

CONNECTION

The Official Newsletter of Zhejiang University

Vol.01

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seeking truth

pursuing innovation



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ZHEJIANG UNIVERSITY
Hangzhou, China

MESSAGE FROM THE EDITOR IN CHIEF

In the lead up to Zhejiang University's 120th anniversary on May 21st, 2017 we take the opportunity in this first edition of *Connection*, the official university newsletter, to celebrate its over centennial services to higher education and the development of science and technology. For this special moment, I invite you to take a journey through many thrilling times and exciting stories from the past and now, right up to our anniversary celebrations. If any thought, question or comment inspired by our stories, you are encouraged to send these to us at newsletter@mass.zju.edu.cn. A selection of feedback will be published in the 'Letters' section in future editions of *Connection*. As a channel to spread the university's important updates to our alumni, friends and supporters, *Connection* also represents your voices on ZJU's progress.

I look forward to hearing from you.

Min Li
Editor in chief

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10 President Wu talks with *Nature*: Insideview

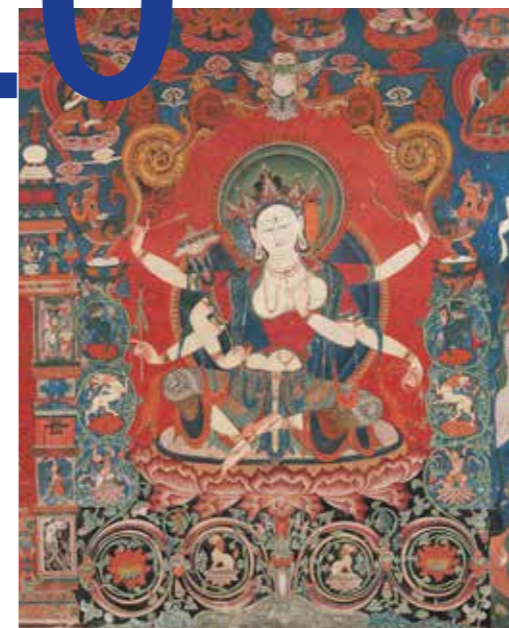


16

The secret for power generation when a waterdrop flows over the graphene



20 A beautiful mural from the White Temple in Tholing Monastery is digitally achieved.



26 Yaping Xu, world champion athlete of the Kayak, wants everyone enjoys this interesting water sport.

Brief News

First National Engineering Laboratory for Waste Incineration Technology & Equipment Established at ZJU

As a side-effect of China's continuously improving living standards, the amount of rubbish and dangerous waste is climbing at an incredible speed, bringing with it the dangers of environmental pollution.

Harmless disposal of garbage and dangerous waste has become a critical ecological issue as many cities find themselves in the uncomfortable situation of "being surrounded by garbage". According to Jianhua Yan,

Vice President of Zhejiang University and Director of the National Engineering Laboratory for Waste Incineration Technology & Equipment, China produces 180 million tons of urban waste and 36 million tons of dangerous waste annually. Since incineration is China's primary disposal route, key technological breakthroughs in waste incineration and industrial promotion will play a crucial role in environmental protection and energy conservation.

On March 11, 2017, the National Engineering Laboratory for Waste Incineration Technology & Equipment, the first one in China, was established at Zhejiang University. The organization will address a series of key challenges in the field of waste incineration, such as low stability in incineration of rubbish and dangerous waste, production of serious secondary pollution and low efficiency of energy utilization. Through this National Engineering Laboratory, basic research is translated into core technologies and equipment development required for clean waste disposal and treatment.



Bulk Donation to ZJU for the Founding of Smart-Doctor Artificial Intelligence Research Center

A Hangzhou version of Watson¹ is about to be born. In March 26, 2017, the Smart-Doctor Artificial Intelligence Research Center established in ZJU with a generous donation of \$14.5 million from the WeDoctor Group. Headed by President Zhaohui Wu, this center will be **the first open medical AI platform in China** under an integrated mode.

The Center will focus on critical technologies in medical AI, including clinical big data, imaging and genomics. Meanwhile, the medical AI services platform will play an important role in the incubation of medical AI service enterprises, the formulation of normalized criteria and development of a higher education system for future experts on medical AI. Mr. Jieyuan Liao, the founder of WeDoctor Group, predicts that the future is bright: "80% of common diseases could be diagnosed and treated by artificial intelligence in the future".

"We will take advantage of the assets of Zhejiang University, in collaboration with medical institutions and experts in an inclusive manner, to make connections between various data sources, set up an interdisciplinary and multi-institutional cooperative system and strive to make breakthroughs in core medical AI technology," said President Wu.

¹ the AI-powered supercomputer in IBM that successfully diagnoses a rare type of leukemia within 10 minutes.

(<http://www.nydailynews.com/news/world/ibm-watson-proper-diagnosis-doctors-stumped-article-1.2741857>)



ZJU-Uchicago Academic Week: A Success!

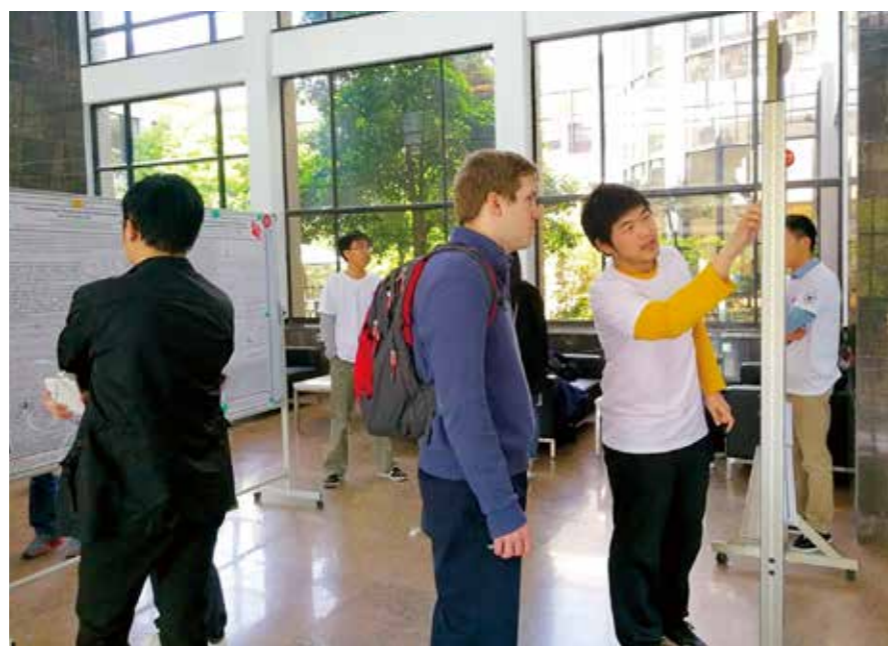
As an important event for the celebration of our 120th anniversary, Zhejiang University – the University of Chicago Academic week was held jointly by Department of Polymer Science and Engineering (DPSE) of ZJU, the Institute for Molecular Engineering (IME) of UChicago and the International Relations Office of ZJU: 9 professors from ZJU, 8 professors from UChicago and more than 100 students attended this event, which lasted from April 13th to 15th on the Yuquan Campus. The opening ceremony was chaired by Dr. Xu Zhikang, Dean of DPSE. ZJU Vice President Dr. Zheng Qiang attended the ceremony and delivered opening remarks in which Dr. Zheng extended a warm welcome to the guests and showed his great appreciation for the significance and influence of this conference, which will strengthen communication, develop friendships, and lay a foundation of further cooperation for both universities.

In the following colloquium, there was a thrilling discussion between experts from two institutions on topics of stimuli-responsive materials, material surface engineering, opto-electronic functional polymers, biomacromolecules, water treatment, material structures, kinetic study and more!

