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NEWSLETTER

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SPECIAL ISSUE

China Has More Intellectual Properties

China has handled 828,000 patent applications in 2008, with a 19.4% growth, and issued 412,000 grants in the same year, with a growth of 17.1% compared with the same period, said TIAN Lipu, Head of State Intellectual Property Office at a news conference held on April 21, 2009 sponsored by the Office of the Press under the State Council.

As of March 16, 2009, China's patent applications have exceeded 5 million in number on a combined basis. In the area of trademark, China has received 698,000 registration applications, with 750,000 trademark applications being reviewed. The trademark

applications reviewed in the year has for the first time exceeded the applications in number. Some 403,000 trademark have been approved for registration. As of the end of 2008, China has approved the registration of 3.441 million trademarks. In the same period, China has registered the copyrights of 49,000 software, and 12,000 copyright contracts. Volunteer registrations of individuals' works have reached 1.04 million in number. Meanwhile, both new plant species applications and grants have enjoyed a large increase.

INTERNATIONAL COOPERATION

New International S&T Cooperation Center

An ecological agricultural park in Ansai County, Shaan'xi Province was recently named as an international S&T cooperation center. JIN Xiaoming, Director of MOST Department of International Cooperation and LIANG Chunlin, Deputy Head of Ansai County made the inauguration for the new center.

International S&T cooperation center is a major strategic step defined by the MOST Department of International Cooperation to shift the modalities of international S&T cooperation, in line with the Outline of China's International S&T Cooperation for 11th Five-Year Period (2006-2010). As of the end of 2007, 85 such centers have been established in the country. Ansai County, one of them, is a major recipient of national support for reducing rural poverty through development.

In recent years, the ecological agricultural park in the County has introduced more than 100 new species from both home and abroad. Researchers in the park have diffused some 20 species desirable to grow in the county, including Dutch tomato and eggplant, French cucurbitaceae, black beauty melon, and cherry tomato, through 150 rounds of training courses attended by some 15,000 farmers. The park is also a bio-agrifoods production center named by Shaan'xi provincial government, and a popular science demonstration park by the Yan'an municipal government. The county has become known for its bio-vegetables in the country.

Exchanges between Chinese and Australia Young Scientists



A program was kicked off on April 16, 2009 to facilitate the exchanges of young scientists between China and Australia. Some 20 representative from the Chinese Ministry of Science and Technology, the Chinese Academy of Sciences, the National Natural Science Foundation, the Australian Embassy in Beijing, and Chinese and Australian young scientists were present at the event. Counselor WANG Qiming from MOST Department of International Cooperation and Counselor Ian Macintosh at the Australian Embassy made opening remarks. They said that the government of both countries would support S&T cooperation and exchanges between the two countries, hoping that Australian young scientists will have extensive and deep exchanges with their Chinese collaborators, and further understand the S&T system/policies and S&T developments in the opposite country.

RESEARCH AND DEVELOPMENT

Brain Injury Does Not Alter Intrinsic Differentiations of Adult Neuroblasts

Chinese scientists at the Institutes of Brain Science, Fudan University in Shanghai have observed the unique behaviors of adult neuroblasts in brain injury, indicating a new way for understanding the migration of adult neuroblasts in brain injuries. The finding was published in April 22, 2009 issues of *The Journal of Neuroscience*, though it was also reported in a recent issue of *Science News*.

Researchers found that adult neuroblasts are unable to grow into the new neurons needed for reconstructing the nervous system. It is just like a collapsed house that needs more bricks to rebuild, rather than sands. The new finding will allow scientists to induce adult neuroblasts to grow new neurons for treating Alzheimer's disease and Parkinson's disease, and for repairing the damaged nervous system.

Repairing Tendons Using Embryonic Stem Cells

A research team, led by Prof. OUYANG Hongwei at Zhejiang University Medical School, has restored the normal functions of the rats with patellar defects, using embryonic stem cells. The paper was published in a recent issue of *Stem Cells*.

