

# Successful Inhibition of *Candida albicans* Utilizing Borate-Based Bioactive Glass: An Emerging Antifungal Material

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This study focused on antifungal susceptibility of *Candida albicans*, a normal gut flora microbe, to borate-based bioactive glass (BBG). *C. albicans* becomes pathogenic in immunocompromised individuals or during acute disturbance to tissue homeostasis. Compromised patients face a 30% chance of mortality when exposed to the fungus which increases by 20% if it progresses to sepsis. Patients become contaminated when *C. albicans* adheres to medical equipment and surgical implants. To a lesser degree, nuisance yeast infections can be caused by *C. albicans*, afflicting 75% of women in their lifetime. Antifungal treatments are difficult to implement because of cost and propensity to damage host cells. BBG is antimicrobial and non-toxic to the host, suggesting possible antifungal application. Research specific to *C. albicans* inhibition is missing from the literature. Live cell imaging, spectrophotometer optical density, proliferation and toxicity assays were utilized to test the efficacy of BBG against *C. albicans*. Initial results show inhibition and eventual clearance of *C. albicans* following BBG treatment. The study was expanded to include a combination of BBG, *C. albicans* and *Dictyostelium discoideum* cells. Results support *Dictyostelium* cell viability while inhibiting *C. albicans* suggesting selective antifungal clearance. BBG is a material with possible species-specific antifungal applicability. BBG may enhance the sterility of medical and at home products and devices.