The Role of *rpoE* in Stationary Phase Mutagenesis in *Bacillus Subtilis*

Turquoise C. Alexander¹ and Eduardo A. Robleto²

Fort Valley State University, Fort Valley, GA¹

School of Life Sciences, University of Nevada Las Vegas, Las Vegas, NV²

**Abstract**

Stationary phase mutagenesis is a phenomenon whereby random mutations are generated in non-dividing cells. In order to understand how these mutations arise, we use Bacillus subtilis, a Gram positive rod-shaped model organism. Transcription is one of the major processes hypothesized to drive stationary phase mutagenesis in this organism. We therefore examined the role of *rpoE*, a gene that encodes for an RNA polymerase delta subunit which is up regulated during stationary phase. To this end, we will first generate a strain bearing a deletion in the *rpoE* gene. In order to determine if this gene is important for mutagenesis, we will examine the rate of mutations in this strain compared to wild type by scoring for reversion to auxotrophy. If *rpoE* is significant in this process, we will expect a difference between the rate of mutations in the mutant strain and wild type. This project is a step towards understanding stationary phase mutagenesis, a process that has implications in evolution, drug resistance and cancer formation.

**Methods**

1) Transformed YB955 with genomic DNA from an *rpoE* deletion mutant in order to obtain isogenic wild type and mutant strains.

2) Inactivation of the *rpoE* gene was verified using PCR.

3) Stationary phase mutagenesis assay was performed on both strains – cells are starved for amino acids for up to 9 days and revertants are scored.

**Results**

**Conclusion**

It seems to be that *rpoE* gene has no significant effect on stationary phase mutagenesis.

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