

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 2

UNDERSTANDING UNIVERSITY STRUCTURE AND PLANNING FOR TENURE

You have no doubt spent many years in academic institutions and are familiar with their overall structure. But now, as a tenure-track faculty member, you are entering into a new set of relationships with your professional colleagues. Perhaps for the first time, you will have to deal with many of the university's administrative offices to fulfill professional responsibilities apart from those associated with your laboratory research.

As a young faculty member you will need to

- ◆ Get to know people who will support your scholarly efforts, including the faculty affairs dean, the department chair, department and college business personnel, research infrastructure personnel, and more established faculty members who can serve as mentors.
- ◆ Understand faculty governance, including the faculty senate and university committees.
- ◆ Know about research infrastructure, including research support services, indirect costs, institutional review boards, and conflicts of interest.
- ◆ Find out what are the expectations for beginning, independent investigators with regard to teaching, advising, service, and scholarship.

This chapter provides you with a starting point for obtaining this type of knowledge. It begins with an overview of the “typical” structure of a research university and an academic health center, as well as the resources available to a beginning investigator. It also discusses the professional responsibilities of academic faculty outside the laboratory, including teaching and service and, in the case of physician-scientists, patient care. Finally, it will give you some insights into how decisions about tenure are made at a university and how you can prepare for this milestone.

ORGANIZATION OF A “TYPICAL” UNIVERSITY

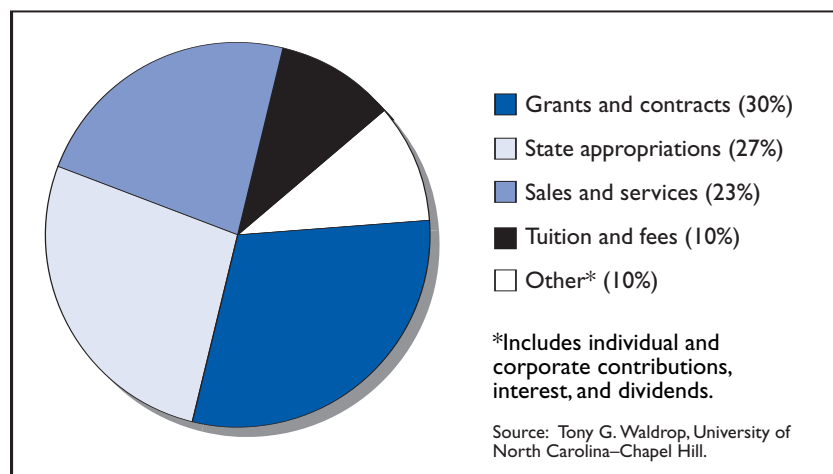
Although the major goal of U.S. universities is the advancement and dissemination of knowledge, universities also need funding to support their activities. A university must seek revenue from a variety of sources (see figure 2.1), and more and more, faculty members are encouraged to generate income. You will need to make your research program either self-supporting or demonstrably worth its cost in some other way.

Most U.S. research universities have roughly similar organizational and reporting structures. The titles of the executive officials may vary, but their functions are generally the same. The organization of a university’s administrative staff and its methods of operation reflect a strong tradition of faculty dominance.

University-Wide Responsibility

- ◆ *Board of trustees or board of regents:* The university’s highest authority, this governing board is composed of academic, business, and community leaders who hold appointed or elected positions with specific terms. The board meets regularly to review all major policy, financial, and management decisions, including decisions about faculty appointments, promotions, and tenure.
- ◆ *President or chancellor:* (Note: For this discussion, “president” is interchangeable with “chancellor.” In some state university systems, the president oversees and coordinates the activities of the member universities, and a chancellor heads each university within that system.) The university’s chief executive officer, this individual has general oversight of the university’s academic programs and financial health. He or she is also the university’s public spokesperson, dealing with “big-picture” issues such as relationships with the legislature and other funding bodies, alumni relations, and fund-raising.
- ◆ *Provost or vice president for academic affairs:* As the university’s chief academic officer, the provost has programmatic and budgetary oversight over all academic activities. The provost reviews the appointment papers of new faculty members and receives reports from the promotion and tenure committee.

Figure 2.1.
Annual
revenue
sources at
a typical
university



The deans of the various colleges report to the provost for academic-related matters. In some universities, vice presidents who are involved with academic affairs (e.g., research, student affairs) also report to the provost.

- ◆ *Vice president for administration and finance:* The university's chief financial officer, this individual is in charge of the fiscal affairs of the university and often also oversees diverse functions such as facilities planning and construction, human resources, and campus services (e.g., parking, public safety, maintenance, and mail service).
- ◆ *Vice president for research:* The university's chief research officer, this individual oversees grants and contracts, research funding, research centers and institutes, issues relating to technology transfer (patenting and licensing), and research-related committees such as Institutional Review Boards (IRBs) for human subjects research and institutional animal care and use committees. At some universities, the vice president for research also deals with scientific ethics issues.