Chaired by Ms. Li Min, Director of ZJU International Relations Office, ZJU Global Lecture Series: Education, Science & Technology was held on the afternoon of the 14th, where Dr. Matthew Tirrell, Dr. Supratik Guha, Dr. Jeffrey Hubbell and Dr. James

Skinner shared with ZJU faculty and students insights and passions in their professional and personal lives. Meanwhile, 40 posters from students in ZJU and UChicago presented their latest research achievements.

Who could better describe this success than a student? Please find below a DPSE student's experience:



Tianwen Bai was introducing his poster to a student from UChicago

"The ZJU-Uchicago Academic Week is amazing, it's just what we need as Polymer Science and Engineering students. At other conferences, it is challenging to speak with world-renowned scientists, but the experts attending from Uchicago and ZJU were there specifically to meet us. It was also great for me to have the opportunity to talk with Professor Ka Yee Lee from Department of Chemistry in UChicago. She carefully

read my poster and gave me very helpful advice on future studies.

I really appreciate how it was an "Academic Week", and not specifically a colloquium on scientific researches. Professors from Uchicago talked about how they dealt with bottlenecks in their career, which is extremely valuable to a fresh PhD candidate. We are often frustrated by many things."

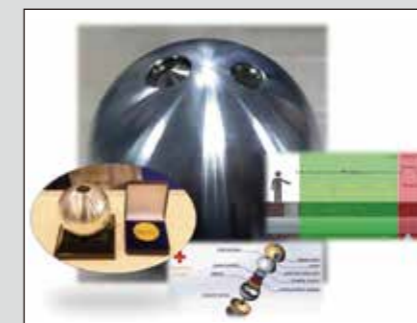
Tianwen Bai is a first-year PhD candidate in the Department of Polymer Science and Engineering, with an emphasis in computational chemistry. He is especially passionate about following an academic career path, and participating in trailwalk.

ZJU scored three Awards at the 45th Int'l Exhibition of Inventions in Geneva

Founded in 1973 and supported by the Swiss Federal Government and the World Intellectual Property Organization, the International Exhibition of Inventions in Geneva is known as the thinking man's fiesta for modernism and innovation. Between March 29 and April 2, 2017, about 1,000 inventions from more than 40 countries and regions debuted on its 45th competition, including 83 inventions from mainland China and 14 from Hong Kong. The Industrial Research Institute of Zhejiang University were honored with three awards for three inventions submitted for this exhibition.

Smart Mouse-Pipeline Doctor (the College of Control Science and Engineering)-This invention can be used in urban pipeline systems to construct a

three-dimensional map and identify leakage points with great precision. Its great sensitivity, accurate positioning, safe operation and excellent portability help it to win the special award from the review committee.



Demo of the portable smart pipeline doctor (Inventors: Dezhan Tu, Master candidate; Naifu Zhu, Master Candidate; Kexin Wang, Master Candidate; Qiangbo Zhu, PhD Candidate; Dibo Hou, Professor)

Pilot-assisted Hydraulic Load Control Valve Using Double Feedback Principle (the School of Mechanical Engineering)- gold medal;



Structural Model of Pilot-assisted Hydraulic Load Control Valve (Inventors: Haibo Xie, professor; Jianbing Liu, PhD candidate; Huayong Yang, Academician)

Novel Material and Its Application for Effective Crack Control and Restoration in Mass Concrete Structures (the College of Civil Engineering and Architecture)- silver medal.

International Team Determines the First Atomic Image of Human Angiotensin II Receptor for New Therapies

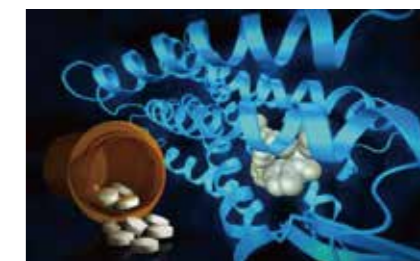
In a discovery that advances the understanding of how Angiotensin II works in the human body, an international group of scientists including Professor Haitao Zhang from the College of Pharmaceutical Sciences have for the first time acquired a three-dimensional atomic image of the human angiotensin II type 2 receptor (AT2R) using an X-ray free electron laser technique.

The crystal structures reveal surprising features of this enigmatic hormone

receptor, giving scientists new insights into drug design for the treatment of cardiovascular diseases and neuropathic pains. Additionally, a novel mechanism of self-blocking action of G protein-coupled receptor (GPCR) is proposed based on its unique positioning of carboxyl terminus helix VIII in the structure.

This study, published by the journal Nature (doi:10.1038/nature22035), was led by a trio of scientists: ZJU's Haitao Zhang and the University of Southern California's Vadim

Cherezov and Vsevolod Katritch. The same group has also determined the other subtype of human angiotensin II receptor AT1R on Cell in 2015 (doi: 10.1016/j.cell.2015.04.011.).



Meet the Robotic Manta Ray that is Wireless, Speedy, and Temperature-Resistant

Perhaps some of you will remember Mr. Ray, the Manta Ray who acts as an underwater teacher and sometime schoolbus in the 2003 hit Disney movie Finding Nemo. Inspired by the Manta Ray's soft body and flexible flapping wings of this incredible animal, a great development in the field of bioengineering was made by the engineers Tiefeng Li and Zhilong Huang in the College of Aeronautics and Astronautics of ZJU. The new bionic fish design could lead to lifelike robots that can explore the ocean, monitor water quality, and discover new creatures without disturbing them. Specifications for the robotay, the fast-moving soft electronic fish:

Length: 9.3 cm (18.5 cm including its tail)

Weight: 90 g

Maxium Speed with battery: 6 cm/s

Maxium Speed without load: 13.5 cm/s

Temperature range: 0-74 °C

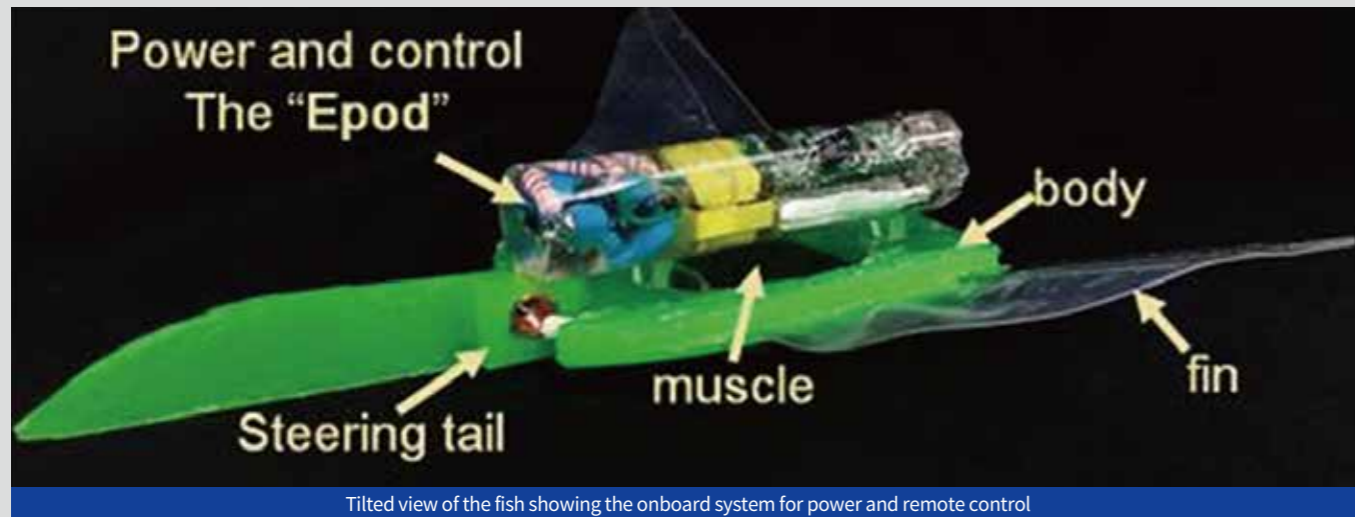
Water depth range: 0-200 m (deeper range remains to be tested)

