

# CONNECTION

The Official Newsletter of Zhejiang University

Issue 25

Nov. 15, 2021



Seeking Truth  
Pursuing Innovation



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## MESSAGE FROM THE EDITOR-IN-CHIEF

As leaves gradually turning yellow in autumn, we once again embrace the students back at campus. We continue our commitment to achieving the UN's 2030 Agenda for Sustainable Development in the new semester.

As part of ZJU's sustainability action plan—Z4G (A Global ZJU for Social Good), the inaugural Sino-German Sustainable Development Forum highlighted multi-stakeholder approach with over 30 experts and industry leaders from both countries. BRIDGE Sustainable Design Action has brought together a new generation of designers and design educators to construct a bridge to a sustainable future through the lens of design.

It's inspiring to see new advances ZJU scientists continue to achieve in the fields of health, pharmaceutical science, Environmental biotechnology, and etc. I'm also proud to share with you ZJU's improved performance in THE World University Rankings and the awards recognizing the remarkable achievements made by our faculty.

As always, we wish you pleasant reading and hope you follow us in the social media and leave your comments!

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# Z J U N E W S R O O M

## International

### Sino-German forum highlights multi-stakeholder approach to 2030 Agenda

including climate change and environment, new energy materials, green development policies and university-industry cooperation.

Hosted by Zhejiang University with support from DAAD China, this forum has received registrations from over 400 participants in 15 countries and regions, with livestream attracting more than 100,000 views.

The inaugural Sino-German Sustainable Development Forum took place in hybrid format on September 24. The event brought together over 30 experts from both countries under major themes

The Forum featured three parallel academic sessions and climaxed with an "industry meets academia" roundtable joined in person by industry leaders from LANXESS and SAP.

### ZJU continues to rise in THE World University Rankings

Zhejiang University continues to rise in the newly released Times Higher Education World University Rankings, climbing 19 places to rank 75<sup>th</sup> in the world. ZJU maintains its strength in the knowledge transfer pillar with the full score of 100 while achieving the improved performance in teaching and research pillars. The University's continued rise in the international rankings is a reflection of ZJU's strong focus on talent, innovation and its global impact.





## Zhejiang University seeks to realize UN's sustainable goals

The BRIDGE Design Week 2021 wrapped up in Zhejiang University on September 11, with 10 teams of students from 17 universities around the world presenting their design proposals to help achieve five of the United Nations' sustainable development goals (SDGs): quality education; decent work and economic growth; industry, innovation, and infrastructure; sustainable cities and communities; as well as responsible consumption and productions.

The design week was the highlight of the Better Responsibility Initiative - Design for Good Earth (BRIDGE) Sustainable Design Action, which was co-hosted by Zhejiang University and Alibaba Design Committee as part of the University's sustainability action plan, A Global ZJU for Social Good (Z4G).

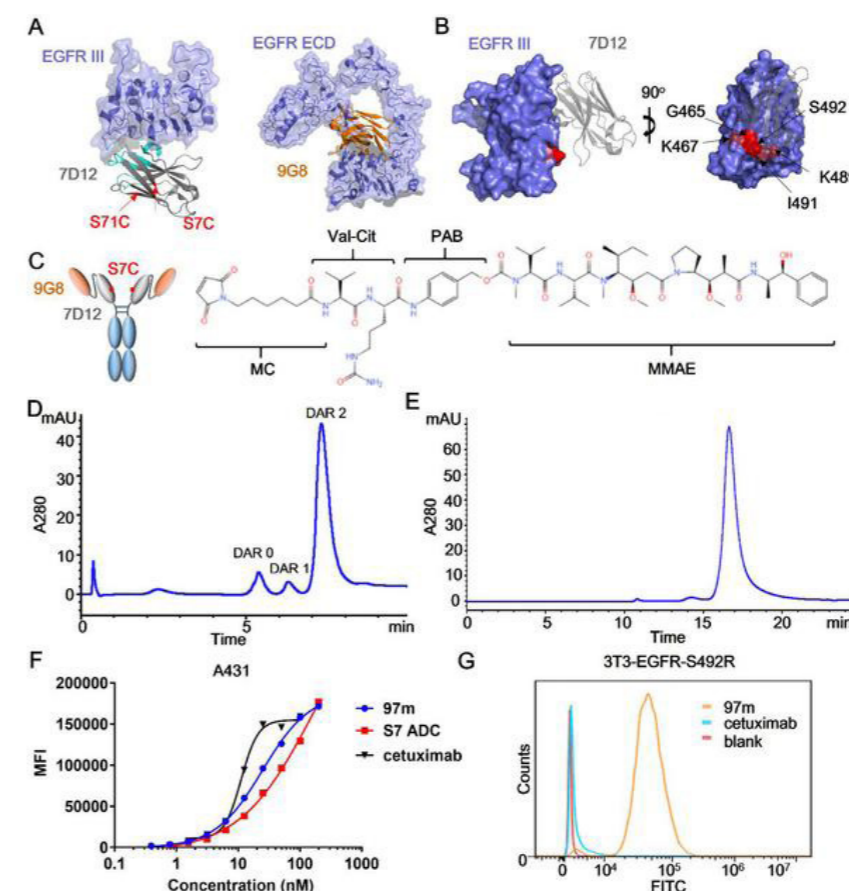
## Zhejiang University and Heidelberg University sign agreement for student exchange program

