

COLLEGE OF AGRICULTURE AND LIFE SCIENCES RESEARCH AWARDS 2001-2002

RESEARCHER OF THE YEAR AWARD:

JIAN-KANG ZHU, PROFESSOR OF PLANT SCIENCES

Jian-Kang Zhu focuses on researching the molecular genetic mechanisms underlying plant responses to adverse environments such as salinity, drought and low temperature. His work has led to the identification of genes for modifying the responses of crops to environmental stresses which ultimately will lead to major contributions to agriculture.

Zhu advanced from assistant professor to professor in just five years. Since beginning his appointment at the University of Arizona in 1996 he has received grant awards totaling more than \$5 million. This represents a high level of peer endorsement for the quality of Zhu's research accomplishments.

Zhu and his colleagues have used the model plant *Arabidopsis* to create mutants that are "salt overly sensitive" (SOS). By cloning and characterizing the SOS genes, they have been able to describe a signaling pathway that mediates the response of *Arabidopsis* to high salinity. His lab is currently working on the structural analysis of the gene products of the signaling pathway and on related proteins that make plants more tolerant to high salt.

In the course of his research Zhu and his colleagues have constructed transgenic *Arabidopsis* plants that literally glow in the dark when placed under various environmental stresses. This feature, called stress-inducible bioluminescence, was created by engineering a gene consisting of an osmotic stress-responsive promoter fused with the firefly luciferase reporter gene. The bioluminescent plants have been used to identify mutants that respond abnormally to water stress. This work demonstrates a paramount role of the plant hormone abscisic acid in regulating specific genes that are expressed during water stress.

Zhu has also played a leading role in the genetic analysis of how plants respond to low temperature (cold) stress and has already discovered several novel regulators of cold-responsive genes important in chilling and freezing tolerance.

Zhu has authored more than 80 scientific papers and review articles in leading journals, including twenty plus publications this past year. He has 10 patents pending review and approval. He is currently an associate editor for the journal "Plant Molecular Biology" and the monitoring editor for "Plant Physiology."

Recently, Zhu assumed the role of scientific advisor to a Rockefeller Foundation program on crop improvement in developing countries.

OUTSTANDING STAFF IN RESEARCH AWARD:

BRENDA HUNTER, SENIOR RESEARCH SPECIALIST, DEPARTMENT OF PLANT SCIENCES

Brenda Hunter has been the laboratory manager for plant sciences professor Brian Larkins' maize research program since 1989. She is responsible for financial management, equipment maintenance, supply orders, record keeping for radioactive and hazardous chemicals, seed, clone and antiserum stock maintenance,, genetic fieldwork and making sure the laboratory is a safe and clean environment in which to work. Her good work was particularly critical when Larkins was serving as department head in Plant Sciences

While Hunter's first priority has been the running of the lab, she believes it is important to maintain a research project of her own. Her Ph.D. and postdoctoral training was in plant molecular biology and virology. For the past four to five years she has actively participated in a laboratory study profiling the patterns of protein synthesis and gene expression in a series of maize (opaque) kernel mutants. She handled the key component of this project. A manuscript describing some of the results from this study was recently accepted for publication in "The Plant Cell" with Hunter as the first author on the paper.

Hunter has a strong work ethic, a great sense of dedication to her job, and takes great pride in the accomplishments of the laboratory, according to her colleagues. She makes her experience and expertise available to many individuals in the college, and has been a strong and active supporter of department and college staff activities. She has played an important role in helping the Plant Sciences Department become an outstanding department. Perhaps Larkins says it best: "In my opinion she is one of the best citizens in the college."