Thanks to the counterintuitive design on the actuation of dielectric elastomer-driven muscle with surrounding water used as the ground end electrode, this robot can move quickly through the water. The outer layer of this fish is covered by soft silicone and an electrode connects with the hydrogel inside. With applied voltage, the hydrogel is positively charged while water outside the robot has negatively charged electrons. The attractions between the positive gel inside and the negative water outside would squeeze the body in between, flattening its original curvous structures on fins and bringing them slightly upward. When the voltage from the inner electrode is removed, the pulling force is lost and the body returns to its original configuration. With the regular pulse of the electricity, the fins will then flap up and down like wings, please visit our website and find an online version of this story

<https://www.facebook.com/ZhejiangUniversityChina/videos/1915139815395619/>

This soft electronic fish possesses

several notable attributes, including wireless mobility, transparency, endurance, and temperature tolerance. International experts on soft robotics have applauded the clever propulsion system design. Jun Shintake, an engineer at École Polytechnique Fédérale de Lausanne in Switzerland, who has used such actuators in soft robotic fish but was not involved in this research, praised the design: "For researchers, it is common sense that an actuator of this kind has to be paired with at least two electrodes. Li et al. had the bright idea of using the surrounding water as one side," Shintake said to a reporter from Science magazine. A "clever, multimaterial integration and design strategy. It's a very elegant demonstration—one that will further propel the field of soft robotics—no pun intended!" said Jennifer Lewis, a materials engineer at Harvard University who worked on the octobot.



Tilted view of the fish showing the onboard system for power and remote control

Science in 900 Seconds

Science in 900 Seconds, a new program of Zhejiang University's Qizhen Cup, was first introduced this year. On the stage, presenters distill their fascinating scientific achievements and mind-blowing knowledge into a 15-minute talk. "ZJU Science + + +", a public WeChat account dedicated to scientific activities in ZJU, collates activities from amongst ZJU's faculties.

1. You have to be young at heart.
2. Your active scientific activities need to draw great academic and social attention.
3. You have to take joy in pursuing scientific achievement.
4. To effectively communicate with people from diverse disciplinary and educational backgrounds, you need to master a foreign language.

In the debut of Science in 900 Seconds on March 2017, four scientists with various disciplinary backgrounds shared their work with the audience and drew loud applause. This new program serves as an effective and novel platform where ZJU scientists and students get together outside of classrooms and laboratories. With ZJU's invigorating academic ambience and its marvelous pool of talents, delicious fruits are expected to grow from the fusion and integration of great ideas.



Tao Xie, PhD, Professor, Department of Chemical and Biological Engineering. Speech Title: **The World of Shape Changing. For more details please find on our website.**



Rongxiao Fu, PhD, Professor, School of Public Affairs. Speech Title: **How do I quickly Switch from Learning to Research? For more details please find on our website.**



Junfang Ji, PhD, Professor, Life Science Institute. Speech Title: **Why are Men More Susceptible to Liver Cancer than Women? For more details please find on our website.**



Baoliang Chen, PhD, Professor, College of Environmental & Resource Sciences. Speech Title: **My Answer to What the Soil Is. For more details please find on our website.**

120 years

of continuous devotion to education and innovation



1897: Qishi Academy, the forerunner to the modern-day Zhejiang University, was founded in this year, making it one of the first modern academies of higher education in China.

1897



1927: Qishi Academy was reopened for operations and renamed the Third National SUN YAT-SEN University.

1927



1928: The Third National SUN YAT-SEN University was again renamed as the National Zhejiang University.

1928



1991: The "Qishi" eagle is redesigned as the University logo.

1991



1978: At the National Science Conference held by the Central Committee of Communist Party, ZJU took home more than sixty Major Science Research Achievement Award despite the chaotic decade-long "Cultural Revolution".

1978



1964: The first chronoteine camera in China operating at the speed of 2.5 million frames per second was invented at ZJU, making it possible to capture amazing images of nuclear explosions.

1964



1958: ZJU scientists designed the first dual water cooled generator with 1.2×10^4 kwatts and 3000 rpm. The generator was built by Hanghai Motor Factory.

1958

1952: ZJU was split into four independent universities, and the disciplines and institutes also underwent major reconstruction.

1952



1949: The P. R China is founded, opening a new chapter in ZJU's history.

1949



1944: ZJU was praised as "Oriental Cambridge" by the famous Dr. Joseph Needham, Fellow of the Royal Society. He was impressed by ZJU scientists' devotion to their studies even during the tribulations of war.

1944

求是精神
竺可桢题

1938: Seeking truth (求是) was determined as the University's motto, inspiring generations of students in ZJU.

1938



1936: Professor Kochen Chu became President of ZJU in this year. He will leave a profound imprint on the history of ZJU.

1936

1998

1998: The current ZJU is reestablished through the merger of three other universities: Hangzhou University, Zhejiang Agricultural University, and Zhejiang Medical University.



2001

2001: Zhejiang University Scientific Park was founded - one of the earliest in China - which serves as an incubator for faculty and students to initiate high-tech startups and promote the industrialization of their technologies.



2007

2007: A research picosatellite (named ZJU First) is successfully sent into the orbit.



2001

2008: Self-developed by ZJU, the first Polyshield Tunnel Boring Machine in China is used in the construction of the Tianjin Metro.



2017

2017: We celebrate our 120th anniversary and confidently say that the best is yet to come!



2016

2016: ZJU is ranked as number 1 in China, with a total number of nine projects winning the National Science & Technology Award.



2013

2013: Carbon aerogel is synthesized at ZJU, which holds the world record for the lightest solid material with a density of just 0.16 mg/cm³.



A look into ZJU's plan to world-class university

In Jan, 2017, Nature's insideview interviews Dr. Zhaohui Wu, President of Zhejiang University, for a profile feature on Zhejiang University. Important keywords are World-class University, Innovation-driven, Innovator Cultivation, Collaboration and Internationalization.



Below is the complete interview of President Wu published in Nature.

Q: What are the steps towards the goal?

We have set up a three-step plan to be consistently listed among the top in world university rankings. To achieve this, our strategies are to cultivate high-quality people, build academic strength, pursue research excellence, attract high-calibre scholars, observe cultural traditions and explore reform approaches. We are implementing comprehensive reform to improve our systems of talent training, academic innovation, faculty team-building, school administration and support. We will keep the momentum of the reform, be open to integration into global education and innovation network, retain an innovation-driven strategy and stay true to the mission of serving regional, national and global needs.

Q: How does ZJU cultivate innovators?

We have a coordinated approach to improve talent training. The goal of our holistic education is to closely integrate knowledge transmission, skill training and personality moulding. We are reinventing an educational model that incorporates general and specialized education, interdisciplinary training, as well as ideological and political teaching. We also try to streamline classroom education, open online courses, mobile learning and internet platforms to diversify students' classroom experience. Future leaders need to be high-quality innovators with an international perspective. We have

leveraged our multidisciplinary strength and entrepreneurial spirit to train interdisciplinary, creative talents. Our achievements are demonstrated by prizes won by ZJU students in international contests, such as a mathematical contest in modelling, an international collegiate programming contest and RoboCups. Entrepreneurial success of ZJU graduates and the amount of funding secured by ZJU start-ups are also outstanding among Chinese universities.

Q: How do you drive innovation at ZJU?

To build an innovative comprehensive research university with a world-class status, we are cultivating students with innovative spirits and leading an educational revolution. Innovation-driven development also means promoting high-quality research and knowledge transfer to support the national economy and meet global challenges. Additionally, innovation of management processes is needed. We are reinventing our organizational structure to create a culture that encourages innovation. We want to build an open system that supports international collaboration. I'm proud of our research innovations. We are leading domestic universities in numbers of SCI publications and citations, patents for invention, national science and technology awards, as well as contracts for technology transfers. Our researchers have achieved significant results, such as the development of high-end control systems, design and manufacturing of tunnel-boring machines, clean energy solutions,

prevention of infectious diseases and cultural heritage protection. Currently, we have 18 areas of study ranked in the global top 1% in the Essential Science Indicator of which seven are ranked in the top 100 and four are in the top 50 worldwide.