On October 26, Prof. HE Lianzhen, vice president of Zhejiang University, and Prof. Marc-Philippe Weller, vice-rector for International Affairs at Heidelberg University, signed an agreement for a student exchange program by video link.



Both parties shared their ideas and initiatives in scientific research and global cooperation. They hoped that the two universities could deepen cooperation in the domains of digital health and sustainable development. They also looked forward to officially launching the student exchange program after the pandemic.

## Research



## A "biological missile" targeting malignant tumor

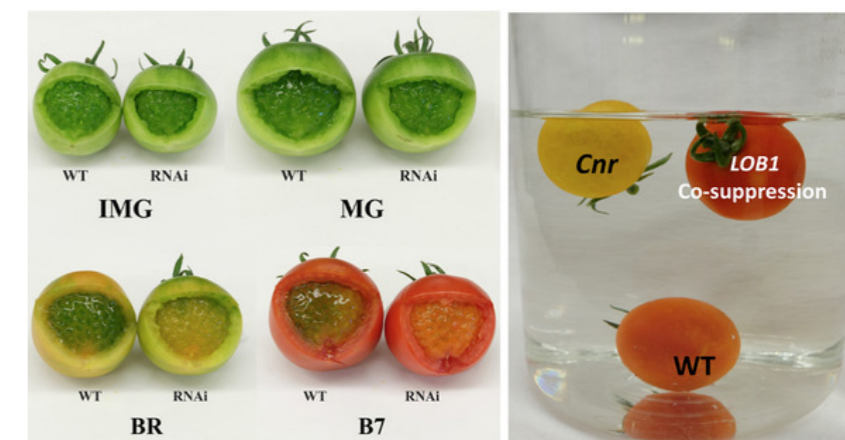
The team led by Prof. CHEN Shuqing and Prof. PAN Liqiang at the College of Pharmaceutical Sciences published their latest research findings regarding a multivalent biparatopic EGFR-targeting nanobody drug conjugate in the journal *Signal Transduction and Targeted Therapy* on September 3.

The researchers constructed a tetravalent biparatopic anti-EGFR ADC (antibody-drug conjugate), which consists of two fused anti-EGFR nanobodies targeting two distinct non-overlapping epitopes. This drug proved to exhibit superior endocytosis than cetuximab and play a better role in delivering toxins into tumor cells.

"This novel ADC could significantly enhance targeted anticancer activity as a 'biological missile,'" said Chen. "It is expected to offer more options for those patients with malignant tumor."

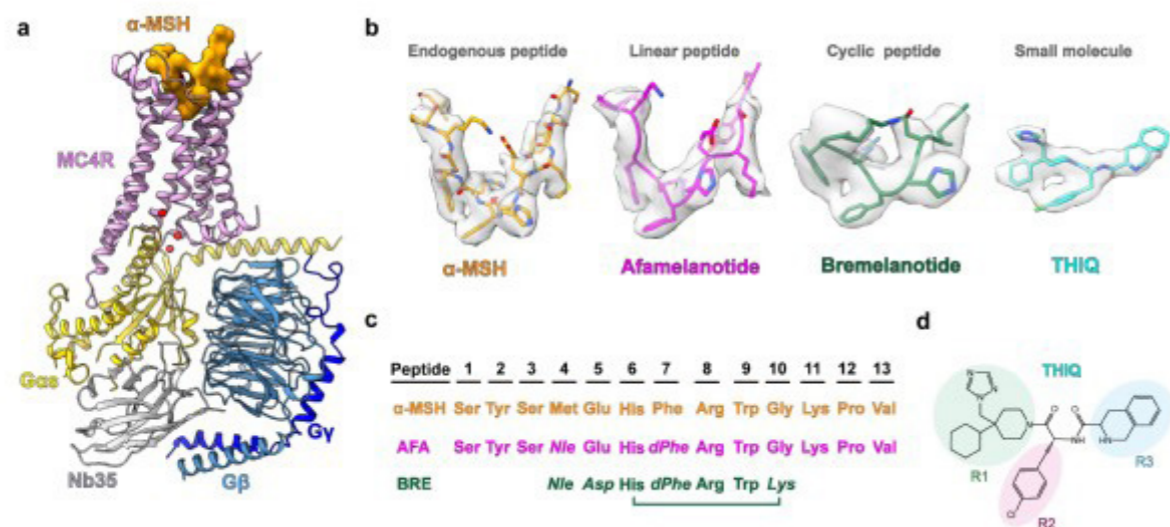
## A novel regulator enhances both texture and nutritional quality

