

# Making the Right Moves

## A Practical Guide to Scientific Management for Postdocs and New Faculty

Burroughs Wellcome Fund  
Howard Hughes Medical Institute



Second Edition

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This manual is also available online at <http://www.hhmi.org/labmanagement>.

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# Chapter 10

## GETTING PUBLISHED AND INCREASING YOUR VISIBILITY

Your scientific success hinges on your ability to produce a body of publications that your colleagues will notice and respect and that granting agencies and your tenure committee will accept as proof of your research accomplishments. You are also, to some extent, responsible for the publication success of your postdocs and graduate students. After several years of graduate school and postdoctoral research, you should be familiar with writing scientific papers and the peer-review process for scientific publishing. This chapter provides some tips on planning for publication and some tricks of the trade to help you get your work published. It also offers some pointers for increasing your visibility in the scientific community.

### A BRIEF OVERVIEW OF SCIENTIFIC PUBLISHING

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This section reviews some of the basics of the publishing process.

#### Types of Journals

Within the broad category of peer-reviewed journals, individual journals vary in the audience they try to reach and in the scope of coverage they provide. For example, some journals—typically the top-tier journals—focus on a broad scientific audience. Others are deliberately narrower in scope, publishing research within a scientific specialty. In addition, a hierarchy exists within the world of scientific publishing. Some journals are more prestigious than others are, a situation that is dictated in part by each journal's *impact factor*—a measure of how frequently papers published in that journal are cited in other papers (see box “A Word About Impact Factors,” page 176). The more prestigious the journal, the more competitive its publication process is.

#### Communication Formats

In scientific journals, primary research holds center stage, although significant space is often allocated to reviews and commentaries. Depending on how complete the study is, original research can be published in a variety of formats, including full-length articles, brief communications, technical comments, or even letters to the editor.

As a beginning investigator, you will need to concentrate on getting your research published as peer-reviewed, full-length articles. These are by far the priority of both tenure committees and the study sections of granting agencies. Technical comments and letters to the editor count for very little in most fields.

A well-written and useful review may be worth the investment of your time, particularly if you've been writing grants and have collected all the literature anyway; however, a review does not carry the weight of original research. Good reviews tend to get cited frequently by other scientists, which would increase your citation index (a measure of how many researchers cite your work); this sometimes makes a difference with tenure committees. However, reviews are extremely labor-intensive. To do them well, you need the breadth and depth of knowledge that generally come only with long experience and in knowing a lot of scientists working in a field who will share unpublished data with you. Writing a review that reveals your lack of expertise could be embarrassing, so be careful.

As your career progresses, you may want to consider other opportunities to express your views—in letters, comments, and discussions of scientific trends. Most readers peruse this “front matter,” and contributing to it gives you quick and wide visibility. In the top-tier journals, however, front matter tends to be commissioned by the editors.

## The Editors

Some journal editors are professional editors who trained as scientists but no longer work in a lab. Others are working scientists who have their own research programs but also serve for a period of time as editors. Journals such as *Cell*, *Science*, *Nature*, and *PLoS Biology* are staffed by professional editors. When talking to a professional editor about your work, be sure to take the time to highlight the general interest of your paper and explain the nuances of the science. An editor who is also a working scientist is more likely to already know these things.

## A Word About Impact Factors

One of several types of data published by Thompson Scientific, the impact factor, is a measure of how frequently the “average article” in a given journal has been cited in a particular year or other time period. The impact factor, which is updated annually, is calculated by dividing the number of current-year citations by the number of citable items published in that journal during the previous two years.

Although the impact factor is often used to provide a gross approximation of the prestige of a journal, many other factors can influence a journal's impact and ranking. For example, review articles are generally cited more frequently than research articles are, because the former often serve as surrogates for earlier literature, especially in journals that discourage extensive bibliographies. The inclusion of review articles in a journal will, therefore, increase its impact factor.

Other methods for measuring citations include Google Scholar and CrossRef. The United Kingdom Serials Group is promoting the “usage factor” (<http://www.uksg.org>) and Google has developed the “Y factor” (<http://www.soe.ucsc.edu/~okram/papers/journal-status.pdf>).

