

# Experimental Analysis And Modeling Of Sigma E Regulation In *E. coli*

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## ABSTRACT

*E. coli* Sigma E is a transcription initiation factor that senses the stress in the periplasmic space. Its activity is modulated by the regulated proteolysis of the anti-Sigma factor, RseA, an inner membrane transmembrane protein. [1] Stochastic modeling of SigmaE regulation suggests that there should be oscillations in the SigmaE activity in a single *E. coli* cell. This prediction as well as the possible correlation of SigmaE activity with *E. coli* cell cycle will be tested measuring the fluorescence of a GFP - reporter of Sigma E activity in a single cell by means of the time-resolved fluorescent microscopy. A translational fusion of RseA and GFP will be used to verify whether RseA is degraded gradually or in all or none fashion in a single cell.

## REFERENCES

[1] Sarah E. Ades, Lynn E. Connolly, Benjamin M. Alba, and Carol A. Gross. 1999. The *Escherichia coli*  $\sigma^E$  - dependent extracytoplasmic stress response is controlled by the regulated proteolysis of an anti- factor. *Genes & Dev.* **13**: 2449-2461