

Friday, September 26, 9:00-9:30 a.m.

“*Mechanisms of immune receptor function in resistance to rust fungi*”

Peter Dodds

CSIRO Plant Industry, peter.dodds@csiro.au

Plant disease resistance can be triggered by specific recognition of microbial effectors by plant immune receptors that encode nucleotide binding leucine rich repeat (NB-LRR) receptors. We have been investigating effector recognition and immune receptor activation in the model system of flax (*Linum usitatissimum*) resistance to the flax rust fungus (*Melampsora lini*). In flax, the L6 protein is a Toll/interleukin-1 receptor (TIR) containing NB-LRR which confers resistance to flax rust through direct recognition of the AvrL567 effector. Using a structure-function analysis approach, we have shown that L6 activation depends on the dimerization of its signalling TIR domain. Regulation of L6 signalling activity in the absence of pathogen relies on intramolecular interactions between the TIR, the NB and the extra LRR C-terminal region that affect the equilibrium between the ATP- and ADP-bound active and inactive signalling states.

We have been extending this work from the model system to understand resistance in wheat to the stem rust disease caused by *Puccinia graminis* f.sp *tritici* (*Pgt*). We recently isolated the *Sr33* and *Sr50* resistance genes from wheat and have begun functional analysis to determine how they trigger defense responses. We are also targeting effectors from *Pgt* that are recognised by wheat *R* genes.