Researchers grew 10-20 embryonic stem cell patches on treated cultivating boards in low density. They collected the one that were qualified for further screening, cloning, and multiplying. The divided mesenchymal stem cells were further cultivated in a special fluid for two weeks to grow into the mesenchymal stem cell sheets that can be rolled into the shape of tendon. They were then stretched and pressed to grow into the tendon cells that work properly.

The new technical lines and techniques employed in the study have significantly lowered the risks of causing cancers as the result of incomplete division of embryonic stem cells in conventional experiments. All the treated rats have produced no tumors, with enhanced tendon reproduction capability.

World's First H pylori Vaccine

A study team, led by Prof. ZOU Quanming at No. 3 Military Medical School, has rolled out an oral recombinant H pylori vaccine based on their 15-year painstaking efforts. The new vaccine, having a class I new drug certificate issued by State Food and Drug Administration, makes the first H pylori vaccine in the world.

Researchers have achieved a range of original findings in working on key technologies and techniques, including the design principle of H pylori vaccine, seeds engineering, and recipe matching. They have for the first time proposed an inner molecular mucosa based vaccine theory. The unique genetically engineered molecular model allows researchers to enhance the immunity of mucosa, keeping H pylori from affecting the surface of mucosa. Researchers also developed special recipes to fend off the possible damages caused by gastric acid and protease to the vaccine, which enhances the stability and effectiveness of the vaccine.

The product, the first original H pylori vaccine that has completed phase III clinical trials

and been granted with the new drug certificate in the world, is able to prevent the infection of H pylori. Clinical research shows that the vaccine is valid and safe for preventing H pylori with a protection rate higher than 72.1%. The proprietary new drug has resulted in eight national invention patents.

New Protein Working on Cancer Inhibitory Genes Found

Not long ago, a study team, headed by HE Fuchu at the State Key Laboratory of Proteomics under the Chinese Academy of Military Medical Sciences Institute of Radiation Medicine, has found a new important protein that can be used to work on cancer inhibitory genes. The finding, published in April 19, 2009 online issue of *Nature Cell Biology*, heralds a new approach for preventing and treating cancers at the molecular level in the future.

Based on massive mining up the new genes and proteins for 6 years, researchers screened out a new protein that can participate in the selective control of p53-mediated cell cycle arrest or apoptosis. The new protein, named Apak, binds directly to p53 in unstressed cells, specifically downregulates pro-apoptotic genes, and suppresses p53-mediated apoptosis to attenuate the acetylation of p53, which significantly lowers down the risks of having tumors.

Raspberry Inhibits Liver Cancer

A study, made by Dr. LIU Ming at No. 4 Hospital affiliated to Harbin Medical University, shows that raspberry is able to noticeably inhibit the growth of liver cancer by weakening the expression of VEGF while enhancing the expression of p53, a cancer inhibiting gene. Researchers have successfully screened out two specific proteins in raspberry that are able to inhibit the growth cancerous cells, which provides an important theoretical evidence for confirming the role of vegetables in preventing primary liver cancers.

Study results show that the increased concentration of chemical elements in raspberry goes along with an enhanced elimination of radicals. For example, raspberry extracts ranging from 0.25 mg/ml to 10 mg/ml have shown increasingly enhanced inhibitory effects up to 90% on HepG-2. Polymerase chain reaction (PCR) tests indicate that raspberry extracts is of strong in-vitro effects on the expression of VEGF and p53. The increased concentration of raspberry extracts would lead to the weakened expression of EGF but an enhanced expression of p53.

Aspergillus flavus and DEN based rat model also shows that the increased concentration of raspberry extracts may lead to the shrunken size of liver cancer, and reduced number of tumors, the tumors formed, and knots formed in the experimental group. Meanwhile, the expression of VEGF and proliferating cell nuclear antigen (PCNA) has gone down noticeably. Rats in the experimental group have seen a large difference in M2597 and

M4513 from the rats in the raspberry group and normal group, indicating that both M2597 and M4513 can be a possible target for treating liver cancers.

