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***Control of Global Transcription in
Escherichia coli***

Abstract:

Global transcription in *E. coli* is regulated to allow proper condition-specific, differential expression of the genome. This is controlled at several levels by both intrinsic and extrinsic factors. For example, transcription of every operon involves promoter-specific interactions between RNA polymerase (RNAP) and DNA. This feature is exploited by a two-factor global regulator consisting of the unusual nucleotide, (p)ppGpp (also known as "magic spot"), and the DksA protein. Both directly interact with RNAP and function synergistically to modulate the kinetic properties of the enzyme at all promoters. This results in the negative control of a small number of highly expressed genes (e.g. ribosomal RNAs) and the concomitant increase in appropriate condition-specific genes. We are using a combination of genomic and biochemical approaches to study the effect of this system on global transcription. The ultimate goal is to develop predictive computational models for condition-specific expression of the genome.

**Tuesday, March 8th, 2005
4:00 p.m.**

Genetics/Biotechnology Center Auditorium
425 Henry Mall