

Research Project

Perception and transduction of microbial signals in plants

Third-party funded project

Project title Perception and transduction of microbial signals in plants

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The term "innate immunity", now widely used in the fields of medicine as well as plant biology, stands for an active defense response against microbial attack, based on the perception of characteristic microbial molecules, collectively called "PAMPs" (or "MAMPs") for "pathogen- (or microbe-) associated molecular patterns". These microbial molecules, the classic "elicitors", are recognized by so-called "PRRs", i.e. "pattern-recognition receptors". One such PRR in plants is the receptor for bacterial flagellin, identified as the leucine-rich repeat receptor kinase FLS2 in Arabidopsis. We have learned that flagellin perception by FLS2 triggers changes in ion flux and the production of reactive oxygen species within 2-5 minutes and the induction of almost 1000 genes within 30 minutes. How does FLS2 work? We have provided clear evidence that the extracellular leucine-rich repeat domain of FLS2 binds a highly conserved epitope of flagellin, the peptide flg22. Current work is aimed at a biochemical analysis of receptor-ligand interaction and at the identification of downstream signalling elements. This includes BAK1, another receptor kinase hitherto thought to be involved in hormone signalling. We have identified BAK1 as an interaction partner of FLS2 and now try to elucidate its mode of action in innate immunity.

Keywords perception, Arabidopsis, Innate Immunity, receptor kinase, flagellin, signal transduction

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