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## **Challenging convention, benefiting science**

### **Scientist rebuffs China ultimatum, and makes a key find at A&M lab**

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This is a sweet story — literally and figuratively.

The literal: Yongde Luo has spent the last nine years studying sugar molecules and recently made a key discovery about the shape of the surprisingly complex structures. His discovery bodes well for scientists looking for new avenues to attack diseases such as cancer.

The figurative: during those same nine years, the Chinese national also has struggled, through little fault of his own, to obtain a biology doctorate. He had expected to earn it around the turn of the century. But three days before Christmas, Luo finally was awarded his Ph.D. degree from Texas A&M's Institute of Biosciences and Technology in the Texas Medical Center.

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The story begins in 1996. Luo, now 35, had just wrapped up his master's degree studies in China.

The mid-1990s were a time of change in Chinese academics, which had been riven by the Cultural Revolution, which sent many intellectuals to labor camps. Thirty years later, universities still were recovering.

Chinese scientists who survived the revolution sought to send their best graduate students abroad, to

study under colleagues with freer research environments. The Chinese scientists began the program in the early 1980s.

"When I first came from China, I had a good theoretical background, but the facilities are better here," he said.

Luo wound up under the tutelage of Wallace McKeehan, a biochemist at A&M's institute. After studying for three years in the United States, under the program's rules, Luo would earn a doctoral degree from Xiamen University, on the southeast China coast.

In his first year in Houston, Luo had some of his work published in scientific journals, and his path seemed set.

The problems began soon after. Luo's mentor in China, a survivor of the Cultural Revolution, died. His death, and changing leadership in that country's government, prompted Xiamen's leaders to reconsider the exchange program. The country was getting serious about science — in recent years U.S. patent applications by China-based scientists have tripled, and the Chinese government has more than tripled its research funding — and wanted to bring its best young minds home.

Luo was given an ultimatum by Chinese authorities in 2002: he could return to China and receive his doctorate, or forfeit his accumulated work by remaining in the United States.

Luo, whose research into sugar molecules in McKeehan's lab was beginning to produce results, chose to stay.

"Facilities in China have improved," he said. "But in the end, the freedom here to challenge the status quo is more important."

That freedom proved important because Luo's work challenged conventional understanding of the mechanism cells in the body use to signal one another. Sugar molecules play an important role in this messaging system.

Scientists long have thought these complex sugar molecules had variable structures.

Luo's discovery — published this month in the *Journal of Cellular Biochemistry* — is that some of these sugar molecules, in fact, have predictable structures. And if the structures are predictable, it ought to be possible to find or design a drug to target these molecules.

Given that communication between cells is an important way to halt the spread of diseases, it's a fundamental advance in the understanding of the human body that could pay dividends for health care.

For Luo, the benefits are more immediate. After spurning his home country three years ago, he began

taking the required course work to earn a degree from Texas A&M's institute. He finished this semester.

Earlier this week, Luo said he probably will remain in Houston to continue work in McKeehan's lab. The next step for a biomedical researcher often is a postdoctoral appointment to continue research in a senior scientist's lab.

While Luo looks for opportunities in the United States and is seeking citizenship, he didn't rule out a return to China.

That's fine with McKeehan.

"Our hope is that scientists like Luo come here and learn to challenge dogma, scientific and otherwise," he said. "We train them to be free-thinking scientists, and then we send them back to their home countries to change them, for the better."

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