



Candida spp. and phagocytosis: multiples evasion mechanisms

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Abstract Invasive fungal infections are a global health problem, mainly in hospitals, where year by year hundreds of patients die because of these infections. Commensal yeasts may become pathogenic to human beings, affecting mainly immunocompromised patients. During infectious processes, the immune system uses phagocytes to eliminate invader microorganisms. In order to prevent or neutralize phagocyte attacks, pathogenic yeasts can use virulence factors to survive, as well as to colonize and infect the host. In this review, we describe how *Candida* spp., mainly *Candida albicans*, interact with phagocytes and use several factors that contribute to immune evasion. Polymorphism, biofilm formation, gene expression and enzyme production mediate distinct functions such as adhesion, invasion, oxidative stress response, proteolysis and escape from phagocytes. Fungal and human cells have similar structures and mechanisms that decrease the number of potential targets for antifungal drugs. Therefore, research on host–pathogen interaction may aid in the

discovery of new targets and in the development of new drugs or treatments for these diseases and thus to save lives.

Keywords Biofilms · Gene expression · Host–pathogen interactions · Polymorphism · Virulence factors

Candidiasis

Fungal diseases are a major public health problem and their incidence has increased significantly lately, especially in immunocompromised individuals (Sardi et al. 2013). *Candida* spp. can be present in healthy individuals' microbiota or cause opportunistic infections when there are disturbances in the human microbiota, such as immunosuppression caused by diseases or drug treatment, as well as skin and mucous membrane lesions (Ha et al. 2011). Infections caused by *Candida* spp. predominate among opportunistic fungal infections worldwide, moreover, *Candida* spp. are responsible for 80% of all systemic fungal infections and are associated with high mortality rates (Canela et al. 2018).

Candidiasis is an infectious disease caused by *Candida* spp. that can affect various parts of the human body, such as oropharyngeal tract, genital tract, mucocutaneous and skin (Pappas et al. 2004).

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