N0.484

CHINA SCIENCE AND TECHNOLOGY
NEWSLETTER
The Ministry of Science and Technology
People's Republic of China

N0.484 August 20,2007

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INTERNATIONAL COOPERATION

China-Germany Build "China Heart Healing System"

A collaborative project named "China Heart Healing", financed by the German Academic Exchange Service and German Federal Ministry for Economic Cooperation and Development, made its official opening on August 15, 2007 at Zhongda Hospital under Southeast University. In Germany, "China Heart Healing" will be implemented by Medizinisch-Naturwissenschaftliche Hochschule. In China, Southeast University, Huazhong S&T University, and Tongji University are the major implementers.

On the same day, a China-Germany training course for diabetes and heart healing also opened. Medizinisch-Naturwissenschaftliche Hochschule dispatched an expert team to share their advanced heart healing theories and techniques with their counterparts in Nanjing.

Both collaborating parties will sponsor an array of training courses, seminars, and workshops on heart healing during the period of 2007-2010, in an effort to establish a clinical healing system for Chinese heart patients.

RESEARCH AND DEVELOPMENT

Pathogenesis of Pulmonary Hypertension Found

Not long ago, a study team, led by Prof. ZHU Daling of Harbin Medical University, has found for the first time in the world that 15-HETE plays a contraction role in pulmonary artery anoxia, which improves people 's understanding of pulmonary hypertension.

While working on a project to study the molecular and ionic channels of pulmonary artery anoxia, ZHU and his collaborators found that anoxia may induce the generation of 15-HETE from 15-LO. The former plays a medium role through three channels, after shifting to the underlying layer of blood vessel' s endothelium. It can inhibit Kv, activating L-calcium channel, and letting calcium ions in from outside of cells, which causes the contraction of smooth muscles. It also inhibits the synthesis of protein in Kv channels, which reduces the number of Kv channels, and results in the contraction of

pulmonary artery. The last role it plays is directly causing the release of calcium stored in the smooth muscle, and indirectly inhibiting Kv channels, which may lead to the contraction of pulmonary artery.

The finding has confirmed the role played by 15-HETE in anoxemic pulmonary blood vessel contractions, providing new theory and evidences for understanding the pathogenesis of pulmonary hypertension, and for designing new drugs.

New Points for Regulating Arrhythmia

Prof. YANG Baofeng, a pharmacologist working at Harbin Medical University, has recently completed a study of preventing the occurrence of heart born sudden death. In the study, YANG found that M3R/IKM3 are the new points that can be used for regulating anoxemic arrhythmia. He observed a twinborn relationship between M3 receptors and 43 (Cx43) . Both play a regulating role when anoxemic arrhythmia occurs. As a result, the two will be an important target for producing a new arrhythmia drug.

YANG and his team found in a rat model that M3/IKM3 can inhibit cardiac muscle anoxemia and cardiac cell decaying, and protect cardiac muscle, while easing the arrhythmia caused by cardiac muscle anoxemia. Using an array of advanced experimental techniques, including immunohistochemical protocols, and laser scanning cofocal microscope, researchers confirmed for the first time the relationship between M3 and IKM3, namely when cardiac muscle anoxemia occurs, the relationship between M3 and IKM3 would be damaged, and when cardiac muscle anoxemia is improved, the same relationship would be repaired.

Researchers told reporters that almost all the arrhythmia drugs in current use work on HERG channels, which inhibit protein expressions as the result of channel mutations. They also found that As2O3 may induce QT, contributing to the occurrence of malignant arrhythmia, in which acidity variation plays an important role in causing anoxemic arrhythmia, as acidity may change in the HERG channels, which makes drugs work differently in treating cardiac muscle anoxemia. The study also confirms that diabetes patients' QT is mostly caused by HERG channel mutations or malfunction.

Weeds Curbs Lake Contamination

Starting from 1992, the Aquatic Plant Lab of Wuhan University Biological School has been working on aquatic ecosystems and associated functions over a water surface of 300-km^2 in Liangzi Lake. The Chinese Ministry of Science and Technology officially approved the site in 2005 a national field observational station.

