Making the Right Moves

A Practical Guide to Scientific Management for Postdocs and New Faculty

Burroughs Wellcome Fund
Howard Hughes Medical Institute

Second Edition
Making the Right Moves

A Practical Guide to Scientific Management for Postdocs and New Faculty

Second Edition

Based on the BWF-HHMI Course in Scientific Management for the Beginning Academic Investigator

Burroughs Wellcome Fund
Research Triangle Park, North Carolina

Howard Hughes Medical Institute
Chevy Chase, Maryland
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Preface

T he Burroughs Wellcome Fund (BWF) and the Howard Hughes Medical Institute (HHMI) have similar missions—to advance medical science by funding scientific research and education. In July 2002, the two organizations entered into a unique collaboration to further advance these goals by offering a course in laboratory leadership and management at HHMI headquarters in Chevy Chase, Maryland.

The idea for the course grew out of feedback that BWF and HHMI staff had solicited over the years from talented young biomedical scientists who had received research training or career development grants from the organizations. These beginning investigators described the challenges they faced in having to fulfill their research, teaching, administrative, and clinical responsibilities while simultaneously being expected to obtain grant support, publish, hire staff, and keep their labs running smoothly—all without formal management training. Their comments suggested that the grantees might have avoided costly mistakes and made better progress if they had learned to be managers as well as researchers before establishing their own laboratories.

The course in scientific management, which focused on these competencies, received an exceptionally enthusiastic response. In the postcourse focus groups and surveys, participants said that a manual based on the course would be a valuable reference for them and for colleagues who could not attend the course. The resulting manual, *Making the Right Moves*, first published in 2004, was, like the course, a success. Since its publication, 15,000 copies of the book have been distributed to individual scientists and professional societies and many more copies have been downloaded as a PDF version available at [http://www.hhmi.org/labmanagement](http://www.hhmi.org/labmanagement). In June 2005, BWF and HHMI organized a second iteration of the course, which included new sessions, and revised the manual to reflect the new material. This second edition of the manual contains one new chapter, “Teaching and Course Design,” and substantially revised chapters, “Laboratory Leadership in Science” and “Project Management.” All other chapters were revised and updated with additional information presented at the 2005 course.

As a companion to this book, BWF and HHMI have also developed a how-to guide for organizing training programs focused on laboratory leadership and management. The guide is intended to encourage universities, professional societies, postdoctoral associations, and other organizations to develop these types of courses for their constituents. BWF and HHMI believe that training in scientific management should be made available to all researchers early in their careers.
Just like the first edition, the second edition of *Making the Right Moves* is intended for laboratory-based biomedical scientists just starting out—advanced postdoctoral fellows ready to enter the academic job market and new faculty members in research universities and medical schools. Much of the material, however, is also relevant to scientists pursuing nonacademic career paths. The manual is available on the Web as a PDF; a hard copy may be requested from HHMI. Academic organizations and institutions are free to distribute copies of the book, or sections of it, for educational purposes.

The purpose of the manual is to alert beginning scientists to the importance of the leadership and managerial aspects of their new (or soon-to-be-acquired) jobs and to give them practical information that will help them succeed as planners and managers of research programs. Not only will the researchers benefit, but the scientific enterprise will benefit as well.

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*President*  
Burroughs Wellcome Fund

**Thomas R. Cech, Ph.D.**  
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**Peter J. Bruns, Ph.D.**  
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This manual and the course on which it is largely based owe their existence to many people. Maryrose Franko (HHMI) and Martin Ionescu-Pioggia (formerly BWF) advocated for both projects, guided their development, and brought them to completion. Laura Bonetta, science writer and course coordinator, and Patricia Davenport (HHMI) were crucial to shaping the content of the manual and managing the editorial process. The following people organized the sessions of the course and reviewed the relevant chapters for the manual: Jim Austin (American Association for the Advancement of Science), Victoria McGovern (BWF), Rolly L. Simpson (BWF), Andrea L. Stith (HHMI), Nancy Sung (BWF), Ahn-Chi Le (HHMI), and Barbara Ziff (HHMI).

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Writers Joan Guberman, Judith Saks, Barbara Shapiro, and Marion Torchia synthesized information presented during the course and conducted additional research to draft chapters of the manual. Former HHMI librarian Cathy Harbert suggested and obtained additional resources for the writers and course organizers. HHMI’s Dean Trackman managed the production process; Cay Butler, Linda Harteker, and Kathleen Savory provided additional editorial support; and Mary E. Coe created the index. Adam Newton, Catherine Newton, and Tom Wood (Raw Sienna Digital) designed the manual.
You are now a fully trained biomedical research scientist. You have earned a Ph.D. or an M.D. or both and have spent several years as a postdoctoral fellow learning the ropes of your specialty. You have the credentials you need for a career as an academic researcher. But as you establish your own laboratory and build your research program, you are becoming aware that research skills are only part—albeit a critical part—of what you need to succeed.

