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NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUE

Beijing Declaration for Traditional Chinese Medicine Cooperation

A conference on international S&T cooperation in the area of traditional Chinese medicine, co-sponsored by the Chinese Ministry of Science and Technology, Ministry of Health, State Food and Drug Administration, State Administration of Chinese Traditional Medicine, State Intellectual Property Office, and World Health Organization, dropped its curtain in the afternoon of November 29, 2007. The meeting produced a Beijing Declaration, showing the consensus on promoting cooperation in the area of traditional Chinese medicine through government channels.

The Beijing Declaration states that the combination of traditional Chinese medicine and other schools of medicine may lead to a novel healthcare model for humans, and will

effectively lower down healthcare costs for both individuals and institutions. Innovation and diffusion of traditional Chinese medicine needs the support of modern science. Newly emerged disciplines, such as genomics, and the steady growth of basic knowledge, in particular, bioinformatics, has provided both means and ways for interpreting the basic principles of traditional Chinese medicine, and associated innovation. It is necessary to promote innovations of traditional Chinese medicine through enhanced international cooperation, in an attempt to further enrich its theoretical system, improve people s understanding of traditional Chinese medicine, raise the level of safety, effectiveness, and quality of traditional Chinese medicine, and accelerate the modernization and internationalization of traditional Chinese medicine industry. Conference recognizes that aiming at the common cause of human healthcare, the international S&T cooperation program in the area of traditional Chinese medicine will strive to enhance the capacity of traditional Chinese medicine in improving people s health, through international S&T cooperation and exchange. Conference also stresses that substantial R&D cooperation shall be fostered among universities, research institutes, and industries in the area of traditional Chinese medicine, including establishing bilateral and multilateral clinical research centers and joint labs for the purpose.

INTERNATIONAL COOPERATION

China-UK Near-Zero Emission Cooperation

A China-UK project to work on near-zero emissions was launched on November 20, 2007 in Beijing. LIU Yanhua, Chinese Vice Minister of Science and Technology, said at the launch ceremony that S&T advancement and innovations are the fundamental solutions to climate change. During the 11th Five-year Plan period(2006-2010), China will support related projects through the nation s S&T programs.

According to a briefing, the near-zero emission project is an initiative to study the feasibility of capturing carbon dioxide released by coal burning power plants, and geological structures for storage, under the framework of China-UK Memorandum of Understanding on cooperation in the area of carbon capture and storage.

LIU explained that this is a China-UK cooperation jointly implemented by universities, research institutes, and industries, mainly working on technologies for capturing carbon dioxide, and associated storage, and on the social and economic impacts of the initiative. He hoped both side get prepared for the design and start of phase II cooperation, implementing the Memorandum of Understanding in a smooth manner.

RESEARCH AND DEVELOPMENT

IGF-1R's Novel Role Unveiled

Researchers, at Chinese Academy of Sciences Shanghai Institutes for Biological Sciences, and University of Science and Technology of China, have found that IGF-1R plays a role in p53-mediated apoptosis through translational modulation of the p53-Mdm2 feedback loop. They believe that inhibition or loss of IGF-1R activity reduces translational synthesis of p53 and Mdm2 protein. Notably, IGF-1R inhibition increases p53 protein stability by reducing p53 ubiquitination, and maintains p53 at a lower level by decreasing p53 synthesis, thus rendering p53 insensitive to stabilization after DNA damage.

The finding, published in the recent issue of *J. Cell Biology*, unveiled the novel role of IGF-1R. Researchers found that the accumulation and apoptosis of DNA-damage–induced p53 is reduced in IGF-1R mouse embryonic fibroblasts or tumor cells treated with the IGF-1R inhibitor. Furthermore, the inhibition of IGF-1R reduces p53 and Mdm2 translation. The eukaryotic translation initiation factor 4F complex is also involved in this translational inhibition. These results demonstrate an unexpected role for translational control by IGF-1R in p53-mediated apoptosis.

Improved Stem Cell Techniques

A research team, headed by Prof. PEI Duanqing of Chinese Academy of Sciences Guangzhou Institute of Biomedicine and Health, has developed a new technique to work on stem cells. The findings were published in the November 6 issue of *J. Cell Research*.

