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

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with Distinction in Biochemistry

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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.

Table of Contents

1. Introduction.....	1
1.1 CitMHS.....	1
1.2 Cit _{Ba}	2
1.3 <i>Bacillus anthracis</i>	2
2. Project Overview.....	3
3. Metal Citrate Transport in <i>Escherichia coli</i>	4
3.1 Introduction.....	4
3.2 Cloning of Cit _{Ba} into <i>E. coli</i>	5
3.3 Expression of Cit _{Ba} in <i>E. coli</i>	6
3.4 Gain of function radioflux assays for <i>E. coli</i> expressing Cit _{Ba}	7
4. Metal Citrate Transport in <i>Lactococcus lactis</i>	9
4.1 Introduction.....	9
4.2 Advantage of <i>L. lactis</i>	9
4.3 Nisin-controlled gene expression (NICE).....	9
4.4 Cloning of Cit _{Ba} into <i>L. lactis</i>	11
5. Overexpression and purification.....	13
5.1 Introduction.....	13
5.2 Expression of Cit _{Ba} with the pNZ8149_His'tag_Cit _{Ba} system.....	13
5.3 Expression of Cit _{Ba} with the pET-25b(+)_FLAG_Cit _{Ba} system.....	14
6. Bioinformatics.....	15
6.1 Introduction.....	15
6.2 TMHMM.....	15

6.3 Prediction of secondary structure.....	16
7. Experimental.....	17
7.1 pET-25_Cit _{Ba} vector construct.....	18
7.2 Media recipes and stock solutions.....	18
7.2.1 Luria-Bertani (LB).....	18
7.2.2 Elliker-Medium.....	18
8. Ongoing & Future Work.....	19
9. References.....	19
Appendix A: Vector maps, protein sequences, and radiation data	CD