Immunology goes global

Scientists seeking immunology posts are looking beyond the United States and scattering all over the globe. They are re-evaluating both the focus of their work and where they choose to pursue it, says **Myrna Watanabe**.

Meet the competition: immunology labs around the world are increasingly competing on equal terms with their US counterparts.

Most of Rachel Kohler's Australian-born colleagues took posts in the United States at the first opportunity. But despite being offered immunology postdocs in New York and Boston, Kohler instead chose to stay in Australia.

The United States has a reputation for attracting the most prominent researchers, building the biggest facilities and providing the most ample funding. But things may be changing. As extramural funds from the National Institutes of Health (NIH) for supporting immunology research that isn't related to bioterror defence become scarcer, immunologists are shifting their job search away from the States. Other countries are fishing for immunologists who once considered the United States the top place to train, by offering sound packages and beefing up their infrastructure.

This sea change makes Kohler's decision to stay in Australia less surprising. "Within Australia, it is strongly impressed upon PhD students that an overseas postdoc is paramount to one's career," says Kohler, who completed her degrees at the University of Adelaide and works at the Centenary Institute of Cancer Medicine and Cell Biology in Sydney. Her friends in the field, she notes, are all working overseas.

Kohler's situation is no aberration, says Robert Kimberly, professor of medicine and director of clinical immunology and rheumatology at the University of Alabama, Birmingham. He has seen a tidal shift from ten years ago, when many US immunology postdocs came from Western Europe. But now, as the immunology infrastructure has strengthened in Europe, international postdocs in the United States are coming from elsewhere.

Wherever they end up, immunology postdocs have a broad field from which to choose. Immunology research ranges from animal models of infectious diseases to human microRNAs and their effects on gene expression. For this reason, immunologists like Kimberly who have spent decades in the discipline, now recommend a less specialized approach to training.

Iqbal Grewal, vice-president for preclinical therapeutics at Seattle Genetics, a biotech firm in Seattle, Washington, suggests a broad background: both basic and applied immunology, plus knowledge of the human disease process, the human genome, molecular biology, and perhaps a PhD in immunology or an MD/PhD.

Neetu Gupta has just such a multidisciplinary and international background. Gupta, who is spending her second postdoc at the University of California, San Francisco, did an undergraduate degree in zoology, a master's in biotechnology and a PhD in immunochemistry. She spent her first postdoc working for the NIH at the immunogenetics lab of the National Institute of Allergy and Infectious Diseases (NIAID).

This approach helped set the next stage of her career. She has a mentored career development award from the NIH, which she can use to secure her next position. She plans to look for a job in the autumn. "I have a grant and this grant is portable," Gupta says.

Tarek Fahmy, assistant professor of biomedical engineering at Yale, has one foot in industry and the other in academia, and illustrates how multidisciplinary training can provide a robust career in immunology. Fahmy first trained as a chemical engineer and then worked for DuPont for four years. While with the company, he reassessed his career goals and enrolled in an immunology graduate programme at Johns Hopkins University in Baltimore, Maryland. His decision to enter immunology was personal. "My father had died of lymphoma," he says. He is now founding a biotech that aims to use immunology to fight cancer.

Perhaps because fewer European scientists are launching their immunology careers in the United States, more positions seem to be available, with relatively low competition for them.

William Paul, chief of the immunology laboratory at the NIAID, says the NIH employs 500 or more people in immunology, about a third of them in the NIAID. While recruiting for two tenure-track investigator positions (the equivalent of assistant professors), Paul was surprised that, despite the positions being funded, he received a mere 56 applications. He eventually sent 350 more e-mails soliciting candidates. His short-list of

seven now contains three who were either born in the United States or spent most of their lives there.

There could be several reasons for this trend. First, although the NIH's budget doubled a few years ago, its funding plateau since then means there is less money for new grants. And immunology faces even more of a crunch. Of the new money that is available, most has been earmarked for research relating to biowarfare and defence, leaving other research out in the cold. Second, researchers from Asia are having a harder time getting US visas, and are wary of coming as they have heard horror stories about colleagues who were refused re-entry or had difficulty travelling to and from the states. In immunology, getting a visa may be even harder for those working in areas remotely related to biodefence, because of security concerns, real or imagined.

Mark Buller, professor of molecular microbiology and immunology at St Louis University in Missouri, has a new postdoc coming from the University of Cambridge in Britain later this year. Now he is looking for another postdoc with a virology background to work on the mechanism underlying a poxvirus model. Most of his postdoc applications come from India and China, but because he has had difficulty securing visas for prospective fellows from these countries in the past few years, he is less likely to recruit them now.

Recruiting staff is even harder for so-called biosafety level 3 and 4 (BSL-3 and BSL-4) labs — highly secure labs that often handle dangerous pathogens such as smallpox. These labs have a different set of requirements from others, according to Lynn Soong of the Center for Biodefense and Emerging Infectious Diseases at the University of Texas Medical Branch in Galveston, the site of a new BSL-4 facility. Besides standard immunology training, candidates need to have experience with selective agents of disease, such as West Nile virus, Lassa fever and rickettsia. People who handle these agents in BSL-4 laboratories must also be prepared to work independently. Because of the high security, they will log into the lab, work for several hours, and then log out — they can't just run out to grab a senior researcher to show them something.

