

Dialogue

# Science: An Impressively Unifying Language

By Staff Reporters

Professor Diana Boraschi, a senior member of National Research Council of Italy, serves as the director of the Laboratory of Inflammation and Vaccines at the Shenzhen Institute of Advanced Technology of Chinese Academy of Sciences (SIAT-CAS). Recently, Boraschi spoke to *Science and Technology Daily* to tell the stories behind her work and share her views on international cooperation.

**S&T Daily:** As an immunologist, your research field is closely related to human health. Could you share more information about your work?

**Diana Boraschi:** I study the mechanisms used by our immune system to recognize and attack infectious agents. I want to find the mechanisms that do not properly function in old people or people with diseases. What I wish to do is to set up a test. My test should be simple and tell each of us if our immunity is strong enough to fight future infections or whether we should be very careful and take preventive drugs because our immunity is weak. I study, in particular, the part of immunity that is not specific, meaning that it works against every type of infection. It is called innate immunity. We also call it inflammation which is a very efficient protective immune mechanism. Thus, remember, inflammation is good, and fever is good because it helps us fight infections in the most efficient way. We only need to take drugs when it becomes too high (over 39 degrees).

**Is there any specific example you can give to describe your work?**

Let's make the example of COVID-19, an infectious disease that all of us know. It is a virus that has developed a very efficient way of infecting our cells (in particular in the lung, since the virus enters by breathing). Our immune system is very good at recognizing viruses and virus-infected cells and therefore, it immediately starts a defensive reaction to eliminate them. The immune reaction is potent and can cause us discomfort. For instance, fever is important because the virus does not live well at high temperatures, and loss of appetite is also important to cut down the energy supply to the infective agent. However, the reaction is so potent to some individuals that it can cause more severe damage.

We now have vaccines for this virus, which have been produced in record time, so quickly [in fact] that we did not have the time for a thorough evaluation of their protective efficacy. Besides, the virus variations may decrease vaccine ef-



Professor Diana Boraschi. (COURTESY PHOTO)

ficacy. Thus, to be on the safe side, we should repeat the vaccination periodically (as we already do for flu) and, most importantly, increase vaccination of the most susceptible people. The elderly (over 65 years old) and people with chronic diseases, such as immunodeficiencies, cancer and infections, have weak immunity and therefore get sick more easily.

**How would you explain, to the general public, the significance of your research, and do you have any advice on better conducting effective science outreach programs?**

Explaining science to the general public is one of the activities I like best. It is also a very important duty of scientists to communicate with the public. I am an immunologist who studies how our body is able to fight diseases and keep healthy. This helps me understand why and how, in some cases, our immune defenses fail, and we get sick. Knowing why and how opens the possibility of correcting mistakes and finding a cure for the disease.

I think that many people do not understand science simply because scientists fail to communicate well. We work for the people, not for ourselves, and it makes no sense that we do not talk to people and people do not understand what we do and why.

When I was in Italy, my home country, I regularly told scientific stories to school kids. The younger generation is inquisitive and very open. I never received so many questions, and even very clever and logical questions, as I got from youngsters. I think we should start talking about science to children so that they grow up liking and trusting science

and, maybe, even deciding to engage it personally. Unfortunately, I can not do this here in China because I can not speak Chinese and this kind of communication must be done in the local language that people feel comfortable with.

**What motivated you to come to engage in further research at the SIAT?**

As an experienced scientist, I had a long and fruitful career, and have worked in several countries and regions, having academic and industrial expertise. Science for me has no borders and no limits. Coming to work at SIAT was only natural because of the exciting challenges of a fast-growing and vibrant society. What I have found in SIAT is a very lively environment, with much emphasis on technological innovation. This is very good for me. Technological innovation allows scientists to perform fundamental research much faster and more precisely, compared to a few years ago. The incredible advantage I see in my research here is that I can explore all the secrets of immunity by exploiting the most innovative and advanced technologies.

