#104

Effector-triggered defence of brassicas against extracellular fungal pathogens

Henrik Stotz
Katherine Noel, Jamie Stone, Bruce D. L. Fitt

Reader in Crop Protection, Hatfield, UK

Extracellular fungal pathogens of Brassica species include the phoma stem canker and light leaf spot pathogens Leptosphaeria maculans and Pyrenopeziza brassicae, respectively. L. maculans and P. brassicae penetrate stomatal pores and the cuticle of their hosts, respectively. Whereas recognition of L. maculans effectors by Brassica napus is dependent on R genes, recognition of P. brassicae by cruciferous hosts is currently not understood.

We have generated a model to help analyse the immune/defence network of brassicas. Current research is focussed on defence responses and plant receptors that interact with pathogen effectors. In contrast to the obligate biotrophic intracellular pathogen Plasmodiophora brassicae, resistance against L. maculans is not dominated by a single class of leucine-rich repeat (LRR) receptors, which makes identification of R genes against L. maculans more challenging. Temperature sensitivity of R gene-mediated resistance against L. maculans is analysed (i) at the level of gene expression and (ii) by characterising BrSNC1 mutants and their possible involvement in temperature regulation in Brassica rapa. Docking models are used to predict protein interactions between the LRR domain of RPP1 and the Hyaloperonospora arabidopsidis effector ATR1. Functional analysis of mutated RPP1 genes will help determine critical amino acid residues contributing to effector recognition.