THE ROLE OF MGTE, A MAGNESIUM TRANSPORTER PROTEIN, IN VIRULENCE MODULATION OF PSEUDOMONAS AERUGINOSA AIRWAY INFECTIONS IN CYSTIC FIBROSIS

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*Pseudomonas aeruginosa* is a gram negative bacterium implicated in the chronic infection of cystic fibrosis (CF) airways due to the ability of *P. aeruginosa* to form biofilms within mucus plugs. A microarray study showed *mgtE*, encoding for a magnesium transporter protein, was upregulated following tobramycin treatment of preformed *P. aeruginosa* (PA14) biofilms on cystic fibrosis bronchial epithelial cells (CFBE cells). Testing, under the same circumstances, of an isogeneic mutant, Δ*mgtE*, revealed increased cytotoxicity toward the CFBE cells compared to PA14. Taken together, changes in *mgtE* expression reveal a possible role in virulence modulation. To further understand this role, RT-PCR and QRT-PCR were employed to demonstrate *mgtE* upregulation following treatment of most of the 12 different antibiotics tested in accordance with the above model system, and Western blotting is currently being used to assess translational effect. Based upon our findings, we propose that changes in *mgtE* expression feed into a virulence regulatory pathway. To further elucidate pathway involvement, we are screening a transposon mutated library looking for specific mutated regulatory proteins causing unexpected cytotoxic changes. Finally, in an attempt to further understand the function of MgtE, we have shown that *Staphylococcus aureus* MgtE has the same impact on cytotoxicity as PA14 MgtE. These studies will lead to an increased understanding of *P. aeruginosa* virulence modulation during chronic CF airway infections as well as provide greater insight into therapeutic options for treatment of *P. aeruginosa* in CF.