

LIFE IN CHINA

Aiming to Conquer Obesity

By BI Weizi

As an emerging hub of high-tech talent, China is attracting an increasing number of esteemed scientists in a wide range of skills. Doctor John Speakman is one of them. He is currently head of the Shenzhen Key Laboratory of Metabolic Health, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences.

Speakman's main areas of expertise are the causes and consequences of changes in energy balance, particularly expenditure-limiting factors, the genetic and environmental drivers of obesity, and the energetic contribution to aging. He recently sat down with *Science and Technology Daily* to discuss his research on these topics.

Interest is the best teacher

Speakman's interest in science was sparked by his early interest in birds. "When I was younger I used to spend a lot of time watching birds," he recalled, adding



Professor John Speakman. (COURTESY PHOTO)

that he would go to the same spot every day to count small wading birds and try to figure out what factors were affecting their numbers.

After graduation from high school, Speakman enrolled at the University of Stirling in Scotland, where he was able to study wading birds for his undergraduate project and went on to complete his PhD. It was there that the idea of seeking a career in science was cemented in his mind.

Why do we get fat?

By studying wading birds Speakman acquired several techniques that he has been able to apply to more applied health related issues in humans - particularly obesity. Obesity is a major health hazard in the modern world. Why do people become fat? How do we prevent them from becoming fat? What's the relationship between energy expenditure and energy intake? These are the areas in which Speakman has taken his research in the past years. "One suggested reason behind obesity is that it's a gradual reduction in our energy expenditure as we develop as a society. We do less and less. We don't have to hand wash our clothes anymore. We don't have to walk 10 miles to get things. So as we developed, there's less and less incentive for us to expend energy," he explained.

However, while there are lots of anecdotes about reducing our expenditure, there is very little data. Speakman has been compiling data on this issue and the surprising result is that expenditure on physical activity has not declined over time. People nowadays expend the same amount of energy as people did in 1990.

"So it seems that the main problem then is something to do with our food. There's something in our food or something about our food that makes us eat more. We have too much energy coming in. We have to put that energy somewhere, [so] we store it as fat."

Many experiment results conducted by Speakman and his team revealed that fat contents of the food we eat is a key element related to energy density. In order to fight against the obesity pandemic, which is a result of prolonged energy imbalance, a healthier lifestyle of eating less fatty food is promoted by scientists. By contrast Speakman suggests increasing physical activity will be much less effective for weight control. "Being

more active is great for your health, and you should do it, just don't expect it to solve your obesity issue if you have one," he said.

China's attractive research environment

Speakman came to China in 2011 when he was successfully appointed on a talents program in Beijing. By that time he had already been coming to China every summer and most winters for about five years, during which his extensive traveling experience around the country provided him with a more comprehensive perspective on local customs and practices and opportunities to try authentic Chinese food. "Both my wife and I really enjoy going to restaurants. When I was in the UK we went out once or twice a week, but now [in China] we go out maybe three or four times a week. It seems that we are on holiday all the time."

But he didn't just come to China for the excellent cuisine, the main reason motivating Speakman to come to China was the research environment. According to him, the Chinese Government is attracting experts to move to China to experience the advantages of doing research in the country.

"The funding level is much higher [in China] than it is in the UK. The success rate to get grants is [also] much higher than it is in the UK. I'd already had lots of contact with Chinese researchers before I came here. So I kind of knew there are lots of talented people here, and I was looking forward to collaborating with them and doing a lot of interesting research," he said.

Since 2011, he has established a world-class metabolic research platform and undertaken several major research projects in China, making breakthroughs in human and animal energy metabolism and evolutionary mechanisms of obesity.

Meanwhile, he has led and participated in many international collaborative research projects and promoted the leap of China's research level in the field of energy metabolism research.

For his hard work and contributions to China's development Speakman was awarded the Chinese Government Friendship Award in 2021. He was overjoyed to receive the award, saying it would encourage him to make even greater efforts with his research so as to bring real benefits to the people.

The Global Nature of Science, Technology and Innovation

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Dr. Kissinger believes that a conflict between China and the United States can have no winner. The two sides should strive to build a candid bilateral relationship, avoid mutual threats and conflicts, and work together to improve bilateral relations and coexist peacefully. I strongly agree with Dr. Kissinger on this point.

When we met in September, he expressed his concerns about the risks and negative impacts of the rapid development of artificial intelligence and other emerging technologies. He supports China and the United States participating in dialogue and cooperation regarding the ethical regulatory management of those technologies.

Montgomery: Diplomatic initiatives can help to foster international scientific collaboration and strengthen scientific capabilities worldwide. These efforts are instrumental in addressing global challenges such as climate change. Can you elaborate on China's diplomatic priorities in working with the United States and the international community to find science-based solutions to these shared problems?

