Wirt-Parasit-Beziehungen

112a - „NRW-Strategieprojekt BioSC" PlaMint: Untersuchung von Pflanzen-Pathogen-Interaktionen zur Verbesserung pflanzlicher Gesundheit und Produktivität

"NRW-Strategieprojekt BioSC" PlaMint: Investigate plant-microbe interactions to improve plant health and productivity

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Rapeseed (*Brassica napus*) is an economically important crop plant which is not only used for food production but also as a renewable resource for fuel production. The fungal plant pathogen *Verticillium longisporum* is one of the major threads of rapeseed which may cause yield losses of up to 50%. The project PlaMint (funded by the „NRW-Strategieprojekt" Bioeconomy Science Center – BioSC) works towards a novel plant protection strategy for *B. napus* against this hemi-biotrophic pathogen by exploiting distinct features of biotic interactions. This may lead to the identification of novel targets for future marker-assisted breeding and possible advanced agricultural practices.

Towards this goal an indirect approach has been chosen using the biotrophic smut fungus *Thecaphora thlaspeos*, which can infect several *Brassicaceae* species including Arabidopsis, as a model. The germination of this fungus requires a yet unknown plant signal which we will identify in the frame of this project. Various accessions of *B. napus* will be screened for their capacity to induce spore germination of *T. thlaspeos*. In a further approach, these lines will then be tested for their response to *V. longisporum*.

For revealing the underlying molecular crosstalk between fungus and the plant host, dynamic *in vivo* imaging of physiological parameters with particular emphasis on the cellular redox homeostasis will be performed initially in the model Arabidopsis. For this Arabidopsis plants will be transformed with genetically encoded fluorescent proteins sensitive to H_2O_2 and the glutathione redox potential. After proof-of-concept in Arabidopsis the same approaches will be applied to *B. napus*. Furthermore, a RNA-Seq experiment will be conducted with *B. napus* plants reacting more tolerant to infections with *V. longisporum*.