

POSTDOCS: STRIVING FOR SUCCESS IN A TOUGH ECONOMY

One thing that's on everyone's mind these days—scientists included—is the dire economic situation. But despite tighter budgets, the attributes contributing to a successful postdoc experience, such as communication and mentoring, have not changed, according to the postdoc supervisors who completed this year's annual survey for *Science Careers*. Yet supervisors say it's all the more important for postdocs to carefully plan their career moves ahead of time and make sure that they get all the training they need during their postdoc years. **By Laura Bonetta**

Since *Science Careers* started conducting annual surveys seven years ago, alternating between polling postdocs and postdoc advisors, the attributes that survey respondents select as being most important to a successful postdoc have not varied much.

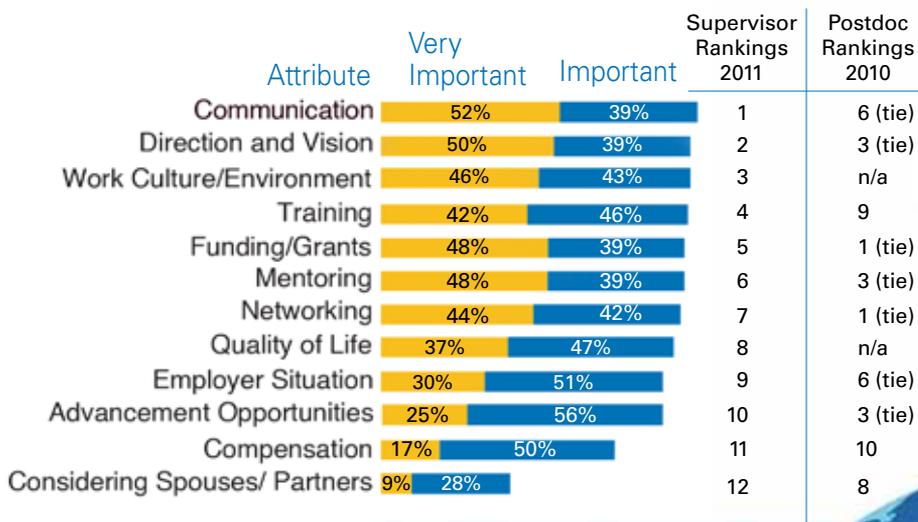
This year's record number of survey participants, comprising 798 postdoc supervisors, ranked the importance of twelve attributes to having a successful postdoc experience. The attributes supervisors ranked most highly, and the ones selected by the postdocs polled in 2010, are listed in the chart on the right.

Only 37 percent of supervisors thought helping postdocs' spouses and partners find a job was important or very important to a successful postdoc experience; in comparison, 86 percent of postdocs felt that way (see "The Postdoc Experience: Taking A Long Term View," *Science*, 2010, doi:10.1126/science.opms.r1000093). The "spouses and partners" category has been rising in ranks among postdocs in their surveys. For example, in the 2006 survey only 16 percent of postdocs polled noted help for spouses or partners to find jobs as a key factor. This increase may reflect a change in the value that postdocs, but not their supervisors, place on their personal lives relative to their work.

That was the case for **Simona Casarosa**, currently an assistant professor at the University of Trento, Italy. After completing her Ph.D. in Italy, she accepted a position as a postdoc in Strasburg, France. Her choice was dictated by the fact that her husband, also a scientist, had finished his Ph.D. months earlier and had already landed a post in France. Casarosa says the choice of a postdoc lab depends on what is important to someone. "You have to ask yourself what you want from your life. If you want to have a striking career and be famous then you should choose on that basis," she says. "But if your personal life is important to you, then you need to take that into consideration."

Traditionally postdocs have sought positions in the scientific powerhouses of the US, UK, and Germany. But postdocs who are looking for something different and a chance to see faraway places might want to consider nontraditional choices like Australia or Singapore. **continued on page 1172 »**

Supervisors Rate Factors That Contribute to a Successful Postdoc Experience, Plus Rankings Compared to 2010 Postdoc Survey



SURVEY METHODOLOGY

This year's survey was launched on March 15, 2011, with e-mail invitations sent out to about 40,000 current and former postdoc advisors worldwide. Of the 798 completed surveys that were collected, 71 percent came from Europe (39 percent) and North America (32 percent). The remaining respondents were located in Asia/Australia/Pacific Rim (20 percent) or other areas of the world (9 percent). Most were males (72 percent) 40 years of age and older (76 percent) and worked in academic institutions (70 percent) and government organizations (13 percent). The primary area represented was the life sciences (57 percent).

