

## 1. Profile of Awardee

Name: Dr. Zhengqiang JIANG  
Affiliation: Professor, College of Food Science & Nutritional Engineering, China Agricultural University, China

## 2. Outline of Research Achievements

### Title of Research Achievements :

Research and application of enzymes & development of innovative technology in the field of food processing

### Outline of Research Achievements

Dr. Zhengqiang JIANG started his teaching career in the College of Food Science and Nutritional Engineering, China Agricultural University (CAU) in 1995. He was promoted to a lecturer position in 1997, and then to an associate professor rank in 2001. He rose to become the youngest professor of CAU in 2004. Between 1998 and 1999, he worked in Kobe University. He studied at the Enzyme Laboratory of National Food Research Institute in Japan from 2000 to 2001. In 2005, he was granted recognition as Author of National Excellent Doctoral Dissertation of China and New Century Excellent Talents in University. He has published five books and more than 80 scientific papers, of which twenty are in internationally renowned journals. His research achievements mainly deal with enzyme engineering and food processing. A second xylanase gene (*xynB*) from *Thermotoga maritima* was first cloned and overexpressed in *E. coli*. XynB was further characterized, and is recognized as a promising enzyme for the food industry. He systemically isolated 500 xylanase-producing microorganisms in China. A newly isolated thermophilic fungus J18, which produced desirable xylanase and was identified as a new species, was named *Paecilomyces thermophila* sp. For his work on the development and production of xylooligosaccharides from corncobs by xylanase, he received the Scientific Technology Awards of Shandong province in 2002 and the National Technology Invention Awards in 2007. In addition, he was granted five relevant patents which are used to instruct many factories to produce instant buckwheat and rice noodles using the innovative technology that he developed.

### Main Publication and Patents

- (1) Transglycosylation reaction of xylanase B from the hyperthermophilic *Thermotoga maritima* with the ability of synthesis of tertiary alkyl -D-xylobiosides and xylosides. J Biotechnol, 2004, 114: 125-134.
- (2) Chinese invention patent: Processing method of instant fresh rice noodles. No. ZL 99125254.3 (To be granted on May 21, 2003).
- (3) Enzyme and enzyme engineering & application (in Chinese). In: chapters 3, 5 and 10. Chemistry Industry Press, Beijing, 2006, pp. 54-84, 100-129, 236-265.

## 3. Reason of Awarding

Dr. Jiang obtained outstanding achievements in the field of food processing, especially in the field of enzyme-engineering. His innovative researches include the development of technology for the industrial production of xylooligosaccharides from corncobs by using xylanase. In China, his results are expected to contribute significantly to the development of the food industry, application of food products and supply of high-quality products to the consumers in the near future. He was presented the Scientific Technology Award of Shandong province in 2002 and the National Technology Invention Award in 2007, and at a very young age of 33, he was promoted to a full professorial rank in 2004. Dr. Jiang, a high-caliber and dedicated scientist, is expected to become one of the leading researchers that would play a central role in the field of food processing in China.

## 1. Profile of Awardee

Name: Dr. Chalernpol KIRDMANEE  
Affiliation: Head of Plant Physio and Biochemistry Laboratory, National Center for Genetic Engineering and Biotechnology, National Science and Technology Development Agency, Thailand

## 2. Outline of Research Achievements

Title of Research Achievements : Research, development and extension on *in vitro* selection and mass-propagation for producing high quality transplants of medicinal, food and industrial crops

### Outline of Research Achievements

Dr. Chalernpol has carried out a wide range of scientific researches on the environmental control engineering in tissue culture to produce high quality transplants of important crops in order to address medicinal, food, bioremediation and bio-energy production related issues that confront the world and the environment today. His abundant achievements include 7 patents, 32 published articles, and 12 technology transfers. More than 3,000 people in the industry, agriculture and academic sectors are conducting their activities under his supervision.

Plant tissue culture technology under environmental control system has been developed to improve the quality of agricultural production, especially in terms of tolerance to salt and drought stresses, and has been distributed to the social and private agricultural sectors. To overcome the salinity/drought problems in agricultural production, their mechanisms were elucidated by investigating osmoregulation related to carbohydrate functions. Salt tolerant trees were classified *in vitro* and grown in a saline area in Mahasarakham province and in a dehydrated salt field in Nakornrathasima province. The results showed a decreasing saline concentration from 10% to 0.5% NaCl in 4 years and from 4% to 0.8% NaCl in 1 year, respectively. The osmoregulation mechanism of aromatic rice was evaluated *in vitro* to identify its salt tolerant ability. The results demonstrated the highest salt tolerance of aromatic rice in the world.

