

From Isolation to Function: Investigating a Novel Enzyme in Plasmodium yoelii

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Plasmodium BEM-46-like protein, or PBLP, is a protein discovered in the malaria parasite *Plasmodium yoelii*. It belongs to the α/β -hydrolase superfamily, which is known to have a wide array of functionalities. The purpose of this investigation was to characterize this protein further and identify potential substrates and biological functions. This is important because the knockout of PBLP has been shown to reduce the infectivity of malaria, making it a viable target for future studies. To determine the potential function of PBLP, we first needed to isolate it. By transforming competent *E. coli* with a plasmid containing our gene of interest, we generated a large culture of recombinant *E. coli* for the expression of our protein. The proteins were then released from the cells via lysis, followed by centrifugation. We found that optimization of the lysis technique through sonication led to improved yields of PBLP. The soluble proteins were further isolated and purified using nickel affinity chromatography. SDS-PAGE was then used to assess the success of each step. Successfully isolated samples were assayed with various molecules to test activity against different substrates. Among the array of substrates tested, only P-nitrophenyl acetate was hydrolyzed by PBLP, confirming that PBLP exhibits hydrolytic activity. The successful identification and partial characterization of PBLP support its potential as a target for drug development and biotechnology research.