CONNECTION

The Official Newsletter of Zhejiang University

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MESSAGE FROM THE EDITOR-IN-CHIEF

With the 14th edition of *Connection*, winter is in full swing. We are pleased to see that more ZJU students are still on their way to pursuing innovation with so much reap in international contests.

This month, the 5th China College Students 'Internet Plus' Innovation and Entrepreneurship Competition witnessed diverse cultures, mutual exchanges and collisions of ideas sparkling on Zijingang Campus.

Also, I'm proud to share with you the grand opening for Zhejiang University Museum of Art and Archaeology (ZJUMAA). It is an archeology center which integrates exhibitions and conservation showrooms, and offers cultural education to the public. You are warmly welcomed to visit and explore the tangible and intangible heritages of civilizations.

As always, we would love to hear your thoughts.

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ZJU NEWSROOM

INTERNATIONAL

Nature names ZJU 20th globally for prolific research output

According to the latest report from the Nature Index, Zhejiang University ranked No. 20 in the world and 6th among Chinese universities for publication of scientific research. There were 500 academic institutions reviewed for the report.

The ranking is based on research results by ZJU faculty, students and university affiliates published in 82renown scientific journals such as Cell, Science and Nature. ZJU's culture of innovative thinking and open collaboration has enabled our faculty and scholars to complete highly cited and internationally recognized research.

ZJU leadership strengthens cooperation with European counterparts

Prof. WU Zhaohui and Prof. HE Lianzhen, the president and vice president of Zhejiang University respectively, led two separate delegations to Europe to develop and strengthen existing partnerships.

The delegation led by Prof. Wu met with the leaders from the World Economic Forum (WEF), International Telecommunication Union (ITU), U.N. Institute for Training and Research (UNITAR) and Wageningen University & Research.

Prof. HE Lianzhen's delegation visited University College London (UCL), SOAS University of London (SOAS), Imperial College London, the Technical University of Munich (TUM) and RWTH Aachen University (RWTH).

During the working visits, Zhejiang University was formally invited to join the Global University Presidents Forum (GULF), a forum which seeks to promote cooperation among the world's top universities. Additionally, memorandum of understandings were signed with ITU and UNITAR in areas ranging from student internships to research collaboration in new media.

The recent working trips reflect the University's ongoing efforts to expand its global impact. To date, ZJU has established a global partnership network which includes more than 190 institutions across 6 continents.

Homecoming Day for Asian Future Leaders Scholarship.

On September 27, 2019, an alumni reunion was staged for the program of Bai Xian Asia Institute Asian Future Leaders of School of Public Affairs, Zhejiang University. Alumni of five successive grades of the program were reunited by Qizhen Lake on Zijingang Campus. They reminisced about the past together and looked forward to the future.

The program had been carried out for five years. During this beautiful time, we welcomed and saw off one batch after another of excellent youth from countries of Asia. Future leaders set sail here and this reunion day was best witness. In future days, School of Public Affairs will continue promoting the program, stay true to the mission and charge forward.

Honored at the 5th College Students' 'Internet+' Innovation & Entrepreneurship Competition

• With seven gold medals, Zhejiang University was awarded with the greatest number of gold medals at the 5th College Students' 'Internet+' Innovation & Entrepreneurship Competition.This year's competition was hosted by Zhejiang University. The competition took place from the 12th of October to the 16th of October, 2019.

• In the grand finals, two teams from Zhejiang University teams did exceedingly well and brought back the the second and third place. The unmanned helicopter project from Tsinghua University took the championship. "iHe@r" from the International Track impressed the judges and won third place.

• The competition offers a platform to harness the talent of Chinese students to address real-world problems, where they combine innovation and social entrepreneurship with their creativity and passion to make a positive impact on society.

