Pseudomonas aeruginosa is an opportunistic pathogen known to cause disease in debilitated hosts, especially in those with cystic fibrosis. The core oligosaccharide (OS) is a main constituent of the lipopolysaccharide (LPS) in P. aeruginosa and is divided into inner and outer core. The outer core can be synthesized as one of two glycoforms and both consist of D-glucose (D-Glc), L-rhamnose (L-Rha), and D-galactosamine (GalN). Glycoform 1 is “uncapped”, meaning that it contains a terminal glucose (Glc IV) and is not an appropriate acceptor for O-antigen. Glycoform 2 is capped, hence, it lacks Glc IV and is substituted with an O-antigen bonded to L-Rha. The focus of my project is to characterize WapB, a putative 1,2-glucosyltransferase that transfers Glc IV to the uncapped core. A knockout mutant of wapB has been shown to form a truncated LPS core. At present, little is known regarding the enzymatic properties or protein structure of WapB. I will test the hypothesis that WapB is a 1,2-glucosyltransferase whose activity is to transfer a Glc residue from the substrate UDP-Glc to the terminal locus of the core OS of certain P. aeruginosa serotypes. Since glycosyltransferases tend to be insoluble when expressed and purified, I will design truncated versions of WapB that lack the C-terminal hydrophobic residues and determine the optimal conditions for expression and purification. A Malachite green-based assay will be carried out for determining enzyme-substrate kinetics. I will also initiate crystallization screens to study the 3D protein structure and to understand its enzymatic mechanisms, i.e., with time permitting.