

## Science: Ways of Doing Business

Collaborating with others, using the literature, and preparing grant proposals all are integral parts of doing science. Summarized below are four publications from 2005 that address these topics from perspectives related to writing or publishing. The first two look at the effect of scientific collaboration on citation rates, the third summarizes a National Research Council workshop on cost and accessibility of chemical journals, and the fourth provides a systematic approach to applying for biomedical research grants.

**Leimu R, Koricheva J. Does scientific collaboration increase the impact of ecological articles? *BioScience* 2005;55:438–43.**

Citation rates are used to judge journal impact and the scientific utility of individual articles. Leimu and Koricheva state that it is generally assumed that scientific collaboration enhances the value and quality of research studies and resulting articles. But they show that, at least for ecology research articles published in the general ecology journal *Oecologia*, this correlation does not necessarily hold true. The authors evaluated 837 research articles published over a 2-year period and found that scientific collaboration did not greatly affect citation rates. Most—85%—of the papers had multiple authors; however, European scientists collaborated with researchers from other countries more often than did their US counterparts (27% of European papers but only 10% of US papers had international authors). Interdisciplinary scientific involvement correlated with increased citation rates only when multiple institutions were involved. Interdisciplinary collaboration within an institution was associated with lower citation rates than collaboration within a single department. The authors conclude that research in ecology is highly collaborative but that this collaboration has a minor effect on citation rates.

**Beardsley TM. Safety in numbers? *BioScience* 2005;55:387.**

The editor-in-chief of *BioScience* com-

ments on the preceding article by Leimu and Koricheva, noting that the long-held assumptions about the benefits of multiple authorship may have been overoptimistic. The two findings he singles out are that of reduced citation rates with collaboration among colleagues of different departments within an institution and that of the absence of scientific impact of international collaboration. He cautions that the value of collaboration should not be discounted but says that multiple authorship may not always provide “genuine new insights”. Furthermore, individual authorship may produce a better product.

**Heindel ND, Masciangioli TM, von Schaper E, eds. Are chemical journals too expensive and inaccessible? a workshop summary to the Chemical Sciences Roundtable. Washington, DC: National Research Council; 2005.**

Costs of publishing and subscribing to journals, including those in chemistry and chemical engineering, have dramatically increased in recent years, leading some to question whether scientists have adequate access to information they need. In response to this concern, the National Research Council convened a workshop in October 2004 to address issues of cost of and access to chemical journals and the ramifications for academe, industry, and government. The summary of the workshop discusses factors affecting journal costs, possible ways of addressing these costs, and the role of open access. Repeatedly in this summary, it is asserted that chemists and chemical engineers have unique needs—they have special graphics needs to show such data as chemical structures and reactions; they are especially heavy users of the scientific literature; they depend heavily on long-standing literature to conduct their work; and the data they use to do their work are complex and costly. High costs of producing journals pose problems for publishers and subscribers. For publishers, the problem is two-pronged, consisting of publication and archiving costs. For universities, higher costs can translate

into canceled subscriptions, especially for smaller institutions. The report includes participants' discussions about reasons for high costs and possible remedies. An adequate solution, it was noted, requires a unified effort by all parties, including librarians, professional societies, university presidents and provosts, funding agencies, and scientists themselves. Ways of paying for journal publications other than the traditional subscription model were discussed. Access to journals generally was considered sufficient for chemists and chemical engineers in more affluent countries but not for those in the Third World. The costs of archiving journals and journal articles were also addressed at the workshop, as was open access. Some participants encouraged open access; however, Patrick Jackson, of Elsevier, said that his company spent \$40 million to archive its journals and could not participate in this movement, because it had to recoup this cost. Martin Blume, editor-in-chief of the American Physical Society, added that providing open access too quickly could affect revenues from journals and harm publishers. The workshop summary can be accessed and ordered at [www.nap.edu/catalog/11288.html](http://www.nap.edu/catalog/11288.html).

**Inouye SK, Fiellin DA. An evidence-based guide to writing grant proposals for clinical research. *Ann Intern Med* 2005;142:272-82.**

Clinical researchers are finding it difficult to obtain federal research funding, the authors of this paper observe. They note that in 2003 less than one-fourth of new research project applications (R01 applications) to the National Institutes of Health (NIH) received funding. To help researchers obtain funding, the authors offer an approach to writing grant proposals. The information in the article is based

on the authors' review of the NIH reviewers' sheets for 66 R01 applications from one NIH study section (group providing peer review of grant applications). Before discussing specifics of writing grant proposals, the article describes two main types of grants and lists funding sources for new investigators. Advice given by the authors includes the following:

- Review successful grant proposals that have been submitted by other applicants.
- Learn as much about potential reviewers as possible.
- Solicit advice from the grants administrator or program officer at the funding agency.
- State the importance of the proposed study—for example, whether it is an important addition to the existing data or represents a shift in the thinking about an issue—and its expected impact.
- Obtain biostatistical input early in the process.
- Follow the NIH rules for grant application.
- Write the proposal clearly and concisely.
- Use appendixes for supporting information only.

On the basis of their analysis of the NIH reviewers' sheets, the authors provide a checklist for each section of the grant proposal. They also provide appendixes that provide details about the NIH review process and offer sample sections of grant proposals.

RITA M WASHKO was a Science Editor intern when she prepared this article.