Solar Flash Polarization Spectrum Obtained

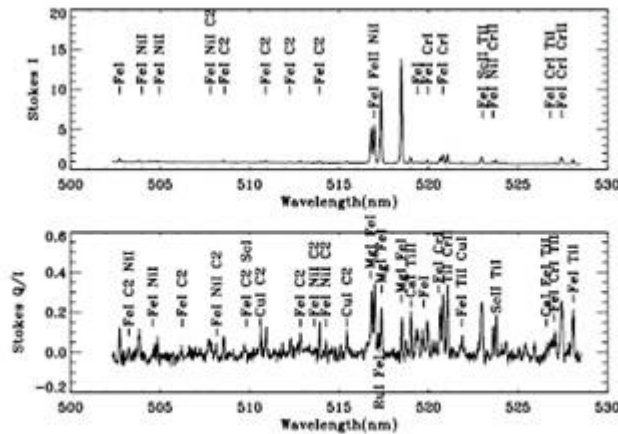


Figure 4. Flash spectrum (shown in the top panel) and the corresponding linear polarization spectrum (shown in the bottom panel) obtained from the sample shown in the bottom panel of Figure 2.

ApJ Letters reported on April 20, 2009 the solar flash polarization spectrum observed for the first time in the world by a team led by QU Zhongquan at CAS Yunnan Observatory.

The Chinese Academy of Sciences organized observations of total solar eclipse on August 1, 2008 in Jinta, Gansu. The team led by QU was part of the activity, and obtained the original observational data on solar flash polarization spectrum. It took half a year for the team to complete the design, development, installation, and test of the needed instruments. The instruments helped researchers to obtain the world's first solar flash polarization spectrum, which is very precious for solar physics study.

Single Real Petaflop Computer

CAS Institute of Process Engineering has recently made the debut of a supercomputer working at the single real petaflop level, the first of its kind in the country. In February 2008, the Institute built a computing system with a 120 trillion single real floating-point operations per second to simulate multi-phase numerical modeling, and material micro-structure modeling at the nanoscale. The application has confirmed the strength and perspective of a multi-scale scattering parallel computing system. In 2009, the computing system was upgraded to a peak operation of 450 trillion times per second, with a newly built single real system up to 150 trillion operations per second supported by a range of CPUs. Meanwhile, the Institute, in collaboration with Lenovo Group Ltd., and DAWNING,

developed two unit systems with a speed up to 200trillion operations per second. In March 2009, the four systems were grouped into a multi-layer system through Gigabit Ethernet with a peak speed reaching the petaflop level to address the joint applications of different CPUs.

NEWS BRIEFS

Sequence the Genomes of Animals in “Three Poles”

Beijing Genomics Institute (Shenzhen) announced on April 24, 2009 that it will study the genomes of three major animals (penguin, polar bear, and Tibetan antelope) living in the Arctic, Antarctica, and plateau. A number of other organizations, including Dalian Laohutan Marine Research Center, Qinghai University, CAS Institute of Oceanology, and China Polar Research Center, are part of the project.

Little efforts have so far been made to study the genomes of the said three animals. The project, equipped with the state-of-the-art sequencing techniques, will work out the full genomes of the animals, and study the animals at the genome level, including identifying functional components in their genes, interpreting genetic information, and understanding the evolution and adaptability of the species. The results derived from the study will become a new starting point and a platform for the future study in the area. Researchers are scheduled to collect specimens in May, and complete the analysis and study before December 2009.

China’s New Remote Sensing Satellite



At 1055 April 22, 2009, China successfully blasted off a remote sensing satellite named China Yaogan VI aboard a CZIIC launch vehicle, from the Taiyuan Satellite Launch Center.

The new satellite will find its applications in a wide range of areas, including land resources survey, environment monitoring and protection, urban planning, crop yield estimation, disaster prevention and preparedness, and space studies and experiments, playing a positive role in China's economic development.

Glucagon-like Peptide-1 Receptor Agonist

The glucagon-like peptide-1 receptor agonist and associated preparation techniques, developed by CAS Shanghai Institute of Materia Medica, has recently been granted with a national invention patent. The product and associated preparation techniques have also received invention grants in Russia and Australia. The agonists can be used to treat glucose metabolic disorders, such as type II diabetes, insensitivity to insulin, and obesity. The new techniques allow easy preparations with a simplified structure, and have overcome the inconvenience of current peptide regulating drugs that are not desirable for oral intake.

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