Q: What are your internationalization strategies?

As globalization increases, opening up is integral to our goal of building a world-class university. We are accelerating our internationalization plan by forging partnerships with world-class academic institutions overseas. So far, we have established collaborations with more than 140 universities around the world, including a number of top-notch universities, like Princeton University and Imperial College London. We have sent out more than 8,000 teachers and students for exchange and received more than 6,000 overseas students as of 2016. We have also built first-rate joint institutes with the University of Edinburgh and the University of Illinois at Urbana Champaign. Our plan to open up also means creating an ecosystem for innovation and entrepreneurship by integrating resources across and outside campus. In education, we are embracing the 'open loop university' concept, providing open-access learning opportunities and building an internationalized platform. We also strive to promote sharing of knowledge and culture.



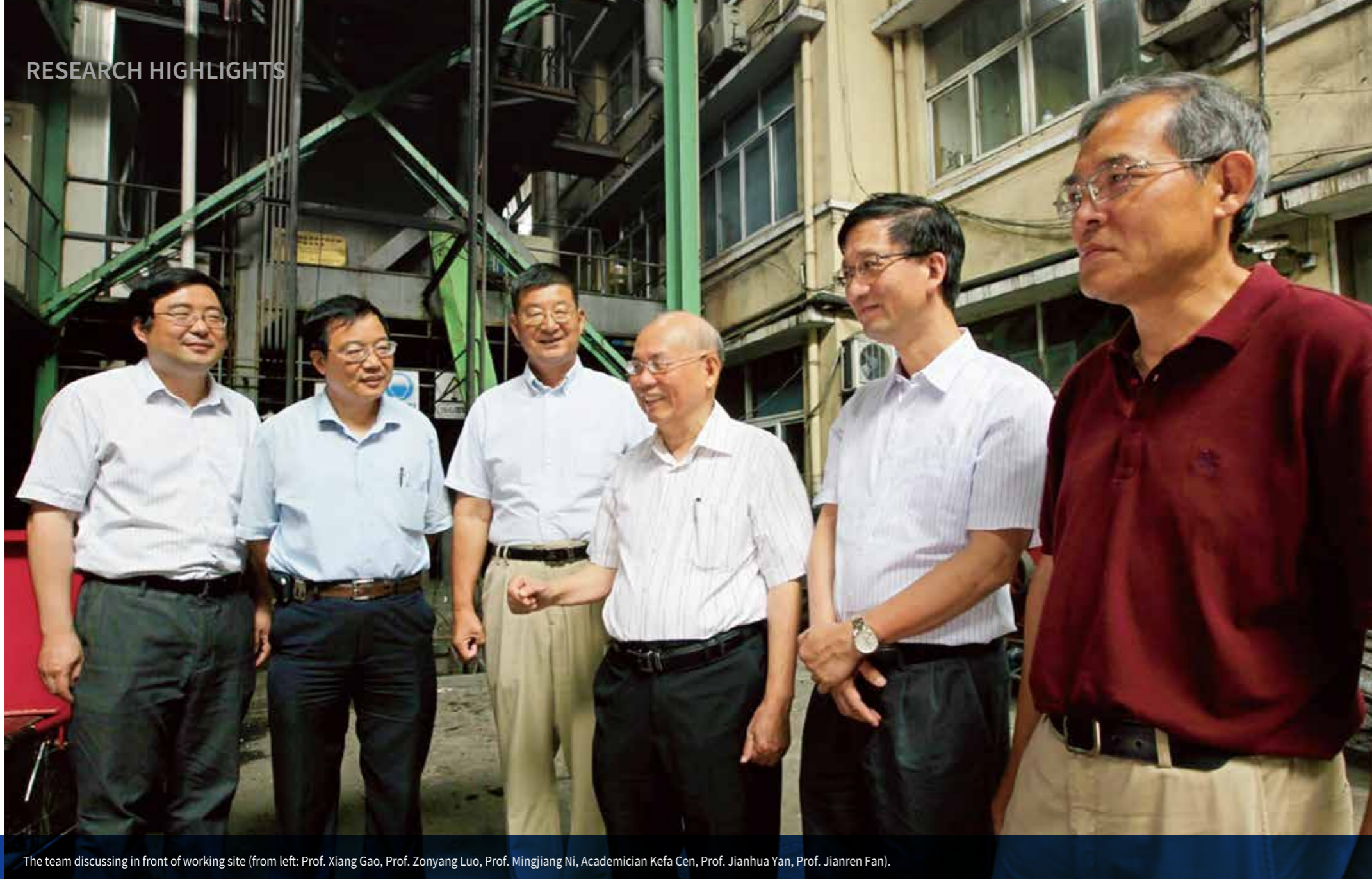
University
Presidents
Summit

Innovation of Universities

DRIVING
FORCE
OF FUTURE
SOCIETY

To commemorate the 120th anniversary, ZJU will host a University Presidents Summit on May 20, 2017. More than 100 participants from 42 global universities and organizations will get together and discuss how research universities serve as engines of innovation to propel economic and societal advancement. The Summit will be a unique platform to exchange views and best practices, as well as address challenges to a university in today's highly globalized context.





The team discussing in front of working site (from left: Prof. Xiang Gao, Prof. Zonyang Luo, Prof. Mingjiang Ni, Academician Kefa Cen, Prof. Jianhua Yan, Prof. Jianren Fan).

THE PROBLEM: ENERGY

Dependency on depleting supplies of fossil fuels, poor urban air quality, acid rain, and climate change are the foremost energy problems globally. Rapid economic growth and urbanization has made China the world leader in energy production, energy consumption and energy importation, which unfortunately also leads to ever-increasing municipal solid waste that threatens our environment. As coal is China's major fuel source and a pressing issue of urban waste disposal, research on pioneering technologies are needed to improve efficiency of conversion into electricity, promoting energy recycling, and minimizing the environmental impact of coal burning and waste treatment.

Recommendations:

Their technology of power generation with solid waste belong to "four mainstream technologies in the field of thermal treatment of solid waste" - by Prof. Themelis, chairman of International Commission of Energy from Waste, member of National Academy of Engineering "Academic Excellence of Zhejiang University and Precious Experience of China" - by state leaders

ZJU SOLUTIONS

A group of scientists in the Institute for Thermal Power Engineering of Zhejiang University, led by Academician Kefa Cen, Professor Mingjiang Ni, Professor Jianhua Yan and Professor Zhongyang Luo, take on the challenges presented by China's coal-centered national energy structure, solid waste treatment and disposal, and environmental protection. They created a new power generation model by using coal as both energy and resource, developing cutting-edge technology for efficient reduction of emissions in coal-fueled power plants and offering a systemic solution to transform ordinary household, industrial and agricultural waste into electricity.

WHAT WE DO

For clean power generation, this team developed a technology involving a multi-stage transformation of coal and coordinated treatment of the pollutants from coal burning in concentrated and separated sources, which changes and optimizes the national structure of coal and power industries and promotes energy saving and emission reduction.

They developed circulating fluidized bed-combustion-based waste-to-energy technology, which accounts for over 30% of total garbage burning. Furthermore, with dioxin emissions lower than the strictest EU standards, application of this technology has been ranked highly in the Chinese market.

For the first time, pollutant control technology realizes efficient control and super-low emissions of smoke pollutants, such as SO₂, SO₃, nitrogen oxides and particulates, in coal-fueled power plants that even meet the requirements for gas-fueled power plants. Over 300 coal-burning units, comprising a total volume of 150 million kilowatts and approximately 15% of the volume of thermal power generating units in the country, have incorporated this technology that contributes to revolutionary progress in coal and power industries in China.

