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**Scientific Publications and the Research Medical Library join forces, expand services**

The former Department of Scientific Publications has merged with MD Anderson’s Research Medical Library and is now known as “Scientific Publications, Research Medical Library.”

Scientific Publications will continue to provide the same services as before, including editing of grants and research articles, one-on-one consultations with authors, scientific writing classes and workshops, webinars on writing and publishing original research and grant proposals, and scientific English classes for nonnative speakers. The Research Medical Library will continue to offer information and educational resources to students, trainees, faculty, and staff at MD Anderson and to advise on publishing concerns such as identifying predatory publishers, finding published research, and writing a great abstract.

To further these efforts, the [scientifc editors, research librarians, and educators](#) from both groups offer continuous support for your research, from idea generation to communication of findings.

Visit [Scientific Publications, Research Medical Library](#) to learn more about the substantive editing and other services available to you, as well as descriptions of currently offered writing and publishing classes. Visit the [Research Medical Library](#) to discover the many research resources that the library offers, including classes and webinars, journals and ebooks, databases, and the opportunity to get one-on-one assistance from librarians by phone, email, or live chat.
Incorporating sex as a biological variable in NIH grant applications

– Amy Ninetto

In 1993, Congress mandated the inclusion of women in NIH-funded clinical trials. More recently, the NIH noticed that sex-based analyses remained rare in preclinical animal and cell studies. With evidence mounting that neglecting to consider sex in preclinical experiments contributes to the irreproducibility of published research, adds costs and time to the drug development process, and exacerbates disparities in health outcomes (1,2), the NIH issued Notice NOT-OD-15-102, which stated the expectation that, beginning in 2016, “sex as a biological variable (SABV) will be factored into research designs, analyses, and reporting in vertebrate animal and human studies.” This requirement was part of a wider effort by the NIH to ensure the scientific rigor, reproducibility, and transparency of funded research.

While NIH study section members report that most applicants are complying with this mandate, some applicants and reviewers misunderstand what is expected (3). Janine Austin Clayton of the NIH’s Office of Research on Women’s Health clarified that the SABV policy does not require researchers to look specifically for sex differences or to include sex-based hypotheses or specific aims. Instead, it requires researchers to consider sex among the biological variables incorporated into their study design, data analysis, and published reports—as a “data point” or an “element of an observation” (4,5).

Because researchers are not required to explicitly test for sex differences, studies need not be powered to detect statistically significant sex differences; thus, doubling the number of research animals (and thereby doubling the cost of the animals) is not necessary (5,6). However, studies should be designed so that it is possible to disaggregate study data by sex to see if this reveals any sex differences that were not apparent from the pooled data. If such differences are found, researchers may wish to propose follow-up studies that are powered to detect sex differences.

Clayton and others have suggested several other ways for researchers to incorporate SABV into their proposed projects. For instance, researchers can use the terms “sex,” “gender,” “male,” “female,” “sex factors,” or “sex characteristics” in literature searches (7,8); search epidemiological data for information on sex-skewed disease prevalence that may suggest differences in underlying biological processes; conduct preliminary studies to determine whether powering the study to detect sex differences is needed; and randomize and balance the sexes in treatment and control groups (5). Authors should also be sure to report the sex of animals used in their published reports.

Applicants for NIH funding should also account for the sex of animals or humans from which primary cells or tissues are taken. If patient-derived xenografts are used, the sex of both the patient from whom the xenograft was obtained and the animal host should be considered (9). In studies of established cell lines, the question of how to incorporate SABV is a bit trickier. The original sex of many commonly used cell lines is not known or, in the case of some chromosomally unstable immortalized cell lines, is difficult or impossible to discern (2,10). However, if the sex of a cell line can be reliably determined, it should be factored into the proposal’s research design and reported in the resulting publications.

If there is a strong scientific rationale for the use of only one sex (for example, studies of prostate or ovarian cancer), the SABV requirement can be waived. Applicants should clearly explain why such an exception is warranted in the Approach section of the proposal’s Research Strategy.
Resources


Gendered Innovations in Science, Health & Medicine, Engineering, and Environment: Training, case studies, and checklists for sex and gender analysis in science and engineering. genderedinnovations.stanford.edu


References


5. Clayton JA. Applying the new SABV (sex as a biological variable) policy to research and clinical care. Physiol Behav. 2018;187:2-5.