Fruit softening is a key component of ripening, causing the damage and loss in the fruit food supply chain. "Our study offers a key target for delaying fruit softening, extending shelf life and ensuring nutrition during breeding," said Prof. CHEN Kunsong from Laboratory of Fruit Quality Biology, who led the research in collaboration with Prof. James J. Giovannoni from Boyce Thompson Institute. A novel ripening-specific LATERAL ORGAN BOUNDRIES (LOB) domain transcription factor was functionally characterized and published in *PNAS*.



Their research revealed that silencing SILOB1 can impede softening while producing no side-effect on the natural ripening and softening process.

# RESEARCH HIGHLIGHTS



## Novel therapeutics against obesity by activating melanocortin-4 receptor

The research team led by Prof. ZHANG Yan from the School of Medicine and the research team led by WANG Mingwei from Fudan University published an article titled "Structural insights into ligand recognition and activation of the melanocortin-4 receptor" in the journal *Cell Research*. Researchers employed sin-

gle-particle cryo-electron microscopy (cryo-EM) to determine four structures of the human MC4R-Gs complexes.

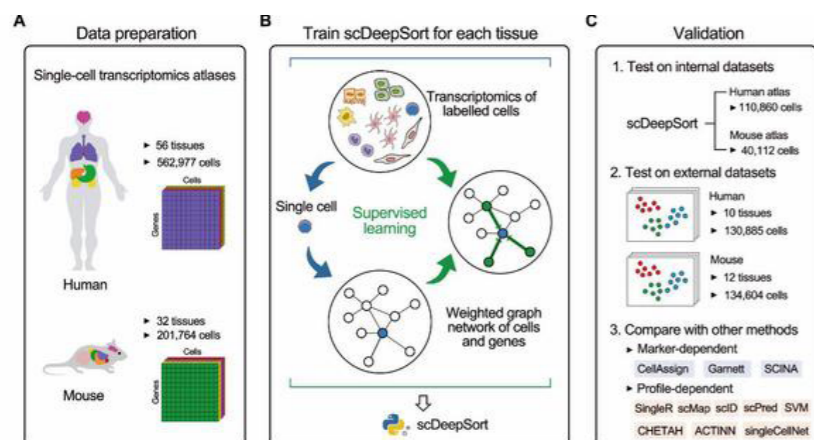
The melanocortin-4 receptor (MC4R) in the hypothalamus is known as the brain's "switchboard" to control appetite and metabolism. "Our research will

serve as a structural template for rational drug design targeting the leptin-melanocortin pathway and facilitate the discovery of novel therapeutics against obesity," said Prof. Zhang.

## A new tool for single-cell transcriptomics

On September 9, *Nucleic Acids Research* reported the latest findings of the research team led by Prof. FAN Xiaohui

at the College of Pharmaceutical Sciences and Prof. CHEN Huajun at the College of Computer Science and Technology—scDeepSort: a pre-trained cell-type annotation method for single-cell transcriptomics using deep learning with a weighted graph neural network. With cells and genes treated as the nodes of the graph neural network and a supervised deep learning model applied to single-cell RNA sequencing (scRNA-seq) data, researchers can make predictions about new datasets, thus providing a novel solution to precise cell-type annotation in scRNA-seq data.



