

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

Duggan S, Essig F, Hünninger K, Mokhtari Z, Bauer L, Lehnert T, Brandes S, Häder A, Jacobsen ID, Martin R, Figge MT, Kurzai O (2015) Neutrophil activation by *Candida glabrata* but not *Candida albicans* promotes fungal uptake by monocytes. *Cell Microbiol* 17(9), 1259-1276.

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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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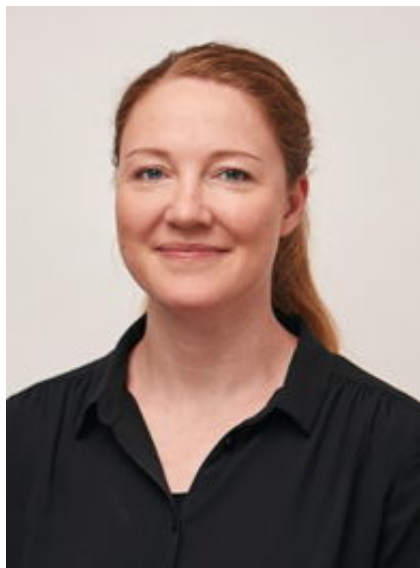
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Identifier

doi: 10.1111/cmi.12443

PMID: 25850517