S-nitrosylation of MYC2 during plant defense responses

Name: Dr. Rana Mazhar Abbas
Home Institute: Institute of Horticultural Sciences, University of Agriculture Faisalabad-Pakistan
Host Institute: IMPS, School of Biological Sciences, University of Edinburgh-UK
E-mail: rmazhar@hotmail.com

Abstract of the Research

Plant disease resistance is an important input trait which protects the plants against various pathogens. Plants utilize either R-gene mediated resistance or basal defense to protect themselves against microbial pathogens. The loss of nitric oxide (NO) production compromises the both defense types in plants against harmful pathogens. S-nitrosylation (reaction of NO to reactive thiols of Cysteine) is an emerging prototypic redox based post-translational modification in plant biology. The regulation in S-nitrosylation levels can help in broad spectrum disease resistance in plants against microbial pathogens.

Plants protect themselves from pathogen attacks through basal and inducible defense mechanisms. Inducible defense is activated by specific pathogens and regulated by defense related plant hormones. These hormones have a key role to determine the corresponding response against specific pathogens. Jasmonic acid (JA) is one of the major plant hormones whose involvement in the activation of defense response against most of the necrotrophic pathogens and herbivores is fully established.

The study of Arabidopsis mutants provides a tool to study the role of JA in protecting the plants from pathogen and insect attacks. Recently, the MYC2 transcription factor has been revealed as a principal regulator of JA signaling in Arabidopsis. The aim of project is to investigate that whether this major regulator (MYC2) is S-nitrosylated during the plant defense responses. The gene has been successfully amplified and cloned into targeted bacteria through gateway cloning. Expression and purification of recombinant proteins are successfully performed. The pETG-40A (MBP tag) based expression vector has been transformed into *Eschericheria coli* and recombinant proteins are purified through amylose resin. Biotin switch technique is used to analyze the S-nitrosylated proteins.