The 21st century could see a temperature rise from 3 to 5 degrees Celcius. To contribute to the worldwide efforts of overcoming the greenhouse effect and energy consumption problems, he is very much interested in developing a system for bioenergy production from oil palm.

### Main Publication and Patents

- (1) Effects of CO<sub>2</sub> Enrichment and Supporting Material on Growth, Photosynthesis and Water Potential of Eucalyptus Shoots/Plantlets Cultured Photoautotrophically. In Vitro. Environ. Control in Biol. 33: 123-132. 1995
- (2) Rapid Acclimatization of Eucalyptus Plantlets by Controlling Photosynthetic Photon Flux Density. Environ. Control in Biol. 33: 133-141. 1995
- (3) The patent is 1'-Acetoxychavicol acetate for TB Treatment (Under US patent)

## 3. Reason of Awarding

After graduating from the University of Chiba, Dr. Kirdmanee, continued and, with originality and creativity, developed his research on the selection of superior plants, high-quality transplants, and organized research groups in Thailand to implement related research activities, application and dissemination. He is also actively involved in the mutual exchange of young researchers from Southeast Asian countries, as well as in research collaboration with Japanese research institutes. He is an exceptionally talented researcher with a strong sense of leadership and high-level nobility, and is expected to be a leader in the field of environmental/agricultural research in Asia.

## 1. Profile of Awardee

Name: Dr. Jonathan Hosier CROUCH  
Affiliation: Director, Genetic Resources & Enhancement Unit, International Maize and Wheat Improvement Center (CIMMYT)

## 2. Outline of Research Achievements

### Title of Research Achievements :

**Molecular breeding of major tropical staple crops for drought-prone environments**

### Outline of Research Achievements

Jonathan Crouch is an tropical crop scientist with a particular focus on genomics research and molecular breeding - covering cereals, legumes, oilseeds, clonal fruit and tuber crops in public and private sectors in Europe, Middle East, Africa, Asia and Latin America. His hands-on research has focused on complex polyploids such as potato, canola, plantain, groundnut and wheat - with an emphasis on enhancing drought tolerance and disease resistance through interdisciplinary research in genetic resources, genomics, transgenics and computational sciences. He has also been active in innovation policy and intellectual property management, championing institutional change, fostering technology cluster incubation, and coordinating science networks across the developing world.

Most recently he joined the International Maize and Wheat Improvement Center (CIMMYT, Mexico) as director of the Genetic Resources Program in 2005, providing scientific leadership for this global research and support group which operates through three operational units: Genebank (Germplasm Conservation, Enhancement and Distribution), Applied Biotechnology Center (ABC), and, Crop Research and Informatics Lab (CRIL). He also retains hands-on research activities in molecular breeding, leads the genetic engineering research group and chairs the institutional intellectual property committee. His current research team is putting particular emphasis on the development of new tools and methodologies for better access to genetic resources and improved efficiency of molecular breeding. The research team works on genetic traits that are identified as priorities by the crop programs, such as drought tolerance, pest and disease resistance, and quality traits. Jonathan Crouch has authored nearly 200 publications including 50 international journal papers.

### Main Publication and Patents

- (1) The molecularization of public sector crop breeding: progress, problems and prospects. *Advances in Agronomy* 95:163-318 (2007)
- (2) Application of population genetic theory and simulation models to efficiently pyramid multiple genes via marker-assisted selection. *Crop Science*. 47:582-588 (2007)
- (3) Development of ESTs from chickpea roots and their use in diversity analysis of the Cicer genus. *BMC Plant Biology* 5(16) (2005)

## 3. Reason of Awarding

A number of molecular breeding approaches have been followed by researchers of CGIAR under the leadership of him in Africa, Asia and Latin America. These have focused on disease resistance and tolerance of water-stress conditions in cereals, legumes and clonal crops. This has included wide crosses, genomics and transgenics approaches, including the development of genetically engineered cultivars containing various gene constructs to enhance the performance of these cultivars under water stress.