

Plant us to develop
novel pest
management
approaches.



Plant biotechnology has been the successful tool to increase qualitative and quantitative properties of crop plants.

It is extensively used to develop herbicide-resistant plants, high yielding plants, and plants with agronomically beneficial characters such as like flavr savr. Partially insect resistant plants are developed by ICRISAT of important crops. Despite that, we are facing the challenge of low crop yields because of insect pests. Insects act as a vector of viruses and other pathogens as well as exhibit insecticide resistance. Amongst them, lepidopteran insects are the major pests. According to the report of Dhaliwal G. S. in 2015, there is 10.

8% crop loss due to insect pests. Because of their rapid life cycle and higher adaptation rate to the environment, it is very difficult to eradicate them.

Primarily chemical pesticides such as endosulfan, chlorantraniliprole, carbaryl etc are used to control lepidopteran pests. But we all are aware of harmful effects of chemical pesticides and it is not advisable to increase their load in the environment. Chemical pesticides become recalcitrant and are not easily biodegradable. They are also responsible for harmful effects in higher consumers as a result of biomagnification.

Also, lepidopterans have developed resistance against most of the pesticides. For example, in *Helicoverpa armigera* the detoxification enzymes such as GSTs are responsible for detoxification of chemical pesticides. This has helped to develop resistance against pesticides.

Therefore, it is crucial to study plant-insect interactions which will help us to develop novel pest management approaches. Plant-insect interaction is a dynamic system comprising of a continuous evolutionary arms race between
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the two. Plants are adapting to the insect attacks by developing the mechanisms that alter their physical and chemical aspects. We know a bit about systemic acFully or partially resistant plant varieties are also present in the environment or are produced by conventional crossing methods and by transgenics. On contrary, insects are also developing strategies to overcome these defense barriers. Hence, studying these interactions will enlighten us about the defense mechanisms and strategies of the host to deal with the pests and of the pests to counteract the hosts' strategies.

The Khorana fellowship will be an opportunity for me to learn about the research in the field and find answers to my questions. Through this internship, I wish to learn about the interactions between the host and the pest and identification of molecular targets by which we can harness the resistance against the pests. I am keen on pursuing research in this field in the future and Khorana fellowship will be an important opportunity for me.