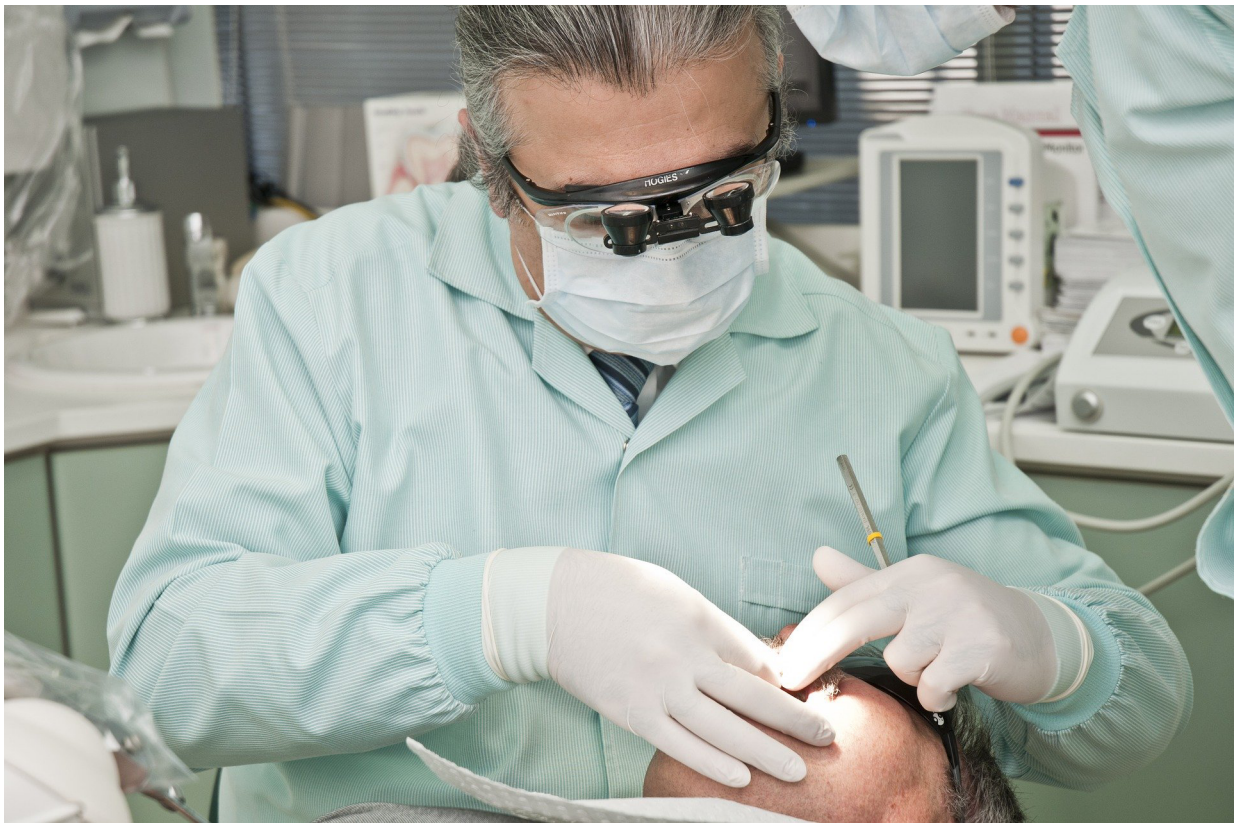
ZJU Food Systems and Policy Lab officially launched

On October 18, the inauguration ceremony for the Zhejiang University Food Systems and Policy Lab (FSPL) was held on Zijingang Campus, Zhejiang University. More than 200 local and international scholars from various universities and research institutes took part in the event.

The FSLP will focus its research work on the construction and development of the nutrition-oriented agricultural system, analysis of safe and high-quality food, analysis on the environment and food system, the construction and efficiency analysis of the food value chain. Ultimately, the research aims to find feasible solutions to a series of problems in the food industry.

EDUCATION

RESEARCH



ZJU scientists develop a novel method to repair tooth enamel

Researchers form Zhejiang University's Department of Chemistry have developed a method to repair tooth enamel by up to 2.5 micrometres. Led by Prof. TANG Ruikang, the solution can be applied to tooth cavities and is able to achieve the same structure of natural enamel within 48 hours. It involves the establishment of a biomimetic crystalline-amorphous mineralization frontier to induce the growth of enamel.

