

Breaking down the barriers

Many Japanese researchers are concerned that they don't compete on a level playing field when it comes to international science. Language and cultural barriers may be partly to blame. But the perception is more forbidding than the reality.

Science is supposed to be universal, crossing borders, overcoming linguistic barriers, and piercing through cultural differences. But Japanese researchers have long fretted that they don't compete effectively on the international scene — and policy-makers have racked their brains to find ways of overcoming the problem.

The latest initiative is a government-backed plan to publish a series of online journals designed to showcase top-quality Japanese research (see page 868). It is, in large part, a reaction to a concern among Japanese scientists that leading journals may be biased against them.

Such feelings are by no means unique to Japan. Speak to researchers elsewhere in Asia and across much of Europe and you will hear similar complaints. In a world of science in which English is the lingua franca, it's not surprising that non-native speakers sometimes feel hard done by. When your paper is rejected without even being sent for peer review, it's tempting to wonder whether a manuscript written in more polished English would have been given the same treatment.

Concerns about language barriers extend even to the elite of Japanese research. Kenichi Fukui of Kyoto University won the Nobel Prize in Chemistry in 1981 for his theoretical insights into chemical reactions. But even after this triumph, Fukui had to deal with critics who disliked his 'inelegant' English formulation of his ideas.

Such is the dominance of English, however, that it pervades most attempts to improve the competitiveness of Japanese science. Even the proposed online journals will be published in English, for example. Institutes established to give Japan a world-class presence in 'hot' fields — such as the Brain Science Institute in Saitama and the Center for Developmental Biology in Kobe — conduct Anglophone lab meetings. There is also a plan to establish an English-speaking graduate school on the poor southern island of Okinawa (see *Nature* 416, 774; 2002). And the desirability of making funding applications in English to facilitate international evaluation is surfacing in current discussions over the reform of Japan's university system (see page 875).

Lab visits

Many individual Japanese scientists, of course, have managed to compete successfully on the international stage, and have done so without worrying too much about whether language barriers will hold them back. They attend conferences, interacting in imperfect English if need be. They invite foreign researchers to visit their laboratories. When they need to visit a foreign lab, they do so, even though they might struggle to converse. And they ask foreign colleagues to comment and criticize their draft manuscripts — both for their scientific reasoning and the standard of their English. Some even hire English-speaking editors to polish their papers before submission.

A little English, it seems, can go a long way. It is a forgiving tongue, in which precise grammar is often not necessary for the meaning to get across. Unfortunately, however, many Japanese scientists seem to be shy of engaging with foreign peers, fearful that

they will be let down by their grasp of English. The way in which the language is taught in Japanese schools may be partly to blame — the emphasis is on memorization and grammar, rather than expression and communication. As a result, almost all Japanese have a fairly broad English vocabulary, but many lack the confidence to apply it in conversational situations.

So what about existing journals? Accusations of bias — which may be unconscious — are difficult to address. But bear in mind that leading journals reject the vast majority of papers that they receive, so there's no reason to jump to the assumption that a rejection has anything to do with the author's nationality or ability to write in English. *Nature* has expanded its pool of Japanese reviewers, and hopes to continue to do so. Our editors — more than a quarter of whom have English as their second language — are happy to work with authors to improve a paper's standard of written English to bring out important scientific points.

Opening up

Specific initiatives to improve the international standing of Japanese science may have some merit, but aren't without difficulties. The proposed new online journals will face a tough task convincing scientists to submit their best work to them instead of the likes of *Nature*, *Science*, *Cell*, *Physical Review Letters* and the *Journal of the American Chemical Society*. The new publications will also have to garner readers and reviewers from around the world if they are to have a reasonable chance of success.

Both the Brain Science Institute and the Center for Developmental Biology, meanwhile, have set and then struggled to meet quotas for foreign staff. Generous grant programmes designed to bring foreigners to Japan are undersubscribed. And there is widespread scepticism about whether the Okinawa graduate school will succeed in its plan to recruit half of its professors from abroad.

Given the difficulty of creating islands of international excellence within the Japanese system, what more can be done to make the system as a whole more international in its outlook? Opening Japanese funding opportunities to applicants writing in English would certainly be a step in the right direction.

But officialdom isn't the only thing that has to change. Postdocs and other researchers visiting Japan often complain that they had problems communicating with their supervisor or with colleagues — problems that have little to do with specific linguistic barriers. Rather, they feel ignored and deprived of opportunities to discuss their research. The reasons are unclear, but perhaps shyness among Japanese scientists about communicating with foreigners could again be a factor.

Internationalization is a two-way street. Japanese labs must become more open and welcoming places for researchers coming from abroad, and visiting foreigners must be prepared to adapt to their new environment (see page 877). In the end, the internationalization of Japanese science is in the hands of individual scientists and their ability to get around language or other supposed barriers. More often than not, the perception of a linguistic or cultural barrier is more inhibiting than the barrier itself. ■