Other vice presidents have responsibility for other areas that may affect the life of a faculty scientist directly or indirectly. These include the following:

Consult the Faculty Handbook

Your university's faculty handbook (often available online) is an invaluable resource for learning about the institution's organization and reporting structure, policies and procedures, and resources to support your research.

- ◆ *Vice president for information technology:* This individual oversees the university's computer facilities and telephone systems.
- ◆ *Vice president for health sciences:* This individual is responsible for the university's health-related institutions, including the medical center and the other health professions schools. (See "Organization of a 'Typical' Academic Health Center," page 28.)
- ◆ *Vice president for student affairs:* This individual oversees dormitories, recreational facilities, and other necessities of student life and is concerned with issues of student well-being.
- ◆ *Vice president for development:* This individual manages fund-raising, alumni networks, and university relations.

School- or College-Level Responsibility

- ◆ *Dean:* All department chairs report to the dean, who is responsible for the administration of a school or college. A university may have several schools or colleges. Each college may also have an associate or assistant dean or both. Not all deans are permanent appointments. For example, associate dean positions may be renewed annually and the individual typically runs an active research lab.

- ◆ *Department chair:* Each college is likely to have several departments, and in the sciences, separate scientific programs within each department. The dean typically appoints the department chair, with input from the tenured faculty, for a limited time period. Within that time frame, however, the department chair exercises considerable control over the allocation of resources within the department, including space, use of support staff, and purchases of equipment and supplies. The department chair makes teaching assignments and oversees the evaluation of faculty performance. The departmental promotion and tenure committee makes its recommendations to the department chair, who then presents the recommendation to the university-wide promotion and tenure committee.

As a principal investigator, you will primarily report to your department chair. If you have an appointment in more than one department, or in a department and in one of the university's separate research centers or institutes, you may have to report to more than one individual. Each department's interest in your efforts should be spelled out in your offer letter. Usually, the reporting relationship is a matter of "following the money"—where your salary comes from is where your reporting responsibilities lie. (See chapter 1, "Obtaining and Negotiating a Faculty Position.")

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When a junior faculty member directly or indirectly experiences discrimination or harassment, he or she needs to go to his or her chair and then to the dean. This is critical. Witnesses are not needed for the dean to have to address allegations.

—Linda Walling, University of California–Riverside

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ORGANIZATION OF A “TYPICAL” ACADEMIC HEALTH CENTER

An academic health center within a university is a complex set of institutions, typically a medical school and hospitals; outpatient centers; and, in many cases, schools of nursing, pharmacy, and other allied health professions. Because much of the teaching conducted under the auspices of the medical school actually takes place in the hospitals and clinics, these organizations should have agreements or understandings in place that allow the faculty to appropriately carry out activities, from teaching to research to the provision of clinical care.

Key academic health center officials include the following:

- ◆ *Vice president for health sciences:* This individual oversees the entire complex and reports to the president of the university.

- ◆ *Chief executive officer(s) of the hospital(s) and clinics:* These individuals are responsible for the day-to-day operations of the hospitals and clinics and report to the vice president for health sciences.

Administrative Structure of the School of Medicine

The administrative structure of a medical school parallels that of the university in many respects. However, one distinctive feature is that the school is composed of clinical and basic science departments.

Medical school officials include the following:

- ◆ *Dean:* The dean's functions are similar to those of the dean of any other university college; the only exception is that he or she may also serve as vice president for health sciences. On administrative matters (e.g., procurement), the dean of the medical school may report to the vice president for health sciences. On academic and faculty matters, the dean reports to the provost. The medical school often also has associate and assistant deans with specific areas of responsibility.
- ◆ *Department chairs:* As elsewhere in the university, the chair is the administrative head of the department.
- ◆ *Division chiefs:* Frequently, large clinical departments in a medical school are grouped into divisions. In such cases, a scientist may be a division chief who, in turn, reports to a department chair.

If your appointment is in a basic science department, you report to the department chair; if your appointment is in a large clinical department, you usually report to the division chief. It is not uncommon for an investigator to hold a primary appointment in a clinical department and a secondary appointment in a basic science department or vice versa. In this case, the investigator reports to the department in which the primary appointment resides.

PEOPLE YOU SHOULD GET TO KNOW

As a beginning investigator, you will want to quickly learn which individuals can affect your career progress. They include

- ◆ Department chairs and division chiefs
- ◆ Full professors within your own department or division
- ◆ Senior physicians (if you are a physician-scientist)

It's also a good idea to get acquainted with faculty in your own department and in other departments whose research interests are complementary to your own. You may find, for example,

- ◆ Colleagues with whom a research collaboration is possible
- ◆ Colleagues who will have a good understanding of any health and safety risks associated with your research, and who can advise you about the policies of the university and safe procedures for controlling research risks

You should also be sure to get to know your departmental business manager and the other administrators in your department or division. These individuals are generally very experienced in dealing with matters such as requesting maintenance, purchasing, tracking grant expenditures, and a host of other issues that you will not have time to deal with in detail. These individuals will also be valuable in preserving stability when inevitable changes such as the retirement of a chair or division chief take place.