This study has been published in the journal of Science Advances. This achievement has increased the understanding of biomineralization and has also provided a new pathway for bioinspired design and production. In the future, the researchers hope to further enhance their work by tailoring their solution to a multitude of situations.

PUBLIC ENGAGEMENT

ZJU hosts inaugural UN Job Fair in China

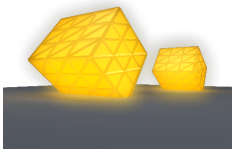
The United Nation (UN) Job Fair was successfully hosted by Zhejiang University's Centre of Career Services on Tuesday, October 29. Organized by China Scholarship Council (CSC), the fair was held in China for the first time and featured 25 UN agencies and organizations.

More than 1300 students from 38 universities attended the fair in ZJU. The career fair offered a valuable opportunity for students of Hangzhou and the surrounding areas to explore opportunities at the international organizations. During the event, students also had the chance to speak directly with the UN representatives to learn more about internships and working life in the United Nations.

School of Medicine at ZJU becomes China's first UDNI member

On the morning of October 18, the Zhejiang University School of Medicine received confirmation from Prof. Eric W. Klee, chair of the Undiagnosed Diseases Network International (UDNI) Membership Committee, that the university will become an official UDNI member. It is the first time that UDNI has approved of a Chinese organization as a clinical member.

IN THE MEDIA



Research Design New Process for 3D-Printing Mini Soft-Robotic Actuators

ZJU researchers have successfully developed a 3D-printing process using digital light projection (DLP). This method is used to create pneumatic actuators for soft robots. This new method sets the stage for easier fabrication of small, soft robots. Being smaller than a coin, these robots can be used in scenarios ranging from jet maintenance to medical technology.

The researchers also applied this novel method in the building of a debris remover. Consisting of a 3D printed miniature soft pneumatic grip and a continuum manipulator, the debris remover can navigate through a confined space. It can also collect small objects in difficult-to-reach areas.

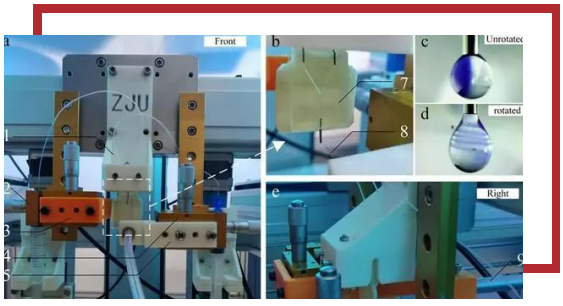
This work was completed in collaboration with Southern University of Science and Technology and the Singapore University of Technology and Design. The method was published in the journal Advanced Materials Technology.

