

A Lab with a View: American Postdocs Abroad

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As recently as the early 1970s, a postdoctoral research experience overseas was a valued part of training for a U.S. biologist aspiring to an academic position. Not only did the U.S. scientists benefit educationally from participating in different laboratory and cultural systems, but labs outside the United States were enriched by the ideas, perspectives, and skills brought by the visiting researchers. In the past 30 years, this migration of young U.S. scientists has notably declined while the United States now plays host to thousands of scientists, from all over the world, drawn to the energy and productivity of the large, U.S. research enterprise (Figure 1).

Although the United States gains from retaining its native talent and attracting ambitious foreign scientists, other nations suffer from the loss of their own and visiting scholars. A study of postdoctoral fellows in the Human Frontier Science Program (HFSP), which funds international collaborations in molecular biology, demonstrated that more than 60% of HFSP fellows, representing 47 countries, journeyed to the United States for research, whereas less than 7% of the fellows were Americans going abroad (Wiesel, 2000). The limited dispersal of young U.S. scientists is also reflected in data gathered about career plans of newly graduated PhDs. A recent survey (2000) showed that of approximately 10,000 U.S. citizens earning science PhDs, fewer than 300 chose to go abroad for further study after graduation. For specifically the biological sciences, this amounted to fewer than 100 U.S. citizens leaving for overseas (Hill, 2001). While globalization has made the world a smaller, more interconnected place, why are young, U.S. biologists reluctant to experience research in a foreign country?

When asked this question, most faculty members and graduate students seem to share a common perception that the tenure-track faculty job market is too competitive to risk doing a foreign postdoc. Additional barriers keeping U.S.-trained scientists at home include fear of language difficulties and expectations of poorly funded research environments abroad. Furthermore, many overwhelmed PhD students do not know how to begin searching for a postdoc position in the United States, much less in the entire world. Ironically, some of these barriers are rooted in a basic fear of disappearing from the mainstream of U.S. academics in a time when technology

makes staying connected across great distances simple. I recently navigated the process of choosing a postdoc position and personally encountered all these barriers during my planning, but I still decided to move abroad for this phase of study. Below, I describe how I made this choice and offer advice for how others may direct their postdoc decision process. In addition, I share what I have encountered in my experience, from language difficulties to teaching opportunities, during one year of living in Europe.

I should admit that my fantasies of living in a foreign country for my postdoc began early in graduate school. Images of setting up polymerase chain reactions beside the Mediterranean Sea or starting a restriction digest in the shadow of the Alps could revitalize me at the end of a frustrating day in lab. I cast aside these daydreams as I progressed through my thesis research and came to envision a more conventional future of joining the throngs of Boston-area postdocs. I rationalized this as a more practical choice for finding an academic job and for gaining teaching experience because I aspire to work at a liberal arts college or a small university. Then, during one fateful summer, these pragmatic plans were turned upside down.

Within a few weeks that summer, my husband, an environmental scientist, and I, a yeast cell biologist, both attended large academic meetings, and we both serendipitously encountered Swiss scientists interested in considering us for postdoc positions with their groups. Although our positions appeared by chance encounters at meetings, there are many more directed ways to go about finding a postdoc position abroad. Western Europe and Great Britain, as well as Singapore and other parts of Asia, all support academic research institutes with high-caliber molecular and cell biology labs. The directors of many outstanding labs are pleased to recruit an open-minded American. At any given time, multiple laboratories in these institutes are advertising open and often fully funded postdoc positions on their web sites. If funding is not available from a particular institute, Americans seeking to do research abroad qualify for a variety of fellowships. Of note, the U.S. NSF, the European Molecular Biology Organization (EMBO), and the HFSP offer International Research Fellowships, with a goal of balancing the exchange of scientists between countries (Table 1). These fellowships come with competitive salaries and money for traveling to meetings. Additionally, these grants fund a period of transition back to the native country

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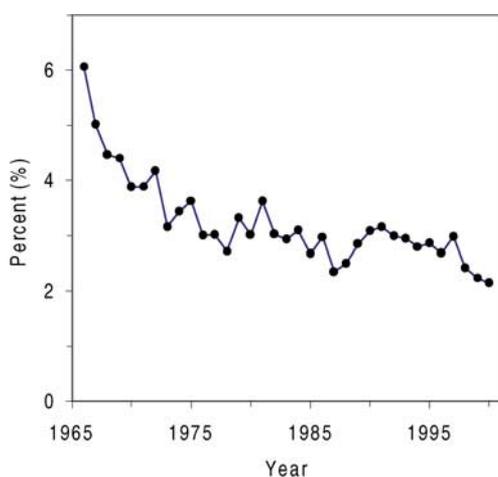


Figure 1. Percentage of biological sciences PhDs who are U.S. citizens who went abroad for postdoctoral study, from 1966–2000. Data were collected from National Science Foundation Science and Engineering Doctoral Reports accessible through the web site <http://caspar.nsf.gov>.

to ease career concerns of reintegration and to facilitate job searches. Furthermore, a variety of postdoctoral fellowships, including those from the U.S. government as well as private foundations can be used by a U.S. citizen working in an academic laboratory outside the United States (Table 1). Practicalities such as job and funding opportunities generally should not inhibit a young, U.S. biologist interested in doing research abroad.

