publication. Papers in the area of ecotoxicology and human environmental health should provide novel information on effects of chemicals or lead to new insights into the mechanisms and processes underlying effects of chemicals and other stressors. *ES&T Letters* also encourages submission of studies that address challenges associated with the "Replacement, Reduction, and Refinement" of animal studies. At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their research work. Authors are also expected to provide an explanation in their cover letter why they believe the manuscript belongs in *ES&T Letters* and why their research will interest our readers with an emphasis on the novelty and environmental relevance of the contribution.

### ***ES&T Letters* Minimum Requirements**

- All studies must clearly articulate the environmental relevance of the study to the broad *ES&T Letters* community.
- Studies should provide novel insights into relevant environmental processes or mechanisms, i.e., studies that only describe the outcomes of standard laboratory or field tests or commercially available products are not appropriate for publication in *ES&T Letters*.
- An assessment of uncertainty or sensitivity analysis should be included in reported data where applicable, with adequate quality assurance/quality control reported. New analytical methods should be thoroughly developed and quality ensured.
- Manuscripts should include evaluations performed under environmentally realistic conditions and concentrations. Concentrations and treatment levels should be reported as measured and not nominal. Ensure that key variables are measured and reported if relevant (e.g., pH).
- Manuscripts on toxicity and ecotoxicity should include positive and negative controls and consider multiple concentrations relevant to environmental exposures and/or a time-course

study. Results should inform AOPs or mechanisms of action.

- The scope of the reported data in ambient monitoring studies must yield conclusions applicable to more than the particular site or time when the data were taken, i.e., findings should not be location specific representing a case study, but rather generalizable and/or transferable to other contexts.
- Studies on environmental contaminants should provide information that is clearly related to that compound's fate, transport, transformation and/or effects in the environment.
- Manuscripts on adsorption should consider kinetics as well as isotherms. First-principle models of mass transfer are preferred over purely empirical models.
- Manuscripts that emphasize chemical engineering, new catalysts synthesis or analytical chemistry must provide a concise argument that the research represents an advance that is of primary importance to the environmental field and include comparison to state-of-the-art approaches where appropriate.
- Manuscripts on novel materials (e.g., sorbents or catalysts) should demonstrate the materials have been tested under at least one environmental condition using relevant concentrations of target contaminant.
- Manuscripts on air quality and particulate matter should include adequate characterization of the particles relevant to the study.
- Articles describing advances in treatment technologies for remediation of contaminated environments or control of emissions should go beyond kinetics and treatability studies by exploring the mechanisms of the technology or develop process models to describe the technique.
- If a manuscript proposes a new application, a general energy analysis or life-cycle assessment should be provided and compared against conventional methods.
- Articles that describe laboratory-scale studies should make meaningful and unbiased comparisons to existing approaches but should not make claims about the economics or relative advantages of the technology without pilot- or full-scale validation studies or properly validated models.

Manuscripts that report on findings of a less urgent nature may be submitted to *Environmental Science & Technology (ES&T)* as a full research article.

Letters are reviewed initially by the Editor-in-Chief, then, if appropriate, by an assigned editor and then, if appropriate, by other scientists who assess the significance, originality, and validity of the work. The Editor-in-Chief and associate editors, listed in the *ES&T Letters* masthead, make final decisions about all research material published in *ES&T Letters*.

## Reviews

Reviews in *ES&T Letters* are unique as they are intended to highlight novel, emerging, forward-looking, pressing, often urgent and quickly developing areas of research, that are new and may not yet have an extensive literature base but are gathering momentum and warrant greater exposure and the consideration of forward research needs. Reviews should improve readers' knowledge through discriminating comparisons and insightful organization of the material. Criteria for acceptability include the current importance of the field under review, the thoroughness of the literature coverage, clarity, and clear identification of research needs. Comprehensive reviews of more established areas are not appropriate (a Review submission in *ES&T* may be appropriate in this case).

Authors are also expected to provide an explanation in their cover letter why they believe the manuscript belongs in *ES&T Letters* and why their research will interest our readers with an emphasis on why this emerging area is in need of review (novelty and emerging/developing nature of the research) and environmental relevance of the contribution.

A brief methods section should present the review strategy including the search terms used when searching the literature, the databases in which the search was conducted, studies identified by other search methods, and a clear logic for inclusion and exclusion of articles in the review. Enough information should be provided that the search could be replicated if needed, and inclusion of documentation of the review approach and results in the Supporting Information is encouraged. Authors are also encouraged to identify the type of review they are submitting using an established review article typology framework (i.e., scoping review, systematic review, critical review, etc.)