## PLANNING FOR PUBLICATION

**B**ecause publishing original research papers is critical to your career, this section focuses on submitting and publishing these types of papers.

### Knowing When to Publish Your Research

Your tenure committee will want to see that you have published at least one paper a year in a highly ranked journal in your field as a senior author. (Some departments and institutions may expect several papers per year; make sure you discuss these expectations with your mentor.) If you have one or more postdocs who want to pursue research careers, each of them is under similar pressure to publish. To obtain a faculty position, it is usually necessary that a candidate be first author on two or more papers, at least one of which is a high-impact paper.

Research projects have a natural point where it makes sense to publish (see box “Creating an Integrated Research and Publication Plan,” page 178). However, you may want to write up your results before you reach this point. If there is competition in your field and you wait to publish, you run the risk of being “scooped”; in this case, you would have to publish your research in a journal that is not as prestigious as the one you had initially envisioned. Also, if you wait to obtain complete results, you may not be able to publish the one paper a year required for tenure.

In deciding when to publish, you will have to balance several considerations, but try to resist the temptation to rush into print, if you have a choice. Remember, the quality of your publications is what matters most in the long run. A paper that is incomplete or carelessly put together is less likely to be accepted for publication and will be an inefficient use of your time. Even worse, incorrect results will damage your reputation.

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*Writing up an incomplete or flawed story is not time-effective, since writing a good or bad paper generally takes the same amount of time.*

—Tom Misteli, National Cancer Institute

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### Choosing a Journal

Because most papers today have several authors, the choice of where to publish often involves considerable negotiations. All authors typically want to publish in the most prestigious journal that is likely to accept their paper, but views on which journal is best will differ. Negotiations will also depend on who is involved. As the principal investigator, you will want to take into consideration the suggestions of students and postdocs in your lab; however, you will generally make the final decision. Decisions about where to publish may become more complex when two or more principal investigators have coauthored a paper that involves extensive inter-laboratory collaboration.

Here are some questions that can help guide your decision:

- ◆ Are my results sufficiently groundbreaking, and do they have enough general appeal, to be considered by one of the top-tier scientific journals? Do I have a larger story that makes my results really exciting?
- ◆ Even if my results are not earth-shattering, have I taken an interdisciplinary approach, making the findings interesting to scientists in several fields and therefore appropriate for a general journal?
- ◆ If my results are primarily of interest to my particular scientific specialty, which journals reach the members of that specialty? Within this group, which journal or journals have included articles on my particular subject area in the past couple of years?
- ◆ Would any journals be particularly interested in my subject because it fits into a theme they have been pursuing? Some journals, and some editors, pursue their own special interests over time.

The top-tier journals receive far more submissions than they can publish. For example, *Nature* rejects about 95 percent of the biomedical papers it receives. Be realistic about your chances. You will lose precious time by submitting your paper to the wrong journal.

It helps to ask trusted colleagues where they think your paper should appear. If they are frequent reviewers for several journals in your field, they will have a good idea of what the standards are for each journal.

## Creating an Integrated Research and Publication Plan

There is a balance to be struck between trying to produce a “dream paper,” which may never get done, and sending out a set of fragmentary observations. One way to find this balance is to integrate your plans for publication into your research plans. In her book *At the Helm: A Laboratory Navigator*, Kathy Barker suggests strategies for doing this. As you decide on the long-term goals of your research and on the series of experiments or calculations you want to undertake, Barker suggests that you envision these experiments or calculations as components of a published manuscript or series of manuscripts. Think graphically; imagine how each set of results will be displayed in a figure, graph, or table. Put your ideas in writing at the outset, sketching out the hypotheses you want to pursue, the methods you intend to use, and the results you hope to get. By integrating research planning, the development of displays of your data, and interpretive writing, you force yourself to focus your energy and you move your project forward. The questions you generate as you analyze and write up the results of each experiment should suggest additional clarifying experiments, which you should also express graphically. As you write, you will uncover gaps in information and shaky conclusions. Eventually, you should be able to decide that you have a set of results that warrants publication.