FACULTY GOVERNING BODIES AND COMMITTEES

Faculty Senate

A representative body of faculty members, sometimes called the faculty senate, serves as the principal channel of communication between faculty and university administration. The faculty senate may elect a smaller executive committee to implement its actions. It can make policy recommendations to the university president and appoint faculty to serve on university committees as well as faculty senate committees. The senate weighs in on the appointment of academic officials and on performance reviews of these officials. It meets regularly during the year.

University Committees

The faculty accomplishes its work through an array of standing and ad hoc committees. The names of committees and their mandates vary among universities, but representative types of standing committees include the following:

- ◆ *Promotion and tenure:* Reviews recommendations for faculty promotion and tenure as well as policies and procedures in these areas.
- ◆ *Admissions:* Establishes admissions requirements.
- ◆ *Academic requirements:* Establishes grading systems and graduation requirements.
- ◆ *Awards:* Makes recommendations regarding faculty who should receive special awards from the university. Nominations for such awards can be critical to the development of a junior or senior faculty member's career.
- ◆ *Curricula:* Approves new curricula and reviews existing ones.
- ◆ *Information technology:* Makes recommendations regarding faculty computing needs and concerns.

- ◆ *Faculty and staff benefits*: Makes recommendations on health and life insurance, leave, and retirement.
- ◆ *Ethics*: Establishes guidelines for appropriate conduct of research. Reviews cases of unethical conduct by faculty.
- ◆ *Human subjects research*: Establishes policies for the ethical treatment of human research subjects and ensures compliance with federal regulations.
- ◆ *Long-range planning*: Develops a long-range plan for the university.
- ◆ *Research*: Establishes policies to promote research and distributes university research funds.
- ◆ *Radiation, biological, and chemical safety*: Establishes procedures to carry out institutional policies for complying with regulations governing the use of hazardous materials in research.
- ◆ *Use and care of animals*: Establishes policies for the humane treatment of animals used in research and ensures compliance with federal regulations.

The meeting schedules and workloads of these committees vary considerably. Generally, committees that have responsibility for case-by-case review of individual applications or projects are the most labor-intensive. However, the workload of a policy committee may suddenly expand when it finds itself dealing with a “hot” issue. (Further discussion of a principal investigator’s priorities with respect to committee work can be found in the section “Responsibilities Beyond the Laboratory,” page 35.)

Departmental committees can include standing committees (such as those responsible for departmental courses and curricula, admission of graduate students, and selection of residents and fellows) as well as committees created in response to a particular need (such as the recruitment of a new faculty member).

SUPPORT FACILITIES AND SERVICES

Universities provide considerable support to aid faculty in their research, teaching, and public service. Support includes traditional campuswide resources such as libraries and media centers, scientific or technical services commonly referred to as “core facilities,” and administrative offices established to help faculty complete grant applications and comply with regulatory requirements. As a scientist, you must know what centralized facilities exist to support you.

You are probably already familiar with the traditional campuswide resources and core facilities at your institution but may have never dealt with administrative support services. Listed below are several offices that may prove essential to you as you get your lab off the ground.

Regulatory Compliance Office

Regulatory compliance may be handled by the university-wide office of research or a similar office in your college or by several offices devoted to specific regulatory issues. Regulatory compliance officers keep track of the licenses and approvals you will need to comply with federal and state regulations for research. Visit them early to find out about the following:

- ◆ Requirements for radiation safety if you intend to use radioactive materials. You may need to attend a training session. You will need to obtain authorization of the Radiation Safety Committee to procure and possess radioactive materials.
- ◆ Requirements for the possession and use of bloodborne pathogens and other infectious materials and for recombinant DNA research. You may have to register your research with the Institutional Biological Safety Committee or have it approve your research.
- ◆ Licenses needed for the use of proprietary reagents and materials and approvals for stem cell research.
- ◆ Approvals for human subjects research. Your research protocols will need to be reviewed by an IRB. Because these boards typically meet monthly and the review process can be long, find out about the requirements early.
- ◆ Requirements for carrying out studies on animals. You will need to have any research protocols that involve animals reviewed and approved by the Institutional Animal Care and Use Committee.
- ◆ Requirements for using lasers and chemicals that have a high degree of acute toxicity and for disposing of hazardous chemical waste. Your institution will have specific protocols and practices to follow for using lasers and handling hazardous chemicals.

Environmental Health and Safety Office

Beginning investigators share a responsibility for laboratory safety. It is important that you participate in the health and safety program of your institution by being familiar with the health and safety guidelines that apply to your research. You should make sure the members of your research group know the hazards that may be present in your laboratory, are trained in safe work habits, and know how to deal with any emergency that may arise. Your institution's environmental health and safety office provides services that can help you with this responsibility. The office typically offers safety training programs, technical assistance, regulatory compliance assistance, risk assessments, and services to test the integrity of safety equipment.