**Length Limit:** The length of a Review is expected to be a maximum of 7500-word equivalents, but up to 10,000 words may be allowed at discretion of the handling editor. Word counts include 200 words for each graphic element such as a concise table or figure. For example, three figures and two tables would count a total of 1000 words. The abstract, figure captions, TOC graphic, acknowledgments, and references are not included in the word count. Manuscripts should not contain large tables of data or more than a few plots or schematics in a single figure. Extensive tables should be placed in the Supporting Information.

At submission, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their work.

## Global Perspectives

Global Perspectives (length limit: 3,000 to 5,000 word-equivalents) will provide rapid exposure, insights, critiques, syntheses and recommendations on urgent, timely and new global strategic directions, topics and ambitions in environmental science and technology. Global perspective articles will highlight topics gathering global attention and funding. These will be in response to emerging environmental challenges such as chemical and biological impacts of environmental concern, global population expansion, demands for clean water, and food and energy demand increases alongside a context of global climate change. Global Perspectives are peer-reviewed and may be invited or contributed without invitation.

Please note: Potential authors of Global Perspectives must first submit a proposal and cover letter (via the *ES&T Letters* submission site in the ACS Paragon Plus Environment). The proposal, to be uploaded as a single manuscript file, should include the following details:

1. Proposed title
2. Author names and affiliations
3. Corresponding author's email address, profile on institutional website (if available), and Google Scholar, Web of Science, or Scopus profile
4. Abstract (length limit: 500 words)
5. Topical outline (length limit: three pages), indicating the headings of sections and subsections, a brief discussion of the proposed content of each section, and key references for each section
6. List of up to five of the authors' papers related to the Global Perspective topic
7. List of key previous articles on the subject in the past 5 years
8. Justification for the need for a Global Perspective on the topic targeting the broader readership of *ES&T Letters*

An assigned editor will issue a decision on the proposal and if approved, the authors will be invited to submit a full Global Perspective for further consideration. If the full Global Perspective is favorably received by the assigned editor, the manuscript will then undergo peer review.

At submission of the full Global Perspective article, authors must provide a short synopsis statement (approximately 20 words), placed after the abstract, stating the environmental relevance and significance of their Global Perspective. Authors are also expected to provide an explanation in their cover letter why they believe the manuscript belongs in *ES&T Letters* and why their research will interest our readers with an emphasis on the novelty and environmental relevance of the contribution. All Global Perspective manuscripts must include a Key Messages section at the end summarizing in bullet form the main highlights and arguments of the manuscript.

## Highlight

A Highlight manuscript (length limit: 800-1000 word-equivalents + author affiliations + 5 references + 1 single-frame figure with 50-word caption OR a 350-word table) is a short manuscript, written in the style of a short news piece or brief opinion in a newspaper or magazine. It enables authors to rapidly publish information of a scientific nature and of pressing importance that impacts the environmental science and technology community in real time. Highlight articles should express urgent information based on scientific research in an environmental discipline, that should not be political, personal, or summary in nature. Highlight articles should not include new scientific data. Highlight articles are not peer reviewed but are reviewed internally by at least 2 members of the *ES&T Letters* editorial team. Corresponding authors of accepted articles will be requested to provide a short biography (up to 200 words) and headshot for inclusion at the end of the published article. A TOC graphic is not required for this manuscript type.

## Correspondence/Rebuttal

Readers are encouraged to provide scholarly comment on papers appearing in the research section (Letters, Reviews, Global Perspectives) via Correspondence/Rebuttal (length limit: 1,000 word-equivalents each including citations) manuscripts. Correspondence should be submitted within twelve months of the publication date of the original paper, with some flexibility in exceptional circumstances, and must raise substantive scientific or technical questions. Correspondence that consists mainly of opinion will not be considered. The author(s) of the original paper will be given an opportunity to prepare a response within one month of receiving the Correspondence. Correspondence on previously published Correspondence will not be considered, and personal invective will not be tolerated. Correspondence/Rebuttal may undergo peer review at the determination of the assigned editor. The correspondence and the rebuttal will be published consecutively in the same issue.

## ACS Researcher Resources

While this document will provide basic information on how to prepare and submit the manuscript as well as other critical information about publishing, we also encourage authors to visit [ACS Researcher Resources](#) for additional information on everything that is needed to prepare (and review) manuscripts for ACS journals and partner journals, such as

- [Mastering the Art of Scientific Publication](#), which shares editor tips about a variety of topics including making your paper scientifically effective, preparing excellent graphics, and writing

cover letters.