Researchers have worked on Oct4/Sox2/Nanog for some time, and rolled out a range of findings on their functions. They demonstrate that four transcription factors, Oct4/Sox2/Myc/Klf4, can reprogram fibroblasts into ES-like cells or induced pluripotent stem cells (iPS cells). This has generated tremendous interests not only in the field of stem cell biology, but also those related fields such as developmental biology and regenerative medicine.

The advance has greatly improved the prospects of generating patient specific pluripotent stem cells for therapeutic purposes without therapeutic cloning, an approach with formidable technical as well as ethical challenges. The conceptual breakthrough of the iPS strategy (in this case, the success rate is 3‰) is quite obvious, demonstrating for the first time that reprogramming of somatic nuclei can be achieved through a rational combination of transcription factors with defined regulatory activities.

Improved Understanding of Synaptogenesis and Neurotransmission

A study team, led by XU Tao of Chinese Academy of Sciences Institute of Biophysics, has published its findings on molecular basis of synaptogenesis and neurotransmission in the November 21 issue of *J. Neuron*.

Researchers have developed direct electrophysiological assays, including membrane capacitance and amperometry measurements, in primary cultured C. elegans neurons. In addition, they have succeeded in monitoring the docking and fusion of single dense core vesicles (DCVs), employing total internal reflection fluorescence microscopy. With these approaches and mutant perturbation analysis, they provide direct evidence that UNC-31 is required for the docking of DCVs at the plasma membrane. Interestingly, the defect in DCV docking caused by UNC-31 mutation can be fully rescued by PKA activation. They also demonstrate that UNC-31 is required for UNC-13-mediated augmentation of DCV exocytosis.

Small Molecule Regulators of Autophagy Identified

Researchers, at Chinese Academy of Sciences Shanghai Institute of Organic Chemistry, Harvard Medical School Department of Cell Biology, and China National Center for Drug Screening, have screened out eight autophagosomes. Interestingly, seven of eight compounds are FDA-approved drugs for treatment of human diseases. The findings, published in the recent issue of the *Proceedings of the National Academy of Sciences*, have provided important evidences for understanding the mechanism of autophagy, and for treating Huntington's and other human diseases associated with the accumulation of misfolded proteins.

Autophagy is a lysosome-dependent cellular catabolic mechanism mediating the turnover of intracellular organelles and long-lived proteins. Reduction of autophagy activity has been shown to lead to the accumulation of misfolded proteins in neurons, and may be involved in chronic neurodegenerative diseases such as Huntington's disease and Alzheimer's disease. To explore the mechanism of autophagy, and identify small molecules that can activate it, researchers developed a series of high-throughput image-based screens for small-molecule regulators of autophagy.

Analyses led to the identification of eight compounds that can induce autophagy and promote long-lived protein degradation. Furthermore, the study shows that these compounds can reduce the levels of expanded polyglutamine repeats in cultured cells. The findings suggest the possibility that some of these drugs may be useful for the treatment of Huntington's and other human diseases associated with the accumulation of misfolded proteins.

Growing Rhodiola Sachalinensis

Thanks to their decade efforts, researchers of Northeast Forestry University have achieved

breakthroughs in understanding the growing environment of Rhodiola Sachalinensis, a medicinal plant. They have worked out the basics for regulating the growing environment of Rhodiola Sachalinensis, and have succeeded in growing the plant in the field, with an improved yield.

A research team, led by Prof. YAN Xiufeng of the Northeast Forestry University Life Science School, started to work on major effective elements in the plant from 1997, in an attempt to understand the basics of the plant, and the effects of environmental factors, such as seasonal variations, sunshine, moisture, and nitrogen, on the formation of Salidroside, and associated genetic properties. Researchers found that there are geographic differences among the Rhodiola Sachalinensis grown in the wildness, and the plant has a yield peak of Salidroside in an age range between 9-12 years. In addition, soil properties, including organic matters, nitrogen, potassium, and pH, are associated with the concentration of Salidroside. Of them, pH has a large effect on the concentration. Growing Rhodiola Sachalinensis is also noticeably affected by seasonal variations, in terms of the concentration of Salidroside. For example, Salidroside will be at its lowest yield, at the end of July or early August, a period enjoying most precipitation in the northern mountainous areas, though annual Rhodiola Sachalinensis makes an exception. Based on the findings, researchers studied the elements that affect the synthesis of Salidroside, such as sunshine intensity and property, in a greenhouse environment. Researchers found that the filter film in red color is able to noticeably enhance the concentration of Salidroside, from 7.13% to 67.57% for the plants that have grown for three years, and 45.45%〜55.27% for the four-year plants.

