

APSA Researchers' Workshop

Topic: From Genome Sequencing to Crop Improvement

Date : February 29, 2012

Venue: Pattaya Exhibition and Convention Hall, Pattaya, Thailand

Registration Form click here. http://apsaseed.org/ASC2011/Registration_Form_Genome.doc

Whole genome sequencing (WGS) of tomato, potato and cucumber has been completed, and numbers of WGS projects are on the way. With tremendous bioinformatics information available in the public domain, how can our members cope up with it or exploit the technology for crop improvement? With the rapid technology development and lower in cost of WGS, what are the opportunities there? Our objectives of this workshop are:

- 1) to introduce advanced genome sequencing technologies and progress of current agricultural-related genome sequencing projects to APSA members
- 2) to introduce implications of genome sequencing on breeding and crop improvement
- 3) to initiate discussion on establishing long-term collaboration among seed industry and between academic, research institution and industry through forming consortium and/ or joint research projects

Program

	Program	Speaker
8:30-9:00	Registration	
9:00-9:20	Opening speech	Dr. Anthony Tse
	Session I: Advanced genome sequencing technology and related latest research for crop improvement Chair: Dr. Simon Jan de Hoop	
9:20-10:00	Next-generation sequencing technologies for decoding new genomes and molecular breeding	Dr. Ruiqiang Li
10:00-10:40	Genomic research to accelerate soybean improvement programs	Dr. Hon-ming Lam
10:40-11:00	Coffee/Tea Break	
11:00-11:40	Application of advanced genomics technologies to development and utilization DNA markers	Dr. Satoshi Tabata
11:40-12:20	A systems approach to defining the capsaicinoid synthesis pathway in pepper (<i>Capsicum sp.</i>)	Dr. Allen Van Deynze
12:20-14:00	Lunch	
	Session II: From molecular breeding to genomic breeding Chair: Dr. Surinder Tikoo	
14:00-14:40	Molecular Breeding for Complex Traits	Dr. Roland Schafleitner
14:40-15:20	Genome-assisted marker development for disease resistance in pepper	Dr. Byoung-Cherol Kang
15:20-15:40	Coffee/Tea Break	
15:40-17:00	Session III: Discussion on joint research and collaboration between research institutes and private sectors Chair: Dr. Narasimhan Anand	

Introduction of speakers

Dr. Allen van Deynze

Director of Research, Seed Biotechnology Center, University of California-Davis, U.S.

Dr. Van Deynze received a BSc. and MSc. degree in Plant Science from the University of Manitoba, Canada and a Ph.D. in breeding from the University of Guelph, Canada. He did a postdoctorate in molecular genetics at Cornell University in the Department of Plant Breeding and Biometry. He worked as a plant breeder for Calgene/Monsanto and as a senior scientist for Celera AgGen and Paradigm Genetics where he developed and implemented strategies to incorporate biotechnology into breeding programs. As part of the SBC's mission to serve as a liaison between public institutions and the seed industry, he develops, coordinates and conducts research on the application of biotechnologies to seed crops. Dr. Van Deynze generates and disseminates scientific and informational content for the Center's educational and outreach programs. Dr. Van Deynze's research interests are the development and application of genomics into plant breeding in vegetable crops and cotton.

Dr. Byoung-Cherol Kang

Associate Professor, Seoul National University, South Korea

EDUCATION

Seoul National University, Korea, 1994 – 1999. Ph.D. in Plant Molecular Genetics Dissertation:

"Construction of molecular linkage map, mapping genes for capsaicinoid contents and *Bs3* in hot pepper"

Seoul National University, Korea, 1990 – 1992. M.S. in Plant Molecular Genetics Thesis: cDNA cloning of alpha-amylase gene in rice

Seoul National University, Korea, 1986 – 1990. B.S. in Horticulture

PROFESSIONAL EXPERIENCE

Seoul National University, Seoul, Korea, 2010. 4. – Present, Associate Professor

Seoul National University, Seoul, Korea, 2006. 3. – 2010. 3., Assistant Professor

Cornell University, Ithaca, NY, 2002 – 2006, Research Associate

Cornell University, Ithaca, NY, 1999 – 2002, Postdoctoral Associate

RESEARCH INTERESTS

Molecular breeding and marker development in *Capsicum* spp.

Dr. Hon-Ming Lam

Professor, The Chinese University of Hong Kong, Hong Kong SAR

Prof. Lam is a plant molecular biologist working on characterization of important and novel genes that may impact agriculture. In his early research career, he pioneered molecular genetics research on nitrogen metabolism using the model plant *Arabidopsis thaliana*. Concerned about the impending food security crisis in China, where 7% of the world's arable land is to feed 22% of the world's population, he began venturing into the areas of salinity and drought tolerance genes in crop plants, most notably in soybean. He has been working on the characterization of stress tolerance genes from soybean and constructed useful genetic populations for further stress tolerance studies in soybean. Starting 2008, he spearheaded a large scale soybean genomic project in collaboration with BGI-Shenzhen. This project aims at learning about the changes in the genome of soybean under artificial human selection through high-throughput genome sequencing. The ultimate goal is to provide important information for soybean research and breeding programs. Prof. Lam serves as the deputy director of the State Key Laboratory of Agrobiotechnology at The Chinese University of Hong Kong, since the approval of establishment by the Ministry of Science and Technology, PRC in 2008. He has been elected to serve as a council member and a Vice Secretary-General of The Soybean Specialty Committee of The Crop Science Society of China since 2001 and 2005, respectively.

Dr. Ruiqiang Li

Former Vice president and Head of Research & Cooperation, BGI, China CEO, Novogene Co. Ltd. Principle Investigator, Biodynamic Optical Imaging Center of Peking University, China

Dr. Li got bachelor degree in physics from Southeast University of China and Ph.D degree in molecular biology from Copenhagen University of Denmark. During the nine years of genomics and bioinformatics research, he developed several bioinformatics tools including SOAP next-generation sequencing software package, which were widely used in the field. He was the team leader of eight genome projects including silkworm, cucumber, panda, potato, first Chinese genome, etc. He is dedicating on developing genomic methods for assisting breeding. His research has published 51 peer reviewed papers on Science, Nature, Nature Genetics, Nature Biotechnology, PLoS Biology, PNAS, which were cited by thousands of times.

Dr. Roland Schafleitner

Head – Molecular Genetics, AVRDC- The World Vegetable Center, Taiwan

Dr. Schafleitner received his Master in Molecular Microbiology, PhD in Biochemical Technology. He has worked from 1996 to 2002 as research scientists at the Austrian Institute of Technology (former Austrian Research Centers Seibersdorf) on molecular plant pathogen interactions, microarray development, and GMO test development. After a sabbatical year at INRA Bordeaux investigating the molecular ecology of plant pathogenic fungi, he joined the Crop Improvement and Germplasm Enhancement Division of the International Potato Center in Peru, and worked on heat and drought tolerance improvement of potato and developed genomic resources for sweetpotato. Since August 2010 he serves as head of the Molecular Genetics Unit at AVRDC – The World Vegetable Center in Taiwan. His tasks research targets heat and drought tolerance improvement of vegetable crops and development of genomic resources for molecular breeding.

Dr. Satoshi Tabata

Deputy Director, Kazusa DNA Research Institute, Japan

Dr. Tabata received PhD from Kyoto university in 1983, worked for University of California, San Diego, Kyoto university, and Nagoya university, then moved to Kazusa DNA Research Institute in 1994 as a project leader. The special field is microbial and plant genomics: genome sequencing and functional genomics in cyanobacteria, rhizobia, model and crop plants. Recent interest is transfer of knowledge from basic to applied science.