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# NEWSLETTER

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## INTERNATIONAL COOPERATION

### China-France Environmental Cooperation

A China-France environmental cooperation forum, jointly sponsored by the Chinese Ministry of Science and Technology, the French Embassy in Beijing, and the French

National Research Agency (ANR), took place on December 13, 2010 in Beijing. Nearly a hundred experts and scholars from Chinese and French governments, research institutes, universities, and businesses attended the forum. At the meeting, the representative from the Chinese Academy of Environmental Sciences briefed the audiences of the R&D activities China has been engaged in the area of environment, while the representative from the French National Research Agency introduced the same development in France. Water resources experts from both countries reported their cooperation and associated progresses in the area of water resources, sharing the proven experience of collaborations. Speakers also had a heated discussion with participants.

The meeting sponsors made air quality monitoring, wastes recycling/utilization, and soil remediation the priority areas for future cooperation, based on the two countries' strength and needs. Chinese and French representatives from the above-mentioned priority areas spoke about the progresses made in their respective countries, exploring the possibility of future cooperation in the areas. Representatives from Environment SA and VEOLIA briefed the audiences of the latest developments they have achieved in the area of environment, and welcome researchers from both countries to be part of their R&D activities.

## Carbon Dioxide Control Seminar

A China-US Seminar on Carbon Dioxide Control Technology, the third of its kind co-sponsored by the Chinese Ministry of Science and Technology Department of High and New Technology Development and Industrialization, and the United States National Energy Technology Laboratory, was held December 11-12, 2010 at Zhejiang University in Hangzhou. Some 130 representatives from Chinese and US universities, research institutes, and enterprises attended the meeting. Participants discussed a range of issues in five major areas, including advanced power generation technology and multi-generation system, CO<sub>2</sub> capture/transport/purification technology, CO<sub>2</sub> displacement and sequestration, CO<sub>2</sub> utilization, and carbon trade/policy.

The organizing parties agreed to further strengthen the collaborations in the area of CO<sub>2</sub> emission control and utilization, and to hold the next round of seminar in due time remaining in Hangzhou.

RESEARCH AND DEVELOPMENT

## Genome 10K Project Launched

Beijing Genomics Institute (Shenzhen) and G10KCOS recently jointly announced the kick-off of the phase I project of Genome 10K (G10KCOS) initiative. Scientists will complete the genome wide sequence of 101 vertebrate species within the next two years, decoding their genetic secrets.

Scientists will map up the genome of 10,000 kinds of vertebrates, including mammals, birds, reptiles, amphibians, and fish, establishing genetic information databases for the vertebrates, studying their biological diversity and evolution mechanism, and providing unprecedentedly rich data for life science studies and global animal protection. 43 research institutions and 68 scientists from across the world will work together to achieve the goal.

Genomics and G10KCOS will work together to build a high-quality genome database, establishing an information platform desirable for data browsing and genomics studies. The genome wide sequence of 221 vertebrates makes the first step towards the grand goal of deciphering the genome of 10,000 kinds of vertebrates. The project list will be updated along with the expanded collection of new species and enhanced financial support received. Scientists will assemble, annotate, and analyze the genome sequence of new species, and publish online the data within 18 months after the completion of genome wide sequence. Both Genomics and G10KCOS welcome more scientists to be part of the efforts, in an attempt to work on more new valuable species.

## Full Range Ball-Shaped Robot

Not long ago, a ball shaped intelligent robot, developed by Beijing University of Posts and Telecommunications under the National 863 Program, passed the expert panel's acceptance check. It took 3 years for Chinese scientists to develop a ball shaped intelligent robot able to operate freely, along with 13 invention patents (4 Chinese invention grants and 1 US invention grant). The robot enjoys numerous merits, including flexible movement, falling resistant, environmental interference resistant, enhanced operating performance, large bearing capacity, easy operationality, and fine stability.

Spherical mobile robot is a ball shaped robot emerged in the last decade, enjoying a booming perspective. Chinese scientists have rolled out the prototype of a ball shaped robot able to roll in all directions, desirable for external operations in the walking process, which creates a ground for ball shaped robot applications.

## Intelligent Robot with Smart Fingers

Harbin Institute of Technology has recently produced an intelligent robot with smart fingers under the National 863 Program. The smart robot that has passed experts' acceptance check is equipped with five modular fingers. Each finger has four joints enjoying three degrees of freedom, or 15 degrees of freedom in total. The two terminal joints are able to move in a coupled manner. The fingers can tell the position, force/torque, and feel.