**Is there anything that stands out, particularly from your research at SIAT?**

I have a reverent respect for science and knowledge, and my approach to every problem is accurate and thoughtful. I am impressed by the attitude of my young students. I always want to predict future problems and design my studies accordingly while they first go and then see whether there might be problems. The difference in the approach is huge, but the fact that we can work together allows us to get the best of both approaches.

Though I do not really have a complete picture of research and innovation

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in China, what I can only tell from my direct experience in SIAT is that, this is a truly exciting period of fast development.

**In the current context, what are your expectations of international collaboration in the sci-tech sphere?**

I firmly believe that science has no borders and that sharing knowledge is the basis for the progress of humankind as a whole. Nowadays, with the strong commercial and industrial interests behind some technologies, there are restrictions to such sharing in many scientific areas. Cooperation is nevertheless possible in many sectors of research and development. I am involved with activities for the internationalization of Chinese vaccines and, in general, sharing vaccine technologies among countries worldwide. It is not easy, again, because of the need for commercial and political agreements, but it is possible and should be pursued.

International collaboration is, in my opinion, the basis for progress. Collaboration means mutual understanding in a joint effort to solve common problems. I never had difficulties in discussing and working on scientific problems with scientists from any country in the world. We may have different cultural backgrounds, habits and ways of interacting, but science is an impressively unifying language. Besides, a great advantage of international collaboration is knowing people with different cultures and traditions. I believe that knowing each other may help people to co-exist in peace. I see scientific collaboration as the first easy step in this direction.

*This article is also contributed by SIAT-CAS.*

## China's Amazing Decade

### My China Story

By Jonathan Miles Adams

This is a brief account, written from my heart, of my experience in China. It is a journey that centers around the beautiful city of Nanjing and the university that has done so much to make my family and I feel welcome. I wish all my friends and colleagues in Nanjing and elsewhere in China, a happy new year and a bright fresh start to their lives as the dark clouds of the pandemic finally lift.

My experience in China has been centered around its ancient capital, Nanjing, but it parallels the story of China as a whole. My first visit to Nanjing was in 2012, when I was a professor working for a university in South Korea. Up until that point, China had been a vast and mysterious land to me. Growing up in England, it had once seemed impossibly far away from me, but now from Seoul it loomed large, just across the Yellow Sea, beckoning me. Though quite honestly I already knew of China's progress from all the media reports, my subconscious could not shake the stereotypes I had built about the country from my childhood.

But when I saw Nanjing for the first time, I finally realized how far China had come. Everywhere across the downtown city, elegant glass skyscrapers had risen, flashing their beautiful colorful designs and indecipherable Chinese characters. Expensive boutiques filled huge gleaming malls, and elegant young people walked on the streets. The roads seemed crammed, not with creaking bicycles but with luxury brands of foreign cars. Now, even my stubborn subconscious was able to move on, convinced that China had changed.

Exploring Nanjing further, I found its tranquil parks, a large beautiful lake, the well-preserved old districts and the imposing city walls. I began to grow very fond of this carefully balanced mix of old and new and marveled at how it was possible to step from the modern world to past centuries, and back again, within the space of a few minutes.

The visits to the Chinese Academy



Professor Jonathan Miles Adams (first from the left) and his families. (COURTESY PHOTO)

of Sciences (CAS) that had first drawn me to Nanjing grew more and more frequent. Science in China has begun its rapid rise, and the collaborations were fruitful. In 2016, I came to spend a sabbatical year in China on a CAS fellowship. In 2019 I took up the offer of a professorship at Nanjing University - moving to the city with my Chinese-speaking wife and our youngest daughter.

My fondness for Nanjing eventually got the better of me, and to my surprise and delight, I discovered that little coffee shops had by now sprung up almost everywhere, serving lattes and flat whites as good as any in a Western country. Good bakeries had also multiplied across Nanjing, satisfying my craving for crusty loaves. Cleaner streets and fresher air made this city more lovely to live in.

