



Apr 18th, 10:00 AM - 11:00 AM

Biochemical Characterization of the *Candida Albicans* PBGS Enzyme

Bryan Rea, '09

Illinois Wesleyan University

David Bollivar, Faculty Advisor

Illinois Wesleyan University

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Rea, '09, Bryan and Bollivar, Faculty Advisor, David, "Biochemical Characterization of the *Candida Albicans* PBGS Enzyme" (2009). *John Wesley Powell Student Research Conference*. 2.
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Oral Presentation O2.2

**BIOCHEMICAL CHARACTERIZATION OF THE
CANDIDA ALBICANS PBGS ENZYME**

Bryan Rea and David Bollivar*
Biology Department, Illinois Wesleyan University

The enzyme porphobilinogen synthase (PBGS) catalyzes the reaction that forms porphobilinogen, 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 morphoforms, an active octameric form and inactive hexameric form. Recent evidence has shown that certain molecules may be able to lock the enzyme as a 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 ion 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.