Thus, logistical problems are not what keep Americans at home but rather a fear of leaving the familiar scientific mainstream when moving abroad for a position. A visit to a well-regarded and well-funded lab in a foreign country, however, can easily demonstrate that the “mainstream” flows beyond the borders of the United States. Six months after the initial encounters with our future Swiss advisors, we journeyed to Switzerland to interview, still skeptical that a European

postdoc was a reasonable career choice. I spent 4 days interviewing in the potential lab, rather than a single day as is customary in a domestic postdoc interview. This generous visit allowed me to present my own work, to talk to each lab member and each professor in the department individually, to observe lab scientific and social dynamics, and to attend lab meetings and departmental seminars. This stay convinced me that the lab environment was stimulating, that interesting and thoughtful science was going on in the lab and at the institute, and that the immediate lab group would be a comfortable and productive place for me. While visiting, I learned of other Americans who had completed successful postdocs in the same institute and were able to obtain faculty positions in the United States. I also had time to register a “gut impression” of what it would be like to live and work in that foreign environment. Thus, the interview was crucial for assuaging my concerns about embarking on a European postdoc. After our interviews, my husband and I took a hike in the Swiss Alps to contemplate the opportunity that lay before us and then decided to take the risk and move to Switzerland.

After we signed letters agreeing to our positions, anxieties suddenly appeared that were never part of the daydream that initially inspired this path. One of my worries revolved around language difficulties that we might encounter while living in Basel, Switzerland, where a special dialect of Swiss German is spoken. Another concern focused on whether I could find practical teaching experiences in the foreign educational system. Then I also began to fret about the combination of the two and was anxious that I would encounter language barriers in teaching. Thus, as we packed our house in preparation for the transatlantic move, many conflicting thoughts danced in my head. However, after a final meal at our favorite grad school burrito restaurant and with our Swiss working permits in hand, we boarded a plane for Basel, with stomachs twisting from apprehension and excitement.

Soon after arriving, I realized that many of these worries were a waste of mental energy. A helpful secretary from the University of Basel Biozentrum, the location of my new lab,

Table 1. Fellowships available for U.S. citizens working abroad

Organization	Web site address ^a
HFSP: Human Frontier Science Program	www.hfsp.org
NSF: National Science Foundation	www.nsf.gov/home/int/europe/opps_graduate.htm
ACS: American Cancer Society	www.cancer.org
LLS: Leukemia and Lymphoma Society	www.leukemia-lymphoma.org
EMBO: European Molecular Biology Organization long-term fellowships	www.embo.org
Pasteur Foundation (study at Institute Pasteur, Paris)	www.pasteurfoundation.org
Life Sciences Research Foundation	www.lsrif.org
Helen Hay Whitney Foundation	www.hhwf.org
Susan G. Komen Breast Cancer Foundation	www.komen.org/grants
Alexander von Humboldt Foundation (for study in Germany)	www.humboldt-foundation.de
Wellcome Trust International Programmes	www.wellcome.ac.uk
IARC: International Agency for Research on Cancer	www.iarc.fr
INSERM: French Institute of Health and Medical Research	www.inserm.fr

^aThe prefix <http://> should be used with each address.

guided us through all the logistics of our transition from registering us with the police for our “Aufenthaltsbewilligung” permit to finding a comfortable flat. The first weeks did involve some language experiences that challenged the basic German I had learned in an adult education crash course in the States. Elderly women on the bus would share stories in Swiss German about their grandchildren (or so I thought). I would smile and nod as they spoke but could not utter a response. In the Biozentrum, the storeroom catalog is in German, so simple tasks such as ordering “glass coverslips” were not straightforward but still possible with the help of a dictionary and coworkers.

Switzerland is an especially flexible place with regard to language because citizens learn many languages at a young age. Other countries have more nationalistic pride in their own language, or students may not learn English as well or as early as the Swiss. For a typical monolingual American, it is crucial to determine the language commonly used in a potential lab and institute and gauge how comfortable future colleagues are with conversing in English. Many European labs are multinational, and fortunately English serves as a common denominator for most lab banter, professional and social. As the lone non-native speaker in a more homogeneous lab, an individual should prepare for some social isolation and enroll in a language course to make an effort to integrate.