Grants and Contracts Office

Staff of this office can tell you about available university financial support and help you apply for it, and they can provide information about outside funding opportunities. This office typically approves budgets prior to grant submission and, in some cases, controls the electronic submission of grants. In addition, this office can help you ensure that your grant application is in compliance with university policies and government regulatory requirements and that it has the necessary institutional

approvals and signatures. Remember to plan ahead; the grants and contracts office may require a few days to a couple of weeks to turn around your grant. Check with your institution's grants and contracts office to find out how soon they need to see your grant application.

Technology Transfer Office

The Bayh-Dole Act of 1980 gives universities the right to elect ownership of the inventions made in the course of federally funded research. Your university has responded to this incentive by establishing a technology transfer office to manage the patenting and licensing process. (See chapter 11, "Understanding Technology Transfer.") Visit the technology transfer office early in your career, keep the staff informed of your research, and let them help you determine whether any discoveries you make are worth licensing for commercial development. The office will also provide guidance on record keeping and documentation to protect your lab's intellectual property. (See chapter 8, "Data Management and Laboratory Notebooks.")

Procurement Office

This office manages purchasing for the university, and you may be required to use it to buy equipment and supplies. The office can negotiate group or bulk discounts. Its staff is familiar with the full range of vendors and products and can help you arrange custom purchases. Staff members are also knowledgeable about regulatory requirements related to the products they buy. They also keep track of payments and receipt of goods, thereby providing a valuable accounting function for your lab.

Human Resources Office

The human resources office can answer your questions about your own employee benefits and can help you in your role of supervisor. Before you hire your first technician or other support staff, visit this office to find out your university's rules and policies concerning employing and terminating staff, on-the-job discrimination, sexual harassment, and performance evaluation of staff. It is very important that you follow these rules and policies, because they involve matters of federal and state law. In addition, find out whether there is a union at your institution and whether any collective-bargaining agreements or union-related rules affect your interactions with university staff or students. (See chapter 4, "Staffing Your Laboratory.")

Public Relations Office

The public relations office keeps the world outside informed of the achievements of the university and its scholars. Its staff maintains contact with the news media and can help you prepare for an interview, translate your findings into "sound bites," and learn how to field questions comfortably.

Development Office

This office is an important administrative branch that faculty are becoming more involved in. It is responsible for coordinating and generating philanthropic support for development of the university by seeking money from individuals, including alumni, companies, trusts, and other organizations. Contacting your college or university's development office will allow special projects to be highlighted in fund-raising activities.

Sources of Information on Research Ethics and Human Subjects Research

Government Agency Web Sites

Office for Human Research Protections, Department of Health and Human Services (DHHS)

<http://www.hhs.gov/ohrp>

This office coordinates implementation of federal requirements for the protection of human research subjects and provides staff support to the secretary's Advisory Committee on Human Research Protections.

Office of Research Integrity, DHHS

<http://www.ori.dhhs.gov>

This office promotes integrity in biomedical and behavioral research supported by the U.S. Public Health Service. It monitors institutional investigations of research conduct and facilitates the responsible conduct of research through educational, preventive, and regulatory activities.

National Institutes of Health Stem Cell Research

<http://www.ninds.nih.gov/stemcells>

This site includes policies and requirements for research on human stem cells and guidance for investigators and IRBs.

U.S. Food and Drug Administration (FDA): Guidance for Institutional Review Boards and Clinical Investigators, 1998 Update

<http://www.fda.gov/oc/ohrt/irbs>

This site gives the FDA's current guidance on the protection of human subjects of research.

Private-Sector Web Sites

Association for the Accreditation of Human Research Protection Programs

<http://www.aahrpp.org>

This association sponsors an accreditation program for institutions that engage in human subjects research.

National Reference Center for Bioethics Literature

<http://bioethics.georgetown.edu>

The center provides a free reference service to the public, free bioethics database services, a Syllabus Exchange Clearinghouse for educators, annotated bibliographies, and other services to facilitate the study and teaching of bioethics. Staff at the center compile the *Bibliography of Bioethics*, an annual listing of 3,000 to 4,000 citations.

Public Responsibility in Medicine and Research

<http://www.primr.org>

This organization promotes the consistent application of ethical precepts in both medicine and research.

Responsible Conduct of Research

<http://rcr.ucsd.edu>

This site is sponsored by the University of California–San Diego and is funded by the National Institutes of Health Office of Research Integrity, the Department of Energy, and the DHHS Office for Human Research Protections. It includes educational materials for research ethics.

RESPONSIBILITIES BEYOND THE LABORATORY

Your roles as a faculty member form a triad of research, teaching, and service. As a scientist at a major university, you will focus principally on research. However, teaching and directing the research of students and postdocs will also be important and gratifying aspects of your activities. Your service responsibility to the university will occur mostly through service on committees. This, too, can be personally and professionally rewarding. If you are a physician, you may also serve the university through your patient-care activities.

