

**Title:** Correlation between lipid bodies biosyntheses and infectivity of the human pathogen *Cryptococcus neoformans*

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**Abstract:**

The yeast *Cryptococcus neoformans* (Cn) is a human pathogen usually isolated from soil contaminated with pigeon droppings. Cryptococcosis in humans results from inhalation of infectious particles, which are initially deposited in the alveoli. Typically asymptomatic, cryptococcosis can become latent and develop during episodes of immunosuppression. Once infection is established Cn can reach the brain and develop the lethal cryptococcal meningitis. Lipid bodies (LB) are organelles that play an important role during lipid metabolism being synthesized as energy storage in face of metabolic stress conditions. It is known that several fungi accumulate LB as a stress response. We believe that LB not only actively participates during energy metabolism of fungal pathogens but are also correlated with their infectivity. As very little is known about the dynamics of LB biosynthesis in Cn, the initial goal of this study is to investigate LB accumulation/degradation under different experimental conditions so we can investigate a possible relationship between LB catabolism and Cn virulence. Initially, three conditions were investigated: pH (pHs 3 to 7); glucose concentration (1, 2.7 and 5 g/L) and autophagy induction (2% sodium acetate in milliQ water). After each test condition the yeasts were incubated with the LB staining Nile Red. Yeasts were then analyzed by flow cytometry and fluorescence microscopy. Initial results show that the pH variation directly influences the LB metabolism, as well as influences the growth of Cn capsule, but not uniformly. Increase in glucose concentration induced LB accumulation in a dose-dependent manner. Finally, when Cn was incubated under autophagy conditions an initial accumulation was detected after the first hours, followed by a reversion to basal levels after 4 hours of incubation. Our results suggest that changes in the environmental conditions are associated with LB metabolism in Cn. Future studies will be performed to understand the role of LB during the infectious process and fungal virulence.

**Keywords:** *Cryptococcus neoformans*, Lipid Bodies, Nile Red

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