China needs to boost funding for graduate students to stay competitive

Tony K T Lam

Countless biomedical discoveries have been made possible thanks to the hard work of graduate students. But students in China lack the same breadth of externally funded scholarship programs as their counterparts have in the West. If the Chinese government wants to strengthen its recruitment of elite graduate students from around the globe, it should expand the scholarship programs it offers.

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China's rapidly growing wealth continues to grab headlines, with the country's yearly economic growth hovering in the double digits for much of the last decade. Buoyed by its economic expansion, two years ago China announced a special effort, known as the 'one-thousand-talents scheme', offering a bonus of 1 million renminbi (\$150,000) per person to attract scientists who hold professorships in other countries (*Nature* 457, 522, 2009). There is a clear drive to entice top-tier faculty: just a year ago, BGI, a genomics institute based in Shenzhen, China, ordered 128 massive, high-tech DNA sequencers, creating an impressive infrastructure that any researcher in the world would want access to.

The push for elite research comes at a time when the country faces a real need for new medical solutions: almost half of the 200 million people in the world with type 2 diabetes live in China (*N. Engl. J. Med.* 362, 1090–1101, 2010). Many laboratories worldwide, including mine in Toronto, have research programs that aim to combat this epidemic. These research operations are made possible largely through externally funded granting agencies such as the Canadian Institutes of Health Research (CIHR). Because operating grants typically fund the daily salary of research trainees and staff in North America, the working capacity of a laboratory is greatly enhanced if the salaries of graduate students can instead be externally funded by a scholarship.

I was invited by the Shanghai Jiao Tong University School of Medicine to deliver my first lecture on diabetes research in China at the Twenty-first Century Innovation Forum that took place there back in April of last year. I was subsequently asked back to lecture to the medical and graduate students at the School of Medicine on a regular basis. On the basis of the interactions I have had in Shanghai, I know graduate students there to be extremely studious and motivated. With appropriate guidance and recognition (for example, in the form of a prestigious scholarship), I strongly believe that graduate students from Shanghai will make breakthroughs in many areas of biomedical research, including diabetes. This belief is one of the reasons I continue to train graduate students in Shanghai as well as to collaborate with local professors on experimental diabetes treatments.

As I have become accustomed to the academic training environment in Shanghai, I have noticed that externally funded scholarship programs do not exist for graduate students the same way that they do for students in Western countries. There are a few opportunities for such external scholarships, such as the Roche Diagnostics scholarship of around 5,000 renminbi, but these are very rare. At the Shanghai Jiao Tong University School of Medicine, the usual source of salary money for a doctoral graduate student, as explained by its chancellor, Guo Qiang Chen, is a combination of the supervisor's operating grants, the school itself and the Chinese government. Notably, the School of Medicine has recently decided that the annual salary of first-, second- and third-year doctoral students will be 14,400 renminbi (\$2,200), 33,600 renminbi and 38,400 renminbi, respectively.

Similarly, in Beijing, the annual salary of a doctoral student is averaging around 20,000 renminbi per year and is funded mostly by

the government. However, externally funded scholarship programs are also rare as explained by Youfei Guan, director of the Diabetes Center at Beijing University Health Science Center.

Although this funding support provides an important step toward supporting graduate students in Shanghai and Beijing, it is still far from level with the playing field across the globe and lacks special recognition for elite students. A Big Mac from McDonald's might cost half as much in Shanghai as Toronto, but the cost of living in China is going up, which makes the situation all the more urgent.

In Canada, CIHR has supplied external funding for students through scholarship programs such as the Frederick Banting and Charles Best Canada graduate scholarships awards, which provide C\$30,000 (\$31,000) per year—nearly ten times what students in China will earn. These external scholarships replace the annual salary of doctoral graduate students in Toronto, which is about C\$26,000 per year (similar rates are found in the US) and is provided solely by the supervisor's operating grants. Graduate students who received external awards will not only have an impressive line to add to their resume and earn more than their peers but also allow their supervisors to use their operating funds to hire additional trainees and staff and to run new experiments to further the lab's scientific mission.

In the end, I believe that the most important aspect of having external awards for graduate students is to provide special recognition to individuals who have exceptionally high potential to pursue a career in biomedical research and to encourage and excite these individuals to do so. In fact, the government of Canada recently administered a new additional external funding opportunity for both Canadian and international doctoral students called the Vanier Canada graduate scholarship. This scholarship is valued at C\$50,000 per year, and the main goal of the program is to ensure Canada can attract and retain world-class doctoral students.

Given the current lack of externally funded scholarship opportunities for students in China and the rapid economic growth in Shanghai, I write with urgency to the Chinese government to consider implementing national programs to provide externally funded scholarships for graduate students. The Chinese government has already shown with its one-thousand-talents scheme that it is serious about enticing elite scientists with a start-up package comparable to what they would receive in North America. I encourage the Chinese government to administer a similar externally funded scholarship program to recruit an international group of elite graduate students, who may choose to stay and, one day, take up local professorships. I strongly believe that when China can begin attracting world-class graduate students, the advancement in biomedical research there will increase in an exponential fashion.

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