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Qualitative analysis of lipid composition isolated from lipid droplets of pathogenic fungi and its biological relevance

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Fungal infections have attracted significant medical/scientific interest due to the increase of infected individuals, mycosis association with immunocompromised patients and resistance of fungal strains to antifungal drugs, such as azole compounds. Ergosterol is an essential lipid for fungal survival and it can be stored in lipid droplets (LD), which are dynamic organelles that act on lipid homeostasis and other cellular processes. The role of LDs in pathogenic fungi is not entirely understood. Therefore, we aimed to characterize the lipid content of LD in pathogenic fungi and to analyze the possible role of these organelles in fungal resistance to azolic antifungal drugs. By using chromatographic techniques, electrospray-mass spectrometry and atmospheric pressure chemical ionization-mass spectrometry, lipid species such as triacylglycerols (TAGs), diacylglycerols, phospholipids (PLs), sterols and steryl-esters were found in LDs from *Candida albicans* (ATCC-5997), *C. albicans* 23R (azolic resistant strain), *C. dubliniensis and Paracoccidiodes brasiliensis.* All strains presented PLs at low levels, although these lipids are the main components of LD's monolayer. A total of 41 different TAGs species were identified and their distribution is different among fungi. Analysis of sterol and steryl-esters profiles showed the prevalence of ergosterol and brassicasterol in all strains. After azole treatment, it was observed a strong increase in 2-3-oxidosqualene, an intermediate in sterol synthesis, which causes disarrangement in cell membranes. The present work opens new vistas for future studies on biological roles of LDs, and their possible involvement in fungal resistance to antimycotic drugs.

Biography

Marcos Sergio de Toledo has completed his PhD from Universidade Federal de São Paulo, São Paulo, Brazil and Postdoctoral studies from Pacific Northwest Research Institute, Seattle, USA. He is an Assistant Professor at Escola Paulista de Medicina, Universidade Federal de São Paulo, Brazil. He has published 36 scientific articles.

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