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IN THIS ISSUE

- * Model for Next Generation Broadcasting Network
 - * China-US Post-Graduate Students Exchanges
 - * First Clinical H1N1 Trials Completed
 - * New Immune Regulation Protein Found
 - * Three Gorge Project Near Completion
 - * China Technology Exchange Established
-

SPECIAL ISSUES

Model for Next Generation Broadcasting Network





On July 31, 2009, a signing ceremony was jointly staged by the Chinese Ministry of Science and Technology (MOST), the State Administration of Radio, Film and Television, and Shanghai Municipal Government to kick off a pilot project to test next generation radio and TV broadcasting network (NGB) in Shanghai. Leaders of sponsors, including WAN Gang, Chinese Minister of Science and Technology, attended the signing ceremony.

WAN pointed out that to realize a frog leap development in the area of broadband information network, and promote the combination of "three networks", MOST has supported innovative activities in the area of broadband information network and associated applications and development, starting from the 9th Five-year period (1996-2000). Thanks to more than decade tireless efforts, Chinese S&T community has developed proprietary network framework, completed the R&D of core technologies, and worked out the set equipment and connection system made up of transmitters, switch, and routers at the Terabit level. Efforts have also been made to improve the combination of high definition TV, broadband network connection, and traditional voice call on an experimental and demonstration basis. A technical and industrial support system has been established for the purpose.

The launch of NGB pilot project in Shanghai marks that China has entered a substantive stage of developing next generation radio and TV broadcasting network. In the future 2 to 3 years, China will build a demonstration network benefiting 10 million households in selected major cities. It will establish a next generation radio and TV broadcasting network that covers the entire country in 10 years, making it a new information infrastructure featured with the combination of "three networks". The efforts will facilitate the development of China's electronics and information industry, modern service industry, and culture industry, rendering a solid contribution to social harmony and national security.

Most Wildlife in Qinghai Protected

Qinghai Province has up to date established 11 nature conservation zones (5 at the national level and 6 at the provincial level) with a total area of 21.8054 million hectares, or 30.39% of the Province's total territory. The nature conservation zones have covered major ecological regions, including Sanjiangyuan, Qinghai Lake, Qilian Mountains, and Caidamu Basin, and become an important carrier of rare and endangered wildlife species

In recent years, forestry authorities in Qinghai has enhanced the capacity building of nature conservation zones by completing the construction of phase I national nature conservation zone projects in Qinghai Lake, Kekexili, and Mengda, and station construction projects at Sanjiangyuan national nature conservation zone. Efforts have also been made to plan and launch phase II conservation projects in Longbao, Mengda, and Kekexili. Sanjiangyuan will have an afforestation project aiming at ecological protection. All these efforts will greatly improve the infrastructures, scientific research activities, and work/living conditions at the nature conservation zones, and intensify natural resources protection and management capability. Meanwhile, illegal exploitation of wildlife has been effectively curbed through intensified education and law enforcement, allowing the effective restoration of wildlife resources.

Statistics show that 85% of the wildlife species in the Province has been placed under protection, and the protected habitats have become the safe haven for wildlife survival and reproduction. 70% of major wetlands on the Plateau has also been protected, and become major water sources for the Province. 30.7% of forests and brushes has been saved to play the role of nourishing water sources and fix/prevent sands. Additionally, 377,600 hectares of desert plants have been placed under full protection, making them a barrier keeping the ecological balance of the Gobi desert.

INTERNATIONAL COOPERATION

China-US Post-Graduate Students Exchanges



A meeting was held on August 6, 2009 in Beijing to report the results of China-US post-graduate students exchange program, co-sponsored by the Chinese Ministry of Science and Technology, Chinese Academy of Sciences, National Natural Science Foundation, and US National Science Foundation in 2009. The meeting reviewed the implementation of the program, and issued the certificates to American students.

In a short period of two months, 44 post-graduate students from American universities visited Peking University, Tsinghua University, China Agriculture University, Beijing Normal University, Fudan University, Beijing Institute of Life Sciences, Chinese Academy of Geology Institute of Geology, China Earthquake Administration Institute of Geology, China Internet Information Center, and other institutes under the Chinese Academy of Sciences, where they had their cooperative studies under the guidance of Chinese tutors. Meanwhile, intentions of follow-up cooperative studies have been reached between the two sides.

China and the United States have implemented the program for six consecutive years starting 2004. The smooth implementation of the program has facilitated the exchange and joint research between Chinese and American young scientists, strengthened mutual understanding and enhanced friendship between the two peoples, and laid a solid foundation for future long term S&T cooperation between the two countries.

RESEARCH AND DEVELOPMENT

Improved Understanding of Coronavirus

A study, led by RAO Zihe, CAS academician and President of Nankai University, reported in

an earlier issue of *JVI* that they have identified the crystal structures of two key ADRP sites, and for the first time analyzed the system structures of ADRP sites in coronavirus. The crystal structures and associated composite structures that produce ADP are 2299E human coronavirus and type II chicken born bronchitis viruses. The finding, the first of its kind in the world, is important to coronavirus study, and has created a ground for understanding the role play by the sites in duplicating the viruses.

Not long ago, RAP and his team has identified the crystal structures of Protein 4C in hepatitis virus A59, a mouse hepatitis virus, which is important to further understanding the role played by the protein in virus infections and duplications. The new finding was published in the recent issue of *PLoS One*.

