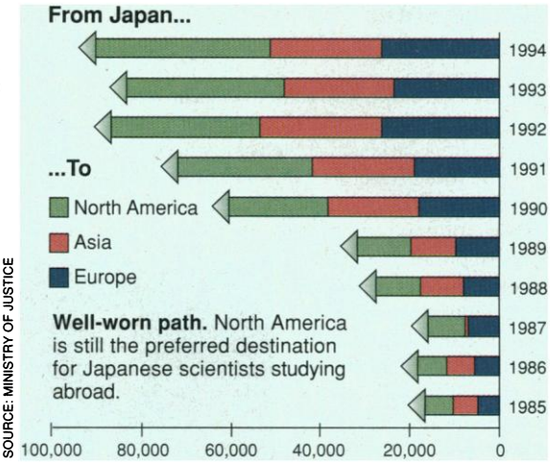
LEAVING HOME

Many Japanese Say West Is Still to Their Liking



In the decades following the end of World War II, European and U.S. laboratories offered promising Japanese scientists intellectual excitement and first-class facilities that were not available at home. Not anymore. Lab facilities at the top universities are becoming as good as, or better than, those found in many Western institutions, and there are growing numbers of internationally renowned Japanese scientists available as possible mentors. So why do so many Japanese researchers still cross the ocean to launch their careers?

One attraction is the highly competitive research environment. Another is the opportunity to polish English-language skills—an essential element for success in the international arena. But perhaps just as important is the chance for a postdoc to escape, at least temporarily, from the often oppressive hierarchy within Japan and get a broader view of the discipline. "There are many good jobs in research laboratories in Japanese companies, but they are permanent jobs," notes Mitsuaki Shimizu, a researcher at the Electrotechnical Laboratory in Tsukuba. "So it is natural to want to go overseas and get experiences before getting a permanent job in Japan. If you do not know other laboratories, you cannot guess what is good or what is wrong in your job environment."

On top of all these factors, however, is the attraction of the science itself: Japanese postdocs in fields ranging from biological signal transduction to optical semiconductor physics say the hottest action is in the West. "In my field, neuroscience, the United States is the major leagues," says Nobuki Nakanishi, a neurobiologist who worked as a postdoc at Columbia University and is now an assistant professor at Harvard Medical School. "This is a highly multidisciplinary field, so you really need a large number of people to have a critical mass," he says.

The fact that the critical mass communicates in English is another reason to study abroad. "In Japan, you need linguistic skills to be successful as a scientist," says Nakanishi, who speaks fluent, idiomatic English after a dozen years in the United States. The desire to improve her English was one reason Noriko Suzuki decided to join Johns Hopkins University biochemist Yuan Chuan Lee this April after earning a Ph.D. in molecular immunology from the University of Tokyo. "It's been frustrating not to be able to express what's on my mind," Suzuki says in Japanese.

While mastery of English is essential, Suzuki says that an even more important goal is to learn "American approaches to solving problems." That is the same reason Kenji Irie, age 31, a research associate in Kunihiro Matsumoto's lab at Nagoya University, hopes to secure a postdoctoral post with Ira Herskowitz, chair of the biochemistry department at the University of California, San Francisco. "Herskowitz keeps generating new concepts. I want to study his way of thinking," he says.

Irie is also attracted by the independence of his U.S. peers. "In the Japanese system, younger scientists can't have their own lab," he explains. Assistant professors and research associates belong to a full professor's lab and typically do not have the psychological or financial independence to pursue their own ideas. "It's just like being a technician," says

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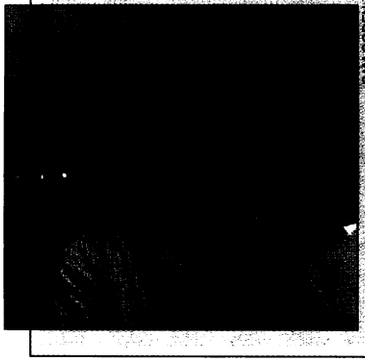
Search for Truth Points to America

Naomi Fukai is a research associate in the department of cell biology at Harvard Medical School. He grew up in Tokyo and received medical and doctoral degrees from Tokyo Medical and Dental University. He has lived in the United States for 4 years and is supported by a grant from the National Institutes of Health. His e-mail address is: fukai@tiac.net.


SAM OGDEN

As a neurosurgeon at a geriatric hospital in Tokyo, I had been interested in cerebrovascular diseases and wanted to learn more about vascular biology. But it was increasingly difficult to be both a clinician and a researcher at the same time. Coming to the United States as a postdoctoral fellow has given me a chance to concentrate on laboratory research in a way that was not possible in Japan.

In addition, the United States has one of the best environments for doing science. Although public funding of research is increasing in Japan, there is much more money available for research in the United States. I have also been impressed by the quality of the management of information needed to carry out scientific research.

A third reason for my decision to come to the United States was my feeling that I could overcome the language problem and become integrated into American society and culture. Not all Japanese scientists hold this attitude, of course, and a similarly open attitude toward Japan is even less common among U.S. scientists. For example, one university in Tokyo recently wanted to hire a U.S. scientist as a postdoctoral fellow but could not because it received no applications. Still, I think that it is easier for Japanese scientists to adapt to the United States than the other way around because U.S. society has fewer social rules that must be followed.