OUR ACHIEVEMENTS

This outstanding team has filed 218 invention patents at home and abroad and won 4 prizes for outstanding patents in China, which is also home to 15 national science and technology awards. In 2017, their innovation and contribution to clean energy utilization in China was recognized as **first-prize National Science and Technology Award for Innovative Team**.

THE PROBLEM: ADVANCED MATERIAL

Mother Nature has long been a source of energy for Mankind. With the fast development of our economy, ever-increasing demand on energy has become a bottleneck problem faced by China and other countries in the world. The eyes of the world have been fixed on the pursuit of man-made materials which can supply clean and renewable energy.



Photo designed by Mr. Sirui Feng, Master Candidate, First year

ZJU SOLUTIONS

Graphene is the thinnest material known in the universe and it can also efficiently conduct electricity as electrons can move with a speed of 1,000 km/s inside. With these unique properties, the potential industrial applications of graphene are very promising. When a pure water droplet flows over a graphene monolayer, an induced voltage is generated in the flow direction. This interesting phenomenon was first observed in the laboratory of Prof. Shisheng Lin at the College of Information Science and Electronic Engineering of Zhejiang University. His recent publication on *Advanced Functional Materials* (Adv. Funct. Mater. 27, 1604226, (2017)) unveiled an important secret: the supporting substrate played a crucial role in this electricity-generating process.

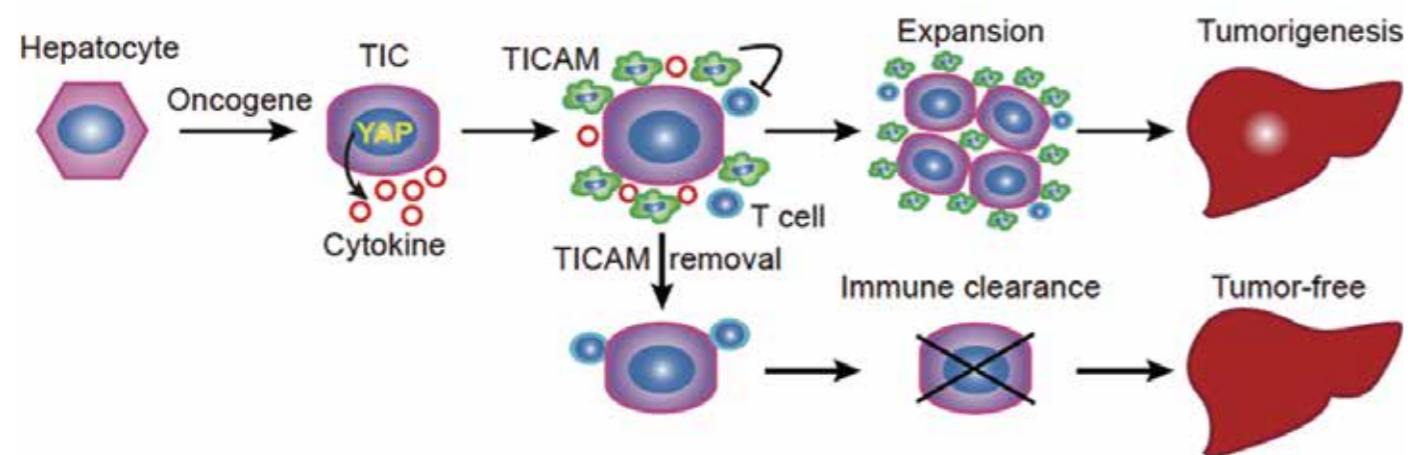
WHAT WE DO

Back in 2011, the possibility to generate electricity by graphene-water interaction was first proposed and its underlying mechanism has undergone serious debate since then. Additionally, significant discrepancies remain on whether de-ionized water or pure water can generate electricity from graphene. To investigate the effect of underneath substrate in induced voltage across graphene by flowing water, Professor Lin proposes a graphene-piezoelectric material heterostructure. Their results showed an obvious voltage output up to 0.1 V was generated even with deionized water after the introduction of this supporting template beneath the graphene layer. This electric potential arises from a continuous charging-discharging process in graphene and the screening effect of the water due to relatively regarded generation of charges in the piezoelectric layer than the graphene layer, which are revealed by first-principles calculations and a number of experiments.

IMPLICATIONS

For the **first time**, Prof. Lin's work reveals a **dynamic charge interaction** among **water, graphene, and the substrate**, which greatly expands our current understanding of flow-induced voltage on nanomaterials. These findings offer novel perspectives on how to generate electricity from flowing water and facilitate the practical applications of graphene-water nanogenerators and graphene-based biosensors.

Schematic drawing on Dr. Dong's work (For the full research article, please go to <http://jem.rupress.org/content/214/4/1065.long>)



Proposed mechanism for tumor initiation in liver cancer (For full research article, please go to <http://genesdev.cshlp.org/content/early/2017/02/21/gad.294348.116.full.pdf+html>)

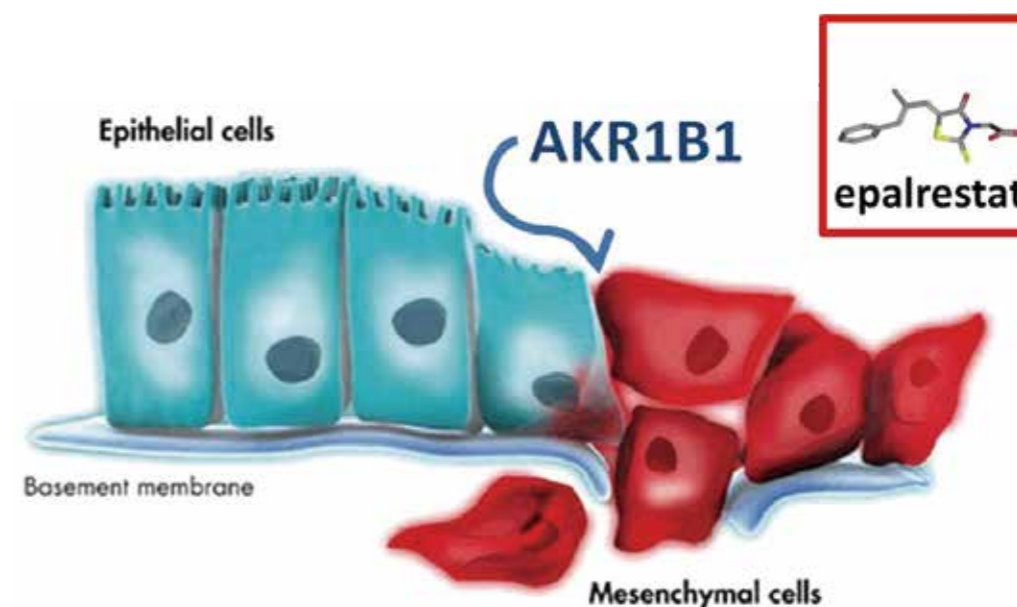
THE PROBLEM: CANCER

Cancer is one of a major health problems impacting millions of people globally. In China, it is reported that approximately three in every ten thousand people are diagnosed with cancer in 2015¹, and the disease causes enormous economic and social burdens as well as great heartbreak. A full range of researches, from cancer initiation and metastasis to novel cancer therapies, are urgently needed to tackle this problem.

¹Cancer statistics in China, 2015, CA: A Cancer Journal for Clinicians, 2016, DOI: 10.3322/caac.21338

ZJU SOLUTIONS

ZJU scientists have tried to fight the very causes of cancer. What will a cell do if it mutates into the first cancer cell, the so called tumor-initiating cell (TIC)? Our scientists have worked on uncovering tumor immuno-evading mechanisms and aim to reactivate our immune system to recognize the tumor cells then kill it. To fight metastasis, researchers in ZJU zoom on the key modulator in tumor aggressiveness and propose a small molecule inhibitor that is effective against a deadly form of breast cancer that significantly threatens women's health.