Meanwhile at work, my research lab is thriving, well supported by my university and filled with the bright young people who have come to work with me. Our research network has extended across China, linking up with new friends and collaborations in every corner of the country. Here, I find many scientists are keen to work together, and the results of these collaborations are particularly effective. Our success has integrated and become part of the rise of China as new science superpower.

*Jonathan Miles Adams comes from Britain, and is a professor at School of Geography and Ocean Science, NJU.*

*Source: NJU GLOBAL*

## Service Info

# Palace Museum Gets New Branch

By Staff Reporters

Beijing's Forbidden City served as China's royal residence during the Ming and Qing dynasties, from 1420 to 1911. In 1925, it became a public museum known as the Palace Museum. Because of its numerous cultural legacies, it has gradually become one of China's most renowned and crowded tourist destinations.

Over 1.86 million cultural artifacts are currently housed in the museum. Due to space and environmental constraints, only 10,000 artifacts can be displayed to the public at any one time.

After nearly a decade of planning and designing, construction on a new northern branch of the Place Museum commenced on December 30, 2022 and is projected to be completed in 2025. It is situated in the northwest of Haidian District, Beijing, approximately 30 kilo-

meters from the Forbidden City.

Once completed, the new branch will comprise 12 exhibition rooms totaling 35,000 square meters, which will be able to display up to 30,000 objects every year.

The northern branch's function is not only restricted to the exhibitions.

"The construction of the northern branch is the most important factor in resolving the museum's safety issues, including the safety of cultural relics and ancient buildings, the safety of visitors as well as the movable cultural relics," said Du Haijiang, deputy director of the Palace Museum.

Du also highlighted that not all relics will be stored in the new branch's warehouses. Based on their nature, these cultural relics may be placed in different locations.

In addition, the new branch campus will feature a "cultural relics hospi-

tal" where visitors can observe the restoration process in a "more open" setting, according to Du. A platform for interna-

tional artifact restoration and a workshop for intangible cultural heritage will also be established.



The picture shows a panoramic view of the Palace Museum in Beijing. (PHOTO: VCG)

## Facts About Trans Fat

### Science Outreach

By Staff Reporters

A new WHO status report finds that five billion people worldwide remain unprotected from harmful trans fat, which increases their risk of heart disease and death.

**What are trans fat and where is it from?**

Trans fat is an unsaturated fat. There are two main types of trans fat found in foods: naturally occurring and artificial trans fat. Naturally occurring trans fat is produced in the intestines of some animals, and foods made from these animals may contain small amounts of these fats. To extend shelf life and improve the texture of some foods, artificial trans fat (or trans fatty acid) is produced in industrial processes, where hydrogen is added to liquid vegetable oils.

**Which foods contain trans fat?**

Trans fat can be found in many foods - including fried foods, such as donuts, and baked goods, including cakes and cookies. You can determine the amount of trans fat in a particular food by looking at the Nutrition Facts label on the packaging, or by reading the ingredient list and looking for the ingredient called "partially hydrogenated oil."

**How does Trans Fat affect your health?**

Your body does not need or benefit from trans fat. Eating these fats may increase your risk of ill health.

**Cardiovascular disease risk:**

- Trans fat raises your LDL (bad) cholesterol.
- It lowers your HDL (good) cholesterol.
- High LDL along with low HDL levels can cause cholesterol to build up in your arteries (blood vessels), therefore increasing your risk for heart disease and stroke.

**Weight gain and diabetes risk:**

- Many high-fat foods such as baked goods and fried foods contain a lot of trans fat.
- Consuming large amounts of trans fat can lead to unwanted weight gain, therefore increasing the risk of diabetes, heart disease and other health problems.

**How to limit the intake of trans fat?**

Read food labels, choose foods that are low in trans fat, and avoid foods produced with hydrogenated vegetable oils or fats. Avoid using hydrogenated oils and animal fat in cooking and food preparation. While cooking, high-temperature oil and repeated frying should be avoided.

Your dietary plan should emphasize fruits, vegetables, whole grains, low-fat dairy products, poultry, fish and nuts. Also limit red meat and sugary foods and beverages.