ABSTRACT

GENE EXPRESSION OF *MYCOBACTERIUM SMEGMATIS* MC² 155 UNIVERSAL STRESS PROTEINS DURING STRESS

Universal stress proteins (Usps) are ubiquitous throughout archaea, bacteria, and eukarya; however their role in the cell is not well understood. Usps have been extensively studied in *Escherichia coli,* where they are upregulated after exposure to various stresses, indicating that they play a major role in stress protection. In mycobacteria, Usps have been shown to be upregulated by hypoxia and/or nitric oxide. To investigate their role in stress protection further, the expression of five mycobacterial *usp*s was characterized by fusing the promoter region of the genes to green fluorescent protein and quantifying fluorescence after exposing *Mycobacterium smegmatis* to various stresses. Acidic, alkylating, DNA-damaging, heat, hypoxic, nitrosative, osmotic, and oxidative stress affected the expression of one or more *usp*s, indicating that (1) Usps are involved in protection against these stresses and (2) Usps have overlapping and/or distinct roles against cellular stresses.

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