Micro 201
Dove Lecture 2, Class 12: Transcription and its regulation continued
March 7th , 2019

Overview

For our second session on transcription, we will begin by discussing transcription initiation in somewhat greater detail, considering the kinetics of the initiation process. Next, we will discuss the transcription cycle as a whole, focusing on the post-initiation stages of transcription, including promoter escape, elongation and termination.

Our paper for discussion describes the discovery that DksA is a transcription initiation factor that is required for the regulation of rRNA synthesis. Unlike classical repressors and activators, which target specific promoters by binding to DNA recognition sites associated with those promoters, DksA binds directly to RNAP and affects transcription initiation at promoters that have distinctive kinetic properties. DksA is an example of a class of regulator called a secondary channel regulator. These regulators gain access to the RNAP active center by binding within the secondary channel of the enzyme. The review from Nickels and Hochschild is provided for background reading.

Paper for Discussion

1. Paul et al., (2004). DksA: A critical component of the transcription initiation machinery that potentiates the regulation of rRNA promoters by ppGpp and the initiating NTP. Cell 118: 311-322.

Background Reading

2. Nickels BE & Hochschild A (2004). Regulation of RNA polymerase through the secondary channel. Cell 118: 281-84.