

Openings in human genome research in China

Three new centres for human genome research in Shanghai and Beijing offer about 100 positions for genome researchers and more genome initiatives are expected soon from the Chinese government (see *Nature* 394, 109; 1998).

Shanghai Human Genome Centre. Headed by Zhu Chen of Shanghai Second Medical University. Will have 35–40 researchers in a year's time, divided into four groups: expression profiles; genotyping of disease; single nucleotide polymorphisms; and functional genomics. Liver cancer, which

is prevalent in Shanghai, is a particular focus. Start-up funds of 60 million yuan (US\$7 million) are coming from local and central government.

Beijing Human Genome Centre. Headed by Boqin Qiang, vice-president of the Chinese Academy of Medical Sciences. Will have about 30 researchers in three divisions, devoted to sequencing; genetic resources; and bioinformatics. There will be a focus on cardiovascular disease and diseases of the nervous system. Start-up funds of nearly 100 million yuan (\$12 million) are coming from

central and local government and a state-owned real estate company.

Shanghai GeneCore BioTechnologies. A private sector initiative by three US companies — PE Applied Biosystems, Axys Pharmaceuticals, and Siniwest Holdings — which will have about 30 staff within a year. This joint venture in collaboration with local institutions is hunting for genes that cause liver cancer but expects to branch out into other areas of genomics. The three companies will make an initial investment of \$10 million.

and general manager of Shanghai GeneCore BioTechnologies.

As there is state support for research with a socioeconomic impact, such scientists-turned-businessmen will be in increasing demand. Recognizing this, members of the Overseas Chinese Physics Association (OCPA) last November formed the Chinese Association for Science and Business (CASB) with US-based Chinese professionals trained in science and engineering but working in finance, computer and information technology, and other business sectors. The general secretary of CASB is Ning Luo, of the department of physiology and biophysics at Mount Sinai School of Medicine in New York.

Luo says: "We see growing opportunities in mainland China as well as Hong Kong, Taiwan and Singapore, not only for Chinese scientists, but also for an even larger number of researchers-turned-entrepreneurs, business executives and professionals. On the one hand are the economies and markets which are ripe for extensive infusion of technology products and investment, and on the other hand is a large pool of expatriate scholars in North America, Europe and Japan and other advanced countries, supplied every year by the world's largest overseas student group.

"Because of their earlier economic successes, Hong Kong, Taiwan and Singapore have had much more experience than mainland China in attracting and utilizing returned talents," explains Luo. In this regard, CASB and OCPA, with the National Natural Science Foundation of China, are organizing an international conference in Guangzhou near Hong Kong this month to explore the "untapped mainland China market for scientists and engineers trained overseas", says Luo. For details of CASB and the conference, see www.casbi.aan.net.

Another network of Chinese expatriates is the North American Chinese Association of Science and Technology, established in Boston in 1994 (www.voicenet.com/~yjin/nacast). This has more than 3,000 members including scientists and professionals in

finance, health care, engineering and education. A chapter of the association formed a corporation with the Pudong New Area in Shanghai last January. This body, the Pudong-Princeton Consulting Corporation, aims to help develop health care and telecommunications industries in the Pudong area, which is also the base for one of China's new human genome research centres (see www.voicenet.com/~yjin/ppcc).

Poor salaries

The very low level of salaries for scientists in the public sector in China remains a major disincentive for people to return. Even university professors in richer departments can only expect about 2,500 yuan (US\$300) a month. In some fields, such as physics, salaries are often much lower.

Mechanisms are being devised to supplement incomes with performance-based bonuses and to provide accommodation and large start-up grants to scientists returning to the country.

Zihe Rhao, for example, who returned to China from Oxford University in the United Kingdom, was given about US\$0.5 million in support from Tsinghua University to set up a structural biology laboratory. And university faculty members can now supplement their incomes from government project grants, provided they work in approved areas of socioeconomic impact.

The new genome research centres in Beijing and Shanghai are being set up jointly by universities, the academy of sciences, and local and central government, and will have new employment practices. Most researchers will be employed on contracts rather than on a permanent basis, and will be paid performance-based salaries. Similarly, a new centre for advanced studies at Tsinghua University will employ most of its researchers on five-year contracts (see page 601).

Although scientists can get higher salaries in industry, the business environment on the Chinese mainland is still "far from ideal", says Luo. But the situation is changing. "The Chinese leadership recently have empha-

sized more and more the importance of science, technology and education in the next phase of economic development," he says. "Especially since the onset of the Asian economic crisis, people realize that labour-intensive export-oriented companies, which have been driving the Chinese economy in the last decade, are not sustainable." The economic crisis has provided the "impetus" to develop technology industries, he says. This in the long run will lead to a "much more attractive environment" for overseas scientists.

Short-stay visits

For those Chinese scientists still disinclined to return, there are growing opportunities for short-term visits. The National Natural Science Foundation of China has since 1992 provided more than 200 small project grants a year, worth about 13,500 yuan (\$1,600) each, for research in China lasting a month or two. This year, the foundation has introduced a scheme that provides much larger grants of about 300,000 yuan (\$36,000) for two to three months for 30 or 40 overseas scientists.

Along similar lines, the municipal government of Shanghai has created the Magnolia Foundation to provide monthly stipends for visiting scientists. Taiwan's National Science Council now offers hundreds of postdoctoral fellowships and opportunities for visiting scholars with generous salaries and allowances to attract people back for short- or long-term visits (see page 603). And Singapore has introduced a scheme to attract top scientists to work on a part-year basis for several years (see page 604).

With the exception of Singapore and Hong Kong, there are at present comparatively few job opportunities in the region for non-Chinese scientists. Academia Sinica in Taiwan is beginning to open up positions to other nationalities, and Singapore is very open in its recruitment policies, drawing scientists from Europe, North America, Australasia, India and China. But in the region as a whole the overwhelming number of jobs are for those of ethnic Chinese origin.