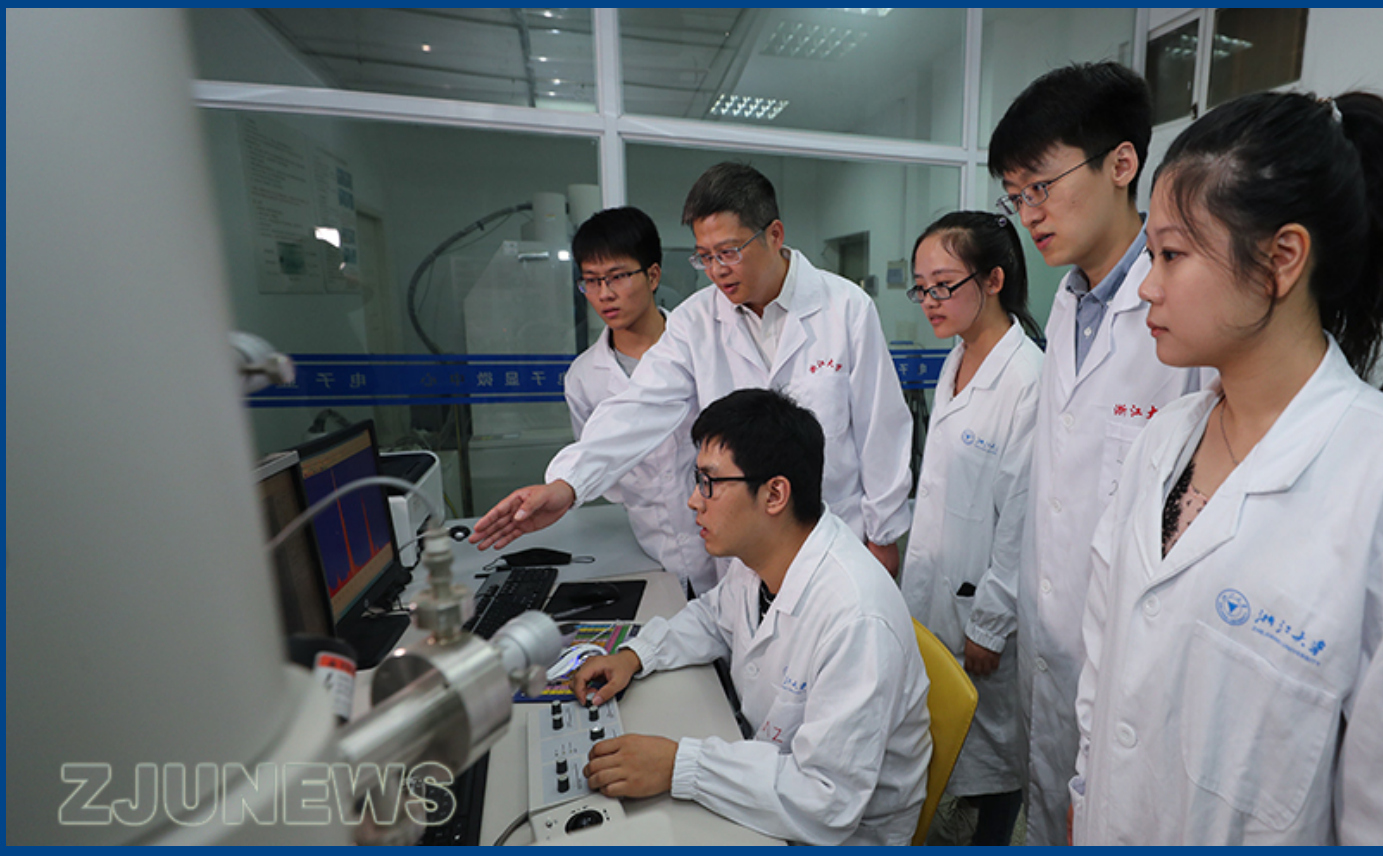
Wolters Kluwer Partners with Zhejiang University to Publish Infectious Microbes & Diseases Journal

OCTOBER 21, 2019 – Wolters Kluwer, Health announced today a partnership with Zhejiang University to publish the journal Infectious Microbes & Diseases (IMD) under the Lippincott portfolio.

The new publication aims to accelerate the dissemination, exchange and utilization of scientific research results in the field of infectious microbes and infectious diseases.

The open access journal provides a forum where researchers, clinicians and policymakers can exchange ideas and keep up to date with significant advances in the field.





RESEARCH SPOTLIGHT

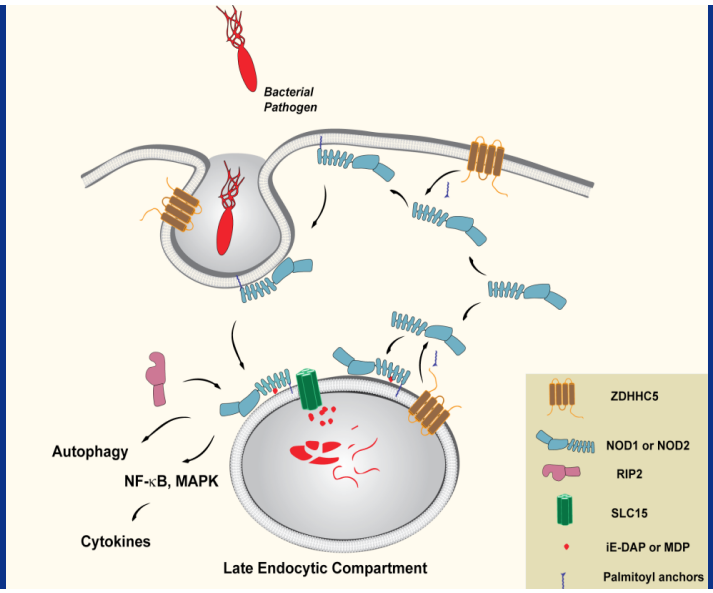
The future of continuous inorganic materials

