CAREERS

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CAREER CHOICES

The mobility imperative

Changing labs is crucial for the next generation of European scientists. But mobility can be a mixed blessing.

BY QUIRIN SCHIERMEIER

Marine biologist Martin Pfannkuchen has been on the move for much of his young career. He realized early on that Swabia, the southwest region of Germany he came from, was not an ideal base for his work on the cell biology of marine sponges and algae. With two national borders and the European Alps between him and the nearest coast, he had limited access to water or a coastal lab. Already, as a research associate in the early stage of his career, he has had valuable experiences abroad. During his PhD at the University of Stuttgart in Germany, Pfannkuchen spent a month at the Natural History Museum in London. After his PhD, he considered continuing his research abroad at the University of Hawaii or Kyoto University in Japan, where he had been offered postdoctoral positions.

But wishing to be close to the sea and to his Croatian partner, nine months after finishing his PhD he resettled in Rovinj, a town on Croatia's Adriatic coast that is home to a small marine research centre at the Ruđer Bošković Institute. Although not a major scientific player, Croatia has all that Pfannkuchen needs. "One has to know how to work self-sufficiently here, but the equipment and grant opportunities are fine, and my faculty prepared me well for this situation," he says. "The best thing is that I can work at sea any day and I have fresh samples all the time."

MOTIVATING MANTRA

Changing countries has become a rite of passage for many young researchers, especially in Europe, where cross-border mobility is common. The call for mobility has become the motivating mantra of organizations such as the Marie Curie fellowship programme, which promotes and supports mobility across Europe. In Germany, for example, to avoid academic 'inbreeding', in which universities hire their own graduates as professors, university tenure rules require scientists to change labs during the course of their postdoc or graduate education, and trips abroad to the United States or elsewhere are all but expected. In many countries, recruiters and funding agencies see international mobility as a mark of an applicant's ability and dedication, making changing labs a key to scientists' professional success almost everywhere.

Nevertheless, the practical professional outcome of mobility is hard to pin down — raising suspicions that it is sometimes undertaken for its own sake, as a means to boost a CV rather than a way to expand one's knowledge base. Crossing borders is often a fruitful enterprise — an opportunity to experience different lab cultures, acquire new skills, learn new methods and establish personal contacts and networks that can be important for future career progressions. But moving for the sake of moving may have little effect on one's capability or marketability. And there are other implications: for later-career postdocs and professors, pensions could be affected, for example. Graduate students and others should therefore consider their own long-term costs and benefits. Although supervisors may ▶

provide guidance, they also have their own research agenda and priorities.

Mobility numbers vary widely depending on region. At leading research universities such as the University of Cambridge, UK, more than 40% of researchers are from abroad. Across Europe as a whole, however, no more than about 7% of research-and-development personnel work outside their native country, according to figures compiled in 2007 by the European Commission (EC) Joint Research Centre in Seville, Spain.

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Regardless, mobility is integral to the EC's scientific workforce initiatives. The European Research Area Board, a consultative body that advises the commission, has set a target of 20% of European Union (EU) doctoral candidates working outside their home countries by 2020 — roughly a tripling of current figures. Outdated tenure, pension and social-security systems all hamper the scientific mobility of EU researchers, the group said in a report released in 2009.

And mobility issues will be freshly addressed as the EU moves towards its 2014–20 Framework programme for research, the priorities and budget of which are being negotiated at present. Under discussion are a European pension fund for mobile researchers (see *Nature* **467,** 489–491; 2010), and the establishment of doctoral programmes that are specific for non-national PhD students at several universities across the EU. "Start encouraging mobility at the doctoral level and you'll get a more international research environment in Europe," says John Smith, deputy secretary-general of the European University Association (see Column, page 565).

In addition, 47 European countries participate in the Bologna process, which was launched in 1999 and aims to improve mobility by uniting education systems throughout the continent with common principles for training and the supervision of students, and reducing the time to a degree. All this suggests that, for fledgling EU scientists, the pressure to be mobile may become even stronger in the future.