- Resources on [how to prepare and submit a manuscript](#) to ACS Paragon Plus, ACS Publications' manuscript submission and peer review environment, including details on selecting the applicable [Journal Publishing Agreement](#).
- [Sharing your research](#) with the public through the ACS Publications open access program.
- [ACS Reviewer Lab](#), a free online course covering best practices for peer review and related ethical considerations.
- [ACS Author Lab](#), a free online course that empowers authors to prepare and submit strong manuscripts, avoiding errors that could lead to delays in the publication process.
- [ACS Inclusivity Style Guide](#), a guide that helps researchers communicate in ways that recognize and respect diversity in all its forms.

## Manuscript Preparation

### Submit with Fast Format

All ACS journals and partner journals have simplified their formatting requirements in favor of a streamlined and standardized format for an initial manuscript submission. Read more about the requirements and the benefits these serves authors and reviewers [here](#).

Manuscripts submitted for initial consideration must adhere to these standards:

- Submissions must be complete with clearly identified standard sections used to report original research, free of annotations or highlights, and include all numbered and labeled components.
- Figures, charts, tables, schemes, and equations should be embedded in the text at the point of relevance. Separate graphics can be supplied later at revision, if necessary.
- When required by a journal's structure or length limitations, manuscript templates should be used.
- References can be provided in any style, but they must be complete, including titles. For information about the required components of different reference types, please refer to the [ACS Style Quick Guide](#).
- Supporting Information must be submitted as a separate file(s).

### Document Templates and Format

The use of manuscript templates is not required for *ES&T Letters*.

General information on the preparation of manuscripts may also be found in the [ACS Guide to Scholarly Communication](#).

### Acceptable Software, File Designations, and TeX/LaTeX

See the list of [Acceptable Software](#) and appropriate [File Designations](#) to be sure your file types are compatible with ACS Paragon Plus. Information for manuscripts generated from [TeX/LaTeX](#) is also available.

### Cover Letter

A cover letter must accompany every manuscript submission. During the submission process, you may type it or paste it into the submission system, or you may attach it as a file.

The cover letter should include:

- manuscript title
- corresponding author's name
- corresponding author's mailing address
- corresponding author's phone number, fax number, and e-mail address
- comments on a) the manuscript's significance and b) the need for urgent publication
- list of related work submitted or published if relevant

Authors should note that a clear statement of the manuscript's goals and significance can be very helpful to the Editors during the prescreening process. Authors are also expected to provide an explanation in their cover letter why they believe the manuscript belongs in *ES&T Letters* and why their research will interest our readers with an emphasis on the novelty and environmental relevance of the contribution.

## Manuscript Text Components

Spell out all acronyms on first use in the abstract and in the body of the article. *ES&T Letters* does not allow footnotes, with the exception of an author information footnote on the title page and table detail/definition footnotes.

The various sections of the manuscript are described in detail below:

- Title and Authorship
- Abstract, Keywords, and Synopsis
- Introduction
- Materials and Methods
- Results and Discussion
- Abbreviations
- Acknowledgment
- References
- Formula and Equations

### Title

Use a brief, specific, and informative title reflecting the content and emphasis of the paper. Keywords in titles assist in effective literature retrieval. If trade names are used, give generic names in parentheses. Avoid abbreviations or acronyms and spell out in full.

### Authorship

List the full first name, middle initial(s), and last name of each author. Omit professional and official titles. An author's affiliation should be based on where they were when the work was performed. When the present address of an author is different, include the new information in a footnote. In a paper with more than one author, the name of the corresponding author, to whom post-publication inquiries should be addressed, carries an asterisk (\*). Provide an email address for the corresponding author.



Many Funders and Institutions require that institutional affiliations are identified for all authors listed in the work being submitted. ACS facilitates this requirement by collecting institution information during the manuscript submission process in ACS Paragon Plus (Step 3 in ACS Paragon Plus: Authors & Institutions).

Include as co-authors all those who have made a substantial contribution to the work. All authors must have participated in the preparation of the manuscript and must have agreed to the version of the manuscript, supporting information, and all revisions submitted. Addition or deletion of an author (s) after submission of the manuscript requires justification from the corresponding author and is subject to editorial approval. Deceased persons who meet the criteria for inclusion as coauthors should be included, with an Author Information note indicating the date of death.