WHAT WE DO

Ranked in the fifth position on incidence rate of cancers, hepatocellular carcinoma is a particular problem in China due to the prevalence of the hepatitis B virus. To uncover the secrets around TICs, genetically defined liver TICs are generated by Dr. Bin Zhao in the Life Sciences Institute of Zhejiang University. Interestingly, active recruitment of M2 macrophages by TICs is found to happen as early as the single-cell stage. Additionally, activation of the Hippo pathway effector Yes-associated protein (YAP) is shown to mechanically participate in this process and elimination of TIC-associated macrophages (TICAMs) abolishes tumorigenesis in a manner dependent on the immune system. Basal-like breast cancer (BLBC), which generally falls into the triple-negative breast cancer subtype,

is associated with an aggressive clinical history, early recurrence, distance metastasis and shorter survival. There is an unmet medical need for the treatment of BLBC due to the absence of effective targeted therapies and poor response to standard chemotherapy. Professor Chenfang Dong of the School of Medicine performed bioinformatic analysis on more than 500 tissue samples of breast cancer patients, revealing statistically significant overexpression of AKR1B1, a metabolic enzyme, in BLBC. Further studies by his group demonstrates its involvement in epithelial-mesenchymal transition (EMT), a critical process in cancer cell migration and metastasis. They also find that epalrestat, the only AKR1B1 inhibitors that approved for diabetic complication in Japan, exhibits an apparent inhibitory effect on BLBC using cellular and mice models in a clinically achievable dose.

IMPLICATIONS

For the first time a decisive role of macrophages in the survival of single TICs is confirmed in vivo and Dr. Zhao's findings provide a proof of principle for TIC elimination by targeting YAP or M2 macrophages, which shed light on the elimination or prevention of tumors through the activation of the immune system. Professor Dong's work has provided an in-depth understanding of the function and underlying mechanism of AKR1B1 associated with cancer aggressiveness. Since epalrestat is already on the market and shows no major adverse drug reactions, its potential as a valuable targeted drug in clinical treatment of BLBC is suggested, which warrants further investigation.

THE PROBLEM:
**CULTURAL
 RELICS
 PROTECTION**

China is proud of its rich cultural relics, a testament to five thousand years of history. It is important to preserve and protect these irreplaceable historic artifacts for people across the country and around the world. These priceless antiquities is facing a range of threats today—war, terrorism, climate change, natural disasters – and proactive efforts are needed to protect them from harm.

ZJU SOLUTIONS

State-of-art computer vision technologies have allowed information about artifacts to be archived digitally, which then can be distributed, studied and appreciated in the future. Scientists in the Institute of Cultural Heritage stand at the frontier of digital humanities. Integrated with multidisciplinary expertise of ZJU on computer engineering, cultural relics & museology, art science, geology and material science, our research platform –specializing in high-fidelity digital collection and information processing of cultural relics has become a national pioneer, particularly in the preservation of precious murals.

WHAT WE DO

Supported by the 2014 major project of the National Social Prefecture Foundation “Digital Protection and Research on Murals of the Ancient Cave Temples in Ngari Prefecture of Tibet”, our large-format high-fidelity digital image acquiring system and multi-view stereo system has been developed and upgraded in accordance with archaeological methods. To overcome light-reflection on murals in

Tibet, the digitizing equipment was updated accordingly and the image acquiring mission at the White Temple in Tholing Monastery was successfully accomplished. This is the first time that these murals have been holographically recorded, preserved and presented. The total area of digitally-acquired murals is 320.5 m² and the image resolution is 300 ppi; proportional printing reflects the real brushwork with a color retention of 96%.

IMPLICATIONS

The digitizing results received high praise from experts in the fields of Chinese archaeology, Tibetology and Tibetan Religion for their informative visual materials on the murals of western Tibet. The achievements of this program have been beautifully displayed in the book ‘Ngari Murals: the White Temple of Tholing Monastery’, which won the Ninth Shanghai Print Award and the 67th Premier Print Award of 2016 in the US. Our technologies have been applied to more than 100 heritage institutions and cultural sites in 20 provinces, municipalities and autonomous regions of China, making great contributions for the protection and inheritance of China’s cultural heritage.



The fourth-generation high-resolution image acquiring equipment at work in the White Temple in Tholing Monastery, Tibet, China

We are hiring!



ZJU is seeking faculty candidates for the highly competitive, well-funded, and newly launched “Hundred Talents Program”, which covers all colleges and departments of ZJU. Successful candidates are expected to establish internationally competitive and independent research programs in cutting-edge areas of the relevant fields. Applicants are supposed to work full-time and deliver excellent research and teaching at ZJU, following the spirits of “Seeking Truth, Pursuing Innovation”.

Except the “Hundred Talents Program”, there are a number of talent recruitment programs and open job opportunities for high-end talents worldwide. For details, please visit: http://talent.zju.edu.cn/redirect.php?catalog_id=20038&object_id=40799 or scan the QR code on the right:



Required qualifications

Successful candidates should have:

- **Demonstrated commitment to excellence in research and teaching at different levels;**
- **Proven track record of academic achievements comparable to those of assistant professors or associate professors in a prominent international university;**
- **A doctoral degree from a world-renowned university/institution; those with postdoctoral experiences are preferred.**

How to apply

Qualified applicants are strongly encouraged to contact our Talents Office at tr@zju.edu.cn by submitting the following materials:

- **Curriculum Vitae with a publication list**
- **Statement of Research and teaching plan**
- **Certificates of academic degrees**
- **PDFs of relevant publications or submitted manuscripts/pre-prints**
- **Contact information of three to five references**

SPOTLIGHT ON: STUDENTS

IdeaBank Makerspace—Cradle of Makers at ZJU for Future Entrepreneurs

IdeaBank Makerspace is an incubator for entrepreneurs, which is a jointed effort by the Graduate School of Zhejiang University and Yibin Lingang Economic & Technological Development Zone. Since its establishment, it has become a magnet for start-up teams from postgraduates.

If a team wants to settle in the IdeaBank, it has to undergo rigorous evaluation procedures regarding to its technology,

talents, market, administration and finance. Currently, a total of 21 start-up teams are operating, including Leon's Voice, VR Engine, Tipix—Everyone Can Be an Artist, CongAcademy and Yunphant.

IdeaBank sets a precedent for ZJU's partnership with other provinces in creating a makerspace. “ZJU's entrepreneurship education is innovation-driven and inclusive. On this account, the Graduate School

signed an agreement with Yibin Lingang Economic & Technological Development Zone to establish a makerspace in October, 2015,” said Lv Miaohua, Director of the Office of Postgraduate Student Affairs, “Yibin Lingang Economic & Technological Development Zone and ZJU aim to create a win-win situation by bringing into full play their respective assets in various fields.”



