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Oxidative inactivation of primary metabolism pathways in the human pathogenic fungus *Aspergillus fumigatus*

Aspergillus fumigatus is an ubiquitous filamentous ascomycete with a generally saprophytic lifestyle, but also one of the most important fungal pathogens. Especially immunocompromised patients like those with chronic granulomatous disease (CDD) or transplant recipients are at a high risk to develop an Invasive Aspergillosis (IA) with a mortality rate of 30 – 98 %. The number of infections is expected to grow in the next few years and there are not many antifungals for clinical use, which highlights the need of new therapeutic approaches.

Since patients with CGD are at a high risk, and their disease is based on a mutation in a subunit of the NADPH oxidase (NOX) complex, which catalyzes the oxidative burst and releases reactive oxygen species (ROS), it seems possible that ROS are of great importance during the defense against *A. fumigatus* infection. Yet the exact role of ROS needs to be determined in future, since the deletion of genes like *yap1*, which render the fungus highly sensitive to ROS like H_2O_2, do not seem to affect virulence. This thesis will target the question of whether specific molecular targets of host derived ROS exist in *A. fumigatus*. It will also try to elucidate not only the ROS-protective mechanism of the peroxiredoxin AspF3, but also the possible role of the other peroxiredoxin-like proteins encoded in the *A. fumigatus* genome.

Publications

Boysen JM, Saeed N, Hillmann F (2021) Natural products in the predatory defence of the filamentous fungal pathogen Aspergillus fumigatus. *Beilstein J Org Chem* 17, 1814-1827. Details PubMed

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Start of PhD

June 1, 2016

Doctoral Disputation

June 21, 2022