Neutrophil activation by Candida glabrata but not Candida albicans promotes fungal uptake by monocytes.

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Abstract

Candida albicans and Candida glabrata account for the majority of candidiasis cases worldwide. Although both species are in the same genus, they differ in key virulence attributes. Within this work, live cell imaging was used to examine the dynamics of neutrophil activation after confrontation with either C. albicans or C. glabrata. Analyses revealed higher phagocytosis rates of C. albicans than C. glabrata that resulted in stronger PMN (polymorphonuclear cells) activation by C. albicans. Furthermore, we observed differences in the secretion of chemokines, indicating chemotactic differences in PMN signalling towards recruitment of further immune cells upon confrontation with Candida spp. Supernatants from co-incubations of neutrophils with C. glabrata primarily attracted monocytes and increased the phagocytosis of C. glabrata by monocytes. In contrast, PMN activation by C. albicans resulted in recruitment of more neutrophils. Two complex infection models confirmed distinct targeting of immune cell populations by the two Candida spp.: In a human whole blood infection model, C. glabrata was more effectively taken up by monocytes than C. albicans and histopathological analyses of murine model infections confirmed primarily

monocytic infiltrates in C. glabrata kidney infection in contrast to PMN-dominated infiltrates in C. albicans infection. Taken together, our data demonstrate that the human opportunistic fungi C. albicans and C. glabrata are differentially recognized by neutrophils and one outcome of this differential recognition is the preferential uptake of C. glabrata by monocytes.

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