Hyperlinks in NIH grant applications

– Stephanie Deming

Providing hyperlinks in a document can be an elegant way to connect readers to helpful resources. We often use this technique in The Write Stuff. However, if you are preparing a grant application for the NIH, special rules regarding hyperlinks apply (1):

Hyperlinks may be provided only if they are requested in the relevant funding opportunity announcement or application guide. Typically, hyperlinks are provided only in the following sections (2):

- Bibliography & References Cited attachment.
- Progress Report Publication List attachment for renewal applications.
- Biosketch Section C: Contributions to Science. In this section, you may provide a hyperlink to a full list of your published work on a Federal Government website (e.g., My Bibliography).

Hyperlinks should not be provided in other sections of the application. There are three reasons for this. First, prohibiting hyperlinks in a page-limited section of an application, such as the Specific Aims section or the Research Strategy section, ensures that all applicants have the same amount of space in which to make their case for funding. Second, if a reviewer were to click on a hyperlink in an application, the reviewer’s anonymity could be compromised. Third, clicking on a hyperlink could expose the reviewer to a virus or malware.

When a hyperlink is allowed, the NIH asks that it be presented in the form of a URL (web page address), not in the form of a word or phrase pointing to a URL (2):

Incorrect: Complete List of Published Work in My Bibliography
[Here, clicking on the “Complete List” hyperlink takes the reader to the web page where the list appears.]

Correct: Complete List of Published Work in My Bibliography:
[Here, the hyperlink text is the URL for the web page where the list appears.]

References


Altmetrics: Looking beyond citation analysis to measure impact

— Don Norwood

People and institutions have traditionally used citation analysis—counting the citations of an article in other articles—as one measure of an article’s quality. However, citation analysis requires searching several databases to retrieve a comprehensive list of citations, a painstaking, time-consuming process that is not always fruitful. Furthermore, citation analysis is complicated by a lack of tools that can track down citations to a particular article.

Fortunately, authors are no longer limited to citation analysis to determine the impact of their published articles. They can now use altmetrics, which are measures of online encounters with published articles that supplement citation analysis results.

Types of altmetrics
Altmetrics consist of an array of measures and qualitative data that provide helpful information about how often journal articles are accessed and talked about worldwide. Altmetrics are used by more than just authors and individual researchers; institutions, libraries, and publishers are using altmetrics for a variety of reasons. As shown on the Research Medical Library’s LibAnswers website, altmetrics include but are not limited to:

- Peer reviews
- Wikipedia and public policy citations
- Research blog discussions
- Mainstream media coverage
- Reference manager bookmarks (e.g., in Mendeley)
- Social network posts

In particular, media, blog, and social network mentions indicate how many people have been exposed to an article. They can also tell an author how and why an article is disseminated and discussed among the general public and other researchers. Furthermore, public policy citations and comments from experts in relevant fields demonstrate that an article is having an effect on a field of research or even society as a whole.

Looking up altmetrics
Altmetrics data are available from various sources, including Altmetric, whose Altmetric Explorer Database is provided by the Research Medical Library for MD Anderson researchers looking for altmetrics data for an article. You can search the database according to:

- MD Anderson author name (currently for full-time faculty only)
- MD Anderson department
- Publisher
- Journal
- ORCID
- Title
- Keyword
Benefits and drawbacks of altmetrics

Because altmetric sources are online rather than in journals or books, altmetrics can be gathered much more quickly than citation analysis can be performed. Altmetrics also provide a greater variety of information on article usage than citation analysis does. Additionally, they can provide information on more types of research outputs than just published articles and books, such as data sets and presentations.

On the other hand, altmetrics are limited in that they complement, rather than replace, the information obtained via citation analysis. In addition, the newness of altmetrics means that more research is needed to determine their true impact and usefulness. Finally, authors can artificially enhance the altmetrics of their articles to make the altmetrics appear more favorable than they really are.

Using altmetrics

When using altmetrics, you must put them in context. Simply stating a metric about a published article is insufficient without the context to properly explain what that metric means. Also, use qualitative data along with altmetrics to make your case for an article’s impact. For instance, you might include the names of any high-impact journals and/or prominent media outlets and blogs that an article is mentioned in when reporting the number of mentions. Furthermore, remember that citations in other journal articles still represent the best measure of an article’s impact.

