Role of pH-regulated antigen 1 of *Candida albicans* in the fungal recognition and antifungal response of human neutrophils.

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Abstract

Candida albicans is an opportunistic human-pathogenic fungus, which can cause superficial but also life-threatening invasive infections. The pH-regulated antigen 1 (Pra1) of C. albicans is a surface-associated and secreted protein highly expressed in the hyphal form. Pra1 can bind to complement receptor 3 (CD11b/CD18) and can mediate adhesion to and migration of human phagocytes. Here, we investigated the role of Pra1 in the activation of human neutrophils. A C. albicans mutant strain lacking Pra1 (pra1Δ) supported neutrophil migration to a lower extent than did the parental wild-type strain. A Pra1-overexpressing C. albicans strain enhanced neutrophil migration and adherence. While inactivated hyphae of the Pra1-overexpressing mutant with surface-associated Pra1 enhanced the production and release of reactive oxygen species, myeloperoxidase, lactoferrin, and interleukin 8 by neutrophils, such responses were reduced when stimulated with inactivated hyphae of the pra1Δ strain. However, Pra1-overexpressing living hyphae, which secrete large amounts of Pra1, also caused a reduced neutrophil activation,

indicating that the release of extracellular Pra1 can inhibit the activation of these innate immune cells. Similarly, soluble recombinant Pra1 inhibited the neutrophil responses elicited by cell-wall bound Pra1. Finally, fungal cells lacking Pra1 were more efficiently killed by neutrophils. In conclusion, surface-exposed Pra1 plays a role in the recognition of C. albicans, especially hyphal cells, by human neutrophils and enhances neutrophil antimicrobial responses. However, the fungus can counteract some of these defense mechanisms by releasing soluble Pra1.

Beteiligte Forschungseinheiten

Infektionsbiologie Peter F. Zipfel Mehr erfahren

Mikrobielle Pathogenitätsmechanismen Bernhard Hube Mehr erfahren

Leibniz-HKI-Autor*innen

Bernhard Hube

Details

Peter F. Zipfel

Details

Identifier

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