My new lab setting was remarkably comfortable, with the same centrifuges, chemicals, and restriction enzymes from all the same companies that I was accustomed to using in the United States. As a bonus, it also has a fantastic view of the Rhine River valley and the Black Forest. In some ways, such as the excellent microscopy equipment, the facilities in this group far surpassed those available in my previous situation in the United States. Although the reagents were familiar, a cultural difference became apparent the first week in lab when I was delighted to realize European “conversation culture” permeates the atmosphere of research here. It is refreshing how much time and patience colleagues will devote to talking about experiments and offering advice. I imagine that this discussion culture was also important to previous generations of U.S. scientists in Europe and is something missing in many of the highly focused and competitive labs in the United States. In these “coffee talks,” experiments are complained about, experimental dreams are tossed around, and collaborations are forged.

Another aspect of postdoctoral training that was of particular personal interest to me, is practical teaching experience. I envisioned gaining experience both mentoring students individually in the lab and participating in formal courses, but I was uncertain about how I could excel in either, given my language and cultural differences. I had little time to worry about these matters because a motivated undergraduate student joined the lab just as I began my position, and I eagerly agreed to be her advisor. She, like most of the Swiss I have encountered, is completely fluent in English; thus, language has never been a problem in our interactions. Furthermore, the process of asking questions and learning is nearly universal, so we have encountered few cultural barriers in our mentor–student relationship. Surprisingly, the challenges of my mentoring experiences stemmed primarily from a different approach to science education in Switzerland. As I discussed papers and experiments with my student, I realized

that her background was not as broad as that of most U.S.-trained biology undergraduates, but it was deep in very specific topics. Furthermore, at the bench, I was amazed at her well-practiced, technical skills. I came to realize that these traits were the result of the design of the undergraduate curriculum at the Biozentrum.

Advanced undergraduate classes here are called “block” courses, and each department in the Biozentrum organizes one 6-week course. In these courses, students are in the teaching labs all day and each day of the week, performing extended experiments planned by graduate students, postdocs, and faculty. For example, in the biochemistry course, students purify an enzyme, assay its activity, introduce point mutations, and observe the impact of mutations on catalytic activity. During incubations or pauses in the labs, the teachers give lectures and discuss experimental results. By necessity, these courses are built around the teachers’ expertise, which results in a more narrow focus than would be found in a survey lecture class. Nevertheless, the experiments are similar to “real” research in terms of their extended time frame and complexity. From these courses, the students gain technical skills and are well prepared for the transition to independent research. A further advantage of this curriculum is that grad students and postdocs gain valuable experience designing and teaching the course labs.

In addition to overseeing an individual thesis project, I participated in a block-style course for an international Swiss–French–German undergraduate program partially based in the Biozentrum. Students in this program study in all three countries, and the courses are taught in French, German, and English, with test questions translated into all three languages. Initially, the “Tower of Babel” atmosphere of the lab was a bit unnerving, but ultimately this mix of languages in the room challenged me to be more self-aware in my teaching. I considered how I phrased ideas, and I used fewer words and many more pictures to convey a point. I naturally waited longer for responses to questions so that students had time to translate as well as think of the answer. Adopting this slower pace with language differences in mind is a useful exercise regardless of the languages represented in a classroom. For the beginning student, science itself is a foreign language, and time has to be given for “translation” of words and concepts in the student’s mind. Thus, leading classes in the students’ nonnative tongue has been a fantastic teaching training exercise for me that I could experience only by teaching abroad.

Before leaving to go to Europe for my postdoc, I received conflicting advice from peers and faculty members, from “You’ll never get a job back in the States” to “I only wish I could have done that” After nearly a year here, I can say that it has been a tremendously broadening experience in which my own liberal arts education has continued through life and travel experiences. Professionally, I am acquiring essential skills for a future career in teaching and guiding research projects. I am still in the early stages of my position in Switzerland and have not yet begun to think about details of a future faculty job search, but anxiety about ultimately finding a faculty position still resides in the back of my mind. Given this concern, I make a point to regularly get in contact with mentors and peers in the United States so that I do not get “forgotten” on the other side of the ocean. I also make efforts to attend as many meetings as possible in the States, at least one or two a year, and to participate in professional organizations

such as the American Society for Cell Biology that keep me connected to the U.S. scientific community. If these efforts are not sufficient to combat the potential isolation of living in Europe, I am also prepared to undertake a second postdoc in the United States in order to transition into a faculty position. Even given this uncertainty, I would never trade this rich life experience for a more traditional, domestic postdoc position.

The rewards and enrichment gained from an international postdoc are often overlooked in the competitive U.S. scientific arena. For certain students, the stimulation of living and working in a foreign city are the perfect catalyst for a rewarding postdoc, and opportunities to work in renowned institutes should not be discounted simply because they are not on U.S. soil. I have learned several key points from this experience that may be useful to others contemplating a foreign postdoc position: Attend academic meetings regularly and use the time not just to learn about science but also to meet the worldwide community of colleagues. Choose a foreign country in which you will feel safe, where science is well funded, and where you are curious to learn about the culture. Most critical is to keep an open mind about cultural differences that will affect how labs are run and organized, how projects progress, how data are discussed, and how students are

educated. Finally, be prepared for a stimulating and life-changing experience.

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