Teaching

As a new faculty member, you may find juggling your teaching and research responsibilities to be a bit overwhelming at first. It's a good idea to remind yourself of the value of what you are doing—conveying knowledge and an appreciation of science to young people and possibly inspiring some of your students to pursue their own science careers. (See chapter 13, “Teaching and Course Design.”)

To have time to get your laboratory operations under way, you may wish to negotiate a lighter teaching load during your first year as a faculty member. Other circumstances may also make it necessary to reduce your teaching load, for example, if your department has given you a heavy responsibility in another area or if you have family or personal problems. Talk to your department head about the options that may be available to you.

No matter when your teaching duties begin, take the time to prepare for them. Work up your lectures, take any “how to teach” courses that are offered on campus, and, if you can, sit in on your colleagues' lectures.

Also bear in mind that teaching gives you an opportunity to meet students who in the long run may be interested in research in your laboratory. At many schools,

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At the same time I was building my research group, I was also teaching. It took about 10 years before I found real joy in teaching. But even in the very early years, I noticed that teaching was a tremendous stabilizing feature for my life—very unlike research, which can be discouraging. With research, there are times when you feel as though you've lost ground and you know less than you did the week before. Whereas teaching is much more steady—you put in a certain number of hours of work and something good comes of it. So, I think the combination of a teaching and a research career is a nice one in that teaching can fill out the dips that are the normal part of doing research.

—Thomas Cech, HHMI

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younger faculty members often vie with senior faculty for the opportunity to teach courses to “undeclared” graduate students. Learning how to teach effectively means that you may have more opportunities to interact with undergraduate or graduate students in your department and in others. (For a discussion of balancing teaching and research responsibilities, see chapter 6, “Time Management.”)

Committee Work

You will be expected to participate in one or more committees, and your contributions will be evaluated as a component of your service requirement for tenure. Although you should take this responsibility seriously, you also need to be judicious in your choice of assignments. Some committees—especially those that review individual research protocols or applications (e.g., IRBs for human subjects research or admissions committees)—are very labor-intensive. Others may deal with politically sensitive matters that may be difficult for a new professor. For example, you might not want to be on a curriculum committee if a controversial restructuring is under way and your department has a stake in the outcome. Such an assignment would be best left to a more senior colleague. Other committees may deal with matters irrelevant to your concerns as a scientist. So, before you accept a committee assignment, ask for a detailed description of what will be expected of you in terms of time commitment and the nature of the decisions to be made.

Many committees, however, do give you a decent return on your time investment. Serving on a faculty search committee may give you a voice in deciding who a new colleague will be. You might also want to be on a committee that puts together a

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At the assistant professor level, you are expected to be setting up your research program and keeping your head down. Being on a high-profile committee can bring you quick visibility, but it can also make you powerful enemies.

—Milton Datta, Emory University School of Medicine

Engagement in the university is critical, but excessive administrative responsibilities can be harmful to research and teaching quality. Most pretenure faculty are involved in department-based committees or committees involving interdisciplinary graduate student training. College-, university-, and systemwide committees are more time-consuming and should not be emphasized until later stages of their careers. Learn to know when to say no!

—Linda Walling, University of California–Riverside

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seminar program or scientific meeting. This will give you a chance to invite your former colleagues, leaders in your field, and new people with whom you may want to network. Work on an admissions committee for graduate students might be worthwhile because it will introduce you to graduate students who could work in your lab. However, work on committees responsible for the admission of medical students can be intensive and time-consuming, and the chances of significant future interactions with medical students (except M.D./Ph.D. students) are less.

A good strategy is to try to get on a committee where your expertise will be useful but where you will not be overburdened. Ask your department chair and mentors for advice on balancing committee work with your other obligations in the pre-tenure years.

Complying with Guidelines for Human Subjects Protection

If your research makes use of human subjects, you must meet the requirements of the IRB with respect to protection of patients' rights and well-being. Your research must be designed to be compatible with the IRB guidelines. In addition, you must obtain and document patient consent, comply with rules for protecting the privacy of patient information, and obtain the IRB's approval before you begin your research.

You may be required to maintain data on your research processes and outcomes for the IRB's inspection. All of this may slow your progress, but failure to comply can shut down your research program. Because obtaining IRB approval can take a long time, find out whether it is possible to apply before you begin your faculty appointment.

THE SCIENTIFIC INVESTIGATOR AND THE OUTSIDE WORLD

As a university-based scientist, you owe allegiance to several constituencies: to the university that supports you, to your profession, and to the general public that stands to benefit from your research. It is absolutely necessary, and possible, to keep these loyalties in harmony.

To keep your outside activities appropriate, you need to be aware of the university's rules and expectations with regard to

- ◆ Service in professional associations
- ◆ Conflict of interest and conflict of commitment, including limits on consulting activities
- ◆ Relationships with the news media and with government and political agencies

Consulting

As your career develops, you may find opportunities to consult with commercial entities such as biotechnology and pharmaceutical companies. Both you and your

home institution stand to benefit from relationships that extend your reputation, add to your knowledge and skills, and may result in practical applications of your discoveries. In addition, you may welcome the added income. Remember, however, that the university, as your employer, has primary claim on your labor and allegiance.

