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EXPRESSION, PURIFICATION, AND CHARACTERIZATION OF PORPHOBILINOGEN SYNTHASE IN CLOSTRIDUM PERFRINGENS

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Clostridium perfringens is the most common cause of gas gangrene, a deadly tissue infection around a skin injury or surgical wound. It also is an agent of foodborne illness in the United States. Analysis of porphobilinogen synthase (PBGS) in C. perfringens may reveal useful information about an important control point in the metabolism of this human pathogen. PBGS plays a major role in the biosynthesis of natural tetapyrrole pigments essential to most life forms. Also known as δ-aminolevulinic acid dehydratase, it catalyzes the condensation of two molecules of δ-aminolevulinic acid (ALA) to form porphobilinogen (PBG). This tetapyrrole pigment is a precursor to heme, a molecule important to cellular respiration. In this study, host Escherichia coli cells were transformed with an expression plasmid containing the C. perfringens PBGS gene. Gene expression was induced and various purification techniques were used to isolate the enzyme. Activity assays lead to initial steps in characterization.