UPCOMING FEATURES

- Focus on Japan—September 2
- Faculty: Financial Planning for Scientists—September 9
- Top Employer Survey—October 7

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“We have 20 to 25 students at our institute, and I take a personal interest in each one of them. I sit down with them and mentor their progress and careers.”

—Joan Heath

Portion of Professional Time Spent Supervising Postdocs

% OF TIME SPENT	% OF TOTAL	% OF MALES	% OF FEMALES
20% or less	65%	69%	57%
21 % or more	34%	31%	43%

After hearing rumors in Australia that there would be Aus\$400 million cut from the National Health and Medical Research Council budget, researchers mounted a vigorous protest campaign that was successful in maintaining current spending for the major research agencies. “Right now success rates for grant applications are about 23 percent, which is not bad in an international context,” says **Joan Heath**, a zebrafish researcher at the Parkville Branch of the Ludwig Institute for Cancer Research in Melbourne, Australia. “We have just escaped a difficult situation.” (In comparison, the success rate for NIH grants in 2010 was 20.6 percent; see: http://report.nih.gov/award/success/Success_ByIC.cfm).

Most postdocs in Australia are appointed on principal investigator (PI) grants, typically at the time that the grant starts until its end in three years, explains Heath. All of her postdocs have salaries of at least Aus\$70,000 (US\$74,500) a year, which is higher than typical postdoc salaries in the US. “I don’t know why our doors are not being beaten down.” Yet Australia is not a popular destination among American postdocs.

Another good place for postdocs may be Singapore. “It’s very nice for postdocs who want to explore another part of the world,” says **Philipp Kaldis**, a PI at the Institute of Molecular and Cell Biology (IMCB). “Public transportation is very well organized, the weather is always nice, it’s very close to many exotic vacation spots, research is well supported by the government, and salaries for postdocs are more than what they are in the United States.” On the downside, apartments are very expensive and going home or to a conference can be a long trip.

THE VALUE OF MENTORS

Year after year, most supervisor respondents in the *Science Careers* survey select mentoring as one of the key attributes for a successful postdoc experience. In this year’s survey, two thirds (65 percent) of postdoc supervisors indicated that they spent 20 percent or less of their professional time on supervisory responsibilities (see table above). The remaining one third (34 percent) spent more than 20 percent of their time supervising postdocs. Most (80 percent) supervisors felt that the time they spent advising postdocs was adequate.

“Mentoring is really important to me,” says **Gail Bishop**, professor of microbiology and internal medicine at The University of Iowa. “I belong to the subgroup of PIs who put a lot into mentoring.” Bishop, who indicated in the survey that she spends over 20 percent of her time mentoring trainees, acknowledges that mentoring is one of those things that a PI typically learns on the job. “We are all selected for our productivity, creative ability at the bench, and our ability to communicate scientifically,” she explains. “Then instantly you become a manager and often have no experience doing it.” A key to learning how to manage people, she says, is to start gradually with only a few people in the lab. “One pitfall for many beginning faculty is building up a lab too fast,” she adds.

The number of postdocs a PI feels they can effectively manage changes depending upon the level of their experience, according to survey respondents. When they were asked about the maximum number of postdocs they could manage, very few (3 percent) felt they should be responsible for only one postdoc, whereas most (63 percent) felt that they could supervise two or three postdocs. Seventeen percent of the survey respondents felt that they could supervise four or more postdocs. The remaining 17 percent were not sure about the maximum number of postdocs they should supervise. In general, as the age of a supervisor increased, so did the maximum number of postdocs that the supervisor thought he/she should be responsible for.

Interestingly, the 2011 survey revealed that female supervisors, on average, spend more time mentoring postdocs than male supervisors. Mentoring may come more easily to female faculty, says Heath, who has been the postgraduate student coordinator at her institute since 1995. She doesn’t think many of her male colleagues would spend as much time as she does mentoring other people’s graduate students. “We have 20 to 25 students at our institute, and I take a personal interest in each one of them. I sit down with them and mentor their progress and careers,” she explains.

That is not, however, to say that men don’t mentor. “I like mentoring,” says **Michael Stumpf**, a systems biologist at Imperial College London in the UK, who also indicated in the survey he spends over 20 percent of his time mentoring postdocs. Stumpf says he tries to get all his postdocs to supervise Ph.D. or Master’s students “so that they see if they like it,” he says. “It will be an important component of what they do as PIs.” He also makes sure they present their research findings at scientific conferences. Because Stumpf holds a joint grant in collaboration with a group in Japan, he also sends all his graduate students and postdocs to spend time in his collaborator’s lab in Japan. “It is important to be exposed to a different way of doing science,” says Stumpf.