Many universities have developed explicit guidelines limiting the extent of a faculty member's work with other agents. It is critical that you know your institution's policies regarding your work outside the scope of university employment and your relationships with outside parties. Your institution should have a clear set of guidelines for these types of activities, and you may be required to report on them regularly. (Additional information on consulting can be found in chapter 11, "Understanding Technology Transfer.")

Public Service

An academic appointment carries with it a public service obligation. As your career progresses, you may be called on to participate on commissions or testify before government bodies on the meaning of your work or on its ethical or public policy implications.

Treat these invitations as a serious responsibility and, as you would with contacts with the press, stay close to the university public relations office. Remember, anything you say in public will reflect on your institution. It is easy to be misunderstood or quoted out of context.

You may also have opportunities to participate in public education—at science fairs, high school assemblies, or other community events. These opportunities can be both enjoyable and rewarding.

PLANNING FOR PROMOTION AND TENURE

You are more likely to succeed if you understand from the start how the decision regarding tenure and promotion is made at the institution you are joining. You can then start planning your strategy accordingly.

Criteria for Tenure

The official criteria for tenure form a "three-legged stool." You will be judged on your research, teaching, and service to the university, your profession, and the public. Whether or not these criteria have been spelled out in detail, the following expectations are typical.

Research. Your research must be of a quality and quantity that contribute substantially to your scientific discipline. Publication in peer-reviewed journals in your specialty and statements from individuals in your field who can testify to the quality of your research are the principal pieces of evidence showing that you meet this standard. Publications in scientific magazines that reach a wider audience give you additional credit. Substantial, ongoing research grant support is required; for

example, some institutions require that you have at least one NIH R01 grant. Additional evidence includes prizes and other recognitions of your work as well as invitations to present your work at conferences.

Teaching. You must have evidence that you are a competent teacher and that you fulfill your responsibilities to your students in a conscientious manner. Teaching is notoriously difficult to evaluate, but your department should have mechanisms to do so. Colleagues in your department may be assigned to supervise your teaching and offer guidance. Students' evaluations are another piece of evidence of your competence and rapport with your students. You may also be asked to report on your own teaching activities.

Service. You must demonstrate that you are willing to work for the betterment of the university, your profession, and the public at large. Service on departmental and other campus committees, on research ethics boards, on editorial boards of journals, and on grant study sections demonstrates your willingness to assume your share of responsibility. Invitations to serve on editorial boards and study sections also demonstrate scientific recognition outside of your institution. Work for professional associations and work as a consultant to government and industry also count as service.

The weight that will be given to each area by your tenure committee will depend on the mission of your institution and your department. In a premier research department or institution, research is primary, and it is the progress of your particular program that counts the most.

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You build a research group by being in the lab as much as possible. The assistant professors who don't get tenure are the ones who spend all of their time in the office instead of in the lab.

—Thomas Cech, HHMI

The legs on the three-legged tenure stool have different thicknesses, with the research leg being considerably more substantial than the teaching and service legs. The second two have to be there or the stool topples, but it's impractical to think they carry the same weight as the research component.

—Matthew Redinbo, University of North Carolina–Chapel Hill

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The Review Process

The review processes for promotion from assistant to associate professor and tenure are intertwined. Tenure review entails a series of yes-or-no decisions by committees established at the department, school, college, and campus or university levels. The decision of the university-wide committee must be ratified by the president or provost of the university and governing board of the institution.

Universities vary as to whether the tenure process is open or closed—that is, whether you and anyone else will have access to the file containing the evidence for tenure and the record of the committees' deliberations. Regardless, a candidate usually has an opportunity to appeal a negative decision.

The process unfolds *roughly* as follows:

- ◆ During your second or third year of employment, your department chair creates your promotion and tenure dossier (see below for details about what it should contain).
- ◆ Before the end of your third year, the tenured faculty within your department vote on whether to recommend your reappointment for another three years.
- ◆ After the vote, your department chair meets with you to discuss any problems that may hinder your future prospects.
- ◆ During your fifth and sixth years, letters are solicited from both internal and external experts in your area and comments are solicited from your current and former trainees. At some institutions this may include solicitation of outside letters inquiring about your progress.
- ◆ The tenured faculty in your department review the materials and vote on whether you should receive tenure.
- ◆ If the department votes in your favor, your tenure dossier goes forward to the college's or university's appointments and promotions committee. Your department chair goes before this committee to discuss your qualifications.
- ◆ If this committee's decision is favorable, the package is sent to a university-level ad hoc or standing committee. The package is then sent to the provost and university president (or chancellor) and then on to the governing board for final approval.

