Metals in fungal virulence.

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Details



Abstract

Metals are essential for life, and they play a central role in the struggle between infecting microbes and their hosts. In fact, an important aspect of microbial pathogenesis is the 'nutritional immunity', in which metals are actively restricted (or, in an extended definition of the term, locally enriched) by the host to hinder microbial growth and virulence. Consequently, fungi have evolved often complex regulatory networks, uptake and detoxification systems for essential metals such as iron, zinc, copper, nickel and manganese. These systems often differ fundamentally from their bacterial counterparts, but even within the fungal pathogens we can find common and unique solutions to maintain metal homeostasis. Thus, we here compare the common and species-specific mechanisms used for different metals among different fungal species-focusing on important human pathogens such as Candida albicans, Aspergillus fumigatus or Cryptococcus neoformans, but also looking at model fungi such as Saccharomyces cerevisiae or A. nidulans as well-studied examples for the underlying principles. These direct comparisons of our current knowledge reveal that we have a good understanding how model fungal pathogens take up iron or zinc, but that much is still to learn about other metals and specific adaptations of individual species-not the least

to exploit this knowledge for new antifungal strategies.

Involved units

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Topics

Evolution & adaptation in pathogenicity

Nutrient acquisition in infections

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