When a cup of dense saltwater is continuously heated, small crystalized particles will appear. The research team led by Prof. TANG Ruikang of the Zhejiang University's Department of Chemistry "intercepted" a special precursor, ionic oligomers, in their endeavor to "suspend" this crystallization process.

IMPLICATION

The "pause key" is a small molecule called triethylamine (TEA). It can act as a capping agent to stabilize oligomers by forming a hydrogen bond with a protonated carbonate through its tertiary amine group. Oligomers ((CaCO3)n, in which n represents the number of Ca2+:CO32− units) are rod-like with a length of 1.2 nm. Similar to polymer materials, oligomers can also be cross-linked. This would result in the formation of continuous and bulky inorganic materials. The research demonstrates the possibility for inorganic materials to be manufactured monolithically and also highlights the possibility of manufacturing complex shapes through this method.

The capabilities and advantages of this method result from the properties of the oligomers and their crosslinking, and could enable the production of inorganic materials by a route analogous to that for organic polymers.



How gut gate keeper proteins NOD1 and NOD2 are attached to the membrane?

Recently, the research team led by Prof. Dante Neculai from the Zhejiang University School of Medicine has proved that nucleotide oligomerization domain-like receptors 1 and 2 (NOD1 and NOD2), two proteins responsible for detecting bacterial products, require lipid modifications for their recruitment to the cell membrane and function.

The specific modification, palmitoylation at a cysteine thiol, is mediated by the enzyme ZDHHC5. This study was published in the October issue of the journal, Science.

IMPLICATION

According to their research, researchers proposed that NOD1/2, together with ZDHHC5 and various transporters (such as SLC15A3), form specialized platforms for pathogen sensing. Removal of key modification residues in NOD1 and NOD2 abolished their function, compromising antibacterial responses.

Their findings are expected to promote the understanding and ultimately the treatment of NOD-driven inflammatory diseases, including NOD-dependent autoimmune diseases and chronic bacterial infections.

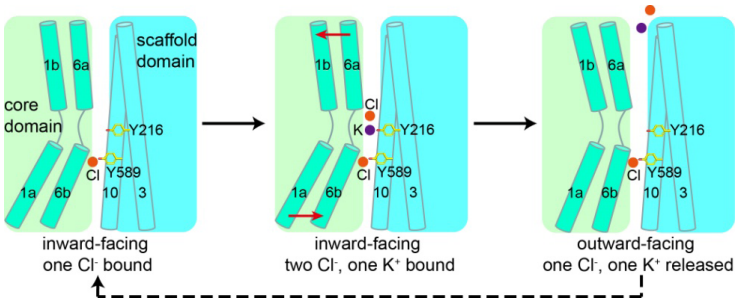
"Seeing through" the structure of KCC opens the door to epilepsy treatment

Recently, the research team led by GUO Jiangtao from the Zhejiang University School of Medicine has successfully deciphered the first structure of human potassium-chloride cotransporter KCC1 through the cryo–electron microscopy (cryo-EM). The KCC1 carries positively charged potassium ions (K+) and negatively charged chloride (Cl-) ions across cell membranes and helps regulate the volume of the cell. The protein is one of a large family of cotransporters found in many of the body's tissues, particularly in the kidneys and the brain.

