Candida species rewired hyphae developmental programs for chlamydospore formation.

Böttcher B, Pöllath C, Staib P, Hube B, Brunke S (2016) *Candida* species rewired hyphae developmental programs for chlamydospore formation. *Front Microbiol* 7, 1697.

Details



Abstract

Chlamydospore formation is a characteristic of many fungal species, among them the closely related human-pathogenic dimorphic yeasts Candida albicans and C. dubliniensis. Whereas function and regulation of filamentation are well-studied in these species, the basis of chlamydospore formation is mostly unknown. Here, we investigate the contribution of environmental and genetic factors and identified central proteins involved in species-specific regulation of chlamydosporulation. We show that specific nutrient levels strongly impact chlamydospore initiation, with starvation favoring sporulation and elevated levels of saccharides or peptone inhibiting it. Thresholds for these nutritional effects differ between C. albicans and C. dubliniensis, which explain species-specific chlamydospore formation on certain diagnostic media. A C. albicans $nrg1\Delta$ mutant phenocopied C. dubliniensis, putting nrg1 regulation at the basis of species-specific chlamydospore formation under various conditions. By screening a series of potential chlamydospore regulators, we identified the TOR and cAMP pathways as crucial for sporulation. As rapamycin treatment blocked chlamydosporulation, a low basal Tor1 activity

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Leibniz-HKI-Authors



Bettina Böttcher

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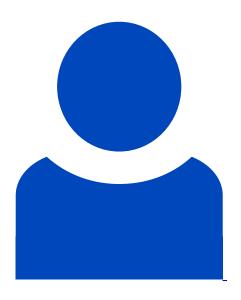
Sascha Brunke

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Bernhard Hube

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Christine Pöllath

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PMID: 27833594