Resources


Guidelines for reporting your research methods to improve reproducibility and rigor

– Sarah Bronson

In recent years, increasing recognition of the need for reproducibility and rigor in scientific research has led to new guidelines for not only the design but also the reporting of research. Critical to the reporting of research in a reproducible manner is a comprehensive Methods section. To this end, over the past decade, guidelines for methods reporting have been developed by the National Centre for the Replacement, Refinement, and Reduction of Animals in Research (NC3Rs); by the reproducibility and rigor initiative from the National Institutes of Health (NIH); and by Cell Press.

ARRIVE guidelines for reporting animal research

In 2010, NC3Rs published the Animal Research: Reporting In Vivo Experiments (ARRIVE) guidelines to improve animal research–reporting standards, and the guidelines have since been
republished or endorsed by more than 1000 biomedical journals. The ARRIVE guidelines are presented in the form of a checklist, with a focus on the Methods section. The checklist indicates the necessary details of experimental design (e.g., definition of the experimental unit), procedures (e.g., drug formulation and dose, site and route of administration, and time of day), animal characteristics (e.g., species, strain, age, and weight), housing and husbandry (e.g., number of cage companions, temperature, and light/dark cycle), sample sizes (e.g., how the number of animals was arrived at and the number of independent replications of experiments), randomization or matching, primary and secondary outcomes, and statistical methods. In 2019, ARRIVE will be updated to designate 10 prioritized checklist items, explain the rationale for each item, and give examples from the literature.

**NIH rigor and reproducibility standards**

In 2014, the NIH put forward principles for improving rigor and reproducibility in preclinical research reporting. These guidelines encourage the use of community-based standards such as ARRIVE, and they require the reporting of specific experimental details (e.g., the number of times each experiment was performed and details about sample collection), statistical details (e.g., tests used; N values; and center, dispersion, and precision measures, such as mean, median, and standard deviation), randomization, blinding, sample size estimation, and inclusion and exclusion criteria for data or subjects (e.g., outcomes that were measured but not reported in the Results section). The guidelines also require that papers stipulate that datasets can be requested by editors, reviewers, and readers; recommend deposition of data in public repositories; and encourage machine-readable formatting of data. The NIH principles are endorsed by several prominent associations, journals, and societies in the biomedical sciences.

**STAR Methods**

In 2016, following the lead of the preceding guidelines, Cell Press introduced the Structured, Transparent, Accessible Reporting (STAR) Methods format, which has been adopted by several Cell Press journals, including *Cell, Cancer Cell, Cell Metabolism, Cell Stem Cell*, and *Molecular Cell*. More extensive than a checklist, the STAR Methods format is a detailed framework for organizing the Methods section to facilitate reporting as well as replication. The format both reinforces the ARRIVE checklist for animal research and expands on it to guide reporting of *in vitro* experiments and clinical research. For example, for human subjects, age, sex, and gender identity (if known) are required, and for cell lines and primary cultures, growth conditions, temperature, and sex are required. As with the other guidelines, the STAR Methods format includes details of procedures, experimental design, and statistical analysis. The format calls for particular detail in explaining how to access any newly generated materials, datasets, protocols, algorithms, sequences, or clinical trial registries. Unique to the STAR Methods is the Key Resources Table, with descriptive names of materials used, their sources, and their Research Resource Identifiers, which facilitate the accurate citation of resources such as antibodies, model organisms, and software. Although this format is not required upon submission, having these details on hand will make revisions go smoothly and improve the quality of the manuscript up front.

Overall, these guidelines highlight the necessity of making clear how, when, where, and why each experiment was done. Some common elements across these guidelines are both important and frequently unstated in publications—for example, how potential bias was minimized in allocating animals or patients into groups and how researchers assessed whether data met the assumptions of the statistical approaches used. Regardless of specific journal instructions, these guidelines can be useful resources for ensuring comprehensive reporting of your methods and thus raising the quality of your manuscript and of its scientific contribution.
Unusual terms used in scientific writing and publishing: Core Grant

– Bryan Tutt

The Cancer Center Support Grant, also known as the CCSG or the Core Grant, provides funding for shared resources (also called core facilities) that are available to all investigators at The University of Texas MD Anderson Cancer Center.

