Fifty years of mentoring and advising

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Fifty years of mentoring and advising

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ABSTRACT Advancement of science depends on thoughtfully mentoring a rare group of scientists that are highly educated, creative, and motivated—and that come from every country in the world. On the basis of my own experiences, I suggest ways to recruit top young scientists of both genders, support their development into leading researchers, and advise them about careers inside and outside of academia. Creating a family-friendly environment within the laboratory and the institution is crucial to these efforts.

INTRODUCTION I am deeply honored to receive the American Society for Cell Biology’s Women in Cell Biology Sandra K. Masur Senior Leadership Award—especially during this, my 50th year of mentoring and advising trainees as a faculty member at MIT and the Whitehead Institute. Among the more than 200 undergraduate and PhD students, postdoctoral fellows, and sabbatical visitors I have mentored, two received the Nobel Prize, seven have been elected to the National Academy of Sciences or the National Academy of Medicine, and many are deans, holders of endowed chairs, or leaders of major research institutes. Others lead in the biotechnology field and in nonprofit scientific foundations. See Figure 1.

Importantly, one third of my mentees are female. Of these women, 23 had one or more young children (two had three) while in my laboratory, while others had children after they left. All have gone on to very successful careers, mostly in academia, where many have achieved leadership positions.

I hope that some of what I have learned about mentoring both women and men into successful leaders in science will help both principal investigators and their institutes to create a family-friendly culture that allows young scientists with families to succeed in scientific research careers and achieve leadership positions both inside and outside of academia.


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Thus I often instruct foreign trainees, both male and female, how to be more assertive and critical in front of professors at lab meetings, seminars, and conferences.

I was immensely flattered when four of my fellows asked me to officiate at their weddings, especially since all were born outside of the United States. Planning the ceremonies and getting to know these couples at a deep personal level was very rewarding—not to mention the amazing food at the wedding banquets. See Figure 2.

The 18 years I served on the Board of Trustees of Kenyon College, my alma mater, was also especially enriching. Sitting through many exhausting meetings on budgets, the physical plant, and administrative appointments, I learned first-hand of the complex compromises and tough decisions required to run a first-rate teaching institution. Extensive contacts with faculty made me aware of the challenges and rewards of teaching in a non-research-intensive institution.

Small liberal arts colleges like Kenyon produce a highly disproportionate share of leading American scientists, and I was pleased to be able to convince the Board to raise the money for a new science center, where every faculty member now has a personal, well-equipped laboratory to conduct state-of-the-art research with undergraduate students.

I have also become heavily invested in training physician scientists. More than 30 of my trainees had an MD or both MD and PhD degrees, and all have gone on to successful careers in academic medicine. Many have made important advances in understanding human diseases and in developing new therapies for them.

While some may hesitate to recruit researchers with families, because of the idea that they may devote less time to the lab, I have found that men and women who have children as graduate students or postdocs have excellent time management skills. Although caring for young families often means leaving the lab in time for daycare pickup, or staggering work hours with spouses when children are home sick, trainees with children in my group were easily as productive as my trainees who did not have children. Importantly, I neither wanted nor tried to micromanage their time. My belief was, and still is, that trainees who are fulfilled in their personal life will be most productive.

An important way of creating a family-friendly environment is to treat all lab members as adults, free to plan their own schedules. Aside from attending our weekly lab meeting, and being available to talk with me for an hour or so each week, I have never kept track of anyone’s face time in the laboratory.

HOW REWARDING EXPERIENCES OUTSIDE THE LAB HAVE INFORMED MY MENTORING AND ADVISING

One of the benefits of mentoring a diverse group of multitalented trainees is that one gets to appreciate many foreign cultures and educational systems, as well as the difficulties many have had during their childhood and education, especially during their adjustment to the “American” system. Often I am tasked with giving advice on issues far from research, such as helping couples balance two careers, helping recent immigrants adjust to the culture of the United States, and teaching fellows how to deal with talented but difficult colleagues. In many cultures young people are acutely deferential toward anyone in authority, and in general this does not foster healthy scientific debate.

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For the past dozen years I have been privileged to serve on the Board of Trustees of Boston Children’s Hospital, one of the nation’s premier pediatric research hospitals. As Chair of the Scientific Advisory Board of the Trustees of Boston Children’s Hospital, I have been able to help shape the future of pediatric research and care, and to ensure that the needs of children are at the forefront of all decision-making. See Figure 3.

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Board and currently Chair of the Board Research Committee I helped introduce a system of mentoring junior faculty, and I also helped break down traditional barriers that separated different medical disciplines. I learned how difficult it is to attract and retain top physician scientists to research careers, and to support them so they can spend more than 80% of their time on laboratory or clinical research. I have also helped the hospital increase its research support from local biopharmaceutical companies, as well as to take discoveries from their research laboratories into the commercial marketplace.

Beginning in the late 1970s I have been heavily involved in the biotechnology industry, helping found successful companies including Genzyme (purchased by Sanofi) and Millennium (now part of Takeda). Most recently I helped start Rubius, a company developing engineered red blood cells expressing foreign proteins to treat a variety of human diseases.

Working with my own start-up companies, and serving on the scientific boards of many others, large and small, has given me many insights into the business world that takes advances from academic laboratories and converts them into real drugs, medical devices, and diagnostics. Equally importantly, these and other consultancies have enabled me to advise students and fellows about charting satisfying careers outside of academia—including patent law, research and administration in companies, and science policy.

These “extracurricular” activities have greatly enriched my life. They also enabled me to be much more aware of the complex issues affecting our graduate students and research fellows, especially those pertaining to life-career balances during the long period of training now required to attain a principal investigator position in a university, college, or academic hospital, or to assume a research or administrative position in a company.

LOOKING AHEAD
My final comments are directed to students of both genders who are looking for a postdoctoral position. Ask the question of your potential mentors that I am almost never asked: “What happened to your last five (or 10) postdoctoral fellows; where are they now?” And make sure your mentor not only will provide you with excellent career opportunities both inside and outside of academia, but also respects and appreciates your personal and family life.

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