Ambassador Qin: Confronted with the pandemic, China has shared information and experience and strengthened international cooperation in the joint R&D for vaccines, treatments, and testing. China has provided more than 1.8 billion doses of vaccines to more than one hundred countries and international organizations, and the total number of vaccines we provide for the world this year will reach two billion doses. China has partnered with thirty countries in the Initiative for Belt and Road Partnership on COVID-19 Vaccines Cooperation to promote the fair international distribution of vaccines. We hope that China and the United States will strengthen their scientific and technological cooperation to help the world overcome the pandemic as soon as possible.

Climate change is a common challenge to mankind, and all countries need to work together to address it. As

the world's largest developing country, China has adopted a host of strategies and actions on climate despite economic and social difficulties. These efforts have paid off. President Xi Jinping recently announced that China is striving to reach peak CO₂ emissions before 2030 and carbon neutrality before 2060.

There is much room for China-U.S. cooperation regarding climate change. In both countries, fossil fuels account for more than 80% of energy consumption. Both are also transitioning to renewable energy faster than any other countries in the world, and are looking for advancements in clean energy technologies. The U.S.-China Clean Energy Research Center (CERC), a typical example of bilateral research cooperation, has produced many mutually beneficial achievements in the past decade. The project has been suspended, but we hope to find a new model of cooperation regarding clean energy.

Montgomery: In the past few decades, China has significantly increased its international scientific collaborations, including a focus on South-South collaboration with S&T programs in Africa, South Asia, and Latin America. How are these international scientific engagements advancing China's diplomatic objectives in general and in the Global South specifically?

Ambassador Qin: South-South cooperation is an essential means for less-developed countries to help each other and develop together. China is always prepared to work with other developing countries on scientific and technological exchanges.

I would like to highlight three measures that we have carried out. First, we share with these countries mature and applicable technologies, putting them to local use to boost those countries' economic development. Second, we have established joint laboratories with them, conducting joint research in agriculture, radio and television, clean energy, and more. Third, we hold training classes on applicable technologies and carry out exchanges among young scientists. With the implementation of the Belt and Road

Science, Technology and Innovation Cooperation Action Plan, we have supported over 8,300 young foreign scientists to work in China. We have established thirty-three joint laboratories and five technology transfer platforms with less-developed countries, as well as science parks with eight of them.

One exciting example is China's cooperation with the Comoros, an island country in East Africa, to fight malaria. Mohéli, the Comoros' smallest island, had suffered from malaria for years. When the Comoros sought to cooperate with China to fight the disease, the medical professionals of our two countries agreed to use Artequick, a Chinese-developed artemisinin-piperazine tablet. Within five years (2008-2013), the annual incidence of malaria in Mohéli dropped by 95% and the death rate fell to zero. The research on using artemisinin to fight malaria was initiated by a Chinese female scientist, Dr. Tu Youyou, in 1969, who shared the 2015 Nobel Prize in Physiology or Medicine with two other scientists.

Montgomery: You served as the head of the information office of the Chinese Foreign Ministry. What advice would you give to scientists who want to communicate their research and findings more effectively to the diplomatic community and the public?

Ambassador Qin: We have much to learn from the popularization of science in the United States. For example, *Science* magazine, published by the AAAS, does an outstanding job. In addition to scientific research papers, each issue of the magazine includes short stories on current affairs regarding scientific areas such as quantum mechanics, black holes, and artificial intelligence.

My impression is that when scientists communicate scientific information to the public, the difficulty of the concepts and complexity of the data create some barriers. For example, it is difficult for the public to understand the concepts of 1.5 °C and 2 °C of global average temperature rise, as described in the Sixth Assessment Report of the IPCC. These abstract concepts should be illus-

trated through real-life scenarios. For instance, scientists could explain that if the temperature rise exceeds 1.5 °C, some natural disasters which used to happen once in a century will likely occur every year. This explanation will make the temperature rise easier to understand and could help increase support for action.

Montgomery: China is a vast and diverse country. When travel is more feasible, what destination highlights would you recommend people to see when visiting China, particularly if they are interested in science and technology?

Ambassador Qin: China is a vast country, with immense geographic and cultural diversity and time-honored historical traditions.

If you are interested in the Chinese scientific achievements of the past, I would recommend the ancient observatory in Beijing and the Dujiangyan irrigation project in Chengdu, Sichuan Province. Dujiangyan was built in 272 BC. I have been there myself, and have seen how it is able to control the river and use the floodwater for irrigation. It is amazing that the 2,000-year-old project is still running today. If you are interested in something modern, the "Sky Eye" (Five-Hundred-Meter Aperture Spherical Radio Telescope, FAST, one of the largest in the world) in Guizhou, the Jiuquan Satellite Launch Center in Inner Mongolia and the remote sensing satellite ground station in Hainan can give you a good idea of China's scientific achievements in current times.