## Mechanisms of "dialogue" between roots and leaves

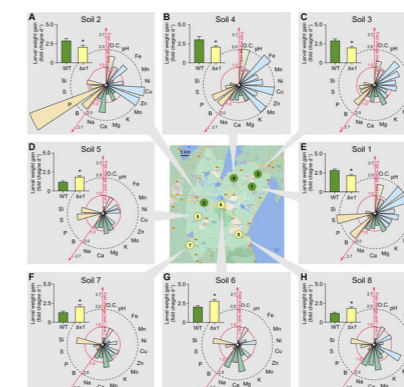
The research team led by Prof. XU Jianming at the College of Environmental and Resource Sciences has investigated the underlying mechanisms of iron in regulating benzoxazinoid-mediated plant-herbivore interactions. Their findings were published in *PNAS*, entitled "Soil chemistry determines whether defensive plant secondary metabolites promote or suppress herbivore growth".



As a group of secondary metabolites widespread in grasses, benzoxazinoids can be synthesized in leaves and roots and released into the soil as secretions. To test whether the defensive function of benzoxazinoids is influenced by soil properties, Xu and his team collected two types of soil (Anthrosols and Ferrosols) from eight different arable fields. They found that the secreted benzoxazi-

noids could interact with the soil, thereby increasing the amount of iron in plant leaves. Iron ions are known as an essential and limited micronutrient, and they play crucial roles in the synthesis of plant chlorophyll and other substances.

Iron ions can enhance photosynthesis and contribute to corn yield. Looking forward, Xu believes that this research will provide new perspectives for crop breeding, and new targets for breeding pest-resistant plants.





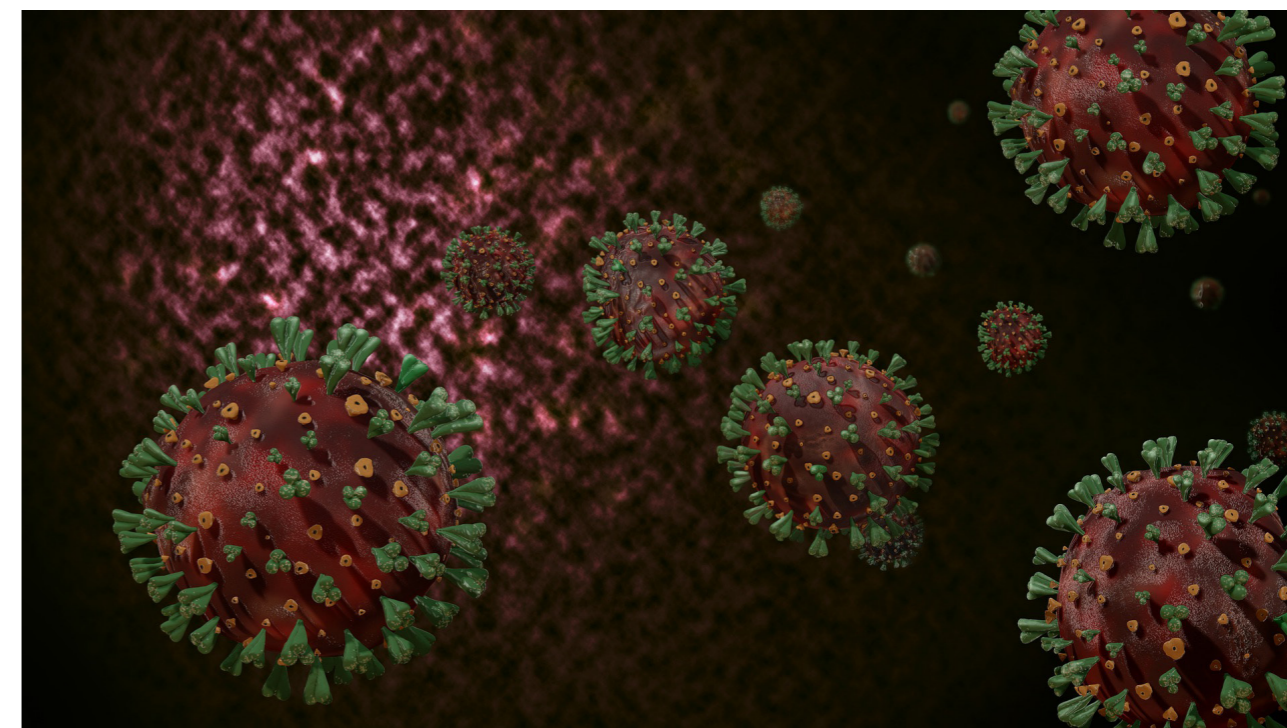
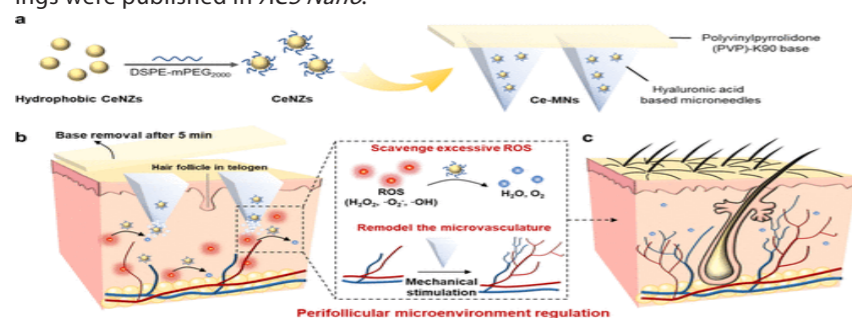
## Ceria nanozyme-integrated microneedles for rapid hair regeneration