## **Abstract, Keywords, and Synopsis**

### **Abstract**

All Letters, Reviews, and Global Perspectives must contain an abstract, not exceeding 200 words, which should state briefly the purpose of the research, methods or procedures, significant new results, and implications. Define any abbreviations or acronyms used in the abstract. Do not include reference numbers in the abstract.

### **Keywords**

Letters, Reviews, and Global Perspectives must be accompanied by 5–8 keywords. Authors are encouraged to include keywords that do not appear in the title. Indicate the keywords in the cover letter as well as in the manuscript file.

### **Synopsis**

Letters, Reviews, and Global Perspectives should include a synopsis. A synopsis is a brief and succinct statement (~20 words) of the environmental implications and impact of your research work to the environmental research community. The synopsis should be a complete sentence. The synopsis is NOT a description of the TOC graphic.

## **Introduction**

The introduction should clearly and concisely explain the motivation for the work, its importance and originality, where it fits in the development of the field and why it should be of interest to *ES&T Letters* readers. Discuss relationships of the study to previously published work, but do not reiterate or provide a complete literature survey. If a recent article has summarized work on the subject, cite that article only, and not the sources it cites. Current findings should not be included or summarized in this section. Introduction sections are typically around 500 words in length.

## **Materials and Methods**

In this section, describe pertinent and critical factors involved in the experimental work but avoid excessive description. In many cases, details not essential for understanding the paper can be placed in Supporting Information (SI). However, placing all the experimental methods, or critical

aspects of the methods, in the Supporting Information is not permitted. Specific experimental methods should be sufficiently detailed for others to repeat the experiments unequivocally. List and describe preparation of special reagents only. List devices of a specialized nature or instruments that may vary in performance or affect the quality of the data obtained (e.g., spectroscopic resolution), including the vendor. If the procedures are already published, provide citations to previous publications, and expand only on differences in the current work. Authors must emphasize any unexpected, new, and/or significant hazards or risks associated with the reported work and this safety information must be included in the Materials and Methods section.

## Results and Discussion

Here you can discuss your findings, postulate explanations for the data, elucidate models and compare your results with those of others. Be complete but concise. Avoid irrelevant comparisons or contrasts, any speculation unsupported by the data presented and verbose discussion.

Results and discussion may be combined or separated into separate sections. Do not include a Conclusions or Summary section. Include major conclusions in the body of the Results and Discussion sections.

## Abbreviations

Specialized abbreviations may be used provided they are placed in parentheses after the word(s) at first point of use. Do not include a separate Abbreviations list. Use SI units and consult the [ACS Guide to Scholarly Communication](#) for lists of SI units and preferred forms of commonly used abbreviations.

## Acknowledgment

Include only essential credits to acknowledge financial or professional assistance to the conduct of research. Sources of financial support must be acknowledged. Omit academic and social titles.

## References

All article types in *ES&T Letters* use the same reference style. Authors are encouraged to cite peer-reviewed works and books. Any references in publications that would be difficult for most reviewers to obtain or are unpublished should be uploaded into the *ES&T Letters* ACS Paragon Plus submission site as Information for 'Review Only'.

References should be numbered in order of appearance in the text, and the corresponding numbers placed at the appropriate locations in the text as superscripted numerals without parenthesis.

For work published online but not yet in an issue (ASAP) and work submitted for publication (e.g., submitted; in press), the digital object identifier (DOI) of the paper should be furnished in addition

to the standard bibliographic information. DOI is an accepted form of citation before and after the article appears in an issue. The title of a journal article should be in sentence format (first letter capitalized, with the remaining title in lower case).

In the Web edition of the Journal, references will be linked to various electronic sources (e.g., the corresponding abstract from Chemical Abstracts Service, full text from other American Chemical Society journals, etc.); therefore, the accuracy of the references is critical. Authors are responsible for the accuracy of the references.

## Formulae and Equations

Chemical formulas should be embedded in the text at the point of relevance and should correspond to the [ACS Guide to Scholarly Communication](#). Chemical equations should be balanced and numbered consecutively along with mathematical equations. Mathematical arguments should be as brief as possible.

## Supporting Information

This information is provided to the reviewers during the peer-review process (for Review Only) and is available to readers of the published work (for Publication). Supporting Information must be submitted at the same time as the manuscript. See the list of [Acceptable Software by File Designation](#) and confirm that your Supporting Information is [viewable](#).