I hope to continue working here after my current project is completed, although my future is dependent on funding. In the meantime, I have appreciated the opportunity to learn more about vascular biology and to meet researchers from many other countries. That interaction will continue as long as the U.S. keeps its door open to scientists seeking truth. **–Naomi Fukai**

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Futoshi Shibasaki, who turned down an assistant professorship at the University of Tokyo for a postdoc at Harvard Medical School.

The loose structure of U.S. labs also improves the flow of information, he says: "In Japan, you can't get information before a paper is published. Here there's lots of personal communication prior to publication." Similarly, Suzuki finds that her colleagues at Johns Hopkins communicate more freely than those in Japan. "Here the lab is smaller, only about 10 people, while in Japan, the lab has many people—more than 30 where I was—so they break up into groups and overall communication gets poor."

SAM KITTNER

Speak up. Noriko Suzuki says lab interactions work best in English.

Openness may not always be enough, however. In some fields, such as high-energy physics, poor job prospects in the West can make the grass seem greener at home. "Most of my colleagues and classmates don't want to go overseas," says Tsuyoshi Nakaya, a particle physicist working at Fermi National Accelerator Laboratory outside Chicago. "Most of them want to work on the B-meson factory [under construction at the Institute of High-Energy Physics in Tsukuba]." Conversely, even in fields where opportunities in Japan are more limited, many young scientists are reluctant to go abroad because they fear losing out in the competition for jobs back home.

Yet the idea of studying abroad remains an irresistible challenge to Japanese scientists like Nakaya, who are suspicious of security. "My American friends ask me, 'Why are you here?' In Japan, research jobs are very stable," he says. "But if you have to find a new job every few years, you must think of new things all the time. If I got a job for 10 years, I don't think I'd do any new science."

–June Kinoshita

WORKING IN JAPAN

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been removed. The language barrier is real. Alisa Erika Koch, a professor at Northwestern University Medical School in Chicago who was a visiting researcher for a year at the University of Tokyo's Institute of Medical Science, recalls being stymied by some cautionary instructions posted on a centrifuge she wanted to use. "It's like being a child again if you can't read," she says.

There is also the question of the professional payoff from a stint abroad. U.S. physicist Douglas Tweet found that his experience working at NEC Corp.'s Fundamental Research Laboratories in Tsukuba "wasn't seen as an asset" by most U.S. companies he contacted as his 3-year postdoc was coming to a close 2 years ago. Fortunately, he was able to satisfy his desire to learn more about Japan by taking an open-ended position at the national Electrotechnical Laboratory in Tsukuba.

Patricia Gercik is managing director of the Japan Program at the Massachusetts Institute of Technology, which places science and engineering students in Japanese laboratories for up to a year. She says that the increasing number of joint ventures between Japanese and American firms is raising the value to U.S. companies of people with both technical and cross-cultural skills. But many companies still "don't get the picture," she says.

ELJI MAYAZAWA/BLACK STAR

Topnotch. Bridget O'Neill says her Tokyo lab is very well equipped.

Despite the inherent difficulties of working in a strange country, Western officials say that recent trends are positive (see graph). Some programs, such as a U.S. "Summer Institute in Japan" scheme which places U.S. graduate students in private and public labs in Japan, are already oversubscribed. One reason for the increased interest, says Weber, is simply a greater awareness of the level of work being done here.

Sheffield's Parbrook agrees. "What really counts is the science you do while you're there," he says. "As information [about the quality of Japanese research] becomes more available," he predicts, "people are going to be more aware of the value of coming here."

–Dennis Normile

PRECOLLEGE EDUCATION

Reformers Fight to Draw More Students Into Science

TOKYO—On a hot and muggy evening this summer, a classroom at Shotoku Gakuen High School began to fill up with people carrying wires, tubes, and chunks of metal. They each took turns demonstrating simple experiments and discussing how to work them into classroom activities. One illustrated the concept of phase change—and demonstrated basic metalworking techniques—by showing a new metal alloy that melts in hot water and can be cast into molds. Another showed a videotape of how a simple homemade accelerometer could measure the change in *g* forces experienced during amusement-park rides. "It's a way of studying while playing," the presenter said.

It was a typical monthly meeting of the Galileo Workshop, an informal group of high school physics teachers formed in 1985 to discuss innovative approaches to teaching their subject. These gatherings are more than a forum for exchanging ideas for novel experiments, however. The participants hope such grassroots efforts will stave off the harmful effects of a drop in the number of hours spent on science in the classroom and shore up declining student interest in science, especially physics. Part of the problem, they say, is that Japan's long-standing emphasis on education has degenerated into a narrow focus on passing tests, particularly the university entrance exams. "Science is covered in the curriculum," says Yutaka Furuta, a physics teacher at the private Tokyo-area Rikkyo High School and a workshop regular. "But there is little chance for students, let alone ordinary citizens, to learn the joy of scientific experiments."

Yoji Takikawa, a physics teacher at International Christian University High School and a driving force behind the Galileo Workshop, worries that these trends will undermine not only the government's plans to boost basic research and increase graduate enrollment, but also the country's economic health. "I have to wonder about Japan's future," he says.

Takikawa may be more pessimistic than most science teachers, but he is hardly alone in his concerns. A few years ago the Physical Society of Japan found "various problems with primary and secondary science education," says Toshio Hyodo, a professor of phys-