Wild Boars and Domestic Pigs 'Origins Studied

A study team, led by ZHANG Yaping, an academician of Chinese Academy of Sciences Kunming Institute of Zoology, has confirmed that all the domestic pigs in East Asia have an origin of single clade D, through a population phylogenomic analysis of mitochondrial DNA in wild boars and domestic pigs in East Asia. The domestication events mainly took place in the Mekong region and the middle and downstream region of the Yangtze River. The findings were published in the November 19 issue of *J. Genome Biology*.

In the study, population phylogenomic analysis was conducted in domestic pigs and wild boars by screening the haplogroup specific mutation motifs inferred from a phylogenetic tree of pig complete mtDNA sequences. None of the domestic pig samples from Northeast Asia, the Yellow River region, and the upstream region of the Yangtze River share the same haplogroup status with the local wild boars. The limited regional distributions of haplogroups D1 (including its subhaplogroups), D2, D3, and D4 in domestic pigs suggest at least two different in situ domestication events. The use of fine-grained mtDNA phylogenomic analysis of wild boars and domestic pigs is a powerful tool to discern the origin of domestic pigs. Findings also show that pig domestication in East Asia mainly occurred in the Mekong region and

the middle and downstream region of the Yangtze River.

NEWS BRIEFS

China's Largest Proprietary Wind Turbine

On November 22, 2007, a proprietary wind turbine with a capacity of 2000 kilowatt hours of electricity rolled off the assembly line in Chongqing. The new wind turbine has secured three Firsts in the country: first proprietary wind turbine with the largest unit capacity in the country, China's first largest wind turbine accredited by GERMANISCHER LLOYD (GL), and China's first larger capacity generator tested by German Wind Energy Institute (DEWI). The wind turbine is designed to accommodate both the climate and environment in the country, with a products line covering three major wind belts, including 90% of the atmospheric convection area, 70% of the water-land convection area, and mountain winds areas. The new system is able to work under extreme conditions, including high temperature, low temperature, sand and dust storms, heavy fogs, high sea level, and typhoon.

Jointly designed by CSIC (Chongqing) Haizhuang Windpower Equipment Co. Ltd., and Aerodyn, the new wind turbine currently has a localization of 70%, and will be up to 90% when the new system is put into bulk production.

China's First Marine Wind Turbine

China National Offshore Oil Corp. announced recently that it has put a proprietary wind turbine into official operation on November 28, 2007, after a 20-day trial operation. The wind turbine, independently designed and constructed by Chinese engineers, is the first marine application for offshore oil platforms in the country.

Physically located in the 36-1 oilfield, 70 km away from the sea shores, the wind turbine is a 1.5 megawatt generator driven by wind power installed on a giant rack standing in a water depth of 30m. It sends electricity to the center platform of the oilfield via a 5-km submarine cable. The generator reached a full load operation on November 8, with a maximum output of 1500 kilowatt hours of electricity. In an official operation, the generator will be up to an annual capacity of 4.4 million kilowatt hours of electricity, which means a reduced annual diesel consumption of 1,100 tons, or an annual economic saving worth RMB 6 million. Meanwhile, it will reduce emissions of carbon dioxide by 3500 tons, sulphur dioxide by 11 tons, which is equivalent to the amount of tail gas discharged from 164,000 vehicles.

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content should be directed to:

Mr. Mao Zhongying, Department of International Cooperation, MOST 15B, Fuxing Road， Beijing 100862, PR China Tel: (8610)58881360 Fax: (8610) 58881364

http://www.most.gov.cn