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Biochemical Characterization of the *Candida Albicans* PBGS Enzyme

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BIOCHEMICAL CHARACTERIZATION OF THE *CANDIDA ALBICANS* PBGS ENZYME

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The enzyme porphobilinogen synthase (PBGS) catalyzes the reaction that forms pophobilinogen, an important precursor in the biosynthetic pathways that lead to the production of heme, chlorophyll, and other tetrapyrroles. Previous studies have indicated that PBGS often exists in two states, termed morpheeins, an active octameric form and inactive hexameric form. Recent evidence has shown that certain molecules may able to lock the enzyme as an hexamer, thereby inactivating it. Such selective agents against the PBGS enzyme could be very effective in dealing with pathogenic organisms. One such pathogen is *Candida albicans*, a fungus responsible for thrush, most common in babies and immunocompromised individuals, e.g. those with AIDS. The goal of our current study was to isolate, purify, and characterize the PBGS enzyme from *C. albicans*. Our data indicate that our purified product is indeed capable of catalyzing the reaction to form porphobilinogen. Furthermore, our results indicate that the optimum pH of the enzyme is approximately 8.7, and it requires the presence of zinc and reducing agents. Further study will shed light on the optimal level of zinc required, other metal on requirements (such as magnesium), and identification of possible inhibitors of enzymatic activity. The results obtained will provide a much clearer picture of the general biochemistry of the *C. albicans* PBGS. Such information combined with structural studies, like NMR spectroscopy or X-ray crystallography, may lead to the development of an agent that can selectively inhibit the *C. albicans* PBGS enzyme.