## Making Your Pitch

To make sure you write your paper for the right journal, you may want to submit an initial query to your target journal to gauge its interest in your work. Most journals have guidelines for submitting so-called presubmission inquiries; check journal Web sites for this information. If the journal does not provide guidelines, send an e-mail to one of the editors. (Try to find out the name of the editor who handles papers in your area.)

A presubmission inquiry usually includes the following:

- ◆ An abstract stating the purpose of the project, methods, and main findings and conclusions. This abstract can be slightly longer than the abstract of a typical research paper and may include citations of relevant journal literature. Make sure that the abstract is clear to nonspecialists and that they will be able to understand what the scientific advance is.
- ◆ A cover letter briefly describing what questions led you to your research project, what you did, why you think your findings or methodology is significant, how your findings advance the field, and why they are of special interest to that journal's readers. Limit the cover letter to no more than 500 words.

Presubmission inquiries are typically considered within a few days; when that time has elapsed, follow up with a telephone call or e-mail. If you contact an editor by phone, use the opportunity to make your pitch. Be sure to allude to the larger context of your research—the big picture that makes your particular effort meaningful.

You can expect a reply of either “we’re not interested” or “send the full manuscript.” A positive response to a presubmission inquiry is *not* a guarantee that the manuscript will be sent out for formal peer review. The editor will want to see the actual paper before making that decision.

## GETTING YOUR PAPER PUBLISHED

### Writing Your Paper

Once you have decided where you want to submit your manuscript, review the journal's editorial guidelines (available from the journal's Web site or directly from the editor) and follow them carefully.

The main consideration when writing a paper is to clearly describe your most important findings and their impact in your field. Don't let your manuscript look like a compilation of lab data; make sure the reader can understand how you have advanced the field of research. But don't overdo it—claiming that your work is more important than it really is earns little more than contempt from reviewers.

Assign the task of writing the first draft of the paper to the student or postdoc who will be first author. Encourage that person to prepare the figures, tables, and legends first, because a scientific paper is best written with the final form of the

data in front of the writer. Then work with the author to get the paper into shape. Although this may not be the most efficient way to write a paper, it is important for people in your lab to get experience and feedback on writing papers.

Once you have a good draft, send it to colleagues in your field and in your department for review. Have it proofread by someone in your lab with access to your data and the documents you have cited. The last thing you want to do is to appear careless; doing so will raise suspicions about the quality of all your work. It is also a good idea to give the paper to someone outside your field to see whether they understand its importance.

Three particularly difficult parts to write are the title, abstract, and cover letter.

**Title and abstract.** Create these two elements after the manuscript is complete. The title should summarize the take-home message of your paper. The abstract should briefly summarize the paper and should stand on its own. Describe the experimental question, the methods, the main results, and the conclusion. Unless the main point of the paper is a new technique, methods should be limited to a sentence or a few words. Keep in mind that the abstract will announce the existence of your work to people who may not have time to read your paper. If the abstract attracts their attention, they could be induced to read your article, rather than passing on to the next abstract. Also note that your title and abstract will be used as the basic tools for the retrieval of your paper from electronic and paper libraries.

**Cover letter.** The cover letter should explain why the paper is significant and why you think it is appropriate for the journal to which you are submitting it. The letter should cite a major question in your field and describe how your work helps answer it. You may want to cite other papers the journal has published in this field or provide other reasons why the journal's readership would find your work of interest. The letter of introduction is the place to mention whether there is competition in the field that could lead to your being "scooped," as well as to include a list of colleagues who have reviewed the paper and any information necessary to ensure a fair review process. Most journals will give you an opportunity to suggest people who are qualified to comment on your work and to exclude one or two particular individuals who may be competitors and should not be reading about your work before it is published. Be sure to take this opportunity.

Many books and articles that explain how to write scientific papers are available in print and online. (Some of these are listed under "Resources" at the end of this chapter.)

## Submitting Your Paper

Most major journals require that manuscripts are submitted electronically through the journal's Web site. Each journal has its own requirements, such as preferred file formats for text and figures and the procedures for uploading files. Consult the journal's Web site for specific instructions and be sure to follow them.



Regardless of whether they receive a paper manuscript or an electronic version, most journal editors will let you know that they have received your manuscript and how long you can expect the review process to be.