Photos by Just for Happy

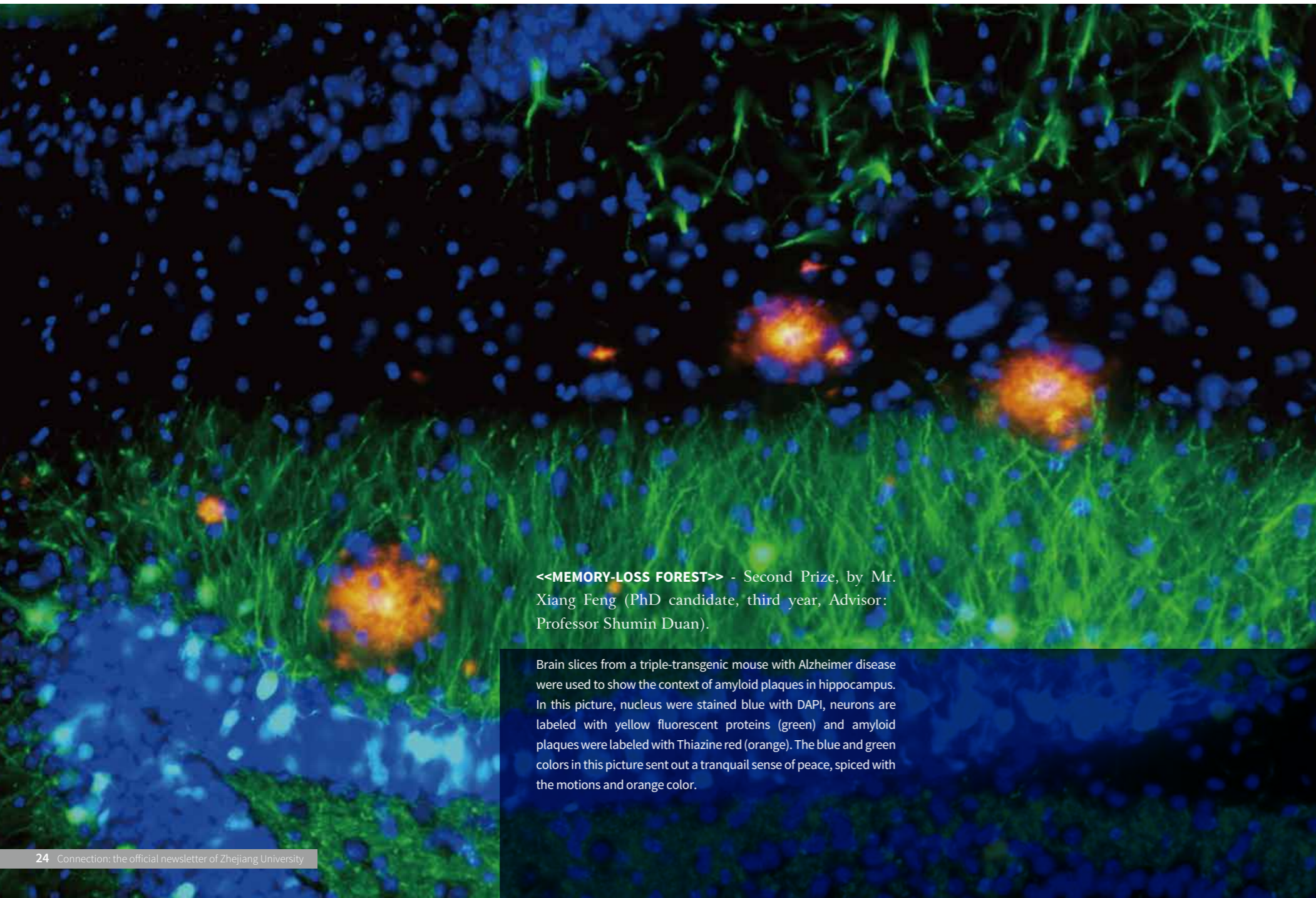
Way To Go, the Robotic soccer teams of ZJU!

The RoboCup Iran Open 2017 was held at Tehran International Fair in April 5-7, 2017. As an attempt to foster AI and intelligent robotics research, the RoboCup (originally Robot World Cup Initiative) provides a platform in a primary domain of soccer game where a wide range of technologies can be integrated and examined, as well as being used for integrated project-oriented education. For this match two of ZJU's robotic soccer teams -ZJUDancer and ZJUNlict—each won 1st place in the Humanoid and Small Size Robot Leagues

respectively. In addition to these wins, the two teams have an impressive track record in the history of RoboCup. ZJUDancer was established in 2006 and has clinched the 2nd place award twice (2015 and 2016). ZJUNlict, the first robotic soccer team in ZJU, is now thirteen years old and took home two consecutive World Championships (2013 and 2014). Iran Open is a warm-up for the RoboCup this year, which will be held in Nagoya, Japan. Fight on, ZJUDancer and ZJUNlict! We expect more great news from Nagoya!

The merger of science and art- 2nd Scientific Photography Contest

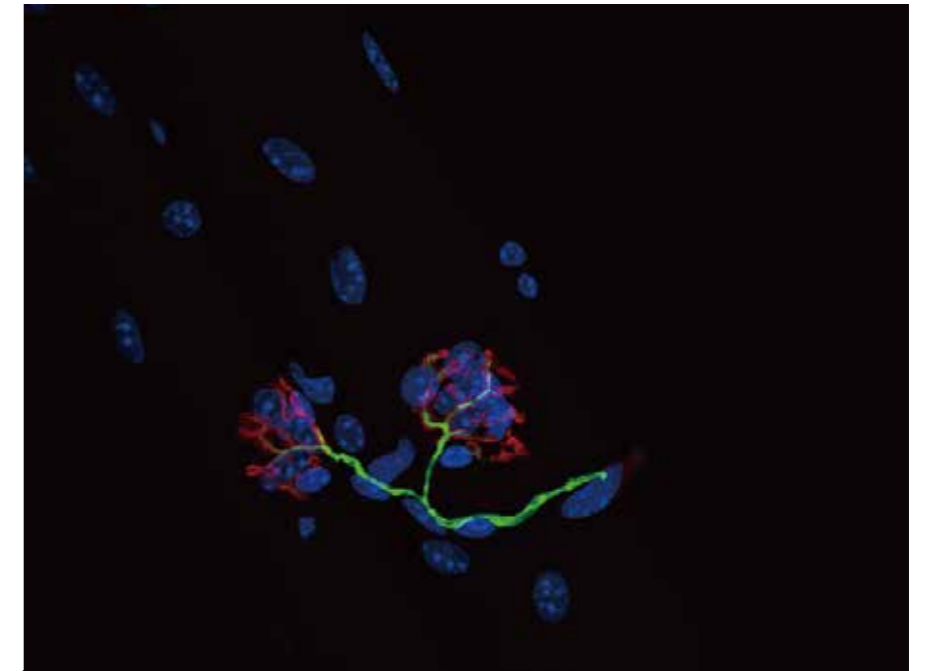
On the afternoon of January 12, the winners of the Scientific Photography Contest were announced by the Public Technology Platform of the School of Medicine in Zhejiang University, the organizer for this event. 2017 is the second year for this contest and its theme is Innovating, Invigorating and Sharing. The goals of this contest are to inspire students to uncover fun in the research and explore the beauty of the microworld, develop their artistic sense and foster creative thinking. More than sixty participating photos were received. After an expert committee review, both on-site and Wechat online votes, ten photos stood out. Here three award-winning photos are present.



<<MEMORY-LOSS FOREST>> - Second Prize, by Mr. Xiang Feng (PhD candidate, third year, Advisor: Professor Shumin Duan).

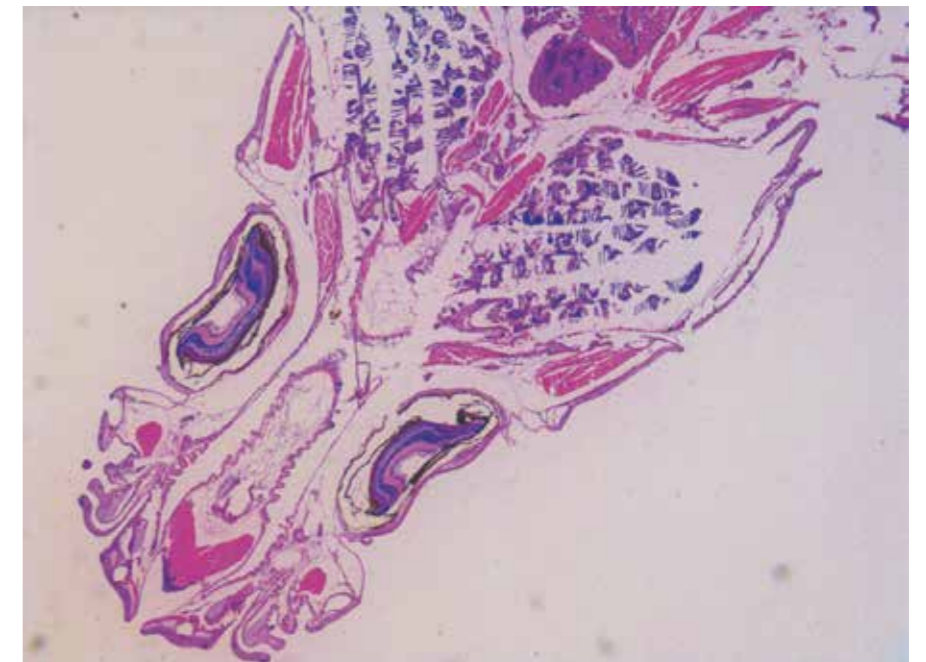
Brain slices from a triple-transgenic mouse with Alzheimer disease were used to show the context of amyloid plaques in hippocampus. In this picture, nucleus were stained blue with DAPI, neurons are labeled with yellow fluorescent proteins (green) and amyloid plaques were labeled with Thiazine red (orange). The blue and green colors in this picture sent out a tranquil sense of peace, spiced with the motions and orange color.