In your first few years as a tenure-track faculty scientist, you will be asked to balance multiple new demands on top of your research, including teaching, administrative tasks, and perhaps clinical responsibilities. At the same time, you will be expected to hire staff and establish a laboratory, plan a coherent research program, obtain grant funding, and publish in the top journals. Meanwhile, your tenure clock will be ticking, placing you under enormous pressure to produce. You need special skills to meet all these expectations—a mixed bag of competencies that can be loosely characterized as “scientific management” skills. It is unlikely that you have received explicit instruction in any of these skills in graduate or medical school or during your postdoctoral studies. Like most beginning investigators, you probably were only able to learn a bit through trial and error or by watching your teachers and talking to your advisers, mentors, and fellow students.

“Why do we need something like a lab management course? Biomedical research today is a complex enterprise that spans multiple biological levels, requires a variety of equipment and staff, and demands success with limited funds. Each one of you is really an entrepreneur running your own new small business.”

—Enriqueta Bond, BWF
This manual provides an outline for filling this educational gap. The content of the first edition of this book, published in 2004, was based on the “Course in Scientific Management for the Beginning Academic Investigator,” held at Howard Hughes Medical Institute (HHMI) headquarters in July 2002. The course was developed and sponsored by the Burroughs Wellcome Fund (BWF) and HHMI for selected BWF and HHMI grantees. This revised version of the manual incorporates new information from the second BWF-HHMI course held at HHMI in June 2005. The chapters were developed from the course presentations and panel discussions, handouts from presenters, the question-and-answer sessions, feedback from course participants, and subsequent interviews with the presenters and other scientists. In addition, more information, particularly relevant to physician-scientists, was added to each chapter. Content was also drawn from many of the resources listed at the end of each chapter. Each chapter was reviewed by the session speaker(s), course developers, and other BWF and HHMI staff.

Although Making the Right Moves is directed to laboratory-based academic scientists, much of the material would also be of use to beginning investigators in government and industry labs. The first chapter, “Obtaining and Negotiating a Faculty Position,” offers tips on finding and negotiating terms for a faculty position and outlines the expectations of a faculty job. The next chapter, “Understanding University Structure and Planning for Tenure,” takes a look at the typical decision-making hierarchy of a research university and an academic health center, discusses your professional responsibilities outside the laboratory, introduces some of the academic offices with which you will interact and the resources available to support your research, and outlines the requirements for obtaining tenure.

Two chapters deal with people skills. “Laboratory Leadership in Science” summarizes the role of the head of the laboratory in leading, motivating, and managing members of a lab. “Mentoring and Being Mentored” explores what it means to be a mentor, particularly as a strategy for facilitating learning and training new scientists. It includes approaches to help you be an effective mentor and offers advice on how to obtain the mentoring you need.

“Staffing Your Laboratory” provides pointers on recruiting a team of people who will contribute to the success of your lab. It also discusses what to do if you have to let someone go. Several chapters offer information about time management, project management, and data management. “Getting Funded” and “Getting Published and Increasing Your Visibility” discuss these challenging tasks in the competitive environment of biomedical research. “Setting Up Collaborations” and “Understanding Technology Transfer” are particularly relevant at a time when research projects often involve scientists in different departments and different universities and when research findings are often shared with industry and government.

New to this version of the book is the chapter “Teaching and Course Design,” which offers tips on how to design a course, how to deliver lessons that engage students, and how to keep teaching responsibilities from engulfing your time.
Given time and space constraints, some topics, such as lab safety, scientific writing, public speaking, communicating science to the public, and science policy, were not covered in the BWF-HHMI courses or in this manual. This information is typically taught at most universities or is available from other sources (e.g., HHMI has published several videos on laboratory safety, available at no charge from HHMI’s online catalog at http://www.hhmi.org/catalog).

The manual is not meant to be a comprehensive reference text. It is designed to highlight key points about managing scientific research operations that are not readily available in print elsewhere. The manual is likewise not meant to be prescriptive. It is a collection of opinions, experiences, and tips from established scientists and professionals. A complementary publication, Training Scientists to Make the Right Moves: A Practical Guide to Developing Programs in Scientific Management, serves as a resource for organizations that are developing their own courses in scientific management.

You are encouraged to supplement the information in this book with resources from postdoctoral or professional associations and Web resources, as well as the books and articles mentioned in each chapter. You are also encouraged to discuss ideas in the book with colleagues, mentors, and advisers and to suggest that they organize similar courses at your own institution.