IMPLICATION

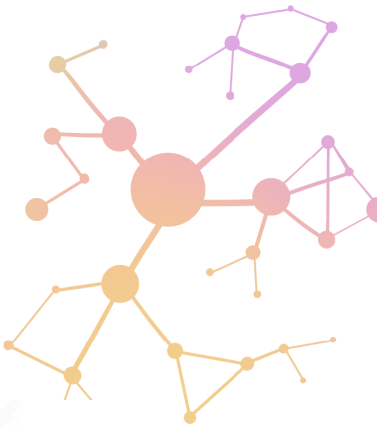
This research reveals one potassium site and two chloride sites in KCC1, enabling them to create a feasible model for a potential ion transport mechanism in KCCs and providing a blueprint for drug design. Relevant research findings were published in the October issue of Science.

Cryo-EM - an advanced technology in which samples are frozen at extremely low temperatures at speeds that prevent the formation of ice crystals.

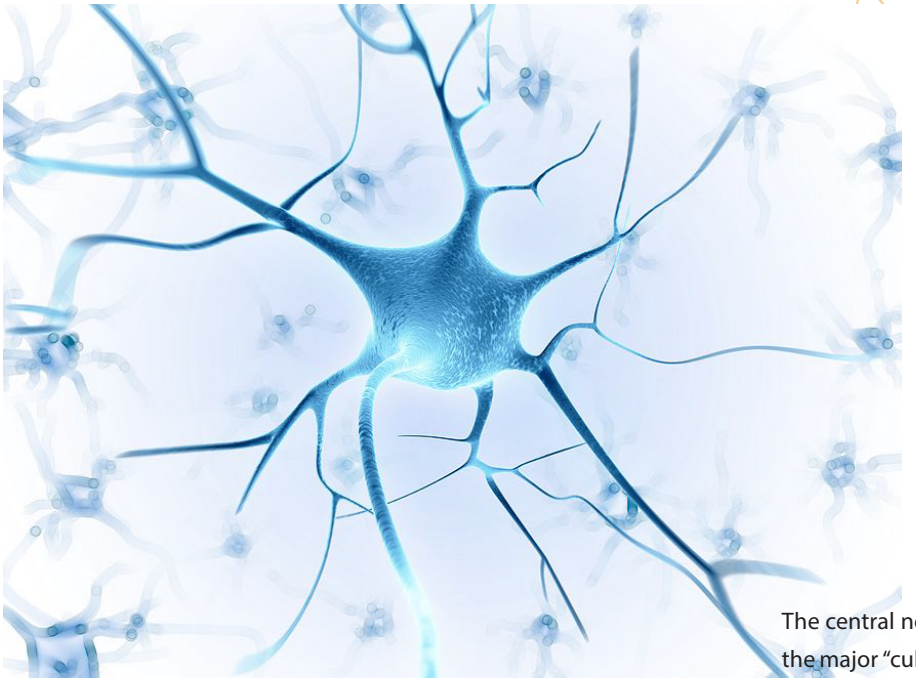


Study shows that peripheral immune cells under stress cause anxiety-like behavior

These results provide insights into the physiological function of adaptive immunity in neurodevelopment and neuropsychiatric disorders. It is expected that the results obtained will create profound implications for developing a valuable therapeutic approach to various psychiatric and metabolic diseases.



