

World Congress on

PLANT PATHOLOGY & PLANT BIOTECHNOLOGY

International Conference on

ORGANIC FARMING, BIODYNAMICS

September 24-25, 2018 | Dallas, USA



Kirankumar S Mysore

Noble Research Institute, USA

Identification of novel sources of resistance against Asian soybean rust in *Medicago truncatula*

Retrotransposons, *Retrovirus*-like elements which encode proteins required for their own replication and transposition, can be used for insertional mutagenesis. Tobacco retrotransposon, Tnt1, has been used to mutagenize and tag the whole genome of a model legume, *Medicago truncatula*. Tnt1 is very active and transpose into, on average, 25 different locations during *M. truncatula* tissue culture. Mutations induced by Tnt1 insertion are stable during seed to seed generation. We have generated over 20,000 independent Tnt1-containing lines encompassing more than 500,000 insertion events. Over 400,000 Tnt1 flanking sequence tags (FSTs) have been recovered and a database has been established. We have pooled genomic DNA from all the lines for customized reverse-genetic screening, and the frequency of insert identification in this pool for average-sized-gene is approximately 85% percent. The range and diversity of mutant phenotypes obtained to date suggest that *M. truncatula* offers a great opportunity to dissect symbiotic and developmental pathways for a comprehensive understanding of legume biology. A forward genetics approach using Tnt1 tagged *M. truncatula* lines has been established to identify genes that confer nonhost resistance to Asian Soybean Rust pathogen, *Phakopsora pachyrhizi*. Several *M. truncatula* Tnt1 mutants with altered response to *P. pachyrhizi* have been identified and being characterized. *irg1* (inhibitor of rust germ-tube differentiation1) mutant inhibited pre-infection structure differentiation of *P. pachyrhizi* and several other biotrophic pathogens. *IRG1* encodes a Cys(2)His(2) zinc finger transcription factor, *PALM1* that also controls dissected leaf morphology in *M. truncatula*. Characterization of other mutants will also be presented.

Biography

Kirankumar S Mysore is a Professor at the Noble Research Institute. He joined Noble in 2002. He also holds Adjunct Professorship at the Department of Entomology and Plant Pathology, Oklahoma State University. He received his Bachelor's degree in Agriculture at the University of Agricultural Sciences, Bangalore (India), Master's degree in Horticulture at Clemson University and PhD in Genetics at Purdue University in 1999. He did his postdoctoral training at the Boyce Thompson Institute for Plant Research, Cornell University. His main research interests center on molecular plant-microbe interactions. Research approaches in his group include genetics and genomics to better understand how plants defend against pathogens. In addition, he has developed genetic resources (Tnt1 insertion lines) in *Medicago truncatula* that is now widely used by the legume community. He has published over 180 papers and book chapters in international journals.

kmysore@noble.org

Notes: