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**Structural and Functional Characterization of a Putative
CitMHS Protein from *Bacillus anthracis***

Qi Wen Li

Candidate for B.S. Degree
with Distinction in Biochemistry

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APPROVED: Thesis Project Advisor: _____

Dr. Robert Doyle

Committee Member: _____

Dr. Samuel Chan

Committee Member: _____

Dr. Surabhi Raina

Abstract

The growing number of strains of antibiotic-resistant bacteria poses a new threat to human health. The development of innovative strategies to treat bacterial infections is essential. The recent discovery of a new class of membrane transporters, CitMHS, unique to bacteria, presents a potential new target for antibacterial therapeutics. CitMHS is a class of secondary metal citrate membrane transporters, with only five members characterized to date (2,3,5,6,7). No crystal structures have been reported. Detailed structural and functional studies of CitMHS are essential to the understanding of infection pathways and, consequently, the ability to block such pathways. Cit_{Ba} is a CitMHS transporter postulated in the Gram-positive bacterium, *Bacillus anthracis*, which is the causative agent of anthrax. Heterologous expression of Cit_{Ba} in *Lactococcus lactis* following functional flux assays may reveal its metal citrate transport capability. Additionally, protein purification may enable antibody production, which may then be used as a vaccine or vaccine component for anthrax.

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