

INSIGHTS

Fostering Sustainable Forest Growth

Voice of the World

Edited by TANG Zhexiao

Climate change is making forests more vulnerable to hazards such as wildfires, pests and diseases, and extreme wildfires could become 50 percent more frequent by this century's end, with current annual damage affecting 340 to 370 million hectares globally.

This was among the observations made in the report *The State of the World's Forests 2024* recently released by the Food and Agriculture Organization (FAO) of the United Nations.

The report highlights the state of the world's forests and calls on forestry divisions worldwide to increase technological innovation for the protection of forests and sustainable utilization of forest resources.

It explores the transformative power of evidence-based innovation in the forest sector and presents 18 case studies worldwide, illustrating diverse ways in which innovation in the sector can bring about positive change.

"Innovation must be scaled responsibly to maximize the contributions of the forest sector to agrifood systems transformation and other global challenges," the report said.

Key role in sustainable development

Forests cover 31 percent of the world's land area and are the habitat of most terrestrial organisms. They



Tourists and trail runners climb mountains in Zhangjiakou, north China's Hebei province. (PHOTO: VCG)

also provide food, fuel, fiber, medicines, wood and non-timber products to millions of people, and help regulate the climate and protect the ecological environment, said Wu Zhimin, director of the FAO forestry division. Wu also said forests play an important role in the global sustainable development agenda.

In 2023, wildfires caused approximately 6.687 billion tons of carbon dioxide emissions globally. The Northern Hemisphere saw a record increase in wildfires, with over 6,000 blazes burning 14.6 million hectares in Canada alone, more than five times the average over the past 20 years.

Climate change also makes forests

more vulnerable to invasive species. It is expected that by 2027, pests and diseases may have a devastating impact on forests in parts of North America.

"Our climate future is rooted in North America's forests," said the Natural Resources Defense Council, an America-based non-profit international environmental advocacy group.

Deforestation on downward trend

Although global forest protection faces a series of challenges, various countries have also achieved positive results in forest protection, restoration and sustainable use in recent years.

Global deforestation is on a downward trend. From 1990 to 2000, the annual global deforestation was 15.8

million hectares; from 2015 to 2020, this dropped to 10.2 million hectares.

Also reforestation in some countries continues to expand. From 2010 to 2020, China, Australia, India, Chile, Vietnam, Turkey, the U.S., France, Italy, and Romania became the top 10 countries with annual net increase in forest area. China has created the world's largest planted forests, with its forest coverage rate doubling from 12 percent in the early 1980s to 24.02 percent in 2023, becoming the main force in global greening.

China's 40-year, billion-tree project is a lesson for the world, according to the *Australian Financial Review*.

"A combination of planting trees also provided an effective way for our country to solve ecological issues and to preserve the water and soil," said Mashudu Silimela, the agriculture counselor at the South African embassy in Beijing.

Dennis Francis, 78th president of the UN's General Assembly, called forests vital for the lives and livelihoods of people around the world. The global community should take action to protect forests and other ecological resources, Francis said.

Science and innovation are the keys to solving forestry problems, according to Qu Dongyu, the ninth director-general of FAO. The report will provide a reference for FAO's work, promoting innovation activities in the forestry sector based on reality and enhancing the sustainability and defense capabilities of the agrifood system, Qu added.

IUSTC International Union for Science & Technology Communication

China's ICGEB Research Center Makes Quantum Leap

By Staff Reporters

In July, the International Centre For Genetic Engineering and Biotechnology China Regional Research Centre (ICGEB China RRC) published two groundbreaking research articles in prestigious international journals, marking a significant achievement for the young scientific center located in China Medical City, Taizhou, south coast Jiangsu province.

The two articles on studies were made under the leadership of Prof. Yang Yili, an expert in the field of immune cell biology.

The first study, published in *Cell Reports* journal, uncovered novel mechanisms involved in the endoplasmic reticulum (ER) stress response. This research marks a major milestone as the first article produced by the ICGEB China RRC since its establishment.

The study focuses on the PERK-SRP14 axis, revealing that SRP14, a crucial component of the signal recognition particle (SRP), is significantly reduced in cells undergoing ER stress.

This reduction is dependent on the PRKR subbranch of the ER stress response and is shown to be a protective measure that mitigates ER stress by temporarily reducing the translocation of newly synthesized proteins into the ER lumen, thus alleviating the ER burden and promoting cell survival. The research, primarily conducted by Dr. Gu Yuexi and other RRC researchers under Prof. Yang's supervision, is also the output of a project funded by the National Natural Science Foundation of China (NSFC), focusing on anti-colorectal cancer strategies.

