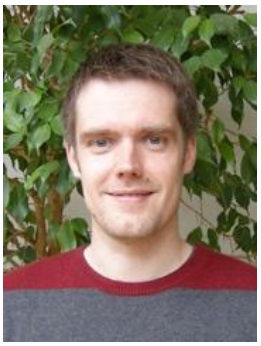
B·DEBATE International Center for Scientific Debate BARCELONA

CRAG CENTRE DE RECERCA EN AGRIGENÒMICA CSIC IRTA UAB

GUNTHER DOEHLEMANN CV

SPEAKER AT:



THE DEATH OF PLANT CELLS.

FROM PROTEASES TO FIELD APPLICATIONS

October, 2nd and 3rd , 2013, Barcelona

Gunther Doehlemann, Research Group Leader at Max Planck Institute for Terrestrial Microbiology, Marburg, Germany

Gunther Doehlemann received a Ph.D. at University of Kaiserslautern, Germany, in 2006. Then he performed post-doctoral research in Max Planck Institute (MPI) for Terrestral Microbiology. After a Short Term Fellowship at European Molecular Biology Organization at Stanford University (Walbot Lab), he became a group leader in MPI for Terrestrial Microbiology. He achieved Habilitation in Genetics at Philipps-Universität, Marburg, in May 2012. Gutnher Doehlemann is Privat dozent at Philipps-Universität, in Marburg, since October 2012.

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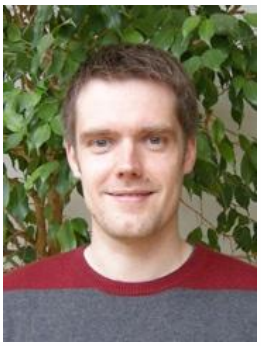

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Modulation of Apoplastic Immunity in the *Ustilago maydis* – Maize Interaction

The smut fungus Ustilago maydis causes the formation plant tumors on all aerial organs of its host plant maize. U. maydis establishes a biotrophic interaction directly upon host penetration and growth intra- as well as intercellularly without eliciting visible defense reactions. This biotrophic lifestyle requires an efficient suppression of plant defense responses. Effector proteins, which are secreted by the biotrophic hyphae are considered to be instrumental for the modulation of host immunity. However, so far only little is known about the molecular functions of individual effector proteins. Our recent findings suggest that conserved components of the apoplastic plant defense machinery are direct targets of U. maydis effectors. This particularly involves papain-like cysteine proteases, which are crucial for the activation of salicylic-acid dependent defense reactions in maize. We now show that a set of cysteine proteases is inhibited both by a U. maydis-induced maize cystatin as well as by the secreted effector Pit2, and both these factors are essential for compatibility. Molecular analysis of Pit2 also identified a conserved sequence motif, which acts as a novel type of plant cysteine protease inhibitors that is essential for fungal virulence. Together, the presented data provide new insights on the suppression of apoplastic immunity by a biotrophic fungal pathogen.

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