Universität Basel

# Research Project

# Regulation of LRR-Receptor kinases in plant innate immunity

## Third-party funded project

**Project title** Regulation of LRR-Receptor kinases in plant innate immunity
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**Department**
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In nature most plants are resistant to most pathogens. A key aspect of this phenomenon is host recognition of characteristic microbial molecules, known as PAMPs (Pathogen/ Microbial Associated Molecular Patterns), by specific receptors. Flagellin, the main building unit of the mobility organ of bacteria, is perceived by the receptor kinase FLS2 (FLagellin Sensing 2) at the surface of plant cells. Binding of flagellin to the domain of FLS2 exposed to the extracellular compartment induces a set of physiological responses inside the cells, which we can easily measure in our lab and which ultimately contribute to limitation of bacterial invasion and plant resistance. How does FLS2 function to transmit the signal from outside of the cell to its inside? Recently, we could demonstrate that upon stimulation with flagellin, FLS2 associates very quickly at the plasma membrane with a second receptor known as BAK1 (BRI1-Associated Kinase 1). Mutant plants lacking the BAK1 protein respond less to flagellin as well as to other PAMPs, indicating its role in positive regulation of PAMP detection. A big surprise is that BAK1 is already known as the co-receptor of the membrane BRI1. BRI1 is another receptor kinase which recognizes the phytohormone brassinosteroids involved in regulation of plant growth and development. The novel function of BAK1 in innate immunity is being further addressed in our lab with the current project using a combination of biochemistry, molecular biology and genetics. In particular we want to study detailed mechanisms of BAK1 and FLS2 for transducing the flagellin signal. Our studies have an essential role in understanding plant innate immunity in a broad sense, and we hope this will help to elucidate molecular mechanisms regulating plants receptor kinases not only in defense but also in development.

**Keywords** plant immunity, PAMP/MAMP, receptor kinase, plant-microbe interaction
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**Add publication**

### Published results

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**Specify cooperation partners**