The core facilities funded by the Core Grant include the Biostatistics Resource Group, Clinical and Translational Research Center, High Resolution Electron Microscopy Facility, Tissue Biospecimen and Pathology Resource, and 20 other facilities. When demand for these resources is high, priority is given to investigators with peer-reviewed funding.

The Core Grant is funded by the US National Cancer Institute, and MD Anderson goes through a renewal process every 5 years. If you use a core facility in your research, or if your study is a pilot project supported by CCSG development funds, the “Funding” or “Acknowledgment” section of the manuscript reporting your research should include the Core Grant number (P30CA016672) and the core facility or facilities used.

Resources

For more information about the Core Grant, visit http://inside.mdanderson.org/departments/ccsg/ccsg-core-resources.html.

To learn more about the individual core facilities, including contact information, visit http://inside.mdanderson.org/departments/translational-research/ccsg-current-yr/shd-res-guide-190404.docx.

Editing services

Scientific Publications, Research Medical Library, is here to help MD Anderson faculty and trainees get published and get funded. We provide a wide range of editorial, educational, and publishing services, free of charge, to the MD Anderson community, including:

• editing grant proposals and research articles;
• teaching workshops and giving lectures on writing research articles and grant proposals;
• teaching scientific English for non-native speakers;
• providing writing advice and support.

For more information about our editing services and how to use them, please visit Our Editing Services.
Upcoming events for authors

Please see the Scientific Publications website for more information on our educational courses.

Short Courses in Scientific English for Non-Native Speakers of English. Courses last 7 weeks and meet twice a week for 1 or 1.5 hours each day. Classes are held early in the morning, during the lunch hour, or late in the afternoon. Classes are free of charge. Participants must speak English at the intermediate or higher level and be familiar with research and general biomedical terminology.

Dates are subject to change. Registration is required through the Research Medical Library’s LibCal system and will open in early November 2019.

Details: Mark Picus (mapicus@mdanderson.org), 713-792-7251, or John McCool (scipubseducation@mdanderson.org), 713-792-3174.

Session 1 – January 6 through February 20, 2020

Pronunciation 1, Pronunciation 2, Conversation 1, Conversation 2, Writing 2

Friday Conversation Group. The Friday Conversation Group provides an informal atmosphere for non-native speakers of English to practice their conversational abilities, learn more about American culture, and meet new friends. The class meets every Friday in the Mitchell Building (BSRB), room S3.8003, from 12:00 to 1:00 pm.

No registration is required. Details: Mark Picus (mapicus@mdanderson.org), 713-792-7251, or John McCool (scipubseducation@mdanderson.org), 713-792-3174.

Third Thursday Writing Retreat. The Research Medical Library sponsors afternoon writing retreats for faculty and trainees. These retreats, offered the third Thursday of every month from 12 to 4 pm in the Research Medical Library conference room (FCT21.6040), allow 4 hours of protected time for researchers to work on their grants and manuscripts. A scientific editor is present the entire time to answer questions, offer advice, and provide consultations on early drafts. (A separate room is available for lengthy consultations.) A librarian is also present to help with literature searches, reference formatting, EndNote issues, etc. Details: John McCool (scipubseducation@mdanderson.org), 713-792-3174.

November 21, 2019
December 19, 2019
January 16, 2020
Writing and Publishing Scientific Articles (WAPSA). WAPSA is a structured, practical, in-depth writing-education program for postdoctoral fellows and clinical trainees at MD Anderson taught by Scientific Publications, Research Medical Library. This 16-contact-hour course provides an excellent opportunity for advancing participants’ skills in writing and publishing research articles while developing their in-progress manuscripts under the guidance of scientific editors.

Locations and times to be announced. Registration is required through Scientific Publications, Research Medical Library. Details: John McCool (scipubseducation@mdanderson.org), 713-792-3174.

December 4 and 11, 2019
February 19 and 26, 2020

Writing Persuasive R01 Proposals. This grant-writing workshop for clinical and basic science research faculty at MD Anderson focuses on the content, organization, and structure of an R01 grant application. Taught by senior editors in Scientific Publications, Research Medical Library, this 1-day workshop includes lecture, discussion, and guided grant outlining and development.

