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CHINA SCIENCE AND TECHNOLOGY

NEWSLETTER

**The Ministry of Science and Technology
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SPECIAL ISSUE

New Biotech Plan Released

Chinese Ministry of Science and Technology recently publicized a biotech development plan for the 12th five-year period. The Plan says during the 12th five-year period (2011-2015), China will see a noticeably enhanced biotech

innovation capability that matches an internationally advanced level, and become a world leader in certain aspects. China has enjoyed in recent years a booming development of biotech industries, covering biomedicine, bio-agriculture, biomanufacturing, bioenergy, bioenvironmental protection among others. As a result, biotech industry has become a pillar sector supporting the development of national economy, making China a biotech power.

The Plan points out that China will foster world-class key laboratories, engineering research centers, research resources sharing platforms, and industrialization demonstration bases, through a range of supporting measures, strengthening visionary basic research activities in the areas of agriculture, population, health, and bioindustry. Efforts will be made to achieve technological breakthroughs in the areas of "omics", synthetic biology, bioinformatics, stem cells, regenerative medicine, genetic therapy, cellular therapy, molecular typing and individualized treatment, bio-chips, bio-imaging, bio-process engineering, bio-catalysis engineering, drug targets screening, drug design, plant and animal species design, biological safety among others. Efforts will also be made to develop major products and technical systems for biomedicine, bio-agriculture, biomanufacturing, bioenergy, and biological environmental protection.

INTERNATIONAL COOPERATION

MOST and Gates Foundation Partnership

December 7, 2011-WAN Gang, Vice-Chairman of Chinese People's Political Consultative Conference and Minister of Science and Technology, met with Bill Gates and his Bill & Melinda Gates Foundation team. WAN spoke highly of what Mr. Gates and his Foundation has done in the areas of health, global development, and education. WAN briefed the other side of the breakthroughs China has achieved on basic research and cutting-edge technologies, especially in the areas of agriculture and healthcare, during the 11th five-year period. He pointed out that these achievements not only contributed to the wellbeing of 1.3 billion Chinese people, but also to the world peace and development as well. WAN said MOST collaboration with the Gates Foundation is strategically important, and the two sides will work together to support research institutions and high-tech businesses in China and in involving countries, promoting scientific and technological progresses and finding spin-offs in the areas of agriculture and healthcare, developing crop varieties, biological drugs, and vaccines featured with good quality and low price, and

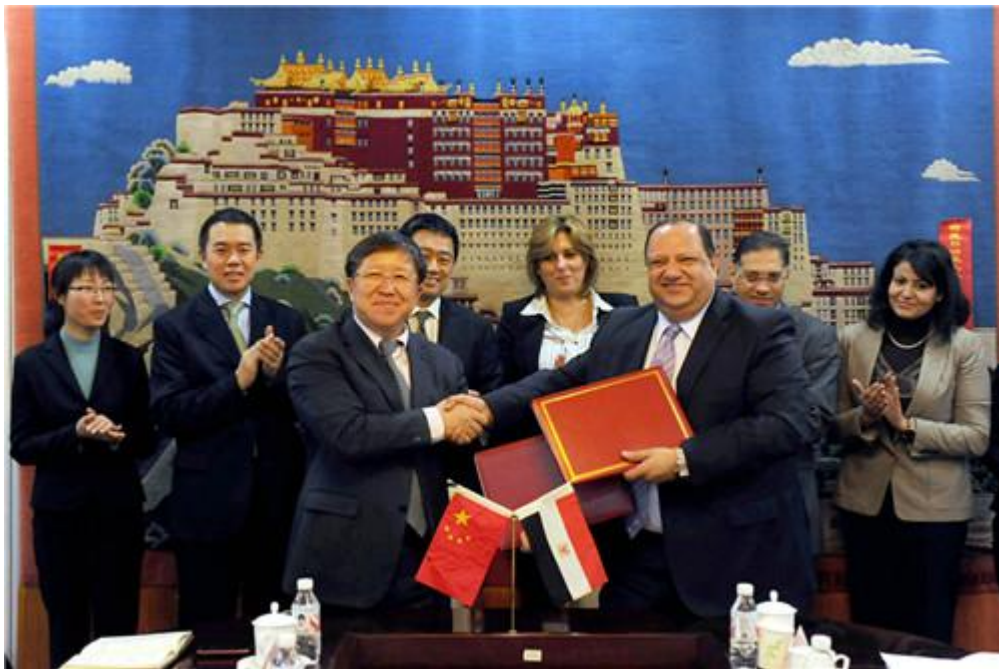
allowing them to be applied and diffused in China and in other developing countries and regions in South Asia and Africa. He added that the collaboration between the two sides will render an important contribution to addressing a range of global issues, including food security, environment, and health, and to the development and progress of human society. WAN also expressed his support to expanding cooperation areas on the existing basis, while exploring collaborations in other areas.



