

# nature neuroscience

## Neuroscience in China

Browsing any biomedical journal these days, one is struck by the high percentage of Chinese names among the authors. Most, however, are in Western (primarily American) labs, a scientific diaspora who have come to the West to study and who in many cases have chosen to remain. China's domestic scientific productivity, in contrast, lags far behind that of its expatriate community; in most fields, China's scientific impact is negligible compared to that of many smaller countries. However, the government has now begun to address this situation with a major reorganization of the Chinese Academy of Sciences, which supports most of the country's top research institutes. One product of these reforms will be a new Chinese Institute of Neuroscience, which is scheduled to open in Shanghai toward the end of this year.

The CIN will be headed by Mu-ming Poo, a prominent neurophysiologist at the University of California, San Diego. Poo, who is originally from Taiwan, will retain his position at UCSD but will spend three months each year in Shanghai. The challenge he has set himself is to create an institute that can produce world-class neuroscience research, with regular publications in leading international journals. The institute will focus on basic science rather than practical applications. Although the majority of China's research budget goes to applied rather than basic research, the government has acknowledged that basic research is an important component of their long-term strategy and, according to Poo, has recognized neuroscience as a major scientific frontier. They have guaranteed to fund the CIN for ten years, and Poo hopes that further money will come from other central sources, as well as from the local government in Shanghai.

By the time of the official inauguration in November, Poo expects to have at least 9 research groups in place, and this will increase to around 30 over the next ten years. Among the first wave of appointments, a few—like Poo—will be part-time and will retain academic positions elsewhere, for example the US or Hong Kong. Most group leaders, however, will be full-time. Three have already been recruited from the West (two of whom—Youming Lu and Qi Wan—happen to have published papers in *Nature Neuroscience* within the last few months). Others will join the CIN from other institutions within China. One of these will be Chien-ping Wu, who is currently the director of the Brain Research Institute in Shanghai, and whose administrative skills have been in large part responsible for making the CIN a reality. Another will be Chao-yi Li, a visual physiologist who studies cortical receptive field properties and who is also based in Shanghai.

If the new institute is to succeed, it will need to avoid some of the problems that have plagued Chinese research in the past. These include not only a lack of funding, but also limited mobility and contact with colleagues elsewhere, as well as nepotism, political interference and a culture that rewards quantity more than qual-

ity of research. It is encouraging that the Chinese government now seems aware of these problems; for instance, the minister of science and technology recently wrote an editorial in *Science*, stating her government's intent to devise fairer and more effective ways to fund and evaluate researchers<sup>1</sup>. Poo is optimistic that this can be achieved at the CIN. Laboratories will be well equipped, and faculty will receive a level of funding and salary support that is generous by Chinese standards, along with substantial freedom to organize their labs, apply for additional grants and set their own research directions. Academic review will be an important element in Poo's strategy, and he plans to establish an international advisory committee as soon as possible, to ensure that evaluations are both rigorous and unbiased.

Whether the CIN can achieve its goal of international competitiveness will depend in large part on its ability to attract top Chinese neuroscientists back from the West. Many feel a deep attachment to their country and are interested in the possibility of returning, but few so far have been willing to do so. There are of course many reasons for this, but the main one seems to be a perception that they will not be able to maintain the quality of their research once back in China. Several factors, however, may cause the balance of arguments to shift. For one thing, it is becoming increasingly difficult to find research jobs in the US<sup>2</sup>, and the problem is often exacerbated for Chinese researchers, many of whom feel that linguistic and cultural barriers make it difficult for them to compete on equal terms with native English speakers. Meanwhile, China is becoming steadily more prosperous, and despite many pressing demands on public funds, the government appears to be serious in its commitment to high-quality basic research. Moreover, despite the recent deterioration in China's relations with the West, the long-term trend is toward a more open society, and even if multi-party democracy is not yet on the horizon, personal freedoms are much greater today than they were a few years ago. Finally, if the earliest people to return are successful, they will establish a precedent that will encourage others to follow.

The success of so many Chinese scientists in the West proves that Chinese science need not be limited by any lack of talent, nor by any deficiencies in its primary education system. The limiting factor is neither people nor money, but something more subtle: the need to create a cultural environment in which science can flourish. By learning from Western models and adapting them to one of the world's largest and fastest-growing economies, China clearly has the potential to become a major source of scientific knowledge in the next century.

1. Zhu, L. *Science* 283, 637 (1999).
2. *Trends in the early careers of life scientists*. National Research Council, Washington, DC (1998).