

## **Influence of Culture Media on Biofilm Formation by Candida Species and Response of Sessile Cells to Antifungals and Oxidative Stress**

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### **Abstract**

The aims of the study were to evaluate the influence of culture media on biofilm formation by *C. albicans*, *C. glabrata*, *C. krusei*, and *C. parapsilosis* and to investigate the responses of sessile cells to antifungals and reactive oxygen species (ROS) as compared to planktonic cells. For biofilm formation, the *Candida* species were grown at different periods of time in YP or YNB media supplemented or not with 0.2 or 2% glucose. Sessile and planktonic cells were exposed to increasing concentrations of antifungals, H<sub>2</sub>O<sub>2</sub>, menadione or silver nanoparticles (AgNPs). Biofilms were observed by scanning electron microscopy (SEM) and quantified by the XTT assay. *C. albicans* formed biofilms preferentially in YPD containing 2% glucose (YPD/2%), *C. glabrata* in glucose-free YNB or supplemented with 0.2% glucose (YNB/0.2%), while *C. krusei* and *C. parapsilosis* preferred YP, YPD/0.2%, and YPD/2%. Interestingly, only *C. albicans* produced an exopolymeric matrix. This is the first report dealing with the in vitro effect of the culture medium and glucose on the formation of biofilms in four *Candida* species as well as the resistance of sessile cells to antifungals, AgNPs, and ROS. Our results suggest that candidiasis in vivo is a multifactorial and complex process where the nutritional conditions, the human immune system, and the adaptability of the pathogen should be considered altogether to provide an effective treatment of the patient.