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SPECIAL ISSUES

Practical Technologies for Quake Rescue

A strong earthquake of a 8.0-magnitude shook the Wenchuan County, Sichuan Province at 14:28 May 12, 2008, with a string of adjacent provinces and municipalities being affected by the quake. Chinese Ministry of Science and Technology (MOST) published on May 14, 2008 in its portal the first array of technologies that can be employed to deal with public sanitation and food safety problems appeared in earthquake rescue. Meanwhile, it published a booklet to answer 49 frequently asked questions. The list has covered major technologies and response strategies to deal with some 30 infectious diseases commonly appeared after the quake, including enteric diseases, diseases shared by both human and animal, pests born diseases, skin ailment, and food borne diseases, along with a range of preventative measures that should be adopted in the disaster areas. The booklet asks

people in the disaster areas to fence off infections by killing fly and rats, frequently washing their hands, applying medicine over their skin wounds, and see doctors when having a headache or fever.

The part of food safety has its focus on drinking water and food in the disaster areas, with ten preventative measures for possible food poisoning, two simple procedures for judging food poisoning, and three simple approaches for handling food poisoning. It also introduces basic techniques and methods for ensuring drinking water safety in the disaster areas, including drinking water disinfection/purification, and judging the quality of drinking water, with 74 key technologies and products available for food safety after a disaster, including techniques and approaches for monitoring pathogenic organisms in food, testing poisonous matters in food, and examining chemical residues in food.

MOST plans to publish more practical technologies and techniques in line with the development of disasters.

Enhancing People's Health Awareness

LIU Qian, Chinese Vice-Minister of Health, kicked off on May 12, 2008 an action to promote Chinese citizens' health literacy, with a health and nutrition booklet. The booklet, the first of its kind published by the government in the world, introduces basic knowledge and skills about keeping fit and taking right nutrition. More than a hundred experts in the area have contributed their knowledge to the booklet. As an authoritative book introducing health and nutrition related knowledge, the booklet has covered 66 topics, including basic concept of health, rational diet, appropriate exercise, restraining from drinking and smoking, mental health, good sleeping habits, no-smoking in public places, respecting non-smokers, and passive smoking.

INTERNATIONAL COOPERATION

China-US Food Safety Center Established in Shanghai

China-US Food Safety Research Center opened on May 12, 2008 its first annual meeting, where a ceremony was also held to mark the establishment of the new center at Shanghai Jiaotong University. Some 80 Chinese and US officials and experts were present at the event. At the meeting, 4 Chinese experts from Shanghai Jiaotong University, East China University of Science and Technology, and the University of Hong Kong, 7 American experts from US Department of Agriculture and Purdue University, and 1 expert from the UK, spoke about the latest issues on food safety. The meeting enhances participants' understanding of the latest development, current, and potential issues in the area. During the meeting, YE Quyuan, Vice-President of Shanghai Jiaotong University and Dr. James Lindsay, National Program Leader of Food Safety, USDA, signed an accord to conduct joint studies in the area of food safety.

Redefine the Mass of the Milky Way

CAS National Observatory, in collaboration with Max-Planck-Institute for Astronomy, has for the first time calculated the mass of the Milky Way to be 1011M⊙, indicating a slimmer Milky Way. Researchers selected some 2500 Blue Horizontal-Branch (BHB) halo stars drawn from SDSS-II dataset, the largest in number and widest in distribution (5-60 kpc). BHBs can be measured in an accurate manner, as they are mostly in an evolutionary stage to become a star, desirable for studying the Milky Way's halo. Chinese and German scientists have worked out the latest mass of the Milky Way based on kinematics of BHBs. The finding, with XUE Xiang-Xiang of the CAS National Observatory as the first author, was published in the recent issue of Astrophysical Journal.

With a large array of halo stars, one can calculate the mass of the Milky Way in an accurate manner, and study the structure of the Milky Way's halo, in an attempt to understand the forming process of the system. China's LAMOST that will soon be put into operation is able to produce the most spectrums in the world, and is expected to work out start spectrums with an improved quality. A high quality spectrum is very useful for raising the speed of star

viewing and accuracy of atmospheric parameters, making collecting more and better halo samples possible. China's LAMOST can also be employed to study the structure and formation of the Milky Way.

RESEARCH AND DEVELOPMENT

Biochip: A Promise for Individualized Cancer Treatment

China's biochip industry has rolled out some 400 types of biochips

A meeting, jointly sponsored by the Ministry of Science and Technology and the General Administration of Quality Supervision, Inspection and Quarantine, was recently held to discuss applications of biochips in medicine and food safety. Participants believed that biochips are of a promising perspective in treating cancers on an individualized basis. For example, Prof. ZHAN Qimin, Vice-President of the Chinese Academy of Medical Sciences, has obtained 285 genes displaying different expressions in the study of breast cancers, using the 22K Human Genome Array developed by CapitalBio. A further molecular interpretation of 285 genes has led to preliminary expression spectrums at the molecular level. These spectrums are the theoretical evidences for providing individualized treatment for breast cancer patients. Meanwhile, Prof. HE Jie, Vice-President of Tumor Hospital under

Chinese Academy of Medical Sciences, and coworkers have discovered miRNA molecules that cause lymph node metastasis using biochips, making molecular markers available for studying esophageal cancer, and allowing an improved clinical classification for individualized treatment. Participants agreed that individualized treatment can effectively improve cancer treatment, and address insufficient or excessive treatment, bringing more benefits and hope to patients.

