

## Melanin dependent survival of *Aspergillus fumigatus* conidia in lung epithelial cells.

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### Projects

Acute and chronic *Aspergillus* infection in mice studied by PET-CT and comparative gene expression  
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Molecular mechanisms of the interaction between *Aspergillus fumigatus* and alveolar macrophages  
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### Abstract

*Aspergillus fumigatus* is the most important air-borne pathogenic fungus of humans. Upon inhalation of conidia, the fungus makes close contact with lung epithelial cells, which only possess low phagocytic activity. These cells are in particular interesting to address the question whether there is some form of persistence of conidia of *A. fumigatus* in the human host. Therefore, by also using uracil-auxotrophic mutant strains, we were able to investigate the interaction of A549 lung epithelial cells and *A. fumigatus* conidia in detail for long periods. Interestingly, unlike professional phagocytes, our study showed that the presence of conidial dihydroxynaphthalene (DHN) melanin enhanced the uptake of *A. fumigatus* conidia by epithelial cells when compared with non-pigmented pksP mutant conidia. Furthermore, conidia of *A. fumigatus* were able to survive within epithelial cells. This was due to the presence of DHN melanin in the cell wall of conidia, because melanised wild-type conidia showed a higher survival rate inside epithelial cells and led to inhibition of acidification of phagolysosomes. Both effects were not observed for white (non-melanised) conidia of the pksP mutant strain. Moreover, in contrast to pksP mutant conidia, melanised wild-type conidia were able to inhibit the extrinsic apoptotic pathway in A549 lung epithelial cells even for longer periods. The anti-apoptotic effect was not restricted to conidia, because both conidia-derived melanin ghosts (cell-free DHN melanin) and a different type of melanin, dihydroxyphenylalanine (DOPA) melanin, acted anti-apoptotically. Taken together, these data indicate the possibility of melanin-dependent persistence of conidia in lung epithelial cells.

### Identifier

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