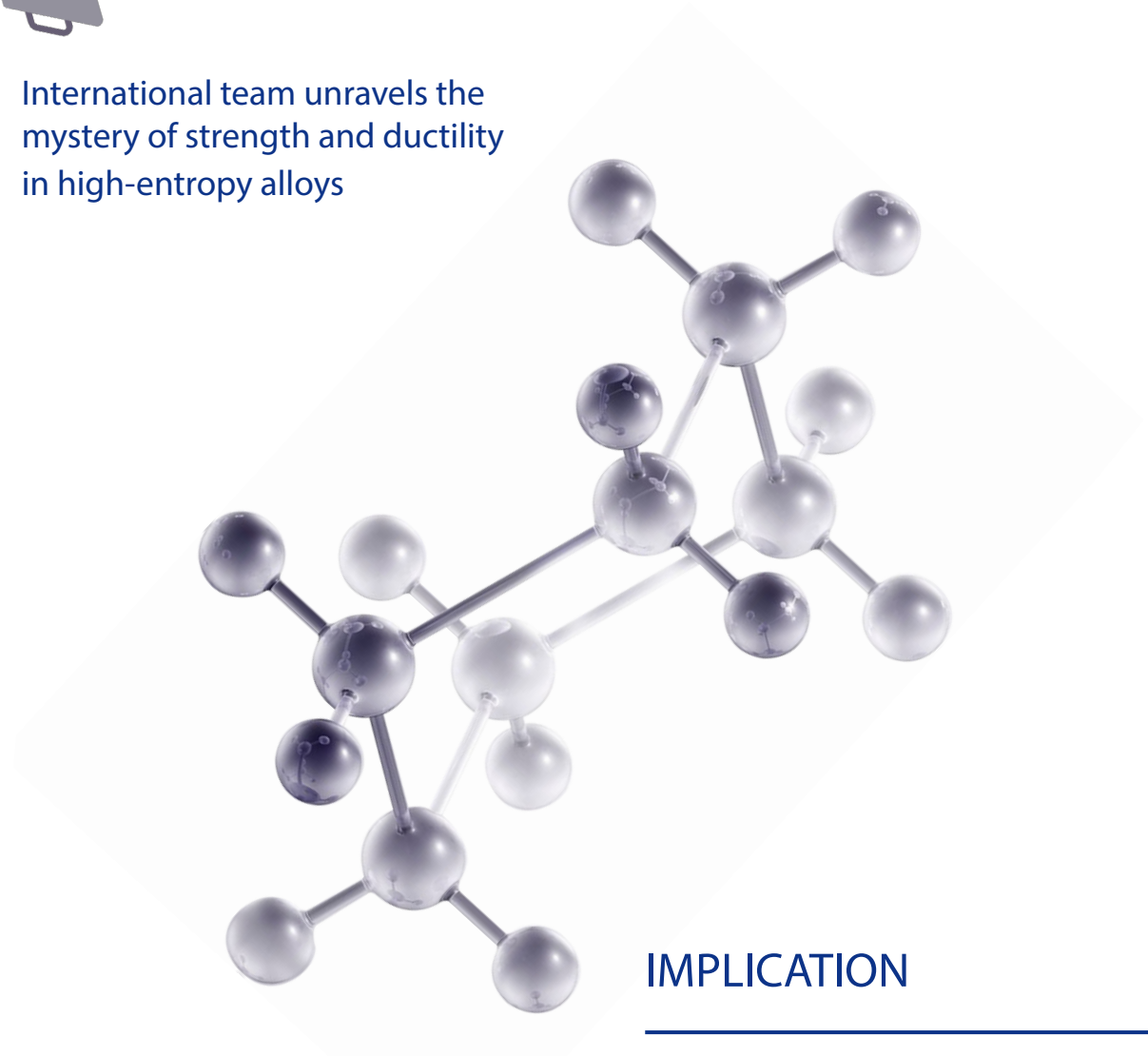
IMPLICATION



The central nervous system was previously assumed as the major "culprit" behind depression and anxiety. Little attention was paid to the role that other organs played in this process. Recently, researchers from the JIN Jin Lab at the Zhejiang University Life Sciences Institute found that physical stress-induced leukotriene B4 triggers severe mitochondrial fission in CD4+ T cells.

A large amount of purine (xanthine) is synthesized via the pentose pentaphosphate pathway, which easily pass through the blood-brain barrier to reach the amygdala, the emotional processing center of the brain. This leads to a variety of behavioral abnormalities including anxiety, depression, and social disorders. The findings are published in the October issue of Cell.

International team unravels the mystery of strength and ductility in high-entropy alloys



Researchers from Zhejiang University, the Georgia Institute of Technology, and the University of California, Berkeley, engage in collaborative research to find out the truth about high-entropy alloys (HEAs). Their findings on outstanding mechanical properties of HEAs are published in the October 10 issue of the journal of Nature.

HEAs, a class of materials that contain five or more elements in near-equiatomic proportions, display exceptional mechanical performance, including superb strength, remarkable ductility and toughness, especially at low temperatures, making them potentially attractive materials for many structural applications.

IMPLICATION

According to atomic-scale mapping of chemical distribution and associated correlation analysis the inhomogeneous element distributions and associated deformation mechanisms can strongly influence the mechanical properties of HEAs.

