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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!
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 BOUNDARIES (LOB) domain transcription factor was functionally characterized and published in *PNAS*.

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 tetraivalent 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

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.

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

**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.

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 Z.J.U for Social Good (Z4G).
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 single-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.

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 benzoxazinoids 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.
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 mechan-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.”

Ceria nanozyme-integrated microneedles for rapid hair regeneration

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.

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The 7th 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 2nd 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.

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.

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.

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.