Technology Offer

Novel compounds against rust and smut fungi

Ref.-No.: 0706-6146/6147/6148-IKF

Rust and smut fungi are plant pathogens which cause diseases of considerable relevance in agriculture. Both fungi are biotrophic and require living plant tissue for proliferation. Instead of killing their host plants, they manipulate host cells to assure that these sustain fungal growth. During the infection, the fungi release an entire cocktail of so-called effectors which function either in the interaction zone between fungus and host or are delivered to plant cells. Effector proteins suppress plant immunity and promote parasitic infection. At present, the mechanism how effectors of plant-pathogenic fungi end up in plant cells remains a mystery.

Technology

Scientists from the Max-Planck-Institute for terrestrial Microbiology have developed novel anti-fungal agents against plant pathogenic rust and smut fungi. The compounds inhibit virulence of tested smut and rust fungi but do not affect growth of the smut fungus Ustilago maydis in culture. Co-IP analysis of predicted fungal effectors in the smut fungus U. maydis revealed a protein complex of 7 proteins of which every single one is essential for virulence. This complex serves as likely target of the compounds. The complex is anchored in the fungal membrane, protrudes into host cells and likely contacts channel-forming plant plasma membrane proteins. Formation of the complex in the fungal membrane is essential for both suppressing plant defence responses and triggering non-host resistance, making it likely that the complex is required for the delivery of fungal effectors to the plant. As orthologues of the complex-forming proteins are conserved in smut fungi, the complex may become an interesting fungicide target.

We are now looking for a collaboration partner to further develop this exciting project.

Patent Information

A PCT application was filed on February, 2nd 2021: WO2022167503. National in EP, US and BR.

Publication

Ludwig et al. (2021). Nature Microbiology 06; 6(6): 722–730.
https://doi.org/10.1038/s41564-021-00896-x

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