Of course, I would also recommend metropolises such as Beijing, Shanghai, and Shenzhen, which are home to many well-known universities, research institutions, and high-tech enterprises.

As Chinese ambassador to the U.S., I warmly and sincerely welcome you and the American people to visit my country. With its long history and a vibrant future, and the perfect blend of art and science, China will not let you down.

Source: Embassy of the People's Republic of China in the United States of America

Letter to the Editor

The Engineering Behind Gelato-making

By Andre Slawik

In 2006 I was working in the construction industry in Germany when I got the opportunity to interview for a job as a construction manager for the company's branch office in Shanghai. I applied for the position and was successful, moving to China in January 2007.

On the way over I started to get anxious as I was not sure what to expect when I arrived with just my passport and a suitcase filled with winter clothes. The size of the airport shocked me and I wondered how my driver would find me. It needn't have worried as he was waiting at the arrivals hall with my name on a signboard. It was at that moment that I fell in love with China and felt I should have come much earlier in my life.

During my first few years in China, from 2007 to 2014, I worked as a construction engineer and project manager on the outskirts of Shanghai, Beijing, Yinchuan and Nanjing. Construction work takes place much faster here in China. The labor force is incredibly large but there needs to be more checks and quality control.

When the financial crisis began in 2014, I returned to Germany and worked in my old company office. There I noticed how different the construction work in Germany was. For example, Chinese projects were handled by 20 engineers, whereas in Germany we need 3 times more than that. So, it was not a surprise that I took the first good offer available to head back to China which I was missing so much. Five months after returning to Germany, I got an offer from another German company in Beijing with a high-rank position.

I lived in Beijing from 2007 until 2008 and I loved the art scene there. I usually spent my Sunday afternoons, which was my only day off, walking around the hutongs (narrow alleyways in the old parts of the city), which was always a delight. I really love Chinese food, as the delicious tastes range from spicy to sweet and sour. Additionally, I love how nice and friendly the people are, even if a person can't communicate in German or English, they are willing to listen, help and become your friends.

At the end of 2016, I had to leave the construction company that I had

joined in 2014 due to some internal issues. However, I decided to stay in Shanghai for an extra year developing an ice-machine to produce a special type of ice. By then, I had decided to set up my own business and decided to start making gelato (a type of ice-cream), which I had become very interested in. In 2016, I moved to Xiamen to be with my girlfriend and started to work on my project called "Papa Gelato," which was the name I gave my slightly risky shop concept.

Unfortunately, due to circumstances beyond my control, I only started work on getting the correct business documents and licenses in 2018. Then in 2019, I had to postpone the process until the beginning of 2020. That year, my girlfriend went home to Malaysia for Chinese New Year and in the meantime I continued to search for a suitable shop location. Then the pandemic and the lockdown happened and once again I had to postpone my plans.

However, something great happened during the pandemic outbreak, my girlfriend got pregnant and our first baby arrived in December 2020. It was the best thing that could ever happen to us during the pandemic.

The birth gave me the motivation to continue with my gelato project. In February 2021, I again went in search of a suitable shop location and finally after a few weeks found a place and started creating my dream in March. Most of the renovation work was completed by the end of July. In August 2021, Papa Gelato opened for business in Xiamen.

There is a secret formula to making gelato that nobody will tell you unless you buy a gelato company or find out by yourself. It requires lot of experimentation, and exact calculations are needed to find the right balance of ingredients. So, after (only) 4 failures I found my secret recipe! It's always different when I start making new flavors, hoping that the customers will love it. Listening to them gives me new ideas for further flavors. It is thanks to all my supporters and family that I embarked on this challenging gelato journey. Nothing feels better than putting a smile on a child's face when they eat gelato.

Andre Slawik is a former technical manager in construction and current gelato maker.

Photo News

Sci-tech Sparks the Vitality of Traditional Culture

The Youth Works Exhibition on Cultural Confidence and Sustainable Development - Tiangong Xiwu was held on December 19, which was jointly sponsored by Science and Technology Daily and the Palace Museum. It is the first time that the youth works were showcased in the Forbidden City.

This activity aims to encourage young people to use modern science and technology to stimulate history and culture's inherent vitality constantly so that traditional Chinese culture can be kept vibrant and innovated.



The teenagers participate in the event of Youth Works Exhibition on Cultural Confidence and Sustainable Development in the Palace Museum. (PHOTO: Zhou Weihai from S&T Daily)