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Innovation

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Blinding Science: China's Race to Innovate

The country is making a move to be a leader in science, medicine, technology, R&D, and energy -- and the government is behind the charge

Looking for the cutting edge of stem cell science? Instead of Stanford or Cambridge or Singapore, consider Shenzhen. That's where Chinese entrepreneur Sean Hu has set up one of the most radical businesses in the field. Hu is chairman of Beike Biotech, a joint venture involving the Shenzhen government, Peking University, and the Hong Kong University of Science and Technology.

Launched last year, Beike specializes in stem cell treatments that doctors in the U.S. wouldn't dare to try experimentally, let alone commercially: taking stem cells from aborted fetuses and implanting them into patients with otherwise incurable diseases.

In the U.S., simply using stem cells from embryos is controversial. That's not the case in China, where regulators are also far more permissive about experimental therapies than their U.S. counterparts. So far, Hu and his doctors have treated more than 100 patients suffering from autism, ALS (Lou Gehrig's disease), crippling strokes, and other severe problems. Now, Hu plans to make Beike a nationwide company with global reach. "We will be able to apply the most advanced stem cell technology and use our network to collaborate with foreign biotech companies," he says.

IT'S A SCIENCE. Hu's ambitions -- and the regulations that allow him to operate -- indicate just how far China is going in its attempt to build a more modern, flexible economy. In Beijing, innovation is the buzzword. President Hu Jintao set the tone in January with his call for China to make the transition from a manufacturing-

based economy to an innovation-based one. Innovation was a major theme at the recently concluded National People's Congress, with the government unveiling its latest five-year plan calling for big increases in spending to nurture innovation.

China is targeting a broad range of sectors, including some controversial areas such as stem cells, gene therapy, and genetically modified crops; and some areas that the U.S. has long dominated, including software, semiconductors, and space exploration. And China aims to become a leader in emerging technologies such as renewable energy sources ranging from solar, hydro, and wind power to fuel cells. By 2050, China intends to surpass the U.S. and become the biggest player in the world of science.

There are many reasons that Beijing wants to push the innovation agenda. One is national pride: As a great nation that was coming up with innovative breakthroughs when Europe was in the Dark Ages, China believes it should be a leader, not a follower. Another reason is national security. The Communist regime doesn't like being at the mercy of foreigners for key technologies.

CALL TO INNOVATE. There are solid economic reasons for China to reduce its reliance on smokestack industries that have devastated the environment and dramatically increased China's consumption of oil. "The leadership has been searching for a new, more sustainable model for growth for some time," says Richard Zhang, a director at McKinsey & Co. in Shanghai. "With innovation, the hope is that the environmental cost will be much lower."

As a result, the government is aggressively boosting the profile of China's scientists and engineers. Top government officials routinely exhort scientists and business leaders to get with the program and become more innovative. In January, for instance, Vice-President Zeng Qinghong spent the day visiting government-backed labs working on agritech and biotech projects and China's space program.

In typical Chinese fashion, the government has unveiled an ambitious long-term plan to build its innovation economy. A big part of the strategy is money: Today, China devotes only 1.2% of its GDP to R&D spending, and the government has announced its intention to boost that figure to 2% by the end of the decade and 2.5% by 2020, with the government pitching in about 40% of the total, and the private sector contributing the rest. By then, China will be spending \$110 billion annually on R&D, putting the country in the same league as the U.S.

and Japan.

PROJECT PROPAGANDA. To their credit, the Chinese recognize that more money alone won't put the country in the major leagues. So the government is also talking about the need to reform the financial and tax systems in order to promote the growth of cutting-edge industries.

The regime is even planning to launch propaganda campaigns to educate the Chinese masses. The Party propaganda department has organized online discussions on the topic, and has put together an "innovation demonstration team" to tour the country promoting the idea. In March, the State Council, China's cabinet, said that improving "people's scientific knowledge is a basic social project in building an innovation-oriented country."

Of course, China faces plenty of obstacles. For instance, the government is throwing money at Chinese-born academics from the U.S., luring them back to China to help boost the country's R&D base. But some are skeptical of the effort. One academic last year published an article in a Beijing newspaper complaining about "irresponsible" foreigners wasting China's money.

MONOPOLY MONEY? China has been suffering through several academic scandals involving homegrown talent, with local professors accused of faking their achievements. One case in the news now involves Chen Jin, a high-flying professor at Jiaotong University in Shanghai who in 2003 led the team that developed China's first locally made digital signal processor. The government is now investigating charges that Chen stole his DSP design from Motorola ([MOT](#)).

Other stumbling blocks include China's notoriously lax attitude toward counterfeiting. At a meeting in Beijing this week with U.S. Commerce Secretary Carlos M. Gutierrez, Vice-Premier Wu Yi said China's innovation economy ambitions require the country to do more to safeguard intellectual property. China may also have trouble staffing all the research labs and start-ups needed to create an innovation economy.

For example, despite having about 1.6 million engineers, only 160,000 of those have the skills required by multinationals, estimates McKinsey & Co. "China has zillions of talented people," says McKinsey's Zhang. "But people with English, who are capable of operating in a global environment, and who have strong technological [skills] are still very limited."

CORPORATE ROLE. One key to the push will be China's state-controlled research labs. Among them is the China Academy of Sciences, a massive collection of research institutes that is the midst of a major expansion and reorganization. By the end of the decade, the government hopes the Academy will be a major incubator for high-tech, and its labs are already at the forefront of Chinese efforts to build the country's biotech and nanotech industries. The Academy's labs are also working to find ways to modernize and commercialize traditional Chinese medicine.

China's corporate sector will play a role as well. Computer maker Lenovo, for instance, last year bought IBM's ([IBM](#)) PC division and last month launched a new line of desktop and notebook PCs in the U.S. with the Lenovo brand name. Telecom gearmaker Huawei has boosted its research spending, and a big R&D center inhabits one of the signature buildings on the company's sprawling campus on the outskirts of Shenzhen.

Huawei's biggest rival, Shenzhen-based ZTE, also recently completed a new R&D complex. Both companies are trying to become leaders in next-generation networks and other advanced telecom equipment. And appliance maker Haier has come up with a washing machine that requires no detergent.

GOOD LOOKS. Plenty of foreign companies will contribute, too. Barely a week goes by without a multinational unveiling ambitious plans to expand its R&D presence in China. On Mar. 24, for instance, German software giant SAP ([SAP](#)) announced its intention to build a Chinese R&D operation. The day before, Motorola, which already has 16 centers in China, announced it was opening yet another, this one focused on wireless technology, in the eastern city of Hangzhou. And Intel ([INTC](#)) recently opened a new R&D center in Shanghai, adding to the 80 researchers it has in Beijing.

These R&D centers are coming out with products that help their parent companies compete globally -- and also help them meet the needs of China's demanding consumers. China may be an emerging market, but its citizens want the latest innovations, says Colin Giles, senior vice-president and manager of China handset business for Nokia ([NOK](#)).

"Chinese consumers pay a lot more attention to the design of products than consumers in other markets," he says. "This is one distinction that we see from the studies in China. Design plays a much greater role in purchase behavior."