ZHANG Laiwu, Chinese Vice-Minister of Science and Technology, held talks with Mr. Gates, before meeting the media. ZHANG said MOST and the Gates Foundation will work together to explore the possible mechanisms and approaches through which government agencies can work with non-profit international organizations in a strategic manner, addressing a range of global issues, including food security, environment, and health. He said MOST will work on the consensus reached in the MOU for strategic cooperation between MOST and the Bill and Melinda Gates Foundation, under two cooperation mechanisms. First, efforts will be made to select potential collaborative R&D projects through the "joint working panel", establishing a projects database. Second, a cooperation fund will be established, based on the results of evaluation, to support and invest in the commercial application and scale production of proven technologies in the selected areas.



China-Egypt S&T Committee Meeting



The 6th China-Egypt Intergovernmental Joint S&T Committee meeting was held on November 30, 2011 in Beijing. The meeting was co-chaired by CAO Jianlin, Chinese Vice-Minister of Science and Technology, and Maged Al-Sherbiny, Egyptian Deputy

Minister for Higher Education, Scientific Research and Technology. The two sides briefed the other side of the latest S&T developments and policies in the country, and reviewed the projects implemented since the last joint S&T committee meeting and cooperation and exchange activities staged under China-Africa Science and Technology Partnership Program. Both sides agreed that these activities have enhanced pragmatic cooperation between the two countries, and rendered a positive contribution to the development of bilateral S&T cooperation. Thanks to the concerted efforts of S&T authorities in both countries, the bilateral S&T cooperation has proceeded in multiple forms and in diversified fields at different levels and through different channels.

The two sides also discussed priority areas and possible channels for the future collaborations. After the meeting, CAO and Maged Al-Sherbiny jointly undersigned the summary report of the meeting.

RESEARCH AND DEVELOPMENT

Largest Embryonic Stemcell Study

An international team of scientists from 19 countries, including China, the United Kingdom, the United States, and Israel, has completed a human embryonic stem cell genetic variation study, the largest of its kind in the world, under the sponsorship of the International Stem Cell Initiative (ISCI). The findings derived from the study were published in the recent issue of *Nature-Biotechnology*.

Scientists analyzed 125 human embryonic stem (ES) cell lines. Single-nucleotide polymorphism analysis revealed that they included representatives of most major ethnic groups. Most lines remained karyotypically normal, but there was a progressive tendency to acquire changes on prolonged culture, commonly affecting four chromosomes 1, 12, 17 and 20. No common variants related to culture were observed on chromosomes 1, 12 and 17, but a minimal amplicon in chromosome 20, including three genes expressed in human ES cells, ID1, BCL2L1 and HM13. Of these genes, BCL2L1 is a strong candidate for driving culture adaptation of ES cells.

A study team, led by JIN Ying of CAS Shanghai Institutes for Biological Sciences, in collaboration with Prof. FENG Yun at the Ruijin Hospital in Shanghai, established seven human embryonic stem cell lines, including the three lines established without animal ingredients, and supplied human embryonic stem cell lines to both domestic and overseas research institutions. The Chinese race embryonic stem cell

lines SHhES1 and SHhES2 established by Chinese scientists have become part of the genetic variation study. The valuable stem cell lines enriched the coverage of the study, allowing the data to be further analyzed, and making studying Chinese race specific genetic mutations possible.

New Drug Breakthrough

A research team, led by Prof. HUA Zichun of Nanjing University School of Life Sciences, recently announced that it has, in collaboration with Changzhou Qianhong Biopharmaceuticals, landed a breakthrough in developing a novel cancer drug. The patented tumor specific apoptosis inducer has entered the pilot production phase. Meanwhile, a targeted antithrombotic protein drug stemmed from the earlier collaborating study has applied for a clinical trial.

Comparing with similar anticancer drugs in phase II or phase III clinical trials, the tumor specific apoptosis inducer is able to deliver the drug directly into tumor tissues, or "tumor only", promising minimized side effects to other organs. An international comparison also shows that the new drug is able to produce the same or even better anti-tumor effects at a dosage that is only 1/3 of the dose offered by other similar drugs.

China Completed New Ocean Expedition

"Ocean-1" research vessel successfully completed its 22nd expedition across the destined oceans, and landed ten "firsts". The expedition found 16 hydrothermal areas on seafloors, 5 in the southern Atlantic ocean, and 11 in the eastern Pacific. Of them, the one found in the southern Atlantic sits in a southernmost hydrothermal area over the central part of the South Atlantic Ridge. Chinese scientists also found for the first time suspected new species of deep-sea fish and massive colonies of hydrothermal biological creatures, such as blind shrimps, in the southern Atlantic, providing valuable evidences for ecological studies of hydrothermal areas.

