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NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUE

China ś NWP System into Operation

China Meteorological Administration said on April 29, 2009 that it has put into a global numerical weather prediction system developed by Chinese scientists into quasi operation. The development indicates that China has established a well functioned operational NWP system with global numerical weather prediction as the core, in an attempt to accommodate different weather forecast needs.

The new generation global numerical weather prediction system developed by Chinese scientists has won the approval of experts last March for its quasi operation. The enhanced performance of the new system has allowed a valid forecast period up to 7 days for the northern hemisphere. Of the data used in the new system, satellite data has reached 30% or more.

Based on the framework of the new global system, China Meteorological Administration will establish a platform for NWP related studies, in an effort to eventually put the system into an official operation. By 2012, China will realize six major targets in the area: establish a global numerical weather prediction system with a resolution up to 25 km, with a valid forecast period for 7 days or more; develop a regional NWP system up to 5 km, with a raised rainfall forecast score by 5% for Chinese regions; realize a higher resolution typhoon NWP system, with a reduced track forecast error by 5%-10% for the western Pacific region; create a singular vector perturbation based ensemble prediction system with a global resolution at 50 km and regional resolution at 15 km; and establish an enhanced platform for diagnosis/validation and product interpretation.

INTERNATIONAL COOPERATION

World Largest Bird-Like Dinosaur

Paleontologists at the Paleontology Research and Development Center, part of No. 3 Geological Survey Institute in Gansu, in collaboration with American scientists, have confirmed that the Peishansaurus unearthed three years ago in Gansu is the largest bird-like dinosaur so far found in the world. Peishansaurus is both longer and heavier than the Gallimimus, a bird like dinosaur found in Mongolia that was once deemed the largest bird like dinosaur unearthed in the world. Peishansaurus, including 4 limb bones, 8 tail bones and some neck bones, was unearthed in the northern mountain area of Yujingzi Village in Gansu, China in June 2006.

Lab reconstruction and study shows that the bird like dinosaur has a length about 8m, and a weight of 626 kg. Apparently, it is longer and heavier than Gallimimus that is 4m long, weighing 440kg. Researchers also found that Peishansaurus has a front claw as long as 15cm, with front limbs that are stronger than other bird like dinosaurs, falling into the category of plant-eating dinosaurs. Both Chinese and American paleontologists named it

Giant Peishansaurus for its large size and strong limbs.

Chinese paleontologists have reconstructed the skeletons of Giant Peishansaurus based on the fossilized specimen, allowing more people to know and understand the largest bird like dinosaur so far found in the world.

RESEARCH AND DEVELOPMENT

World's First Photonic Telephone Network

A research team, led by PAN Jianwei at the University of Science and Technology of China, has recently made a substantive progress by establishing the world's first photonic telephone network. The development indicates that an absolutely safe quantum communication system is walking into people's daily life from the lab.

In 2003, scientists in a number of countries, including the Republic of Korea, China, and Canada, proposed a quantum coding theory that can be used to address the deteriorated safety of quantum communication over extended ranges under the existing technical know-how. In the summer of 2006, a study team led by PAN Jianwei, Los Alamos National Laboratory in the United States, and a joint study team at Munich University and Vienna University have independently realized the said theory, allowing a safe quantum communication for a range exceeding 100 km. PAN and coworkers have recently raised the safe quantum communication range to 200 km.

