

Making Informed Career Decisions

Science is not what it was a decade ago—and neither are the career directions that scientists are taking. At the November 2001 meeting of predoctoral and physician postdoctoral fellows, HHMI convened a panel of speakers who have taken three very different career paths since receiving their Ph.D. degrees. The focus of the discussion was on flexibility and remaining open to all options.

Panelist Darrel P. Cohen, M.D., Ph.D., associate director, clinical research, oncology, Pharmacia Corporation, was one of HHMI's first predoctoral fellows. His transition from predoctoral laboratory research in an academic setting to clinical research with a pharmaceutical company was facilitated by the experience he gained each step of the way. After completion of a seven-year M.D./Ph.D. program, including laboratory research that focused on signal transduction (basic science research) in murine B lymphocytes, he spent the next six years in clinical training programs in internal medicine and hematology/oncology. As a fellow in hematology/oncology, he returned to laboratory research, applying experience gained during predoctoral research to conduct *in vitro* cytotoxicity analyses of novel camptothecin analogs (translational research) in chronic B-lymphocytic leukemia. During the past three years, Dr. Cohen has expanded his research interest to include clinical aspects, conducting phase I and II clinical trials of novel anticancer drugs and drug combinations in cancer patients. In his current position with Pharmacia, he is involved in all phases of cancer drug development, including interacting with laboratory scientists and clinical investigators worldwide.

Dr. Cohen explained that working for a biotechnology or pharmaceutical company should not be viewed as a second-rate alternative to the traditional career path of the academic or clinical researcher. Rather, it represents an extension of laboratory and medical science into the applied fields. Industry attracts highly qualified scientists who are more interested in working on projects with commercial application, including novel technologies and therapeutic agents. Instead of designing and conducting experiments or trials to unravel the complexity of biological systems, industry scientists focus on commercially viable development plans with clear timelines and decision points. This often requires



Darrel P. Cohen, Ellen Gadbois, and Kevin Davies spoke with HHMI fellows about careers outside the lab.

close collaboration with academic scientists and investigators. Ultimately, success is measured by the introduction of a new drug or technology into the marketplace that will improve the lives of others.

Like Dr. Cohen, Ellen Gadbois, Ph.D., was an HHMI predoctoral fellow. She received her doctorate in biology from the Massachusetts Institute of Technology, where her research focused on the regulation of gene expression in eukaryotic cells. Dr. Gadbois entered the field of science policy as an American Society for Microbiology Congressional Fellow with Sen. Edward Kennedy on the Senate Health, Education, Labor, and Pensions Committee. She wrote legislation on human cloning, genetic discrimination, the confidentiality of medical records, and other health issues. Following the fellowship, she was a senior policy analyst for government relations with the National Bioethics Advisory Commission. Currently, Dr. Gadbois is a senior policy analyst in the Office of Science Policy in the Office of the Assistant Secretary for Planning and Evaluation at the U.S. Department of Health and Human Services, where she focuses on the protection of human subjects and bioethics issues.

As a congressional fellow on Capitol Hill, Dr. Gadbois learned firsthand how science policy is made. Never knowing when a critical vote would occur, she also became acutely aware of the importance of being in the right place at the right time. She found that scientists have credibility on the Hill—they are seen as a group that cares more about knowledge than about a political agenda. The excitement for her is knowing that she is providing a service by bringing relevant science to those who influence science policy.

Dr. Gadbois admits that life on the Hill is unpredictable and does not often allow for regular working hours, especially when Congress is in session. The daily life of a policy scientist revolves around hearings and meetings. Those who do well in this field are those with a reputation of giving unbiased information.

Kevin Davies, Ph.D., asked the HHMI fellows to consider a career in science publishing, especially if they begin to feel that bench science is becoming

drudgery or if they find they are more interested in talking about science than in doing science. Dr. Davies is currently the editor in chief of *Bio-IT World*, a monthly magazine devoted to the integration of information technology and life sciences. He was a biology editor at *Nature*, the founding editor of *Nature Genetics*, and the editor in chief of Cell Press. He is also the author of *Cracking the Genome* (New York: The Free Press, 2001), an inside look at the race to

Career Resources

Industry

Several industry-partnered training grants and fellowship programs are available for young scientists to gain experience in an applied-science career. For information, contact the following:

- Center for Drug Development Science, Georgetown University: Fellowships for those with M.D., Ph.D., or Pharm.D. degrees (<http://cdds.georgetown.edu/programs/fellowship.html>)
- Rutgers University: Fellowships for those with a Pharm.D. degree (<http://pharmacy.rutgers.edu/fellows/>)
- PhRMA Foundation: Drug-discovery grants for Ph.D. candidates in the pharmacological sciences (<http://www.phrmafoundation.org/>)

