Biochemical characterization of Deoxycytidylate Deaminase (SmDEOC) of Schistosoma mansoni

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Schistosoma mansoni is the causative agent of schistosomiasis, endemic neglected disease that infects millions of people emerging countries. According to WHO, schistosomiasis receives low investments in development of new drugs (around to 52 million dollar/per year), although it's responsible for 12,000 deaths per year. The enzyme SmDEOC belongs to thymidylate cycle, an essential metabolic pathways essential in the parasite and it catalyzes the irreversible hydrolytic deamination of the dCMP to dUMP. In eukaryotes, the enzyme activity is strongly correlated with cell proliferation, fact indicated by high levels of these enzymes and frequent localization in developing and regeneration tissues. Studies of SmDEOC suggest that this enzyme undergoes periodic adjustment in the eukaryote cell cycle. The ORF of SmDEOC was identified, amplified by PCR and cloned into pET28a (Novagen). The protein has 175 residues with a molecular weight estimated in 118 kDa and presents hexameric conformation. In this work, the protocols of the expression and purification were performed and crystallization trials are presented. The data demonstrated SmDEOC conformation as a homocomplex and circular dichroism and intrinsic fluorescence measurements showed the secondary structure and thermal stability of this enzyme. The crystallography structure and kinetic mechanism can be determined in the future.

Keywords: S. mansoni, Thymidilate Syntase; Hexameric oligomer.

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