Identification of *Aspergillus fumigatus* surface components that mediate interaction of conidia and hyphae with human platelets.

Rambach G, Blum G, Latgé JP, Fontaine T, Heinekamp T, Hagleitner M, Jeckström H, Weigel G, Würtinger P, Pfaller K, Krappmann S, Löffler J, Lass-Flörl C, Speth C (2015) Identification of *Aspergillus fumigatus* surface components that mediate interaction of conidia and hyphae with human platelets. *J Infect Dis* 212(7), 1140-1149.

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Abstract

BACKGROUND:

Platelets were recently identified as a part of innate immunity. They are activated by contact with *Aspergillus fumigatus*; putative consequences include antifungal defense but also thrombosis, excessive inflammation, and thrombocytopenia. We aimed to identify those fungalsurface structures that mediateinteraction with platelets.

METHODS:

Humanplatelets were incubated with Aspergillus conidia and hyphae, isolated wall components, or fungalsurface mutants. Interaction was visualized microscopically; activation was quantified by

flow cytometry of specific markers.

RESULTS:

The capacity of *A. fumigatus* conidia to activate platelets is at least partly due to melanin, because this effect can be mimicked with "melanin ghosts"; a mutant lacking melanin showed reduced platelet stimulating potency. In contrast, conidial hydrophobin masks relevant structures, because an *A. fumigatus* mutant lacking the hydrophobin protein induced stronger platelet activation than wild-type conidia. *A. fumigatus* hyphae also contain surface structures that interact with platelets. Wall proteins, galactomannan, chitin, and β-glucan are not the relevant hyphal components; instead, the recently identified fungal polysaccharide galactosaminogalactan potently triggered platelet activation.

CONCLUSIONS:

Conidial melanin and hydrophobin as well as hyphal galactosaminogalactan represent important pathogenicity factors that modulate platelet activity and thus might influence immune responses, inflammation, and thrombosis in infected patients.

Beteiligte Forschungseinheiten

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