## Submitting Image Files

Today, most images are obtained digitally and programs like Adobe Photoshop make it very simple to modify their quality. But sometimes by adjusting an image you can make inappropriate changes to your data, which could be classified as scientific misconduct. Since 2002, the *Journal of Cell Biology* has been doing simple, routine checks of every image of all accepted manuscripts to look for signs of manipulation. This step has in some cases caused editors to withdraw the acceptance of a paper and in a few cases to notify relevant institutions. Other prominent journals may take similar steps.

Here is what the *Journal of Cell Biology* says constitutes inappropriate manipulation of images: “No specific feature within an image may be enhanced, obscured, moved, removed, or introduced. The grouping of images from different parts of the same gel, or from different gels, fields, or exposures must be made explicit by the arrangement of the figure (e.g., using dividing lines) and in the text of the figure legend. Adjustments of brightness, contrast, or color balance are acceptable if they are applied to the whole image and as long as they do not obscure or eliminate any information present in the original. Nonlinear adjustments (e.g., changes to gamma settings) must be disclosed in the figure legend.”

For more information, see Rossner, M., and K. M. Yamada “What’s in a Picture? The Temptation of Image Manipulation.” *J. Cell Biol.* 166:11–15, 2004.

## Navigating the Review Process

The reviewers of your paper will be chosen by the journal’s editor, who will take into account any names you have suggested, his or her own knowledge of the field, and a literature search.

**Receiving the reviewers’ comments.** A paper is rarely accepted after the first round of review. When you receive the editorial decision and the reviewers’ comments, you will have to decide how to proceed. Sometimes the editors will indicate they would like to publish your work, provided that you make a few minor revisions or do a few additional experiments. In other cases, the editors will say that the work is potentially interesting but too preliminary or that it has significant flaws that preclude its publication. Another possibility is that the reviewers will advise the editors not to publish the work even if it is revised, because it is either not sufficiently novel or it does not fit the scope of the journal. Most editors are happy to talk to you by telephone to help you assess whether you should revise and resubmit your paper or try another journal. In any event, it is important to remain unemotional during such conversations.

**Responding to reviews.** Do not react defensively. Focus instead on the substance of each editorial comment. Value good advice wherever you find it. Read the reviews carefully and communicate your responses in writing to the editor. It is a

good idea not to respond as soon as you hear from the editor. Let a couple of days go by. A hastily written and emotional response will hurt your chances for resubmission.

If the reviews include a request for additional information that will require a few more experiments, carry them out and send your response to the editor. You can make the process easier by repeating each comment, stating your response, and indicating explicitly where in your paper you are making a recommended change. If the main problem is that the manuscript does not convey the importance of the work, you may want to rewrite it and add more data. You might want to check with the editor first to make sure this is an appropriate course of action.

In the end, you will have to do a cost-benefit analysis. If you believe that satisfying all the reviewers' concerns would bog down your research program in unnecessary experiments, you may have no choice but to take your paper elsewhere.

### **If You Are Asked to Review a Paper**

As your relationships with journal editors develop, you may be asked to review manuscripts submitted by other scientists. Take the task seriously. Do the reviews thoroughly and promptly. If you don't have time or don't think you have the right expertise, let the editors know right away. They will not hold this against you. A late or weak review, however, could hurt your reputation with the editors. The benefits of serving as a reviewer are potentially great. Not only will you learn about others' research, you will improve your own critical skills and confirm your standing as a knowledgeable scientist in the eyes of the editors. Your own future papers will be taken more seriously if you do good reviews. You will be asked not to reveal the contents of any article reviewed and be reminded that you should not use your knowledge of the unpublished results to further your own research. Take this admonition seriously—it is essential that you respect the confidentiality of the review process. If you have a conflict of interest that precludes you from reviewing an article (e.g., you are directly competing with the author of the article you are reviewing or the author is one of your former postdocs), stop reading the paper and let the editors know immediately. They will not be pleased if they find out about a conflict of interest after you have reviewed the paper.