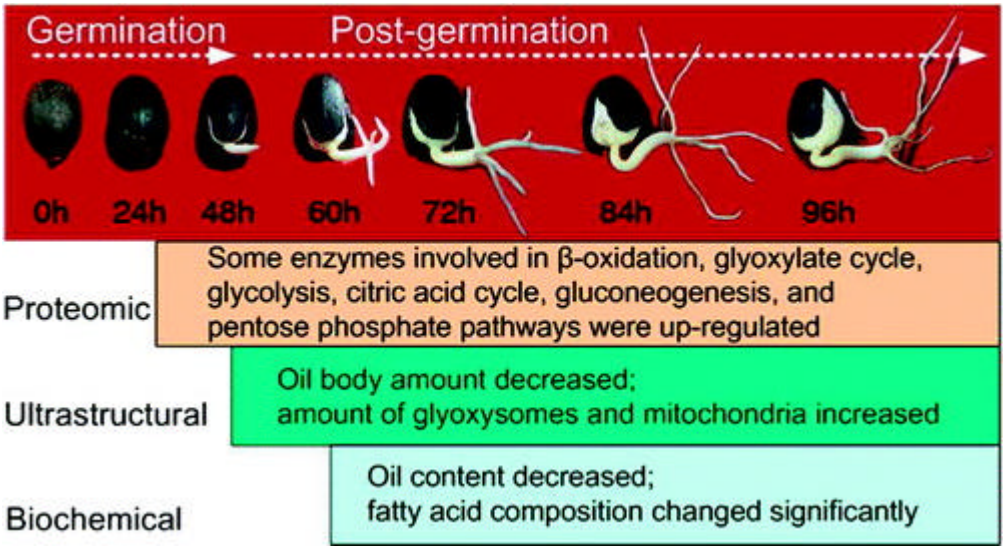
After that, PAN and coworkers have developed the prototype telephone set for quantum communication, and established a scalable photonic telephone network in a commercial optic-fiber network with a node range up to 20 km, allowing the desired coding modality. The real-time telephone network is designed with a completely safe calling mode for three-party conversation, calling upon dialing, and real-time encrypted voice communications. The findings, published in the April issue of *Optics Express*, were described by the journal *Nature* as quantum telephone is calling.

Natural Antiviral Regulator Found

A study, led by SHU Hongbing at Wuhan University College of Life Sciences, has found

that ISG56 is a negative-feedback regulator of virus-triggered signaling and cellular antiviral response. A paper introducing the findings was published in the April 28, 2009 issue of the *Proceedings of the National Academy of Sciences*. Another research team, headed by YANG Fuquan with the Institute of Biophysics under the Chinese Academy of Sciences, validated the protein spectrum for the study. Researchers found that ISG56 disrupted the interactions between MITA and VISA or TBK1, two components in the virus-triggered IFN signaling pathways, suggesting that ISG56 is a mediator of negative-feedback regulation of virus-triggered induction of type I IFNs and cellular antiviral responses. The finding adds more details to the functions of ISG56, allowing people to understand the actual regulation process of natural antiviral responses.

Scientists Found Oil Mobilization Network in Jatropha Curcas



Not long ago, SHEN Shihua and coworkers at Chinese Academy of Sciences Institute of Botany made a proteomic analysis of oil mobilization in seed germination and postgermination development of jatropha curcas. Researchers also performed ultrastructural observation and proteomic analysis of endosperm in germinating Jatropha curcas seeds. The finding was published in a recent issue of *Journal of Proteome Research*.

Results showed that the oil mobilization was initiated during germination, and then the oil was consumed for early seedling development. The significant change in abundance of 50 protein spots (17 spots are directly involved in oil mobilization) during germination

indicated that several pathways including ß-oxidation, glyoxylate cycle, glycolysis, citric acid cycle, gluconeogenesis, and pentose phosphate pathway were involved in the oil mobilization. Researchers also concluded that at least two pathways were desirable for oil mobilization.

China Rolled Out H1N1 Test Kit

Chinese Ministry of Agriculture Office of the Press announced May 3, 2009 that Chinese scientists have developed an RT-PCR kit for testing H1N1 viruses. The test kit is able to tell if a person is infected with H1N1 viruses in 5 hours.

Since the outbreak of human infections of H1N1 viruses, Chinese Ministry of Agriculture has organized a number of research institutes, including the National Bird Flu Lab, and China Animal Health and Epidemics Center to work on a fast test kit for the viruses. The National Bird Flu Lab obtained the genetic sequences of H1N1 viruses from an international organization. It took less than one week for Chinese scientists to work out the design of the test kit, and kick off clinical trials. They have made repeated experiments to ensure the valid sensitivity, specificity, stability, performance of the test kit.

The new kit is of a fine sensitivity and specificity, not only desirable for testing swine infections of the viruses but also for detecting human infections.