Your Tenure Dossier

You should have the opportunity to contribute to your dossier. It should include the following:

- ◆ Your personal and professional history—essentially an extended CV detailing your education; academic positions and other professional employment; honors, prizes, and achievements; invited lectures and conference presenta-

tions; offices in professional societies; editorships of journals and other learned publications; grants received; and service on study sections

- ◆ A list of your publications and other creative works
- ◆ A summary of your teaching activities, including courses you have taught, other contributions to the university’s instructional program, the results of students’ evaluations, and your own report of your teaching activities
- ◆ Details about the work and subsequent placement of graduate students supervised
- ◆ A description of your internal and external service to the university, your profession, and the public
- ◆ A statement of your research goals and accomplishments, expressed so that members of a campuswide tenure and promotion committee can appreciate the importance of your work
- ◆ Letters from outside reviewers, who should be leading experts in your field and aware of your work (you may be asked to suggest several of these scientists)

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Nothing is too trivial. If you were recognized in some way, make sure it appears in your dossier.

—Tony Waldrop, University of North Carolina—Chapel Hill

On the clinical side, it comes down to billable time—the clinical hours you work. The physician-scientist must find a department chair who’s supportive of his research and communicates this to others in the department and institution.

—Milton Datta, Emory University School of Medicine

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Time Frame for Progress Along the Tenure Track

The exact time frame for tenure and promotion has been established by your institution. In general, if you are appointed as an assistant professor, you can expect to be considered for advancement within about six years. Set specific, achievable objectives right at the outset of your career, with timelines that tell you what you need to accomplish each year. The whole process will seem more manageable, and you will be able to make realistic career decisions based on your progress.

Year 1. You should

- ◆ Set up your lab as soon as possible. Try to remodel your lab space, order equipment, and hire technicians before you arrive. If, after you arrive, you encounter problems, you may need to revise your tenure schedule.
- ◆ Learn your institution's ground rules for tenure.
- ◆ Ask for a faculty mentor if you are not automatically matched with one. You need someone who is effective in helping you wade through department politics and protocol. You may need an unofficial mentor if the official one disappoints you. In this case, be tactful.
- ◆ Get to work. If appropriate, write up your postdoctoral research and submit it to a journal.
- ◆ Accept committee responsibilities, but avoid becoming bogged down. Think carefully about the workload of any committee you are asked to join. You also need to consider the nature of the work. Some committees may be too politically sensitive to be of much use so early in your career. (See chapter 6, "Time Management.") In general, it is a good idea to ask your mentor before accepting to sit on any committee.
- ◆ Enter the "grantsmanship" game. You may want to start by applying for small grants (\$5,000 to \$25,000) from your own institution or from other sources to test the waters as you begin work on your major R01 grant submission.

Year 2. You should

- ◆ Try to publish the research you did in your first year.
- ◆ Apply to NIH or the National Science Foundation for a basic research grant. (See chapter 9, "Getting Funded.") Ask your mentor and other colleagues to review your proposal.

Question: What do I need to do every year to help me attain tenure?

Answer: Update your CV, network with professional colleagues, and keep in close touch with your department chair and your mentors to evaluate your progress. Keep a "living document" of your accomplishments, activities, honors, and so on, so that you won't forget relatively small things, such as a poster presented by a student, or a short-lived but important committee that you served on. Having such a document will make assembling your tenure dossier much easier. In addition to these ongoing tasks, review your objectives and update them if necessary.

- ◆ Teach with the tenure review process in mind. Have your chair, mentor, and other colleagues observe your teaching. Be sure your students fill out the evaluation forms at the end of each course. You may want to create your own simple essay-type evaluation form for your students as well as the trainees and other personnel who work in your lab. You want their feedback. (See chapter 13, "Teaching and Course Design.")

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I advise clinician-scientists who do basic science to develop a “clinical niche.” To the extent possible, they should focus on a clinical problem that has some relationship to their scientific work. For the purpose of tenure evaluation, this is advantageous because it helps others define you and to understand and describe what you do. For the purpose of time management, it takes you away from general medical care, which is extremely time-consuming. Having a stable of patients with a very narrow set of problems is a way of protecting research time. A generalist-type practice is death to a basic science research career.

—Ann Brown, Duke University School of Medicine

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Year 3. This is the year the tenured faculty will vote on your reappointment. You should have been meeting regularly with your department chair to discuss your progress, so you should have a tenure file that will support your reappointment.

- ◆ Ask your mentors if you are on track for tenure. If not, take stock and consider adjusting your career goals at this point. If you are not doing well in a tenure-track position, and if you are a physician and want to stay in academia, this may be the time to think about moving into a research or clinical track.
- ◆ Ask your department chair for a checklist of the information to be included in the file.
- ◆ If your R01 was not funded, resubmit it and have a plan for backup funding. (See chapter 9, “Getting Funded.”)

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The general rule of “publish a good paper, then get a grant,” is an appropriate goal for most beginning faculty. Use your start-up package to get those key results and then get them into the literature. It shows the funding agencies that your group is moving and being productive, which will enhance your chances to get those important first grants. Along the same lines, try not to submit premature grants; it is always better to wait a cycle or two if possible so that you can show stellar progress.