Researchers incorporate all needed mechanical, electrical, and sensing components in a highly integrated module, and implant the module in the palm, or in the fingers. As a result, the robot is able to identify and capture the objects in different shapes, and work on them on its own, using smart and sensible fingers. Researchers also realized the delayed remote teleoperation from Harbin to Wuhan, allowing the robot to open the solar panel, taking advantage of the internet based 3D graphic simulation capability and the robot's proprietary capability. The smart robot has found applications in numerous research institutions at home and abroad, and made its appearances in a number of shows.

## New Foot-and-Mouth Vaccine

Based on three-year painstaking efforts, a study team, led by YU Li, a research fellow at Harbin Veterinary Institute under the Chinese Academy of Agricultural Sciences, has produced a novel foot and mouth vaccine tailored to the serum-type defects in adenovirus expression commonly seen in China. The new vaccine has passed experts' acceptance check on December 16, 2010.

The new foot and mouth vaccine can effectively fence off the infection of the disease in different serotypes. It has overcome the shortcomings of traditional foot and mouth vaccines, by excluding the genetic materials of the foot and mouth disease, allowing the vaccine safer with a prolonged immune response/protection and reduced side effects. The production of the vaccine produces defected adenovirus viruses only, which are harmless to both humans and animals. The production of the vaccine can be made in a moderately closed environment, with both reduced safety requirements and costs of production. More importantly, adenovirus viruses, as a carrier, will not duplicate themselves in human body, implying that no implications on the immune effects of revaccination.

## Pig Stem Cells

PEI Duanqing, Dean of Chinese Academy of Sciences Guangzhou Institute of Biomedicine and Health, recently told reporters that Chinese scientists are currently working to make pig a substitute for mouse in producing stem cells, in an attempt to land a new breakthrough in regenerative medicine.

PEI said, according to China's medium and long-term science and technology development plan, China will initiate and implement 16 major earmark projects and 6 major research programs concerning "development and reproduction," and "stem cells". Among them, "Tissue and disease sourced ips pluripotent differences and associated molecular regulation mechanisms", and "Major mammalian reproductive models" are the two projects listed this year as a major earmark stem cell initiative, with the former enjoying a finance package worth RMB 28 million for a period of 5 years.

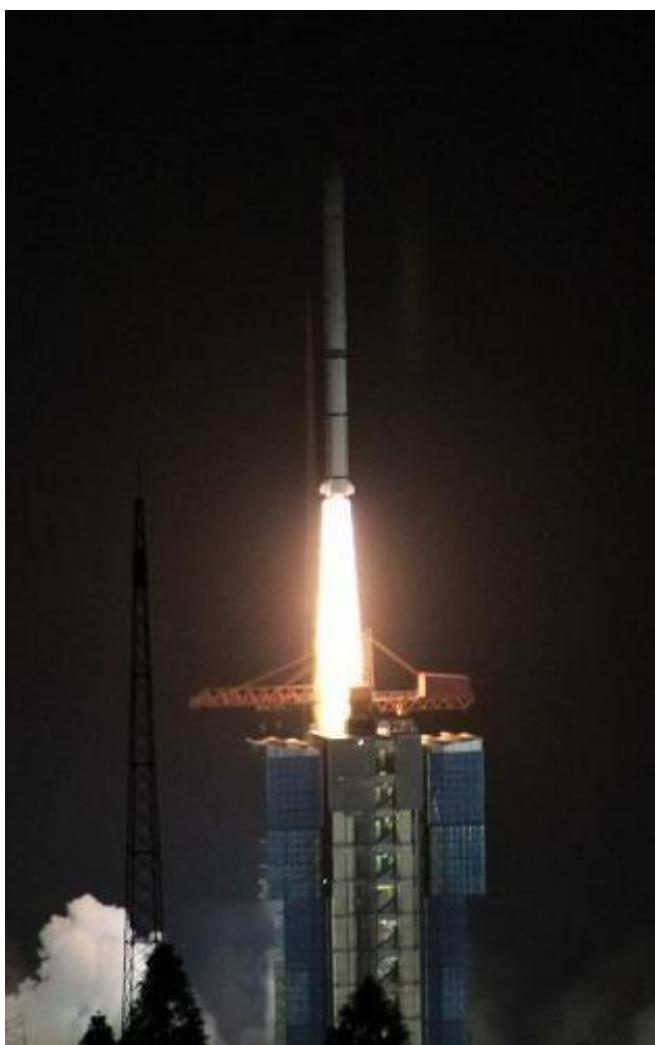
PEI added that the project of "Major mammalian reproductive models" will mainly work on pig based stem cell models. In the past, westerners have overwhelmingly used rodents as animal models. As a matter of fact, it will be more applicable to humans if a pig model is employed. Once a breakthrough is made in the area, China will become a world leader in stem cell research, with more core technologies at hand.