This study may provide a fundamental basis for tuning compositions and atomic configurations to produce new deformation mechanisms and mechanical properties in HEAs. It is expected that HEAs will enjoy extensive applications in aviation and polar materials as well as in the anti-impact domain.

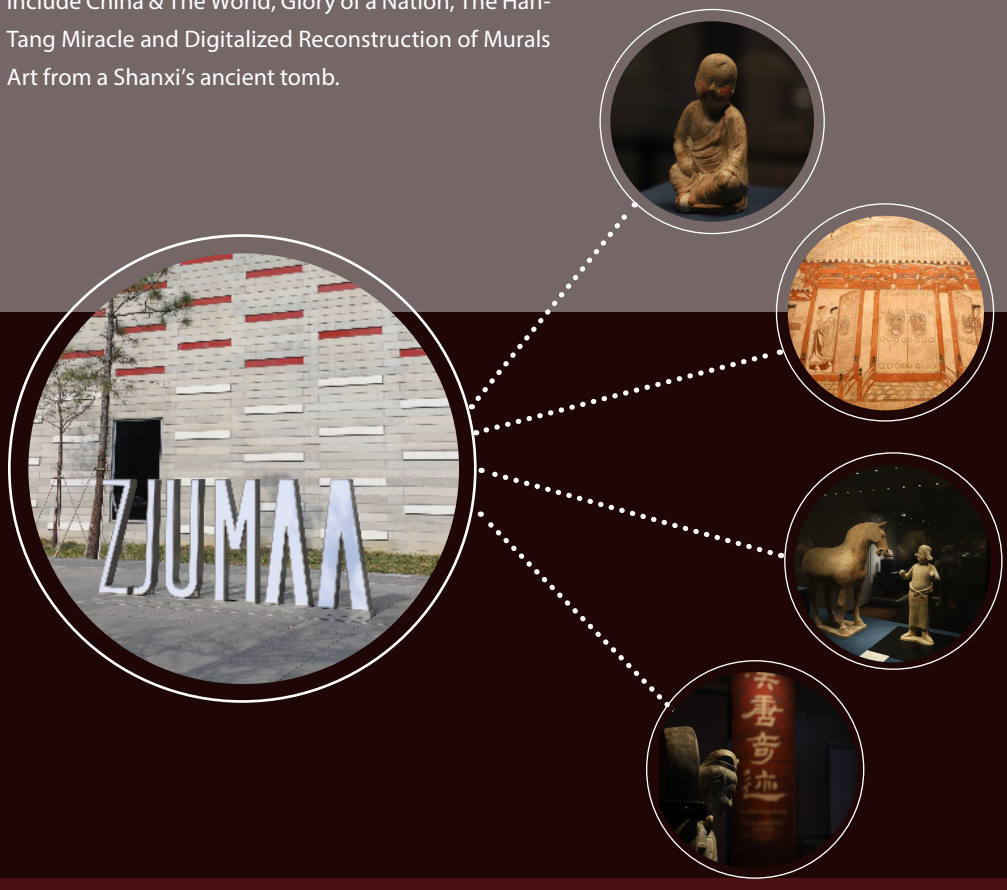
SPOTLIGHT ON: CAMPUS

Launch of ZJUMAA at Zijingang Campus

A grand opening for the Zhejiang University Museum of Art and Archaeology (ZJUMAA) took place on 8 September 2019. . This long-expected museum finally unveiled its interior to the public.

The state-of-the-art museum, which boasts of a minimalist external façade, is home to a range of temporary and permanent exhibitions. Current exhibitions include China & The World, Glory of a Nation, The Han-Tang Miracle and Digitalized Reconstruction of Murals Art from a Shanxi's ancient tomb.

For more information and the latest exhibition updates, the museum has a dedicated webpage: https://zjumaa.zju.edu.cn/education/detail/69.

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Northern Dynasties' Memori
of the Han-Tang Miracle:
Digital Reconstruction of the Murals of a
Northern Dynasties Tomb in Jiuyuangang
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