If you think a requested additional experiment is unreasonable, write a rebuttal letter explaining why the experiment cannot be done or why it will not help strengthen the conclusions of your paper. You may discuss your concerns with the editor, before working on a revised manuscript. For example, you should ask, "If I do revisions A and B, but instead of doing experiment C, I do D, will you still consider a revised manuscript?" Remember that you are the person best acquainted with the details of your work and the limitations of your research tools. If you think a referee's comments are completely off the mark, write a rebuttal letter explaining your concerns. If all three referees, or even two out of three, had serious misgivings, it may be difficult to convince the editor that the referees missed the point.

Regardless of how you proceed, keep your emotions in check. You should never demean the reviewers. The reality is that reviewers, especially those who manage their own laboratories, sometimes work under unrealistic time pressures. Occasionally, the reviewer selected may not have the expertise to judge a paper competently. Whatever the case, do not question a reviewer's expertise. If you think a reviewer missed an important point, politely tell your editor, who has the option of identifying additional reviewers for your paper if doing so seems warranted.

**Submitting your paper to another journal.** If you are advised that your paper isn't appropriate for the journal to which you have initially submitted it (e.g., it is not sufficiently novel or does not have the right focus), the best course is usually to select another journal. In some cases, you may not want to inform editors of the second journal that the manuscript was submitted elsewhere and rejected—it might prejudice the process. For example, if your paper was rejected by *Nature* and you resubmit it to *Science* (or vice versa), don't let the editors of the second journal know. These journals compete for the best papers and don't want to publish each other's rejections. If, however, your paper was reviewed by *Nature* or *Science* and the reviews were generally positive but the editor did not feel the paper had a sufficiently high impact value for a top-tier journal, you may be able to use the reviewers' comments as leverage for your next submission to a second-tier journal. Ask the first journal's editor to support the resubmission, and tell the second editor that your paper has already been reviewed. The second review process may be expedited.

Regardless of your course of action, never send a rejected manuscript without changes to a second journal. If, as is likely, the same reviewers receive it a second time, they will be annoyed to see that you have completely ignored their comments.

## INCREASING YOUR VISIBILITY

Your patience and persistence have paid off, and your article has been accepted by a good journal. Now you can use your newly minted publication as a tool in a legitimate effort at self-promotion. You want to become known to your scientific colleagues nationwide. Here are some things you can do:

- ◆ Announce the publication on your personal Web site and in e-mail correspondence with your friends. Consider making it available in PDF format.
- ◆ Give a workshop or a brown-bag presentation at your own institution on the research described in your article and your future research plans. Doing so is relatively easy and is good practice.
- ◆ Call your friends at universities around the country and offer to give a talk on your research at their institutions or at conferences they are organizing. However, don't invite yourself to a meeting by writing to the organizers if you do not know them. You might come across as arrogant and put people in the awkward position of having to turn you down.
- ◆ Once you have an invitation, take it seriously. Prepare and rehearse your talk.
- ◆ Consider going public. Contact your university public relations office for help in contacting the media. It is in the university's interest to have the good work of its scientists publicized.
- ◆ If your research was supported by an outside funder, let the appropriate staff at the funding organization know about the publication as soon as possible.

- ◆ If a reporter contacts you, make an effort to speak with him or her. Your university's public relations office can help you prepare for the interview. Keep in mind that many reporters are not scientists and you will need to give them sufficient background for them to understand the importance of your work. If possible, ask reporters to give you a copy of the story before it is published so that you can check for accuracy (note, however, that many reporters work on tight deadlines and will not be able to accommodate the request).

Getting your work published and promoting your publications are essential, interrelated tasks of scientific communication. So think “big picture” and “long term” when working on your publications, presentations, and other efforts to bring your work to the attention of others in your field.

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*I learned early on that if you want to be promoted, you need to get a national reputation. This means that you have to be invited to give talks at universities around the country and at national conferences. The people listening to you might be the ones recommending you for promotion, they might be sitting on an NIH study section when your grant comes up for review, or they might be potential collaborators. Or they might be graduate students who would consider coming to your lab as postdocs. So how do you get these invitations when you're just starting out? Well, you can't be shy. You have friends all over the country who are also young faculty and carrying out work that would be of interest to your department colleagues. Call them up and make a deal: "I'll invite you if you'll invite me."*

—Thomas Cech, HHMI

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## RESOURCES

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