**Stress interaction in plants**

Plants being sessile have developed a sophisticated machinery to perceive and respond to continuously changing environmental conditions. Due to changing climatic factors, plants are sometimes even expected to combat the unique combination of stresses via specific response for combating them. Such adaptations used by plants are exciting to study.

Small non-coding RNAs (e.g. miRNA and siRNA) have recently been implicated in plant development and stress responses. There are reports of transkingdom movements of small RNAs during fungal infections. We are exploring the role of miRNAs and other small RNAs in fungal stress response.

We are also interested in studying role of small RNAs in plant’s response during combination of abiotic and biotic stresses. Our lab uses vegetable crops to study the unique genes involved in disease resistance of these plants against *Verticillium dahliae* and other necrotropic pathogens. This project will enable us to understand the nature of combined stress interaction and specific defence responses of stressed plants against biotic and abiotic responses.

**Non-host resistance of plants against pathogens**

Plants are regularly exposed to wide variety of disease-causing pathogens in their environment. The plant immune system comprises an intricate network of active and passive mechanisms that successfully prevent the colonization of a host by a pathogen. R-gene mediated defence responses are highly specific and limits the host range of a pathogen to the member of a single species and is often overcome by the pathogen. In contrast, non-host resistance is a response to all races of a particular pathogen and occurs in all cultivars of a non-host plant species. We are particularly interested in understanding non-host resistance of vegetable crops (tomato and eggplant) against a few bacterial and fungal pathogens. Using CRISPR-Cas mediated genome editing tool, we aim to develop nontransgenic plant showing enhanced resistance against the pathogens.