The second study, published in *Nature Communications* (impact factor: 16.1), is a collaborative effort between the ICGEB RRC and Prof. Liu Yijing from Nankai University. This research

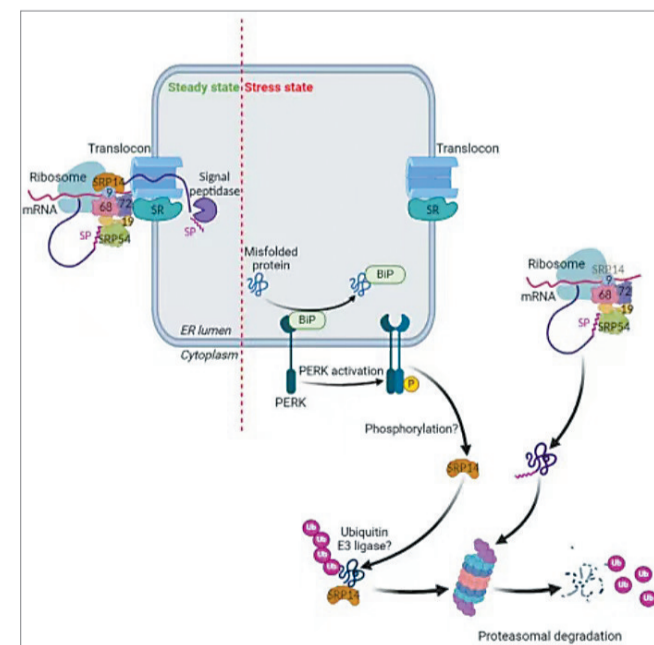
elucidates the structure and functional mechanism of a modified hammerhead ribozyme, known as a pseudoknot (PK) hammerhead ribozyme.

Unlike traditional hammerhead ribozymes, this PK variant preserves its unique mechanistic properties, while demonstrating enhanced activity under standardized conditions. The research, carried out by Dr. Zhan Xuelin at the RNA Technology and Vaccine Research Laboratory of the RRC, underscores the ribozyme's potential for significant therapeutic and biotechnological applications.

Looking forward, the ER stress research team at ICGEB China RRC plans to further investigate the mechanisms behind SRP14 down-regulation under ER stress, with the long-term goal of developing novel therapeutics for diseases caused by dysregulated ER stress responses. Meanwhile, the ribozyme research team will leverage synthetic biology to develop efficient and high-precision detection platforms for vaccine capping efficiency, and will also explore diagnostic product development and ribozyme drug research.

The ICGEB China RRC, established in September 2020, is a non-profit entity jointly founded by ICGEB, the China National Centre for Biotechnology Development (NCBD), and China Medical City (CMC).

The Centre aims to integrate technological innovation and industrialization, becoming a hub for "technological innovation and transfer," "industrial transformation demonstration," "talent training," and "drug development." With a focus on vaccines, biotherapeutics, and novel diagnostic methods, the RRC seeks to promote scientific cooperation and technology transfer between China Medical City and ICGEB member states, contributing to global scientific advancement, particularly in the Asia-Pacific region.



PERK-SRP14 axis mediates translocational attenuation by degrading SRP14 under ER stress conditions. (PHOTO: ICGEB China RRC)

Opinion

A Frontrunner in Green Energy Transition

By TANG Zhexiao

China approved five new nuclear power projects across five coastal provinces of Shandong, Zhejiang, Jiangsu, Guangdong and Guangxi Zhuang autonomous region on August 19.

The five projects involve 11 nuclear power units, which utilize a mix of China's self-developed third and fourth generation nuclear technologies, with total investment expected to surpass 240 billion RMB, according to the National Energy Administration (NEA).

It is "a record amount of permits as the government leans even more heavily on atomic energy to support its push to cut emissions," according to Bloomberg.

In 2022 and 2023, 10 nuclear power

units were approved within each year in China, striving to accelerate the process of decarbonization. With the approval of domestic nuclear power projects progressing steadily, analysts said the country is revving up nuclear power construction as part of its transition to green and low-carbon energy.

Last year, China's nuclear power units generated 433.4 billion kWh of electricity, ranking second in the world. It accounts for 4.86 percent of the country's power generation, reducing carbon dioxide emissions by approximately 340 million tons annually.

China added new clean energy generation in the first half of 2024 equivalent to the UK's entire electricity output in the same period last year, according to *The Guardian*.

If renewable energy continues to displace coal power generation, 2024 emissions could continue to decrease, potentially making 2023 the peak year for China's emissions, said Qi Qin, an analyst at the Centre for Research on Energy and Clean Air think tank.

China is a frontrunner in green energy transition and an action-taker in addressing climate challenges.

As of the end of June 2024, the country's installed capacity of renewable energy power generation has exceeded 1.65 billion kilowatts, accounting for 53.8 percent, with installed capacity of wind power and photovoltaic power generation exceeding that of coal-fired power, according to the NEA.