In addition, scientists collected for the first time microbial membrane specimens at different water depths and genetic samples over a vast sea area in different environments, which is valuable for deep-sea microbial diversity studies and genetic specimen collection. They also gathered for the first time environmental data and biological/microbiological specimens from different sites and at all reachable depth levels in a vast polymetallic nodules environment.

At the same time, scientists collected for the first time dense environmental parameters in the Indian Ocean, in a bid to make the observing data available for studying the impact of Indonesian throughflows on Indian Ocean circulations and climate. They also for the first time deployed an integrated observing system aboard a deep-sea moored buoy in southwestern Indian Ocean that would continuously collect meteorological elements and send them to the ground station in a real-time manner via satellites. Besides, scientists deployed deep-sea moorings in the Eastern Pacific Rise to collect hydrothermal data before having them recovered 111 days later.

Chinese scientists have for the first time collected specimens from the newly found inactive sulfide area in the southern Atlantic using an unmanned cable-controlled underwater vehicle, which marks China's operational capability of using robots in an ocean expedition. They gathered specimens from deeply drilled sulfide zone, made more technical reserves available for evaluating the sulfide mining zone in the future.

In the expedition, a Chinese made acoustic deep-tow system was employed for the first time to collect high-precision data from the hydrothermal areas sitting in the sophisticated ocean ridge terrains, providing a new means to assess sulfide resources. Additionally, China has for the first time carried out a multiple-beam undersea topography and marine environment survey covering an area of 3,726 square kilometers.

NEWS BRIEFS

More Compass Navigation Satellite Launched

At 05:07, December 2, 2011, China blasted off another compass navigation satellite (10th) aboard a CZIIIA launch vehicle, from the Xi'chang Satellite Launch Center. As the 5th of its kind sent to work in an inclined geosynchronous orbit under the Compass navigation network, the newly launched satellite has entered the transfer orbit as scheduled. Having completed the construction of its infrastructure part, the Compass satellite navigation system is now placed under a

comprehensive evaluation. It will before the end of the year start to provide continuous passive positioning, navigation, and time commissioning services to China and its adjacent areas, meeting the application needs in the areas of transportation, fishery, forestry, meteorology, telecommunication, water conservancy, mapping among others, and private users' needs as well.

According to a briefing, the Compass navigation system is developed in "three-step" manner. Before the end of next year, China will launch more Compass satellites, in a bid to achieve a wider coverage, improving service performance, and providing regional navigation services. Around 2020, a Compass navigation system made up of some 30 satellites will be shaped up to provide high-precision reliable positioning, navigation and timing services to the global users.

New Statistics for China's Scientific Papers

According to the statistics released by the Institute of Scientific and Technical Information of China (ISTIC) on December 2, 2011 to calibrate the worthiness of Chinese scientific papers, Chinese scientists have published 836,300 international papers during the period of 2001-2011 (as of November 1), ranked 2nd place in the world, or two places advanced compared with 2010. Chinese papers registered 5.1914 million citations, sitting in 7th place in the world, or one place advanced compared with 2010. As a result, each paper would have 6.21 citations on average, or 5.8% up against the preceding year, or 1.3% up over the preceding year. Apparently, China has a gap from the world average (10.71 citations), though enjoying a rapidly advanced status.

Statistics show that during the period of 2001-2011, Chinese papers that fall under the top 1% citation rank reached 5,856 in number, ranked 6th place in the world, following the United States, the UK, Germany, France, and Canada. China has overtaken Japan as the latter registered 5,639 papers for the top 1% citation rank.

China's Major Freshwater Lakes Protected

China's five major freshwater lakes and their protection/development, a study report written by 20 experts from Chinese Academy of Sciences Nanjing Institute of Geography and Limnology, was recently released in Nanjing. Consisting of eleven chapters in three parts, the report reviewed in Part I the past history and status quo of five major freshwater lakes in China, including Dongting Lake, Poyang Lake, Chaohu Lake, Taihu Lake, and Hongze Lake, tracing their formation, evolution, protection, and development, and assessing their health. In part II, the authors

reviewed and analyzed the hot issues concerning the five lakes, along with diagnosis and strategic policy proposals. A range of protection strategies and priority action plans, including fund raising, were put forward in part III, in line with the proven lake protection and development practices found both at home and abroad.

The Report says the five freshwater lakes have been protected under a system featured with comprehensive resources utilization, water security, and ecological environment protection, though developed in their own unique manner. As an important part of national development strategies, the protection and development of the lakes has entered a stage featured with coordinated development, protection, and management, rather than the previous mode mainly on the development, desirable for resource development and utilization, environmental protection, and socioeconomic development.

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