Centre of research excellence replicates

The molecular biology laboratory nearest to the Equator has done excellently in an unlikely setting and in a short time, but the Internet has not yet banished isolation.

Singapore. Chris Tan, otherwise Tan Yin Hwee, has a simple goal: to introduce and spread the new technology of molecular biology to Asia. And Asia means not only the ethnically Chinese belt running north from the Equator here to the northern borders of Manchuria, but also the ethnically Indian parts of the fastest growing region in the world.

Tan, a native of Singapore, is the director of the Institute of Molecular and Cell Biology of the National University in Singapore. Now in his early fifties, but (in the Chinese manner) looking younger, he was happily in the swim of things in North America (Manitoba, Yale, National Institutes of Health, Johns Hopkins, Calgary) until 1983, when he was persuaded by the then vice-chancellor, Lim Pin, to build a new institute, physically and intellectually.

The place has cosmopolitan roots. Its sponsors from the beginning have included Dr Sydney Brenner from Cambridge and Dr Alice Huang (otherwise Mrs David Baltimore), who is dean of science at New York University, both of whom have repeatedly said, "You must go to Singapore!" They, together with Louis Lim (from the Institute of Neurology in London) and Chua Nam Hei (from the Rockefeller University) remain the sole members of the Scientific Advisory Board. Brenner and Lim are also engaged in programmes at the institute.

The institute has been a going concern for seven and a half years. Although it began as simply another department of the university, for all but the first three years its funds (US$20 million this year, up 10 per cent) have come direct from the National Science and Technology Board. That change has several consequences. One is greater freedom in making appointments (and, for that matter, in what is euphemistically called de-hiring people). Another is that the institute can spend generously to enable members of the staff to attend conferences overseas. One conference a year seems to be the minimum; graduate students also travel. There seems to be no problem about equipment.

The organization is starkly simple. There are a dozen divisions, each with a head, comprising 200 people. Most qualified scientists are employed as postdoctoral fellows (and Tan himself is the only one with university-style tenure). Each group is rigorously evaluated every other year by the Scientific Advisory Board with the addition of one outside expert. (Drs Richard Lerner and Robert Gallo have done stints in that role, Dr Robin Weiss will take over from Gallo.) Tan insists that the evaluations are not formalities, but that groups are often disbanded as a consequence of them. People at the institute may be freed from the chore of applying for research funds, but there are other means of keeping them on their toes.

Evaluation also gives the institute's programme flexibility. Since the beginning, the overall pattern of work has become, surprisingly, more concentrated, not more diverse. The almost unifying theme is now signal transduction within cells, which is Tan's own field. But that, of course, encompasses much of what is now biology, from the regulation of the cell cycle to developmental neurobiology.

How does this contribute to another of Tan's declared aims of "fostering a modern scientific culture" in Singapore? The transparent pursuit of excellence is part of the story of course. Institute members repeatedly refer to their collective publication record. (There is a steady trickle of papers in this journal; only international journals are taken seriously.)

So also does the incessant (and again transparent) hunt for talent, in the shape of postdoctoral fellows and graduate students. At the senior level, there seems to be a flourishing trade in the capture of people from Asian countries who have completed a successful stint in the United States or Western Europe. Mainland Chinese are much sought after. But so are people with origins in India, while caucasian faces are also prominent.

In the recruitment of graduate students (who are paid a decent stipend), members of the institute's staff follow their counterparts elsewhere in seeking to winkle bright students away from other institutions, often by means of collaborations. One advantage for Singapore, and part of the explanation of its commercial success in recent decades, is geography; it may be as easy to collaborate with a group in Shanghai as with one in London. (Shanghai and Singapore will collaborate this May in the "inaugural Hot Springs Life Science symposium", which is one of Tan's many jokes.)

The graduate students are, of course, part of the institute's contribution to the spread of the technology of molecular biology in Asia. More immediately, Tan plainly also regards the institute as a means by which tangible enterprises can be spun off from the largely academic research programme. In that spirit, there is now to be an Institute of Molecular Agriculture (accommodating the groups from Tan's institute previously concerned with plants).

Then, in the past year, no fewer than three companies have been founded by members of the institute's staff. One (with an eye to the export trade) has the down-to-earth purpose of inhibiting the bacterial and fungal spoilage of horticultural products from the region. Another, founded by Dr Robert Ting, who was a student of Luria at Illinois, who has experience in US biotechnology and whose expertise is in the use of antisense oligonucleotides, plans to operate in China as well as Singapore.

The companies will gladden hearts at the National Science and Technology Board, if only because they fit in well with Singapore's economic strategy. The aim is to make up for the small size of the population. As things are, Singapore has to import people to do jobs the locals disdain. The best solution is to foster a corps of companies that are in some sense multinational, so that people working elsewhere will contribute to the national economy.

Tan insists that the whole concept of his institute, and of the others now being formed, reflects the government's strategic thinking and its willingness to take a long-term view of investment in research. The guiding spirit seems to have been Dr Tony Yam, a mathematician who was minister of education from 1980 to 1992.

So when will the institute become the dominant force in molecular research on which Tan has set his sights? It is a great triumph to have won such a reputation in just under eight years. The language of Singapore (English) will help in many subtle ways. So will links with companies outside Singapore. (Glaxo still funds the neurobiology programme it founded, and has more recently financed a centre for natural product research.) And then there is the freedom, especially to travel.

But, at least for some, the isolation is a problem. Planned visits are not a substitute for chance meetings, and there is no chance of seeking help with a problem "by going to the lab upstairs", as one put it. Even ordinary academics at the National University (who might be envious) acknowledge the institute's achievement. An important question for the attainment of Tan's ambition is the degree to which personal networking and the Internet will make up for Singapore's lack of an intellectual critical mass. **John Maddox**