

After more than 20 years working as a senior scientist at Toronto's Hospital for Sick Children, medical geneticist Lap-Chee Tsui is returning to his homeland this month to become vice chancellor at the University of Hong Kong. He shared his thoughts about the move with *Nature Medicine*.

Lap-Chee Tsui

The position of vice chancellor at the University of Hong Kong is the equivalent of president at an American university, an important job indeed. But Lap-Chee Tsui will take the move in his stride. "Everyone has warned me of the complexity of the job and I am aware of it," he says. "It will not be any more difficult than the scientific problems I have been working on."

Born in Shanghai, Tsui obtained his Bachelor's and Master's degrees from the Chinese University of Hong Kong before leaving to pursue a PhD at the University of Pittsburgh. After two short postdoctoral fellowships at the Oak Ridge National Laboratory and The Hospital for Sick Children, he joined the faculty of The Hospital for Sick Children in 1983.

He became head of the hospital's genetics and genomic biology research program and the director of the Center for Applied Genomics and its Bioinformatics and Supercomputing Center. He also helped establish Genome Canada, a not-for-profit corporation that is developing and implementing a national strategy in genomics and proteomics research.

So far the organization has received CAN \$300 million from the Canadian government, which has been used to distribute CAN \$600 million in grants through a system of matching funds.

But it was for his discovery of the cystic fibrosis (CF) gene in 1989, along with Francis Collins (then at the University of Wisconsin) and Jack Riordan (also in Toronto), that Tsui gained international notoriety. "When we discovered the gene we thought it would provide the starting point for therapies," says Tsui, "but we realized we knew little about the disease." Thirteen years later, scientists have a much clearer understanding of the disease, although there is still no cure for the condition because of its highly complex nature.

The *CFTR* gene encodes a channel for chloride ions and although more than

1,000 mutations of the gene have been identified, this only partially explains the variability in disease symptoms of CF. Based on studies of a mouse model, Tsui's group has identified several chromosome regions where potential 'modifier' genes, which influence the disease state, may reside. For example, his team recently narrowed its search for a gene associated with meconium ileus—a severe intestinal obstruction that occurs in about 20% of CF patients—to a 3-megabase region on chromosome 19. "I often tell people that CF is not a single-gene disease," says Tsui, "but neither is *CFTR* a single-disease gene." In fact, Tsui and others have linked *CFTR* mutations to male infertility, pancreatitis and asthma.

Tsui's plans to continue to work on CF at his Toronto laboratory for at least three more years when he moves to Hong Kong, although his other major research focus—an effort to construct an integrated physical and genetic map of chromosome 7—will continue in the laboratory of his colleague and former trainee Steve Scherer.



Harmonizing East and West

Tsui knows he will face quite different challenges when he moves. A major impediment to research is the weak collaborative spirit among scientists and the small research grants. In this climate, it is difficult to pursue large, long-term projects. Tsui's first attempt to "cultivate the collaborative spirit" is going to be through the establishment of a genome research center at the University of Hong

Kong, which will bring together researchers and resources from within the university and other institutes in the Hong Kong region.

Thus far, Hong Kong University has spent HK \$120 million (US \$15 million) on its genome center, one of the signs to Tsui that the time is ripe for change throughout the country's biomedical research community. Hong Kong has just completed a major review of its higher education system. According to a report released in May

by Lord Sutherland, vice chancellor of the University of Edinburgh who headed the review process, a small number of institutions in Hong Kong should be singled out as the focus of public- and private-sector support to enhance the country's capability to compete at the international level. The report also states that the funding of institutions in respect to both teaching and research should be more performance-based.

Under the current system, the government distributes funding among universities based on the number of students enrolled, and only a relatively small amount of money—HK \$500 million or US \$64 million in 2001—is earmarked for research. Thus, in addition to implementing Sutherland's recommendations for performance-based funding, another important goal will be to "tap into private money," says Tsui. Unlike the situation in the US and Canada, very little research money presently comes from private donations. Thus, his aim is to implement changes that will bring Hong Kong's research system more in line with that in Western countries.

Tsui has always maintained close relations with Hong Kong. Since 1994, he has chaired the committee responsible for allocating government funds to biology and medicine research proposals; through this position, he has become familiar with the University's research and with his future colleagues. He also has ties to industry in the region. In 2001, he cofounded Vita Genomics, a Taiwan-based company that conducts genomics research on diseases that are prevalent among Asian populations.

Like many geneticists of his generation, Tsui has helped transform the way research is conducted. "When we were students we worked on projects, one at a time," he recalls. "Today, to be able to compete, you have to do experiments in parallel, you have to get the answers all at once." The faster pace of discovery, which has many driving forces, has made "collaborations essential," says Tsui. And this is the kind of transformation that he will strive to bring to the University of Hong Kong.

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