New Probe Telling H1N1 Results in 2 Hours

The Chinese Academy of Military Medical Sciences announced on May 2, 2009 that its researchers have developed a proprietary nucleic acid probe able to tell H1N1 test results in 2 hours. To accommodate possible mutations of H1N1 viruses, researchers have worked out three probes specific to the possible genetic mutations.

The proprietary probe has been granted with a national invention patent, making it the only PRC test kit enjoying a national invention patent in the country. 8 intense pathogen test kits built on the said technology have registered for clinical applications. The new test kits will soon be put into use. Meanwhile, researchers are working on the biochips that are able to tell H1N1 viruses and associated drug resistance. These products will be soon made available for clinical applications.

Novel H5N1 Vaccine for Human

The Chinese National Bird Flu Lab announced recently that it has rolled out a cold-adapted live attenuated H5N1 vaccine for human applications, which will keep human from being infected by sub H5N1. The new vaccine, developed by the Lab in collaboration with the scientists at the University of Tokyo, is more reliable with a simplified application (nasal spray), compared with other inactivated vaccines. The vaccine is produced directly from egg based culture medium, free from the complicated processes of concentration, inactivation, and purification, with a greatly shortened production cycle. Meanwhile, the eggs needed for producing the vaccine are only 1% or even 1‰ of the quantity needed for producing an inactivated vaccine, desirable for mass production and storage. A paper introducing the findings was published in a recent issue of journal *PLoS Pathogens*.

Test Kit for Screening H1N1 Patients

A Guangzhou based study team has developed a test kit to screen possible H1N1 patients on the spot. Made of immune test papers, the test kit is able to tell the results within 3 to 10 minutes without help of any equipment. The test kit has been tested for its validity using the H1N1 strains separated from an H1N1 patient.

The test kit was tested again on May 8, 2009 for its effectiveness at a national key lab for new infectious diseases chaired by YUAN Guoyong, an academician of the Chinese Academy of Sciences at the University of Hong Kong. The lab test has produced a minimum threshold of 1:8000, as effective as its imported counterparts, with a sensitivity matching the ELSA test kit, desirable for massive screening efforts.

The test kit has been clinically tested using the H1N1 strains separated from a H1N1 patient found in Hong Kong, and was proved effective for fast screening.

NEWS BRIEFS

Chinese Malaria Drug Won International Award

A Chinese medical team, headed by Prof. ZHOU Yiqing of Chinese Academy of Military Medical Sciences, has recently won a non-European prize at the European Inventor of the Year awards (2009) for Artemether, a traditional Chinese medicinal compound for treating malaria. The prize is the first one that Chinese medical community has won in the world.

Artemether, a special malaria drug made of traditional Chinese medicinal herbs, was rated by both the independent judge group and expert judge group set up by the European Patent Office as the best medicine for treating malaria, which is also the priority drug used by Chinese doctors in treating malaria in Africa and southeast Asian countries. The malaria drug has been granted with the patents issued by 43 countries or regions, including the United States, Europe, and Japan since 1991, and has been sold in the mainstream international markets. It has since 2001 saved the life of 550,000 patients. Most of them are children under age of 5 in Africa.

Internet Protocols Acceleration

Researchers at the University of Science and Technology of China School of Computers, working with their overseas collaborators, have achieved major breakthroughs in multi-core based Internet protocols acceleration. They accelerated the operation of TCP/IP and HTTP protocols using multi-core technology, which greatly enhanced the input and output of Internet and world wide web. The new technology is able to perform in-depth analysis of the data packages running in the network, securing safe operations of the network in the area of industry, banking, education, medical service, and e-government. A paper introducing the findings was accepted in April 2009 by the annual supercomputer conference sponsored by the American Association for Computing Machinery.

Saline Resistant Wheat

Chinese scientists at Xinjiang Institute of Ecology and Geography have bred out a new wheat species, Xindong 34, featured with salt/alkali resistance and yield increase through many years 'experiment. The new wheat species has produced an averaged yield of 403.32 kg per mu(1 mu= 0.0667 hectare), sitting in first place among the new species tested for their increased yield, or 6.89% more compared with Xindong 26, another fine species renowned for its saline resistance and adaptability to droughts. In addition to saline resistance, the new species is doing fine for disease and lodging resistance with quality grains.

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