### NEWS BRIEFS

## New Navigation Satellite Launched

At 0420, December 18, 2010, China blasted off another navigation satellite aboard a CZIIIA launch vehicle from the Xi'chang Satellite Launch Center. 832.1 seconds after lifting off, the navigation satellite, the 7<sup>th</sup> of its kind launched by China, entered the preset transfer orbit.

The navigation satellite, named Compass, is a geostationary orbit inclined spacecraft, and is the fifth Compass series navigation satellite launched by China in a row this year. Compass satellite navigation system is a global satellite navigation system independently developed and operated by China. Under a three-phased development strategy, the satellite navigation system will cover the entire Asia-Pacific region by 2012, and be further expanded to a large global navigation system made up of some 30 satellites, ground controls, and user terminals.



## Large Scale Seafloor Terrain Map

It is reported from an academic meeting held on December 11, 2010 in Xiamen to share the results of an offshore maritime survey and associated assessments that Chinese scientists have updated the basic environmental data and information on China's offshore seabed under an earmark project named 908, and prepared for the first time a large scale offshore seafloor terrain map.

LEI Bo, State Oceanic Administration Deputy Director of Marine Science and Technology, said the earmark project was designed to look into offshore seafloor, marine geophysics, and seabed topography in a systematic manner. The investigation has covered some

600,000 square kilometers of China's domestic waters and territorial sea waters. Hundreds of marine scientists have completed investigation missions in their respective areas, with the findings derived from 110 seabed investigation missions having passed an acceptance check.

Additionally, Chinese scientists have prepared a large scale offshore sediment map based the findings of the investigation, illustrating the distribution of offshore sediments, control factors, the evolution of the ancient environment, and changed distributions of suspensions and heavy metals, and providing basic data and scientific evidences for offshore management, seafloor projects, and marine disaster prevention and preparedness.

According to a briefing, the survey has filled up a blank between land and sea rims, revealed the geological structures of China's offshore areas and associated distribution of sedimentary strata. It illustrates the activities occurred since the Quaternary Period, and the variation trends of depression centers. The findings are important to marine oil/gas and mineral resources exploration, marine disaster prevention and mitigation, and national defense.

## China's First Journal Impact Factor Database

A Chinese academic journal impact factor annual report, jointly prepared by Tsinghua University China Academic Journal E-magazine Press, China Scientific Literature Quantitative Evaluation Center, and Tsinghua University Library, was published on December 16, 2010 in Beijing in the form of database series. The database series are made up of two parts: humanitarian and social sciences, and natural sciences and engineering. The database not only presents impact factors concerning journals, basic research, technology development, and humanitarian and social studies, but also adds a dozen of evaluation indicators, including total citations, the numbers of cited journals, and citation half-life.

China is currently publishing more than 6,300 titles of academic journals. The Annual Report in the form of database has gathered evaluation indicators for more than 4,500 titles. 7% of the citations were removed by a search system able to tell academic misconducts. Meanwhile, derived from the database are two sub-datasets for statistical analysis of the influence of academic journals and the performance of journal management agencies.

## 10 Billions for Pollution Sources Watch

It is reported from a national forum on industrial pollution sources control and environmental protection held recently in Taiyuan that during the 11th Five-year Plan (2006-2010) period, China has invested RMB tens of billions to enhance the capacity building of monitoring major pollution sources. China has so far established 343 pollution source watch and control centers at provincial and municipal levels, monitoring 15,559 major pollution sources in an automated manner.

During the 12th Five-year Plan (2011-2015) period, China will further enhance the efforts to cut back on pollution, adding two more indicators, including nitrogen oxides and ammonia content, in addition to chemical oxygen demand and sulfur dioxide. China will focus on the integration of Internet of things technology, market development, and commercial applications, developing the technology and equipment applicable to China, formulating and perfecting the needed policies and legislations, and enhancing the application and diffusion of the prove technology though a combined efforts of both industry and research institutes.

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