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#### Biography

Kirankumar S Mysore is a Professor at the Noble Research Institute. 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. He did 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. He has published over 180 papers and book chapters in international journals.

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### INSERTION MUTAGENESIS IN *MEDICAGO TRUNCATULA* AND ITS UTILIZATION TO IDENTIFY NOVEL SOURCES OF RESISTANCE AGAINST ASIAN SOYBEAN RUST

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%. 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 comprehensive understanding of legume biology. A forward genetics approach using *Tnt1* tagged *M. truncatula* lines has been established (Fig. 1) to identify genes that confer non host 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 bio-trophic 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.



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