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INTERNATIONAL COOPERATION

S&T Minister Met German Guests



WAN Gang, Chinese Minister of Science and Technology met with Hans-Joerg Bullinger, President of Fraunhofer-Gesellschaft and his party on November 10, 2009. Both WAN and Bullinger discussed a range of issues concerning the establishment of an innovation system, the role play by the universities in establishing such a system, and fund raising for S&T activities. WAN told his counterpart that MOST pays great attention to fund raising for S&T activities, and Fraunhofer-Gesellschaft is a good example to learn from. In addition, WAN briefed the German guests of the energy efficient and new energy auto projects and solar photovoltaic generation technology diffusion activities launched by MOST. On the same day, Bullinger and his party attended a meeting to wrap up a China-Germany joint research project for sustainable water resources utilization in the large cities suffering water shortage. Financed by both Chinese Ministry of Science and Technology and German Federal Ministry of Education and Research, the project has produced numerous important R&D findings and applications in the past 4 years.

Smart Rat

A joint team, headed by Prof. CAO Xiaohua at East China Normal University and Dr. Joe Z. Tsien, Director of the MCG Brain & Behavior Discovery Institute, has produced a transgenic rat able to remember novel objects. Dubbed Hobbie-J after a smart rat that stars in a Chinese cartoon book, the transgenic rat has proved that NR2B is a universal switch for memory formation

Scientists found that Hobbie-J consistently outperformed its brothers and sisters even in

more complex situations that require association, such as working their way through a water maze after most of the designated directional cues and the landing point were removed. For example, Hobbie-J was quicker in spotting a landing point (15cm across) in a round water tank (150cmx50cmx30cm) 2cm underwater, after the water was camouflaged with white food dyes, compared with other non transgenic rats from the same parents. Even when the landing point was removed, Hobbie-J remained able to relocate the place where the landing point sat, and stayed there longer than its non-transgenic brothers and sisters. The smart rat also showed an enhanced memory in identifying new objects and in going through a T shaped maze.

Funded by the Ministry of Science and Technology, Ministry of Education, Shanghai Municipal S&T Committee, and Yunnan Provincial S&T Department, the study published its findings in the recent issue of *PLoS ONE*.

Novel Stem Cell Technology

Prof. LI Xihe at Inner Mongolia University College of Life Science, in collaboration with Wellcome Trust/Cancer Research UK Gurdon Institute under University of Cambridge, has landed an important animal stem cell finding in the epigenetic reversion of post-implantation epiblast to pluripotent embryonic stem cells. The finding was published in October 29 issue of journal *Nature*.

Researchers reprogrammed advanced epiblast cells from embryonic day 5.5–7.5 mouse embryos with uniform expression of N-cadherin and inactive X chromosome to ES-cell-like cells (rESCs) in response to LIF–STAT3 signaling. The finding has overthrown the traditional knowledge of epiblast reprogramming. The epiblasts derived from the study are not only able to show all the features possessed by a stem cell in-vitro, but can form up an efficient mosaic in vivo. More importantly, it can be part of the reproduction system, passing the reproduction capability to the next generation.

The finding shows that epiblast reprogramming allows epiblast an explicit division capability, letting it be part of placenta tissues, indicating that the rESCs reprogrammed using the new technique is of a unique potential for life division and associated development. A molecular regulation model has been established for the purpose, allowing people to study the reprogramming mechanisms at different division phases, and to develop stem cell applications for animals raising activities and medicine.

University Alliance for Low Carbon Energy

Three universities, including Tsinghua University, University of Cambridge, and the Massachusetts Institute of Technology, have fostered up an alliance on November 15, 2009 to advocate low carbon energy and climate change adaptation. The alliance will mainly work

on 6 major areas: clean coal technology and CCS, homebuilding energy efficiency, industrial energy efficiency and sustainable transport, biomass energy and other renewable energy, advanced nuclear energy, intelligent power grid, and energy policies/planning. A steering panel made up of the senior experts from the three universities (two from each) will be established to review, evaluate, and endorse the goals, projects, fund raising activities, and collaborations under the alliance. With the Headquarters at the campus of Tsinghua University and branch offices at other two universities, the alliance will be chaired by a scientist selected from Tsinghua University.

According to a briefing, the alliance will need a budget of USD 3-5 million, mainly from the donations of government, industry, and all walks of life. In this context, the R&D findings derived from the alliance will find its applications in improving people's life.

RESEARCH AND DEVELOPMENT

Cymbidium Genome Chart Completed

Chinese scientists announced on November 15, 2009 that the Cymbidium genome project, jointly initiated by the Shenzhen Cymbidium Protection Center, Tsinghua University Graduate School, and Beijing Genomics Institute (Shenzhen), with the participation of CAS Institute of Plant Physiology and Ecology and Taiwan National Cheng Kung University, has produced a genome chart for the flower.

The project was launched on July 20, 2009. The project team has performed a full sequence on *Phalaenopsis equestris*, and made the associated bioinformatic analysis. Researchers also sequenced and analyzed 11 typical Cymbidium plants. Researchers told reporters that they will soon start to work on the detailed functions of *Phalaenopsis equestris* genome, in an attempt to understand the evolution of Cymbidium plants by comparing the genes of 11 typical Cymbidium species.

New Gene Found for Alzheimer's

A study team, led by XU Huaxi and ZHANG Yunwu at Xiamen University Institute for Biomedical Research, has published a finding in the recent issue of journal *Neuron* on identifying a functional mouse gene named Rps23r1 that is able to reduce Alzheimer's β -amyloid level.

Thanks to 8-year efforts, Chinese scientists have identified an Rps23r1 gene in rats, and established an animal model for cell experiment and genetic modification. They proved through the model that the protein is able to reduce Alzheimer's β -amyloid level and tau

phosphorylation, providing a new drug target for treating the disease.

Two Longevity Genes Found

A joint study, led by TIAN Xiaoli of Peking University Institute of Molecular Medicine and ZENG Yi at China Center for Economic Research, part of the National School of Development, found that both FOXO1A and FOXO3A are associated with the longevity trait of Han Chinese populations. Researchers said FOXO1A goes with the longevity of female Chinese, though FOXO3A tells no differences in gender. The finding was published in the recent issue of *Human Molecular Genetics*.

The team led by Prof. TIAN Xiaoli found for the first time that FOXO1A goes with the longevity of female Chinese, which helps explain the traditional longevity of females. Earlier research suggests that FOXO3A is associated with the longevity of a specific population, including Japanese, German, and Italian. Han Chinese population shares the same longevity phenotype with other populations. Researchers believe that FOXO3A is associated with the longevity possibly through regulating the resistance to insulin, while FOXO1A affects the longevity possibly through working on the female reproduction system, in addition to its resistance to insulin. In the study, SNPs from FOXO1A and FOXO3A were selected and genotyped in 1000 centenarians and 1000 younger individuals.

NEWS BRIEFS

New High Tech Fair Opened





The 11th China High Tech Fair opened in Shenzhen. ZHANG Laiwu, Chinese Vice-Minister of Science and Technology attended the event. Covering an area of 100,000 square meters, the Fair is made up of six components, including S&T findings trading, high tech products, forum, super themes, high tech human resources, and a Fair that will never end. Domestic delegations from different provinces, municipalities, and autonomous regions, and Hong Kong, Macao, and Taiwan, and 26 foreign delegations from 17 countries, including the United States, Russia, and Germany, attended the Fair. ZHANG Laiwu visited major S&T finding counters at the section showing the S&T accomplishments, including the moon probe, seawater desalination, and new packaging machine. He also discussed the R&D issues, trends, and market applications with technicians at the scene.

APSTAR-7 Satellite

China Great Wall Industry Corporation (CGWIC) and APT Satellite Company Limited Hong Kong, inked on November 8, 2009 a service contract to launch APSTAR-7 communication satellite in the first half of 2012 at the Xichang Satellite Launch Center, using an enhanced Long March 3B launch vehicle.

APSTAR-7 is designed with 28 C-Band and 28 Ku-Band transponders onboard, for a total frequency of 11.4 KW, and a design life of 15-year. It will replace APSTAR-2R positioned at 76.5° E. APT plans to provide television transmission and satellite communication services using the C-Band to a range of regions, including Asia, Middle East, Africa, Australia and Europe, and direct broadcast TV, SNG and VSAT services, especially intercontinental Ku

communication services to China, Middle-Central Asia and Africa through Ku-Band. Additionally, a mobile beam is included in the Ku-Band design to improve the flexibility of the satellite.

Chinese Domain Name Applied

On November 16, 2009, China Internet Network Information Center (CNNIC) filed an application for the top-level Chinese domain name "Zhongguo" (written in pinyin), to the Internet Corporation for Assigned Names and Numbers (ICANN), a major internet oversight agency. Global netizens will be able to log on to the internet with the new domain in pinyin, such as Xinlang for sina, at the beginning of next year at the earliest. A number of major browser providers, including Google and yahoo, have started to collect the websites under Chinese domain name "Zhongguo". Up to date, more than 90% of the government agencies, over 95% of the media websites, 90% of the major universities, 50% of the businesses on the top 100 lists, and 40% of the businesses on the top 500 lists in China have registered their Chinese domain names.

National Supercomputer Center in Shenzhen

China started to build a national supercomputer center on November 16, 2009 in Shenzhen. Approved by the Chinese Ministry of Science and Technology in 2009, the supercomputer center will jointly be built by the Chinese Academy of Sciences and Shenzhen Municipal Government. Physically located in a university town in Xili, Shenzhen, the new center will consume an investment worth RMB 800 million for 40,000 square meters of floor area on a land of 25,000 square meters. So far the project has completed geological prospecting, environmental evaluation, and design. Expected to put into operation next year, the supercomputer center will allow resources sharing across South China, in a move to reduce both computation and maintenance costs. The center will open to the clients in South China, Hong Kong, Macao, Taiwan, and Southeast Asia, making itself a platform for S&T service, industrial innovation, R&D activities, and human resources development.

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