Meanwhile, more job opportunities at new or growing institutes outside the United States are creating competition for global talent. Australia's Centenary Institute, besides actively recruiting postdocs, is looking for a new head. Nick Pearce, Centenary's business development manager, says the institute will specifically target Australian expatriates.

The Institute of Infectious Disease and Molecular Medicine at the University of Cape Town in South Africa is also looking for a director. According to Frank Brombacher, a professor of immunology who works on knock-out mouse models, the facility receives national and international funding, with some coming from the Wellcome Trust in Britain. Brombacher, who hails from Germany and received his PhD from the Max Planck Institute for Immunobiology in Freiburg am Breisgan, is looking for someone to fill a lecturer's position, which is 90% research and 10% teaching. He is also looking for up to two postdocs to study murine models of infectious diseases.

In Singapore, the Biopolis initiative (see *Nature* 425, 746–747; 2003) is producing many opportunities for immunologists, says Kong Peng Lam, acting executive director of the Biomedical Research Council of Singapore's Agency for Science, Technology and Research (A*STAR). The National University of Singapore is also actively recruiting immunologists. Lam, whose undergraduate and graduate training was in the United States and who did a postdoc in Germany, returned to Singapore in 1998 to join the Institute of Molecular and Cell Biology.

As more institutions like Biopolis rise and grow, so will the global competition for immunologists. Broad training — and a willingness to travel globally — will help young immunologists to find jobs in an exciting multidisciplinary field. ■

Myrna Watanabe is a freelance writer based in Patterson, New York.

OTHER WORLD-CLASS CENTRES

Universities in Europe and around the world that once lost many a recruiting competition with their US brethren are now winning, through growth and infrastructure investment. Most tout their collaborative credentials, including joint programmes with universities inside and outside their own countries, and with researchers from other countries.

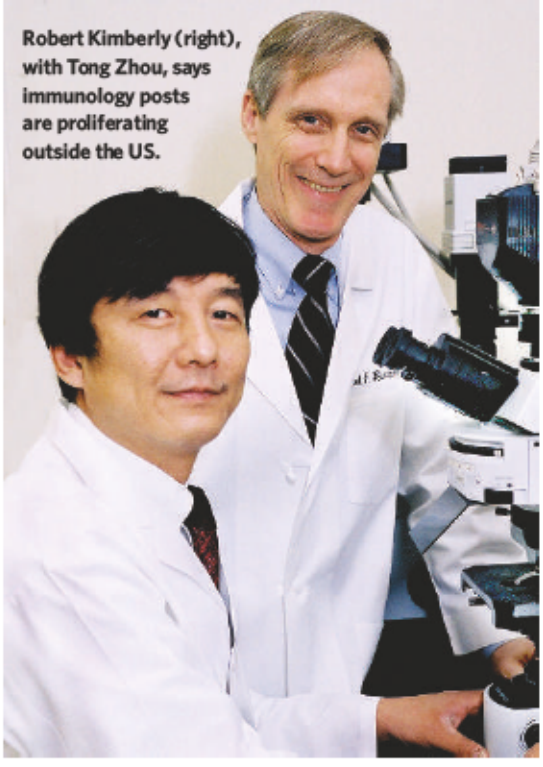
The Marseille-Luminy Immunology Centre, for example, not only collaborates with French research institutions, but also works with others elsewhere in Europe. And the Pasteur Institute in Paris has several departments involved in immunology, with the Pasteur Foundation supporting postdoctoral fellowships specifically for US citizens.

In Britain, the Division of Immunology, Infection and Inflammation at the University of Glasgow runs highly collaborative programmes investigating immune regulation and development, and virulence factors in bacteria. Meanwhile, the Division of Infections and Immunity at the National Institute for Medical Research in Mill Hill concentrates on immune development, the molecular mechanisms of intracellular infection, and the effects of vaccination.

The Institute for Research in Biomedicine in Bellinzona, Switzerland, was founded in 2000 and already has 10 research groups focusing on molecular and cellular immunology.

On the other side of the globe, in Australia, the Walter and Eliza Hall Medical Research Institute in Parkville, near Melbourne, has a long history of immunology research and currently focuses on the function and development of the immune system, including autoimmunity and transplantation.

In Japan, the Institute of Physical and Chemical Research (RIKEN) established a Research Center for Allergy and Immunology in Yokohama in 2001. The institute has 27 laboratories and research units, focusing on everything from cell signalling to allergies. M.W.



Robert Kimberly (right), with Tong Zhou, says immunology posts are proliferating outside the US.

WEB LINKS

Division of Immunology, Infection and Inflammation, University of Glasgow
www.gla.ac.uk/departments/immunology

RIKEN, Japan
www.riken.jp/engn

Institute of Infectious Disease and Molecular Medicine, University of Cape Town
www.iidmm.uct.ac.za

Walter and Eliza Hall Medical Research Institute, Australia
www.wehi.edu.au

Centenary Institute, Sydney, Australia
www.mja.com.au/public/issues/171_11_061299/basten/basten.html

Marseille-Luminy Immunology Centre
www.ciml.univ-mrs.fr