The research team led by Prof. GAO Jianqing and Prof. LI Fangyuan at the College of Pharmaceutical Sciences designed a ceria nanozyme (CeNZ)-integrated microneedles patch (Ce-MNs) that can alleviate oxidative stress and promote angiogenesis simultaneously to reshape the perifollicular microenvironment for androgenetic alopecia (AGA) treatment. The research findings were published in *ACS Nano*.

Hair loss is becoming an increasingly common problem. Over 50% of the general population experience hair loss at some point in their lifetime and it does impact the body images, social interactions, and psycho-emotional health of individuals. The most common form of hair loss is AGA, a chronic and progressive disease.

The team discovered that by using a certain kind of CeNZ which is marked by strong enzyme-mimic activity, it can scavenge a variety of reactive oxygen species (ROS), including superoxide anions, hydroxyl radicals and hydrogen peroxide, improving the hair follicle (HF) microenvironment and therefore, reducing the possibility of AGA.

Nanozymes with dual identities of nanomaterials and enzymes have very unique advantages. Gao has already verified its excellent therapeutic effect on drug-induced liver injury, diabetic wound healing and hopes to continue to make new breakthroughs in the field of nanozymes.



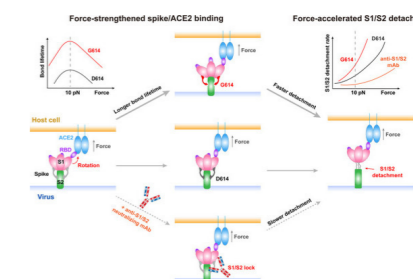
## Mechanical activation of SARS-CoV-2 spike to foster viral invasion

The research team led by Dr. CHEN Wei from the School of Medicine published an article entitled "Mechanical activation of spike fosters SARS-CoV-2 viral infection" on August 31 in *Cell Research*. This research demonstrates that the mechanical force can enhance spike/ACE2 interaction and accelerate the S1/S2 detachment, thus facilitating viral invasion.

Once a virion attaches to the host cells, the pulling force on the spike/ACE2 bonds at the contact zone edge roughly ranges from 0 to 30 pN according to the theoretical analysis of this research.

In addition, this study also identifies an anti-S1/S2 non-RBD-blocking antibody that is derived from convalescent COVID-19 patients and with potent neutralizing activity for virus infection can impede S1/S2 detachment by  $3 \times 10^6$  times under force.

"Our study sheds light on mechano-chemistry of spike activation and on developing a non-RBD-blocking but S1/S2-locking therapeutic strategy to prevent viral invasion," said Chen. "It is a successful case of interdisciplinary cooperation, and also a major breakthrough in the fields of biomechanics and mechanobiology, single molecule biophysics and virology."



