



# Meet an MPRINT Scientist



Mike Hasegawa

Mike earned the B.S., M.S., and Ph.D. degrees (Plant Science and Botany) from the University of California, Riverside. He joined the Purdue faculty in 1977 and is currently Professor, and member of the Center for Plant Environmental Stress Physiology in the Department of Horticulture and Landscape Architecture. Much of his research has focused on the identification of plant salt tolerance determinants and isolation of plant genes involved in the process.

His research has included the transformation of sorghum, lily, and mint, and, with MPRINT's Ray Bressan, resulted in the first peppermint and lily transformations. In collaboration with MPRINT colleagues Ray Bressan, Larry Murdock, Suzanne Nielsen, and Dick Shade, he has worked on host plant resistance to insects mediated by plant cysteine proteinase inhibitors and plant lectins. The cysteine proteinase inhibitor research has focused on developing techniques for directed molecular evolution of the soybean proteins. This research resulted in a phage display selection procedure that can select plant defensive proteins with greater insecticidal activity, based on binding affinity to the substrate.

Research is directed at improving the insecticidal/nematicidal activity of soybean cysteine proteinase inhibitors by site-directed mutagenesis to functional domains in the protein and biopanning selection. Additional efforts are focused on identification and isolation of cysteine proteinases from insects and nematodes that will be targets for molecular evolution. Site-directed mutagenesis has made possible the identification of several determinants involved in binding and insecticidal activity of a lectin from the insect *Griffonia simplicifolia*. Binding is correlated with stability of the protein in the insect digestive tract.

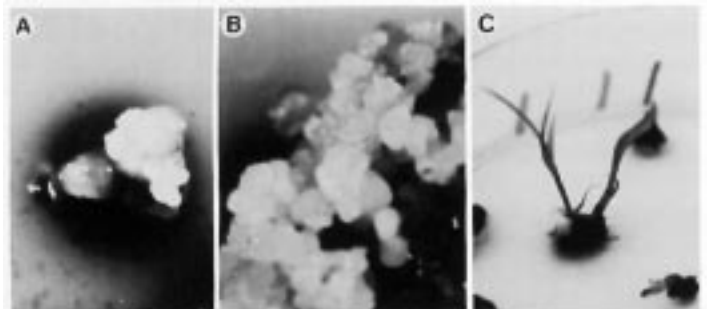
## Some MPRINT Science

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Regeneration of transgenic sorghum plants

## Personal MPRINT

Mike is a sports fan and follows several professional and college teams.