Science Policy

There are many ways to get your feet wet in the area of science policy. The best way to get started is to develop a network of resources. Talk to your mentor or other people you know who are involved in an area that interests you. For fellowship opportunities, contact state associations, law firms, lobbying groups, or one of many scientific societies, including the following:

- Presidential Management Intern Program, NIH Policy Office: For those in their last year of a graduate program (<http://internships.info.nih.gov/main.htm>)
- Christine Mirzayan Science and Technology Policy Internship Program, The National Academies (<http://www7.nationalacademies.org/internship/index.html>)

- Science and Engineering Fellowship Program, American Association for the Advancement of Science: Specifically to work on public policy issues (<http://www.aaas.org/careers/fellowships>)
- Arthur Ashe Institute for Urban Health: For those with an interest in urban health issues (<http://www.arthurasheinstitute.org/programs.html#interns>)

Science Publishing

If you think you might be interested in a career in science publishing or science writing, you may want to check out one of the growing number of graduate programs in science writing (for example, Johns Hopkins University, University of California–Santa Cruz, and Boston University).

General advice, workshops, awards, and an opportunity to network can also be found through organizations such as the following:

- National Association of Science Writers (<http://www.nasw.org>)
- New England Science Writers (<http://www.nasw.org/users/nesw/home.html>)
- Northern California Science Writers Association (<http://www.ncswa.org>)

A Field Guide for Science Writers, edited by Deborah Blum and Mary Knudson (New York: Oxford University Press, 1997), offers a wealth of specific advice for those contemplating a career in this field.

complete the Human Genome Project. Dr. Davies obtained his Ph.D in genetics from the University of London and had postdoctoral fellowships at the Whitehead Institute and Harvard Medical School. He now sees his role as an ambassador of science, bringing the results of research to the public and to those in applied fields.

Science publishing encompasses a wide range of options, from editing and publishing scientific journals and books to writing for audiences such as health-care consumers and professionals. It includes peer-reviewed publications, abstracts, public-health materials, and continuing medical education materials. It also involves writing for medical advertising agencies and pharmaceutical companies, including product monographs and package inserts, clinical-study reports, and summaries of new drug applications.

Dr. Davies explained that science publishing is helping break down the boundaries between research, publishing, and administration. Publishers are looking for people who are broadly read and can effectively communicate science. Most successful applicants have one or two postdoc experiences, although some come straight out of a Ph.D. program. When he was filling positions at Cell Press, Dr. Davies looked for first-author papers and a short explanation of why the applicant wanted to make a career change to publishing.

Publishing can often lead to other career moves. Many people with a science publishing background are now in academic administration, journalism, or technology transfer.

These careers in science have other benefits as well. With computer and other electronic technology, much of the work can be done at home—or anywhere else for that matter. Many people find “applied” careers even more vibrant and meaningful than academic research.

Still, many students are anxious about moving into careers that have been considered “alternative.” Often their mentors do not have connections to these fields,

which means that students are left making cold calls and being resourceful themselves. The panelists urged their younger colleagues to be sure they aren’t choosing a career out of fear of other options or simply to avoid another career they don’t enjoy. However, the fellows were told not to worry too much about making a mistake. The National Institutes of Health now gives grants to those who want to reenter the world of research after exploring another career or even after raising a family.

From an employer’s perspective, your reason for choosing a certain type of position should be clear. A potential employer is likely to look for a passion in something other than the your field of study. Knowledge, skills, and abilities also should be clearly spelled out on your CV. The letter and CV should address the particulars of the job.

What can predocs and postdocs do to try a different career? Young scientists should seek out volunteer or training positions in which they can build experience and comfort in the environment they are considering. Sabbatical and postdoc periods allow young scientists the opportunity to work in different fields. They should also talk to their mentors and others to get the names of people in fields they are interested in exploring. These people can describe their jobs and lifestyles, the funding mechanisms, and the best way to enter the fields. In addition, the Federation of American Societies for Experimental Biology maintains a list of a wide range of job opportunities (<https://career.faseb.org/careerweb>). The important thing is to remain open to all the options—and to be flexible.

Maryrose Franko, Ph.D., senior program officer for HHMI’s Graduate Program, concluded that even those who stay in academic research need to be aware of these other players in the field because researchers may interact with the public, bioethicists, publishers, and even industry. It is more important than ever that bench scientists be involved in the discourse of science beyond the frames of the laboratory.