Prof. YU Dan, chief of the station and a professor teaching at Wuahn University, told reporters that aquatic weeds and algae are two major plants grown in lakes. They are fighting against each other in the same environment. If one takes more nutrients such as nitrogen and phosphor, the other has to take less for a jeopardized growth. In this context, the rich growth of aquatic weeds takes away a huge amount of survival elements, such as nitrogen and phosphor, making the lake poor in nutrients, and creating a poor living environment for algae, which is desirable for keeping a fine water quality.

In the past 25 years, the research team, headed by Prof. YU Dan, has collected some 150,000 specimens of aquatic plants from different parts of the country, in an effort to establish a database. He told reporters that planting aquatic weeds is an approach to fight against lake degradation with a small investment and limited proven technologies.

Data published by the environmental protection agency show that Liangzi Lake has registered a grade I water quality for several consecutive years, with its general water quality kept at grade II, a standard set for drinking water. The site has also maintained a range of ecological indicators at an advanced level, among similar lakes under watch in the country.

New Variety Resistant to WSSMV

Prof. CHEN Peidu, Nanjing Agriculture University National Key Lab for Plant Germplasm, has recently worked out a new wheat variety showing a high level of resistance to wheat spindle streak mosaic virus (WSSMV). The finding was published in a recent issue of journal *China Plant*.

As early as in 2005, Prof. CHEN and others have found that the short arm of 4V chromosome carries the gene resistant to WSSMV. With the assistance of additional technique, Chen and his collaborators obtained additional breeding materials. Unfortunately, additional technique has a disadvantage of allowing both favorable and unfavorable genes into the wheat. To address the problem, they identified one compensating translocation, where the short arm of 4V was translocated to the long arm of 4D of wheat, and bred out a T4VS • 4VL-4AL system. The new system is highly resistant to WSSMV and is also of good agronomic type.

Chen told reporters that the translocation variety makes a new wheat species resistant to WSSMV, which helps Chinese farmers to screen out other new varieties with same resistance to WSSMV, for an improved yield and quality.

Killer of Soil-Borne Diseases

Prof. SHEN Qirong with Nanjing Agriculture University has achieved remarkable results of yield increase and soil improvement, from his extensive experiments in Thailand for soil-borne diseases prevention and control, using microbe organic fertilizers made of agricultural solid wastes and high quality organic fertilizer.

SHEN and his team separated some 200 bacteria that can fight against soil-borne diseases. They produced organic and inorganic compound fertilizers by decomposing agricultural solid wastes, and liquid compost, based on which they worked out microbe organic fertilizers, through implanting the bacteria fighting against soil-borne diseases and repeated solid fermentation. The new organic fertilizers have been applied to cucumber, water melon, cotton, tobacco, and castor-oil plant in Jiangsu, Zhejiang, Anhui, Xinjiang, and in Thailand as well, with a control rate reaching 90% and above. The liquid compost has been applied to some 20 plants over 30 countries or regions, with a remarkable yield increase by 30%—50%, compared with application of chemical fertilizers, or 100%—150%, compared with applying no fertilizers.

The new technology has led to the establishment of a biofertilizer engineering center in Jiangsu Province, and a solid waste based fertilizer producing center in Changshu, the largest of its kind in the country. The Center will take advantage of the combined strength of industry, universities and research institutes.

Surface Plasmon Study

In collaboration with HAN Xiufeng of the National Key Lab for Magnetism, and LI Zhiyuan, a research fellow at the National Key Lab for Photophysics, a research team, led by QIU Xianggang, Institute of Physics and Beijing National Laboratory for Condensed Matter Physics, part of Chinese Academy of Sciences, studied metalfilms grown on an Si wafer perforated with a periodicarray of subwavelength holes. They observed anomalous enhancedtransmission in the midinfrared regime, and high ordertransmission peaks. They have also for the first time observed the peak splits at oblique incidence bothin TE and TM polarization, which confirms that anomalous enhancedtransmission is a surface-plasmon-polariton (SPP) assisted diffraction phenomenon. Theoretical transmissionspectra agree excellently with the experimental results, and confirm therole of SPP diffraction by the lattice. The findings were published in the recent issue of journal of *Physics Review Letters*.