If the manuscript is accompanied by any supporting information files for publication, these files will be made available free of charge to readers. A brief, nonsentence description of the actual contents of each file, including the file type extension, is required. This description should be labeled Supporting Information and should appear before the Acknowledgement and Reference sections. Examples of sufficient and insufficient descriptions are as follows:

Examples of sufficient descriptions: “Supporting Information: <sup>1</sup>H NMR spectra for all compounds (PDF)” or “Additional experimental details, materials, and methods, including photographs of experimental setup (DOC)”.

Examples of insufficient descriptions: “Supporting Information: Figures S1-S3” or “Additional figures as mentioned in the text”.

When including supporting information for review only, include copies of references that are unpublished or in-press. These files are available only to editors and reviewers.

## Research Data Policy

All ACS journals strongly encourage authors to make the research data underlying their articles publicly available at the time of publication.

*Research data* is defined as materials and information used in the experiments that enable the validation of the conclusions drawn in the article, including primary data produced by the authors for the study being reported, secondary data reused or analyzed by the authors for the study, and any other materials necessary to reproduce or replicate the results.

The [ACS Research Data Policy](#) provides additional information on Data Availability Statements, Data Citation, and Data Repositories.

## Data Requirements

### Nomenclature.

Use abbreviations and acronyms sparingly, and all usage should be defined at the first occurrence in the text. Whenever possible, use systematic nomenclature as recommended by IUPAC and IUBMB for chemical compounds and biomolecules, and SI units. The [ACS](#) and [IUPAC](#) websites have links to nomenclature recommendations. Usually, the chemical name or composition should be given in parentheses or in a reference at the first occurrence of such a name. Names of organisms should comply with genetic conventions, with genus and species names written in italics and spelled out in full on first appearance. Trademark names should be defined at the point of first use and registered trademark names should be capitalized whenever used. Registration marks are not required to ensure legal protection for the trademark. Trade and trivial names should not be capitalized.

### Data Presentation

Data should be presented in a way that makes interpretation clear to the reader. For more information on data presentation, see:

1. [Quantifying the Interactions between Biomolecules: Guidelines for Assay Design and Data Analysis](#)
2. [Beyond Bar and Line Graphs: Time for a New Data Presentation Paradigm](#)
3. [Reporting standards and availability of data, materials, code and protocols.](#)
4. MIQE guidelines for ddPCR and QPCR by [Bustin et. al. 2009](#) and [Hugget et. al. 2020](#); [EMMI guidelines by Borchardt et al. 2021](#)
5. [Best practice for 16S Microbiome studies](#)

### Biological Assays

Exposure protocols and methods must be referenced or described in sufficient detail to permit the experiments to be repeated by other investigators. This includes for example information on the preparation of the test materials, medium components, and duration of exposure. In addition, the applied dose or dose range should be given in a meaningful unit and the relevance of the applied dose should be substantiated. Doses and concentrations should be expressed as molar quantities (e.g., mol/kg, mM, etc.), particularly when comparisons of potencies are made on compounds having large differences in molecular weights. The routes of administration of test compounds and vehicles should be indicated. Benchmarks should be included in form of appropriate positive or negative control substances or reference materials. Especially for studies on nanomaterials, assays should be checked for interference induced by nanomaterials, e.g., optical or chemical interference, masking of the analyte or other interference mechanisms by inclusion of appropriate controls. Also, for studies on nanomaterials, sterilization procedures and specification of dilution steps as well as the order of addition should be provided, and as far as possible, various measuring units related to dose (e.g., surface area, mass, particle number per surface area, volume, cell number) should be given to increase comparability with other studies. Data may be presented as numerical expressions or in graphical form. Statistical limits (statistical significance)

for the biological data are usually required. If statistical limits cannot be provided, the number of determinations and some indication of the variability and reliability of the results should be given. References to statistical methods of calculation should be included.

## Use of Human Subjects or Animals in Research

For information about carrying out and reporting on Human and Animal Studies, please refer to the Biological Data section of the [ACS Research Data Guidelines](#).

## Database Deposition

Advancing scientific discoveries can be enhanced when data and materials are made available and readily exchanged. *ES&T Letters* requires for all published articles that authors make materials, data, and protocols available to readers through deposition in a public database. A statement must appear in the submitted manuscript confirming submission of the data and indicating the data bank and any pertinent accession codes/ID.

To identify the repository that meets your particular needs, you may find [FAIR Sharing Databases](#), [Registry of Research Data Repositories](#), and [Repository Finder](#) helpful. Authors may also want to further investigate unstructured and/or large data repositories, such as [Dryad Digital Repository](#), [figshare](#), [Open Science Framework](#), and [Zenodo](#), or institutional repositories for depositing data. If there is no appropriate repository available, general publicly available repositories should be used.