<<TWIN LOTUS FLOWER>> - People's Choice Award, by Ms Ailian Wang (Master candidate, first year, Advisor: Professor Chenyong Sheng).



Representative confocal images showing the structure of neuromuscular junction of mice, where the neurofilament is stained in green; BTX (red); DAPI (blue). The photo was a fusion of scientific and aesthetic beauty with delicate texture and bright color.

<<TROPICAL DRAGON KING>>- Third Prize, by Mr. Zengming Zhang (PhD candidate, first year, Advisor: Professor Liang Wang)



To examine genetic modification on the histology of zebrafish by CRISPR-Cas9 system, digital micrograph of the brain section stained with hematoxylin and eosin were captured under a microscope, which vividly mimics the head of traditional Chinese dragon.

Our Water, Our Sports

Zhejiang University has a special tie with water, as reflected by the University and Campus names in Chinese, as well as vast on-campus water coverage in space. Not surprisingly, diverse student activities happen on the water. Among them, our water sport teams have no doubt to become a distinctive brand of ZJU, which include Dragon Boat Team, Kayak Team, Kayak Polo Team, Sailing Team, Paddle Board and Paddle Board Yoga Team. With intensive financial support from the university administration, active student participation and our

world-class coach, these teams have taken home numerous awards since the 2011. "We hope that we can remove the label or stereotype of our students. ZJUers are the elites in study and work while they are also passionate athletes. Sports will make them more self-disciplined and persistence in their lives", said Ms Yaping Xu, founder of Kayak team, faculty in the Department of Physical and Art Education and a previous world champion athlete. This series of teams not only promote the water sports among the students but also provide a



"The most interesting thing is to witness partner's boat flip over. We laughed, hugged and shrunk against each other to keep warm in the winter. It was really a wonderful feeling to share a cup of ginger tea after that". - Yingqiang Wang, a third-year student majored in Marine Engineering and Technology

balanced campus environment for their intellectual and physical growth.

ZJU Postgraduate Zhenye Xie Wins 4 × 100 m Bronze at IAAF World Relays



Pictures quoted from tencent sports

The 2017 IAAF World Relays was held in Bahamas on April 23. Zhenye Xie, a postgraduate student of the Department of Physical Education, Zhejiang University, clinched the bronze medal in men's 4X100 meters relay race together with Xingqiang Tang, Bingtian Su and Jingsheng Liang. The Chinese team clocked 39.22 seconds to finish third in the final, thus securing a berth in the 2017 IAAF World Championships in London.

SPOTLIGHT ON: ALUMNI

Annual "Love@ZJU" Group Wedding Ceremony held a special edition for 120th Anniversary

As an important part of the year-long celebration of our 120th anniversary, the sixth "Love@ZJU" Group Wedding Ceremony was held on April 9th. An amazing 120 newly-wedded alumni couples walked down the aisle in the Zijingang Gymnasium, with congratulations and best wishes from their instructors and the Chairman of the Party Council, Deshui Jin. This ceremony brought a sweet and romantic feeling to the festive atmosphere here at ZJU.



Photo: Yuan Zhang

Global Celebrations on our 120th Anniversary by ZJU Alumni



From the up-left corner clockwise, these celebration activities happened in the Italy, Canada, France, Japan, Australia and the poster of this relay (the middle).

ZJU alumni around the world celebrated the 120th anniversary with various activities, including University's Flag relay across the France and Chorus on University's song. We appreciate all the passion and love from our alumni. You make us better!

UPCOMING EVENTS

Zhejiang University Global Lecture Series (68): The Hippocampus as a Cognitive Map: History and an Update

Speaker: John O'Keefe
2014 Winner of Nobel Prize in Physiology or Medicine
Professor of Cognitive Neuroscience, King's College London
DATES: 13:30, May 15, 2017
LOCATION: School of Medicine, Zijingang Campus

Aquatic Sports Meeting

DATES: May 19-20, 2017
LOCATION: Qizhen Lake, Zijingang Campus
The Aquatic Sports Meeting provides will be held to celebrate ZJU's 120th Anniversary. Among the activities are kayak doubles, dragon boating, a shipbuilding competition- and much, much more!
All students and teachers are encouraged to attend!

University Presidents' Summit

DATES: May 20, 2017
LOCATION: Qiushi Great Hall, Zijingang Campus

Asia-Pacific Forum of 2017 World Entrepreneurship Forum

DATES: May 20, 2017
LOCATION: Student Theater, Zijingang Campus

Stamp Issuing Ceremony of "The 120th Anniversary of Zhejiang University"

DATES: 8:00-8:30, May 21, 2017
LOCATION: University Library, Zijingang Campus

Zhejiang University 120th Anniversary Evening Performance

DATES: 19:30-21:00, May 21, 2017
LOCATION: Stadium, Zijingang Campus

Zhejiang University Global Lecture Series (72): Career development in science: asking the right question, selecting the right mentor, overcoming frustrations and enjoying achievements

Speaker: Aaron J.Ciechanover
Professor of Israel Institute of Technology, the 2004 Winner of the Nobel Prize in Chemistry
DATES: 15:00-17:00, May 27, 2017
LOCATION: Linshui Lecture Hall, Zijingang Campus

Electron Microscopy for Materials — The Next Ten Years - Jointly organized by Zhejiang University, Nature, and Nature Materials

DATES: May 27- 29, 2017
LOCATION: Hangzhou Huagang HNA Resort
For further information, please visit:
<http://www.nature.com/natureconferences/emm2017/index.html>

The 9th Applied Inverse Problems Conference

DATES: May 29 – June 2, 2017
LOCATION: Linshui Lecture Hall, Zijingang Campus

Chinese and American Forum on Legal Information and Law Libraries (CAFLL)

DATES: June 1 - 2, 2017
LOCATION: Lakeview Hotel Hangzhou

International Summer School "Entrepreneurship in China"

DATES: June 21 - July 11, 2017
LOCATION: School of Management, ZJU
ZJU "Entrepreneurship in China & OBOR" International Summer School is a unique three-week program which offers participants an opportunity to understand the entrepreneurial China in one of China's most dynamic growth areas.
For further information, please visit:
<http://www.cma.zju.edu.cn/en>

The 3rd International Conference on Insect Genomics (ICIG 2017) & The 6th International Symposium on Insect Physiology, Biochemistry and Molecular Biology (IPBMB 2017)

DATES: July 1 - 3, 2017
LOCATION: Sanli New Century Grand Hotel Zhejiang

International Summer Program from Guanghua Law School

DATES: July 4 - 8, 2017
LOCATION: Guanghua Law School, ZJU
Zhejiang University Guanghua Law School will present the 10th International Summer Program in the summer of 2017. The International Summer Program is designed to encourage law students to exchange ideas and explore cultural differences, to enrich knowledge and broaden horizons at a first-rate platform.
For further information, please visit:
<http://www.glhs.zju.edu.cn/english/>