First Clinical H1N1 Trials Completed

SINOVAC BIOTECH CO.,LTD. announced on August 18, 2009 that it has completed the clinical trials of its H1N1 vaccine. Preliminary results show that the vaccine is both safe and effective to humans, and further analysis indicate that one injection of the vaccine is able produce a fine immune response, with a range of indicators, including positive expression of protective antibodies and antibody turning into positive expression, reaching the desired targets, implying that vaccination can protect human body from being infected by the virus.

Kicked off on July 22, 2009 in Huairou District, Beijing, the clinical trial is designed with mono-center and randomized double-blind control schemes. Vaccination was completed on August 15, with 1,614 volunteers above 3 years of age being injected with the vaccine. Their blood samples were taken and examined at an interval of 0, 14, and 21 days. National Institute for the Control of Pharmaceutical and Biological Products completed the test of HI antibodies. Test results show that one injection of the vaccine has produced no serious adverse reactions either locally or wholly. Adverse reactions reported are mainly transient in nature, showing pains at the injection site. The overall occurrence of adverse reaction is similar to the vaccines for seasonal flu, indicating the fine safety of new vaccine.

New Immune Regulation Protein Found

Thank to 6-year efforts, a study team at Beijing Proteome Research Center, led by HE Fuchu, President of Chinese Academy of Military Medical Sciences and CAS academician, has found a liver sinusoidal endothelial cell lectin (LSEctin) that negatively regulates hepatic T cell immune response. As the first immune regulation molecule scientists found in liver, LSEctin, reported in the recent online issue of *Gastroenterology*, has been patented as a new functional protein that may possibly lead to special drugs treating liver

diseases, including hepatitis.

Researchers injected LSEctin into the mice with T cell-mediated acute liver injury, and found that the treated mice had noticeably reduced inflammations in liver, with eased tissue injuries, indicating significant therapeutic effects. Researchers believe that LSEctin may possibly be developed into a special drug for treating liver diseases, including hepatitis. LSEctin specifically recognized activated T cells and negatively regulated their immune responses. In LSEctin knockout mice, researchers have observed enhanced immune responses. The finding makes an important input to liver immunology theory.

Pluripotency Induced from Amniotic Fluid-Derived Cells

JIN Ying, a research fellow at Institute of Health Sciences, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences/Shanghai JiaoTong University, in collaboration with CHEN Fang of Shanghai Xinhua Hospital and coworkers, has found an approach to rapidly and efficiently induce pluripotency from human amniotic fluid-derived cells. The finding was published in the recent issue of *Human Molecular Genetics*.

Researchers found that under the inducement of four human factors, a range of highly expressed elements, including NESTIN, VIMENTIN, GATA4 and unexpressed elements, such as OCT4, SOX2, NANOG and TRA-1-60 in amniotic fluid-derived cells, would undergo a drastic morphological change on day 2 after infection, appeared with human embryonic stem cells like clone on day 4. On day 6, one even can establish a system through screening the right elements. Statistics show that undivided positive AKP is of cloning rate as high as 1.525%. It is also interesting to observe that without C-MYC, the remaining three factors were able to induce iPS clone all the same on day 4, with a slightly reduced undivided positive AKP clone rate. Researchers induced iPS cells from three different patients in a steady and effective manner, indicating that the reprogramming is of a universal nature. Further analysis of 8 induced human iPS cells shows that these cells are able to steadily regenerate and keep the core form of 46xx for a long time, with needed self-updates. Pluripotency markers showing the high expression of protein and mRNA, including NANOG, SOX2, SSEA4, and TRA-1-60, have strong positive AKP. In addition, microarray analysis demonstrates a high correlation coefficient (0.8866) between hAFDC-iPS cells and human embryonic stem cells.

Taken together, these data identify an ideal human somatic cell resource for rapid (6 days) and efficient generation of iPS cells, reducing the possible mutation in the process, and allowing people to establish human iPS cells using more advanced approaches and possibly to establish disease- or patient-specific iPS cells.

Three Gorge Project Near Completion

According to Three Gorge Office, part of the State Council, major hub construction activities, including the power transmission and distribution project, under the Three Gorge Project, have been basically completed, and running smoothly for some time. As of the end of June, 2009, Three Gorge Project has consumed an investment worth RMB 184.9 billion, and produced 320 billion kilowatt hours of electricity on a combined basis. The main ship gate has registered 50,000 operations, with the cargo volume passing through the gate reaching 300 million tons.

The Three Gorge Project, once completed, will place possible floods from the upper Yangtze River under effective control, allowing the middle part of Yangtze River to fend off an exceptional flood that may appear once every hundred years, and saving both Jiang-Han Plains and Dongting Lake area from major floods. The project will provide 100 billion kilowatt hours of clean electricity each year. According to the design plan, the 26 generators at the Three Gorge Hydraulic Power Station can save 50 million tons of coal burned for power generation, providing reliable, cheap, and clean energy for east, middle, and southern part of the country.

China Technology Exchange Established

The opening ceremony of China Technology Exchange (CTE) was held on August 13, 2009 at Haidianyuan, Zhongguancun S&T Park in Haidian, Beijing. CTE, the first technology exchange service at the national level, is established under an incorporate system, with a registered capital worth RMB 200 million. DU Zhanyuan, Chinese Vice-Minister of Science and Technology said the newly formed CTE is designed to establish and improve technology trade system, mechanism, and regulations, launch new trade products and services, consolidate diverse resources, enhance fund raising functions for technology property trade, and create a technology trade platform of international influence. As a national technology trading center, CTE will facilitate the development of technology markets across the country through its radiation effects.

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