Straw Can be Wood Substitutes

Thanks to their 8-year efforts, researchers from Yantai Wanhua Group and Nanjing Forestry University have developed a formaldehyde free PVAC bond. The straw board produced using the new bond has reached the national standards for intensity, dilatability absorption, and nail breaking. This makes the straw board a full substitute for timber in construction and interior decoration activities. Meanwhile, the straw board is made formaldehyde free, as the result of using new bond. A test made by national authorities shows that the straw board releases no formaldehyde.

The successful development of formaldehyde free straw board will ease the shortage of timber boards in the country. Experts told reporters that China may save 70 million cubic meters of timber, if 10% of the nation ‘s straw resources is utilized. This quantity will basically meet the nation’ s needs for furniture and decoration boards, reducing the consumption of forest resources, and protecting ecological environment.

According to a briefing, a straw board production line with an annual capacity of 50,000 cubic meters consumes 60,000 tons of straws. Calculating on RMB 200 per ton of straw, farmers may make an extra money worth RMB 120 per mu (1 mu= 0.0667 hectare), or equal to an yield increase of 80 kg. The new technology also helps to address the air pollution caused by farmers burning unwanted straws.

NEWS BRIEFS

Official S&T Nomenclatures

China will publish a unified and standardized bilingual dictionary for its S&T history next year, disclosed LIAO Yuqun, Director of CAS Institute of Natural Science History. LIAO added that the encyclopedia on Chinese S&T history in both Chinese and English will help Chinese scientists to publish their research findings in international journals, making China 's S&T history part of international history of science and technology.

The book will be compiled, reviewed, and finalized by a dozen of disciplinary teams, covering S&T history in general, mathematics, physics, chemistry, astronomy, geography, biology, agriculture, water resources, machinery, military technology, bridge building, paper making, printing, mining, textile, transportation, architecture, and medicine. The book has also prepared brief definitions for the nomenclatures it published.

LIAO told reporters that the nomenclature screening process has been completed. Now the writing teams are working on entries and associated definitions. The whole book expects to be finalized at the end of the year. In the meantime, experts both at home and abroad will be invited to review the nomenclatures and associated English versions. The book will be finally submitted to the National S&T Nomenclature Committee for approval, before publication.

Gene Chips for Diagnosing Intestinal Cancer

R&D of gene chips and associated clinical applications for diagnosing intestinal cancers in their early stages, a project undertaken by Lanzhou Baiyuan GeneTech, has recently passed an approval check. As a fast and no-wound technique for detecting intestinal cancers, the gene chip, the first of its kind in the country, enjoys numerous merits, including simple operation, compact size, multi-parameter, integrated, paralleled, and low cost. The new technique, a domestic leader in the area, provides new means and approaches for diagnosing intestinal cancers in their early stages, and for pathological classification and prognosis monitoring as well.

Anti-Typhoon Wind Turbine

Guangdong Mingyang Wind Power Corp. rolled out on August 16, 2007 China 's first proprietary 1.5-megawatt anti-typhoon wind turbine. The development marks a breakthrough made by China in producing wind turbines at megawatt level. The home made wind turbine has a reduced cost by 20%, compared with imported products, or products manufactured by joint ventures.

Designed to meet China' s wind resources and climate features, the new wind turbine realizes the lowest cost for power generation, and a capacity resistant to typhoon, sands, and extreme cold weathers. It increases power output by 15%—20%, compared with wind turbines designed in line with European standards, under the same climatic conditions. The new generating system has obtained a full accreditation issued by GL GERMANISCHER LLOYD.

Dust Vacuuming Vehicle

Not long ago, CHEN Jie and WANG Shu of Shanghai Jiaotong University made the debut of an innovative dust vacuuming vehicle. Equipped with numerous merits, including enhanced absorbing capability for all dusts under 25mm, a raised absorbing rate (99.5%%), and no dust blowing, the new system is made up of a number of sub-systems for dust absorbing, collecting, and recovery, and walking.

In addition to its applications in cleaning urban environment, the new system can also be used to clear dust or powder in other industries, such as metallurgy, chemicals, construction materials, foods, and feeds.

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