# SPOTLIGHT ON

# STUDENTS

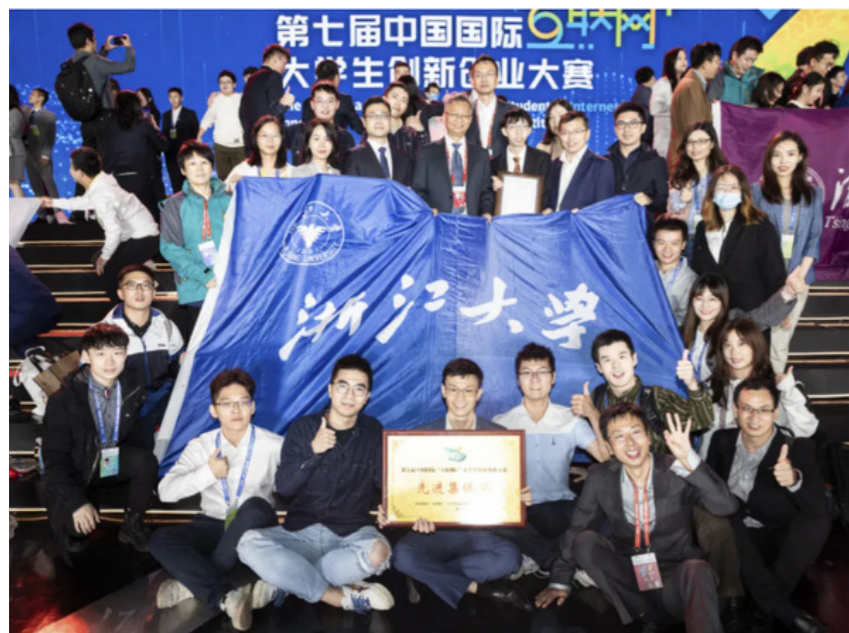
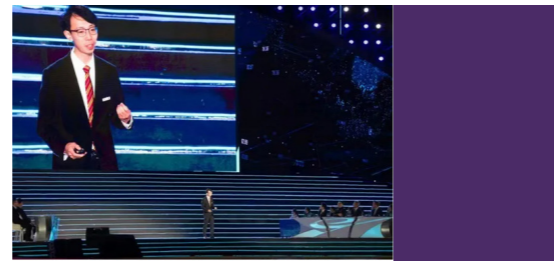
## ZJU clinches 10 gold medals at 7<sup>th</sup> China College Students' "Internet Plus" Innovation and Entrepreneurship Competition

The 7<sup>th</sup> China College Students' "Internet Plus" Innovation and Entrepreneurship Competition was held from October 12 to 15 at Nanchang University. Zhejiang University staged a stellar performance with 10 gold medals, ranking 2<sup>nd</sup> among China's universities. A total of 9.56 million students from 4,347 universities in 121 countries and regions signed up for this year's competition, including students from world-renowned universities such as Harvard University, the University of Oxford and the University

of Cambridge.

GoPrint, the only undergraduate project in the playoff leg for the championship in the Undergraduate Creativity category, won the third place. It can provide customers with a printer to transform their creative idea into a visible and tangible object.

Flexiv won the third place in the playoff leg for the championship in the International Rising Project category. Flexiv is a



global AI robotics company committed to the development and production of general-purpose intelligent robots which integrate high-precision force control, computer vision and artificial intelligence technology.

QIAN Wenxin, chairman of Huasheng Technology Co. Ltd. and CEO of 3Q Technology Co. Ltd., won the Innovation and Entrepreneurship Talent Award. Currently studying at the School of Management, he is dedicated to improving the efficiency of scientific research and strengthening scientific collaboration.

# FACULTY

## HU Hailan wins L'Oréal-UNESCO Award for Women in Science

HU Hailan, professor at the School of Brain Science and Brain Medicine and director of the MOE Frontier Center of Brain Science and Brain-machine Integration, has been honored with the 2022 L'Oréal-UNESCO for Women in Science International Award in recognition of "her major discoveries in neuroscience, in particular her work on depression, which has informed the development of next generation drugs for depression".

Founded in 1998, the Award annually celebrates the scientific excellence of five eminent women scientists, each from a major region of the world. Hu is the 2022 laureate for Asia and the Pacific.



## YE Ming'er named "Food Hero" by FAO

YE Ming'er, associate professor of horticulture at Zhejiang University, has been named "Food Hero" by Food and Agriculture Organization of the United Nations (FAO), which honored 25 "Food Heroes" around the world this year for their great efforts to provide safe food for a healthy tomorrow.

"I am dedicated to producing high-quality fruit to benefit everyone," said Ye, who has been promoting fruit tree technology for 35 years. His innovative approach has boosted growth and yield of citrus and Yang Mei fruit (*Myrica rubra* Sieb. et Zucc.), increasing farmers' income as well as protecting natural resources.



## LEE Der-Horng named dean of ZJU-UIUC Institute

On October 27, the ZJU-UIUC Institute formally inaugurated Prof. LEE Der-Horng as the Institute's dean. Lee was graduated with his PhD degree from the University of Illinois at Chicago (UIC) in 1996. Prior to ZJU, Lee was a tenured professor at the Department of Civil and Environmental Engineering, National University of Singapore.

"It is my great honor to join the International Campus and the ZJU-UIUC Institute. I will learn from my colleagues in research and teaching and contribute all I can to this community," said Lee.