ALL THE RIGHT MOVES

Stints abroad do have their benefits. "The best lab for the type of research you're doing is normally not around the corner — it's in fact very likely to be somewhere else," says António Coutinho, director of the Gulbenkian Science Institute in Oeiras, Portugal, which runs three international PhD programmes in the life sciences.

That has been the experience of Martin Pešl, a PhD student at the International Clinical Research Center Brno in the Czech Republic. "I had the chance to work with some of the leading researchers in my field — that was just fantastic," he says of his six-month stay at the Mayo Clinic in Rochester, Minnesota, from where he returned in December. Pešl, who studies the use of human embryonic stem cells to treat cardiovascular diseases, plans to return to the Mayo Clinic next year to do postdoctoral research, but hopes eventually to start an independent research group in the Czech Republic. "I know where my home is and I love my family," he says.

THE LANGUAGE BARRIER

Although career advisers advocate early-career mobility, some admit that there are downsides. Graduate students considering a period abroad should consider the effect of cultural differences, in an attempt to avoid stress and conflict. Those moving from Europe to places such as Japan (and vice versa) may benefit from cultural coaching to better understand unfamiliar hierarchies, conflict management and body language. And, of course, language is an issue. Working in a lab without knowing the local language may be feasible, but this is more difficult in the case of everyday life. "Let's face it, some countries — especially those where there is little incoming mobility — embrace diversity less easily than others," says András Dinnyés, a biomedical scientist who did postdoctoral research in Japan and China before starting the biotech company BioTalentum in Gödöllő, Hungary.

Students should seek advice, but be aware of its source. "Don't be overly dependent on your supervisor," says Karen Vandevelde, a research-policy adviser at Ghent University in Belgium, who studies mobility among Flemish researchers. "PhD students are in a vulnerable position, especially if their supervisors are not so good. There are lots of reasons why some might not encourage mobility, for example, because they don't want to lose their students."

Empirical data support the idea that the 'mobility imperative' restricts women in science and creates obstacles for academics, says Louise Ackers, chair in European Socio-Legal Studies at the University of Liverpool, UK, who has conducted several research studies on the relationship between mobility and internationalization. Vandevelde says that recruiters often unfairly think that researchers who are not mobile because of family restrictions are not passionate enough about research.

But Ackers — herself a mother of four — has also found that scientific mobility has evolved, as short trips to conferences and collaborators, virtual meetings and remote access to research data can reduce the migration of scientists to some extent. "In fields dominated by large international teams, such as particle physics, successful research no longer demands being where it's at all the time," she says. "You may have to be prepared to travel a lot, but not necessarily to live abroad."

For graduate students, finding funding to move can be a challenge, but there are some mechanisms in place to help. The EC-funded Erasmus and Erasmus Mundus programmes (for student mobility within and outside the EU, respectively) and the Marie Curie fellowships allow thousands of postdocs and PhD students to gain experience abroad every year.

Even so, money is still an issue. A survey of almost 9,000 PhD students throughout Europe in 2009 by the European Council of Doctoral Candidates and Junior Researchers found that more than 20% used personal savings to finance stays abroad or relied on support from partners and relatives. Less than 9% of graduate students were aware of the European Charter for Researchers or the Code of Conduct for the Recruitment of Researchers — recommendations issued by the EC in 2005 for employment conditions and social-security coverage for researchers, including PhD students. These standards addressed issues such as treating PhD candidates as professional scientists, not only as students, and ensuring that they have proper contracts. "It's a disgrace that the charter and code make so little difference," says Snežana Krstić, a chemical engineer who volunteered her time to help conduct the survey. "Many national, and even some EU, institutions haven't yet implemented the provisions."

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No doubt, crossing borders will increasingly become a part of science, but the career import of mobility remains unclear. "There's no easy answer to whether researchers are excellent because they are mobile, or whether they are mobile because they are excellent," says Vandevelde. Nevertheless, young supervisor Pfannkuchen is encouraging his Croatian students to explore international opportunities. "They think that in European labs everything works perfectly, money flows like water, and supervisors let them do whatever they want," he says. "Alas, many return a bit disenchanted." ■

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