Intelligent and Multifunctional Heparanase

A study team, headed by Prof. XING Xinhui, Director of Tsinghua University Institute of Biochemistry, has for the first time developed a concept of intelligent and multifunctional enzyme, in an attempt to produce an enzyme with process integration and control functions, using chemical/molecular/biological means. Researchers also developed the technologies to produce intelligent and multifunctional heparanase. A six-month limited trial production has shown that the intelligent and multifunctional heparanase can be used to prepare low-molecule heparin, through a simple, clean, safe, and effective process.

Researchers recombined intelligent and multifunctional heparanase strains using the cloned heparanase-I gene. They also brought down both the production and application costs, through fast tracing, control, purification, and fixation of the activity of intelligent enzyme. The intelligent and multifunctional heparanase-I is able to effectively decompose large-molecule heparin, and make them into the one with low molecules. Using an advanced bioreactor with a super filter, researchers have rolled out low-molecule heparin products with a molecule weight ranging between 5000—6000. In addition, the advanced bioreactor can be used to prepare a super low-molecule heparin with a molecule weight ranging between 2000—3000.

Remedying Contaminated Soil Using Plants

CHEN Tongbin, director and a research fellow at the Environmental Remediation Center under Chinese Academy of Sciences Institute of Geographic Sciences and Resource Research, told reporters on May 19, 2008 that Chinese scientists have achieved major progresses in remedying the soil contaminated by heavy metals in a number of areas, including Huanjiang in Guangxi, Chenzhou in Hunan, Gejiu in Yunnan, Fuyang in Zhejiang, and Lechang in Guangdong. Scientists have surveyed some 200 mines in more than 20 provinces and municipalities, and discovered an array of plants capable of absorbing 19 heavy metals, including copper, lead, zinc, cadmium, nickel, chromium, and manganese. They also produced three biological additives from the plants of remediation functions, and optimized plant based remediation processes.

CHEN said that to perfect remediation processes, the study team has unveiled the micro-distribution, migration, and transfer of arsenic in the plants, through both indoor and

field modeling, and has created new approaches to position and study the chemicals in the plants.

Started to work on soil remediation in 1997, the Center has been contracted to some ten remediation projects at the national level. In 1998, the center has found a plant able to absorb arsenic: Pteris vittata Linn.. Researchers established in 2001 an arsenic remediation center in Chenzhou, Hunan, the first of its kind in the world. After that, they established a number of remediation demonstration projects in Guangxi and Yunnan to remedy the soil contaminated by heavy metals, such as arsenic and lead. They also worked out a remediation model for inter-cropping of metal absorbing plants and cash crops, allowing remediation amid farming activities.

NEWS BRIEFS

China's Largest Paleoanthropologic Project

Archaeologists working at a Shuidonggou relics in Ningxia (2003)

Not long ago, the Chinese Ministry of Science and Technology kicked off a special project to survey paleoanthropologic relics in the country, and to collect and consolidate the basic data in the area. With a budget approaching RMB 15 million, the 5-year project has been

contracted to CAS Institute of Vertebrate Paleontology and Paleoanthropology, CAS Institute of Geology and Geophysics, and Peking University. The project will work on a range of basic research areas, including paleoanthropology, archaeology in the Paleolithic Age, geology in the Quaternary Age, and chronology. The study team will be engaged in an array of activities, including field investigation, material collection, and survey of major paleoanthropological and paleolithic relics, in an attempt to understand, restore, and interpret the collected paleoanthropological facts and findings.

The project will eventually lead to the establishment of China's own paleoanthropological database and resources platform, ensuring the originality, integrity, and scientific /authoritative nature of fossilized paleoanthropological evidences and materials.

Largest Multi-Component Chinese Medicine Bank

A study team, led by Prof. CHENG Yiyu at Zhejiang University, made Tianjin the home to the world's largest natural multi-component Chinese medicine bank on May 10, 2008. It took five years for the team to collect and store 10,661 multi-component Chinese medicines, and 235 compounds in the bank. As an important resource for developing innovative drugs, the bank is physically a digital database possessing most information on traditional Chinese medicines, and multi-component models, desirable for fast information search.

Thanks to the support of National 973 Program and National Natural Science Foundation, researchers have developed core technologies to produce multi-component Chinese medicines in optimizing the design of traditional Chinese medicine. They have sorted out some 270 potent constituents, and have preserved the constituents in digitized form. Meanwhile, Zhejiang University School of Pharmacy, Tianjin University of Chinese Medicine, and Tasly Group have jointly established an engineering center to develop multi-component Chinese medicine, and to work on related theories. The efforts will eventually create a national platform for developing major new drugs, with new TCM models, and lead to an internationalized TCM industry.

Energy Evaluation for High Performance Computer

China Working Committee for High Performance Computer Standardization and China Electronic Standardization Institute have jointly established on May 9, 2008 a laboratory to evaluate high performance computers' energy consumption. The lab is mandated to test and accredit energy consumption of high performance computers in the marketplace.

According to a briefing, in 2007, electronic and information products have consumed 300-500 million kilowatt hours of electricity in China, which is equivalent to an annual output from the Three Gorge Power Plant. Of the electricity consumed by electronic and

information products, high performance computers, servers, and data centers have taken the lion's share. According to statistics provided by the Ministry of Information Industry, a supercomputer with 1 billion floating-point operations per second would have an electricity bill approaching RMB 5 million. Data centers in the country have registered an annual growth of power consumption by 15%-20%.

To make high performance computers more energy efficient, China Working Committee for High Performance Computer Standardization has established in the early 2008 a project panel to deal with high performance computers' energy saving standards. Shanghai Lanqi S&T Co. Ltd., a member of the project, has developed a novel AMB chip, which can save energy by 30%～50%, when installed on FBD internal memory. In the last six months, the panel has worked out basic energy consumption standards for chip, system, application, and configuration.