Aspergillus fumigatus protein phosphatase PpzA is involved in iron assimilation, secondary metabolite production, and virulence.

Manfiolli AO, de Castro PA, Dos Reis TF, Dolan S, Doyle S, Jones G, Riaño Pachón DM, Ulaş M, Noble LM, Mattern DJ, Brakhage AA, Valiante V, Silva-Rocha R, Bayram O, Goldman GH (2017) *Aspergillus fumigatus* protein phosphatase PpzA is involved in iron assimilation, secondary metabolite production, and virulence. *Cell Microbiol* 19(12),

Details

PubMed

Abstract

Metal restriction imposed by mammalian hosts during an infection is a common mechanism of defense to reduce or avoid the pathogen infection. Metals are essential for organism survival due to its involvement in several biological processes. *Aspergillus fumigatus* causes invasive aspergillosis (IA), a disease that typically manifests in immunocompromised patients. *A. fumigatus* PpzA, the catalytic subunit of protein phosphatase Z (PPZ), has been recently identified as associated with iron assimilation. *A. fumigatus* has two high affinity mechanisms of iron acquisition during infection: reductive iron assimilation (RIA) and siderophore-mediated iron uptake. It has been shown that siderophore production is important for *A. fumigatus* virulence, differently to the reductive iron uptake system. Transcriptomic and proteomic comparisons between ΔppzA and wild-type strains under iron starvation showed that PpzA has a broad influence on genes involved in secondary metabolism. LC-MS under standard and iron starvation conditions confirmed that the

ΔppzA mutant had reduced production of pyripyropene A (PPA), fumagillin, fumiquinazoline A, TAFC, and helvolic acid. The ΔppzA was shown to be avirulent in a neutropenic murine model of invasive pulmonary aspergillosis. PpzA plays an important role at the interface between iron starvation, regulation of SM production and pathogenicity in *A. fumigatus*.

Beteiligte Forschungseinheiten

Molekulare und Angewandte Mikrobiologie Axel Brakhage Mehr erfahren

Biobricks mikrobieller Naturstoffsynthesen Vito Valiante Mehr erfahren

Leibniz-HKI-Autor*innen

Axel A. Brakhage

Details

Derek J. Mattern

Details

Vito Valiante

Details

Identifier

doi: 10.1111/cmi.12770

PMID: 28753224