Candida glabrata tryptophan-based pigment production via the Ehrlich pathway.

Brunke S, Seider K, Almeida RS, Heyken A, Fleck CB, Brock M, Barz D, Rupp S, Hube B (2010) *Candida glabrata* tryptophan-based pigment production via the Ehrlich pathway. *Mol Microbiol* 76(1), 25-47.

Details

PubMed

Abstract

Pigments contribute to the pathogenicity of many fungi, mainly by protecting fungal cells from host defence activities. Here, we have dissected the biosynthetic pathway of a tryptophan-derived pigment of the human pathogen Candida glabrata, identified key genes involved in pigment production and have begun to elucidate the possible biological function of the pigment. Using transcriptional analyses and a transposon insertion library, we have identified genes associated with pigment production. Targeted deletion mutants revealed that the pigment is a by-product of the Ehrlich pathway of tryptophan degradation: a mutant lacking a tryptophan-upregulated aromatic aminotransferase (Aro8) displayed significantly reduced pigmentation and a recombinantly expressed version of this protein was sufficient for pigment production in vitro. Pigment production is tightly regulated as the synthesis is affected by the presence of alternative nitrogen sources, carbon sources, cyclic AMP and oxygen. Growth of C. glabrata on pigment inducing medium leads to an increased resistance to hydrogen peroxide, an effect which was not observed with a mutant defective in pigmentation. Furthermore, pigmented yeast cells had a

higher survival rate when exposed to human neutrophils and caused increased damage in a monolayer model of human epithelia, indicating a possible role of pigmentation during interactions with host cells.

Involved units

Microbial Pathogenicity Mechanisms Bernhard Hube Read more

Microbial Biochemistry and Physiology Read more

Leibniz-HKI-Authors

Matthias Brock

Details

Sascha Brunke

Details

Ricardo Sergio Couto de Almeida

Details

Katja Graf

Details

Antje Heyken

Details

Bernhard Hube

Details

Topics

Interactions with immune cells (MPM)

Awards

Publication award by the "Stiftung der Deutschsprachigen Mykologischen Gesellschaft" 2010

Identifier

doi: 10.1111/j.1365-2958.2010.07052.x

PMID: 20199593