The different morphologies of yeast and filamentous fungi trigger distinct killing and feeding mechanisms in a fungivorous amoeba.

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Abstract

Size and diverse morphologies pose a primary challenge for phagocytes such as innate immune cells and predatory amoebae when encountering fungal prey. While filamentous fungi can escape phagocytic killing by pure physical constraints, unicellular spores and yeasts can mask molecular surface patterns or arrest phagocytic processing. Here we show that the fungivorous amoeba Protostelium aurantium was able to adjust its killing and feeding mechanisms to these different cell morphologies. Yeast-like fungi from the major fungal groups of basidiomycetes and ascomycetes were readily internalized by phagocytosis, except for the human pathogen Candida albicans whose mannoprotein coat was essential to escape recognition by the amoeba. Dormant spores of the filamentous fungus Aspergillus fumigatus also remained unrecognized, but swelling and the onset of germination induced internalization and intracellular killing by the amoeba. Mature hyphae of A. fumigatus were mostly attacked from the hyphal tip and killed by an actin-mediated invasion of fungal filaments. Our results demonstrate that predatory pressure imposed by amoebae in

natural environments selects for distinct survival strategies in yeast and filamentous fungi but commonly targets the fungal cell wall as a crucial molecular pattern associated to prey and pathogens.

Beteiligte Forschungseinheiten

Evolution mikrobieller Interaktionen Falk Hillmann Mehr erfahren

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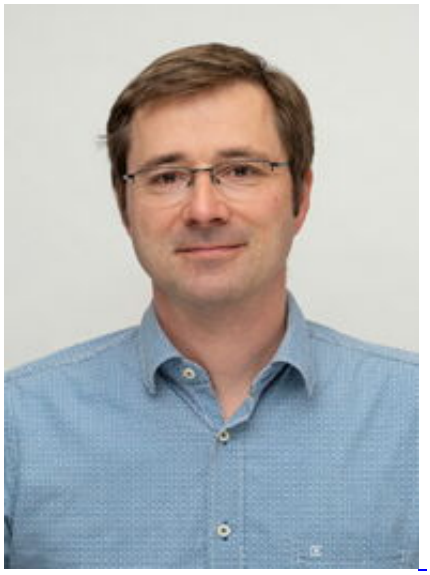
Details



Falk Hillmann

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Silvia Radosa

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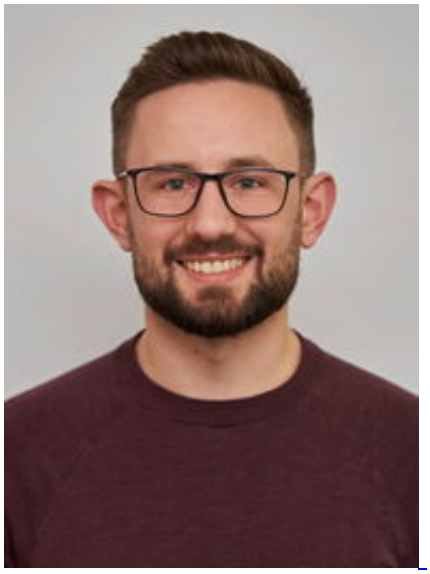

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