Moreover, the latest data from the China Association of Automobile

Manufacturers shows that sales of new energy vehicles in China overtook conventional fuel autos for the first time ever in July, accounting for more than half of all units sold during the month.

China is installing record amounts of solar and wind, according to the Australian Broadcasting Corporation, "While Australia is falling behind its renewables installation targets, China may meet its end-of-2030 target by the end of this month."

Given that the latest figures have shown and reinforced the trend that China's racing ahead in renewable energy, "It is a transformation that analysts are saying could be the world's best hope yet of staving off climate catastrophe," said *The Guardian*.

Experience Economy Emerges as New Growth Model

By Staff Reporters

As Chinese consumers' preferences for culture and tourism become more diverse, the "experience economy" is flourishing in China. This concept originates from the book *The Experience Economy* by American scholars Joseph Pine and James Gilmore. They argue that the "experience economy" is an extension of the service economy, emphasizing the satisfaction of customers' emotional needs and focusing on their psychological experience during the consumption process.

In the past two years, Chinese tourists have shifted from traditional sightseeing to seeking deeper, more personalized travel experiences. The age structure of Chinese outbound tourists is also changing, with young people, especially those born in the 1990s and 2000s, emerging as a driving force of the market. Travel agencies are now viewing trips with friends, family tours, and couples' getaways as the most promising segments.

Vineyards in Ningxia in northwestern China, for example, are creating memorable experiences for visitors. Ningxia's Chateau Hedong produces about 250,000 bottles of wine annually and has excelled in creating a tourism space. The winery offers experiences ranging from train rides through the vineyards to lodging in rooms converted from old trains, all designed with the visitors' comfort in mind. This innovative atmosphere attracts tens of thousands of visitors each year.

Companion services cater to emotional needs, a type of consumption particularly popular among young people in China. These services include shopping companions, chat companions, and gaming companions. Zhang Yi, chief analyst at iMedia Research, noted that the core of these companion services is meeting consumers' emotional and psychological needs. As the younger generation ages, the demand for such services is expected to grow further.

How has the experience economy gained traction in China? A series of gov-

ernment initiatives to boost consumption, alongside improvements in supporting services across various cultural, tourism, and entertainment industries, have provided fertile ground for its growth. Local governments across China are capitalizing on the experience economy trend by sponsoring new cultural and sports events to attract tourists and stimulate local economic growth.

The "village super league" in Rongjiang County, Guizhou province, also known as "Cun Chao," is a case in point. This event combines football matches, ethnic music and dance, and fireworks displays into a carnival-like experience.

Between May 13, 2023, and June 30, 2024, the "Cun Chao" series attracted 11.69 million visitors, generating 13 billion RMB in tourism revenue. The local government is now investing in projects like leisure vehicle parks and camping bases while advocating for more high-speed train services and the construction of additional football fields.

The consumption boom driven by the experience economy is influencing

many related industries. For example, in the coffee industry, the "coffee craze" is leading the transformation of metropolitan culinary leisure activities, with more and more Chinese exploring coffee shops, searching for new coffee flavors, and obsessing over tasting uniquely flavored coffees. This phenomenon suggests that China, with its large base of potential consumers, is poised to become a new driving force in the global coffee industry.

The personalized and diversified consumption demands of the cultural and tourism industries are propelling the development of China's tourism sector. The World Economic Forum recently released its 2024 Travel & Tourism Development Index, in which China ranks eighth globally in promoting tourism development, making it the only developing economy in the top 10. This ranking not only showcases China's success in creating a favorable tourism environment but also highlights China's growing potential as a major international tourist destination.

China, Brazil Sow Seeds of Success

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Chinese experts shared the benefits of agricultural mechanization knowledge with local farmers.

In recent years, Chinese agricultural machinery and agricultural solutions have gradually been favored by the Brazilian market and helped Brazilian farmers improve their productivity. For example, of the 16 types of drones approved to date by Brazil's Civil Aviation Agency, seven are Chinese. Drones are widely used in Brazil's agricultural sector.

China and Brazil released a joint statement on deepening the comprehensive strategic partnership in April 2023. The statement affirmed the strategic significance of bilateral cooperation in agriculture and trade of agricultural products and pledged to strengthen dialogue

to promote the development of trade in food and agricultural products.

In addition, the two sides also signed the Memorandum of Understanding on Promoting Social Development and Combating Hunger and Poverty, which expanded the scope of China-Brazil agricultural cooperation.

Meanwhile, research institutions from both countries are also taking action. South China Agricultural University has signed cooperation agreements with Brazilian universities and research institutions including the University of Brasilia, covering soybean breeding, food safety, sustainable agriculture and other fields.

"China is a great engine for the Brazilian agro-industry," said Brazilian President Luiz Inacio Lula da Silva while on his visit to China last year.