ENSURING SUCCESS

Each year the *Science Careers* survey asks participants to rank those factors, such as learning new skills or publishing papers, which contribute to a successful scientific career. The top-rated factors have stayed the same over the years, regardless of economic conditions.

This year’s survey respondents felt that conducting high quality research was most important for a successful postdoc (79 percent), followed by learning to work independently (65 percent), and publishing work (60 percent). Significantly fewer supervisors felt that learning how to write grants and obtain funding (36 percent), developing new research skills (35 percent), gaining a deep knowledge of a specific area of research (32 percent), and learning to manage or supervise others (23%) were among the top attributes important for a successful postdoc experience. **continued »**



“It is important to be exposed to a different way of doing science.” —Michael Stumpf

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Learning to work independently was more important to postdoc supervisors (65 percent) than to postdocs (44 percent according to the 2010 postdoc study) for a successful postdoc experience.

In addition to these “traditional academic accomplishments,” says **Hank Seifert**, a professor at the Northwestern University Feinberg School of Medicine in Chicago, postdocs have to learn to “communicate effectively in writing, when giving talks, and in interpersonal discussions. An understanding of the big picture-perspective of their chosen profession is critical to making good career decisions.” These additional skills make a postdoc more likely to land a faculty job when there is tough competition.

Although what it takes to be successful in science has not changed much over the years, in these tough economic times, it is more important than ever for graduate students to start looking for a postdoc position at least a year before finishing their graduate work. “I am always amazed at the number of our graduate students who apply to my lab and people who look for a postdoc with three to six months lead time,” says **Kevin Gardner**, professor of biochemistry at the University of Texas Southwestern Medical Center. Sometimes graduate students delay their search for postdoc positions because they are waiting to have a paper in press, but this strategy does not always work to their advantage because “if the lab is already full and finances are limited, they will not get the job, even if they have good publications,” warns Gardner. In times when funding is good, says Gardner, there is more flexibility for PIs to provide positions on a short notice.

Finding the right lab is a two-way street. The survey showed that the most common attribute PIs look for when selecting a postdoc to join their lab is strong research experience (77 percent). Other sought-after factors include: an interest in working in new fields (56 percent), a graduate adviser with a good reputation (43 percent), and a good research institution (43 percent).

In addition to these professional considerations, it is important that the postdoc and PI get along on a personal level, says IMCB’s Kaldis. For this reason, he asks postdoc candidates a lot of questions over the course of a two- to three-hour-long interview to get insights into their personalities. “A lot of it is gut feeling. It’s a very individual process, but in general I look for people who are open to collaboration, and who want to talk to each other and to me,” he says.

AFTER THE POSTDOC

According to 81 percent of the survey respondents, the average

length of a postdoc in their labs was around three years or less; however, 16 percent placed it at four years or more. In the 2009 survey, 76 percent of postdoc supervisors said the average length of their postdocs was one to three years, and 19 percent said four-plus years. That difference might reflect shorter terms imposed by tighter funding.

Whether someone is successful in finding a job following a postdoc depends on many factors, including “being realistic and proactive, understanding what is needed and what is expected, and what hiring committees are looking for in a resume,” says Bishop. “Regardless of the job, postdocs need to take the initiative early on and set themselves up to have what employers want. The biggest mistake I see is when people do not think about job options ahead of time or do not think about it realistically.”

In addition to being proactive, it is important to be flexible. “My sense is that a lot of postdocs come with unrealistic expectations,” says **Martin Dove**, professor of earth sciences at the University of Cambridge, United Kingdom. “You have to have some idea of where your career might go. You have to come in having a plan A, but also having a plan B so that you don’t hang on to something that is not viable.” He adds that it is also important to set a timeline. “For example, say [to yourself]: ‘If I don’t get an academic post in five to six years, I will switch to plan B.’”

To help postdocs reach their goals, many mentors have career guidance meetings every 2 to 12 months, sometimes using career development plans or simply outlining the goals that postdocs want to reach. “I view a career development plan as a tool, or hammer, to do something constructive, or to hit yourself on the head,” says Marder. Marder meets with his postdocs annually to list the goals that they will need to achieve during the year; then at the next meeting they review those goals to see if they were met and set out new ones.

Despite all the best planning and good intentions, jobs may be hard to come by, so postdocs have to be prepared to be persistent and not get discouraged. “My advice is that if you really enjoy research in an academic environment and are good at it, then persevere, there will always be quality research opportunities available for well-trained researchers,” says Seifert.

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