—Matthew Redinbo, University of North Carolina—Chapel Hill

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Years 4, 5, and 6. You should begin to be recognized in your field for your research. The invitations that come your way to participate on panels or to serve on review committees are indications of success. If these opportunities are not occurring, take steps to gain exposure, perhaps by suggesting a session on your subspecialty at a national meeting. (See chapter 10, “Getting Published and Increasing Your Visibility.”)

You need to address any issues that may hinder your bid for tenure. If you have not obtained funding, this should be your number one priority. Keep up your research, and continue your efforts to get the results into print.

Clearly, the road to a tenured faculty position is not an easy one. But if you think strategically—know what you want and need from your job, present yourself and your research to best advantage to obtain that job, and do what you should do each year to document your productivity—you will be well on your way to achieving your goal.

Designing and Equipping Your New Lab

You probably discussed your space and equipment needs during your interview and the negotiation process. Before you move into your new laboratory, create a detailed plan for how you intend to work within the space allotted to you. This will help you hit the ground running once you start your position. The following is a list of things you should do:

- ◆ Envision the relationships between the various workstations, preparation areas, and offices.
- ◆ Arrange for and help supervise any renovations.
- ◆ Order equipment and supervise its installation.
- ◆ Acquire any licenses required by regulatory agencies.
- ◆ You may need to attend training courses before you can order radioactive or hazardous materials or use animals in your lab; even the use of recombinant DNA needs to be approved.
- ◆ Put in place data management systems both for control of laboratory ordering and expenditures and for the documentation of your research.

A series of online articles, “The Art of Laboratory Feng Shui,” at *Science’s* ScienceCareers.org (<http://sciencecareers.sciencemag.org>), will take you through these decisions. Another resource is a series of videos on laboratory safety, produced by HHMI and available at no charge from the Institute’s online catalog (<http://www.hhmi.org/catalog>).

Special Issues for Physician-Scientists

Plotting Out a Career Trajectory

The career trajectory for tenure-track physician-scientists is different from that of Ph.D. scientists. The table below lists some of the goals you may try to achieve each year, none of which is “set in stone.” The purpose of the table is to provide discussion material for your negotiation with the department chair. For example, you could present the table to the chair during the negotiation period and ask how his or her expectations differ from those listed in the table and why.

	Years 1 and 2	Years 3 and 4	Years 5 and Beyond
Clinical Duties	<p>One month inpatient consult</p> <p>One-month outpatient clinic</p> <p>Protected time for research (70–80%)</p> <p>Guaranteed salary and start-up funds that include support for one trainee, one technician, and a half-time secretary</p> <p>Secure additional funds through internal university grants</p>	<p>One month inpatient consult</p> <p>Two outpatient clinics per month</p> <p>Protected time for research and salary support (50–70%)</p> <p>Ability to keep any unused start-up funds and retain one trainee, independent of current funding</p> <p>Apply for outside funding from nonprofit organizations and the U.S. government</p>	<p>Four to six weeks inpatient consult</p> <p>One to two “specialty” outpatient clinics per month</p> <p>Secure NIH funding (R01, K08, etc.)</p> <p>Two to three publications per year in good quality journals (top 25% of your field)</p>
Teaching	<p>Ten contract hours per year at medical and graduate schools in a variety of courses and teaching settings</p>	<p>Offer to organize a graduate school course (in addition to continuing the teaching efforts outlined in years 1 and 2)</p>	<p>Direct a medical school course (40 contract hours)</p> <p>Teach in a variety of other courses (5–15 contract hours)</p> <p>Attending duties (1 month per year)</p>
Community Service	<p>Network with individuals outside of your home institution</p>	<p>Review manuscripts</p> <p>Departmental and university committees</p> <p>Network with individuals outside your home institution</p>	<p>Review manuscripts</p> <p>Departmental and university committees</p> <p>Thesis committees</p> <p>Medical/scientific advisory boards for nonprofits</p> <p>NIH study sections</p> <p>Write book or review chapters</p>

Special Issues for Physician-Scientists

Straddling the Worlds of Research and Patient Care

As a physician-scientist, you can be active in defining your role by pointing out the value you bring to the department beyond billable hours, such as a scientific perspective on patient care and important training and mentorship opportunities for students and residents. In fact, the federal funding agencies consider physician-scientists to be crucial to the translational science involved in moving from the map of the human genome to strategies for diagnosis and treatment of disease.

You can increase your visibility and security by doing the following:

- ◆ Creating allies who will stand up and protect you. Cultivate a few people in your field who think you're terrific.
- ◆ Making yourself essential by providing an important clinical skill or filling a crucial clinical need. Other clinicians who know your worth can become your advocates and help protect your interests. Advocates need not be in your own department, but they should rely on you and your expertise.
- ◆ Getting the word out that you're doing something. Actively communicate progress on your research with people who matter in your department or division.

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