In addition, ACS Publications' figshare houses all Supporting Information within the HTML presentation of the paper and at [acs.figshare.com](https://acs.figshare.com). Authors also agree to make available to interested academic researchers for their own use any materials reported in the manuscript that are not otherwise obtainable. Any restrictions to the availability of materials or information must be stated at the time of submission. The [ACS Math Style Sheet](#) and [NMR Guidelines](#) are available on ACS Researcher Resources.

## Sequence Data

DNA and RNA sequence data can be submitted to suitable public repositories such as [GenBank](#), [European Nucleotide Archive \(ENA\)](#), the [DNA Data Bank of Japan \(DDBJ\)](#), [dbSNP](#), [dbVar](#), [Database of Genomic Variants archive \(DGVa\)](#), [MGnify](#), [miRBase](#), [NCBI Sequence Read Archive \(SRA\)](#), and [NCBI Trace Archives](#). Protein sequence data should be deposited with the [Protein Identification Recourse](#) at Georgetown University Medical Center, Washington, the [European Bioinformatics Institute \(EBI\)](#), the [Swiss Institute of Bioinformatics](#), or [UniProt](#).

## Omics Data

Manuscripts that present microarray data should follow the MIAME (Minimum Information About a Microarray Experiment) [guidelines](#). Data should be submitted to suitable public repositories such as [ArrayExpress](#), [Database of Interacting Proteins \(DIP\)](#), [dbGaP](#), [Genomic Expression Archive \(GEA\)](#), [Gene Expression Omnibus \(GEO\)](#), [IntAct Molecular Interaction Database](#), [Global Natural Products Social Molecular Networking \(GNPS\)](#), [MassIVE](#), [MetaboLights](#), [Proteomics](#)

[Identifications \(PRIDE\) Archive](#), and [ProteomeXchange](#).

For sequence data and microarray data, the relevant accession numbers should be available at the time that the revision is submitted and should be listed at the end of the Materials and Methods section in the revised version of the manuscript.

## Proteomics Data

Proteomic experiments must meet the standards established by the Journal of Proteome Research. More information is available in the [Publication Guidelines](#) for the Analysis and Documentation of Peptide and Protein Identifications. Protein sequences should be handled in the same way as described above, and accession number and database source should be included.

## Computer Codes

When computer codes are developed or used and are an essential part of a manuscript, sufficient detail must be given, either within the paper or in the SI. Types of languages that are used in the computer codes, compiler/interpreter, and operating system with a specific version must be provided or properly cited. Upon request, after appropriate material transfer agreements to restrict the use of the materials so as to protect the legitimate interests of the authors, codes and input data must be made available for others to validate the calculations. Regardless of whether the source code is open or closed source, it must be properly cited in the References.

## Computational Chemistry Calculations

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- TurboSquid (royalty free license)
- Cinema4D ([www.maxon.net](http://www.maxon.net))
- Pexels

- Pickit
- Freeimages.com
- Autodesk 3DS Max 2015 software
- Photoshop
- Inkscape
- Dreamstime.com
- ChemDraw
- PyMOL
- Microsoft ClipArt
- Wordclouds.com
- Piktochart
- 123RF.com
- Blender
- Mapchart
- Brusheezy
- openclipart.org (CC-BY - allows commercial use)
- Shutterstock (standard license)
- eLife Science (creative commons license)
- Megapixel (royalty free license)
- Protein Database
- Visual Molecular Dynamics (VMD)
- gettyimages.com
- Protter
- Shade 3D
- 3D Max
- QGIS software (uses GNU General Public licenses)
- "R" software (uses GNU General Public license)
- SVG Map v 1.5
- GIMP
- Avogadro Software
- 3D Sketchup Software
- Solidworks
- ArcGIS
- Affinity Designer (v 1.7, Serif Europe Ltd.)
- dreamgenerator.com
- XCrySDen
- National Gallery of Art/NGA Images. With the launch of NGA Images, the National Gallery of Art in Washington, DC implements an open access policy for digital images of works of art that the Gallery believes to be in the public domain. Images of these works are now available free of charge for any use, commercial or non-commercial. Users do not need to contact the Gallery for authorization to use these images as long as credit is given to the National Gallery of Art, Washington, DC. The images are available for download at the NGA Images website ([images.nga.gov](http://images.nga.gov)).