Locations and times to be announced. Registration is required through Scientific Publications, Research Medical Library. Details: John McCool (scipubseducation@mdanderson.org), 713-792-3174.

January 22, 2020
March 5, 2020

Webinars Presented by Scientific Publications. Scientific Publications continues to host a series of webinars on various topics. Webinars previously presented and recorded by Scientific Publications are available here. Links to upcoming webinars will be posted as they become available on the Research Medical Library and Scientific Publications websites.

One webinar is currently scheduled:

Ten Types of Sentences Every Scientific Paper Should Have – December 12, 2019, 11:00 am – 11:30 am

In this webinar, Joe Munch, senior scientific editor in Scientific Publications, Research Medical Library, will talk about the 10 types of sentences that are essential to guiding readers through original research articles. To join the webinar, click here at the appointed time and log in as a guest.

Brown Bag Lecture: “Avoiding the Seven Deadly Sins of Grant Proposal Writing.” In this lecture, Joe Munch, senior scientific editor in Scientific Publications, Research Medical Library, will talk about the cardinal sins of grant proposal writing—and how to avoid them.

November 6, 2019, noon, ACB1.2345
**INTEREST Program.** The INTEREST program is a series of mock study sections that leverage the expertise of experienced MD Anderson faculty in writing fundable research proposals. It involves a rigorous review of extramural grant proposals to improve, critique, and offer experience in the grant review process, from the applicant’s and the reviewer’s points of view. For more information, contact INTEREST@mdanderson.org.

**Important upcoming dates:**

- **December 19, 2019** – Deadline to submit your INTEREST Intent Form and a copy of your grant abstract
- **December 30, 2019** – Full application submission deadline
- **January 14, 2020** – INTEREST Review Meeting

**Grant Writing Advice.** Scientific Publications, Research Medical Library, now offers grant writing suggestions ([Writing R01 Grant Proposals](#)) in the Writing Advice section of our website. This information, stemming from the Grant Writers’ Seminars and Workshops presented annually at MD Anderson and from the NIH’s SF424 (R&R) Application Guide, focuses on R01 grants but can be applied to other types of NIH grants as well.

**Writing the Specific Aims Section of a Grant Application.** In this video, Sunita Patterson, senior scientific editor, presents a summary of the National Institutes of Health’s grant review process and how it affects the grant proposal, an overview of the structure of an R01 grant proposal, and a model for writing the Specific Aims section. The [video](#) is available on the Scientific Publications intranet website.

**Writing Abstracts Online Tutorial.** [Writing Abstracts](#), an interactive, Web-based tutorial, covers the most important aspects of writing good abstracts. The lesson includes many examples and an optional self-assessment.

**Improve Your Chances for IRG Funding.** This [PDF presentation](#) by Walter Pagel, former Director of the Department of Scientific Publications, guides researchers through the process of applying for institutional research grants.

**Anatomy of a Research Article Video Presentation.** In this [video](#), Stephanie Deming, senior scientific editor, presents advice on writing the parts of a research article: Introduction, Methods, Results, Discussion, title, and abstract. The slides shown in the presentation and the [presentation handout](#) can be downloaded as well.
Classes, Workshops, and Webinars Presented by the Research Medical Library. More classes, workshops, and webinars will be posted on the Research Medical Library website once they have been finalized.

Classes and workshops are located in the Research Medical Library classroom in the Pickens Academic Tower (in either FCT21.6008 or FCT21.6040). Details: Laurissa Gann (lgann@mdanderson.org), 713-794-1111.

- **November 4, 2019**, 12:00 pm, Brown Bag, Choosing the Right Publisher, BSRB, S3.8003
- **November 14, 2019**, 10:00 am, class: PubMed for Advanced Searchers
- **November 19, 2019**, 10:00 am, class: EndNote: Basics
- **December 5, 2019**, 10:00 am, class: Library Essentials for Administrative Assistants
- **December 5-6, 2019**, workshop: Systematic Reviews & Meta-Analysis: Introductory Hands-on Workshop. Registration information can be found here.
  - December 5, 2019: 1:00 pm to 5:00 pm
  - December 6, 2019: 8:00 am to 5:00 pm

To register for a Research Medical Library webinar or class, please visit the library’s Education & Events Calendar.

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