

## **Micro 201**

Dove Lecture 1, Class 11: Transcription and its regulation  
March 5<sup>th</sup>, 2019

### Overview

For our first session on transcription, we will briefly review promoter architecture, the multi-subunit RNA polymerase (RNAP), and the role of the RNAP sigma subunit in mediating promoter recognition. The review from the Busby lab is provided for background reading.

There are two papers for discussion. The first, by Ross et al., is a beautiful study from the Gourse lab that demonstrates a role for the C-terminal domain of the RNAP alpha subunit in promoter recognition. Please be prepared to discuss Figures 1-6 and Table 1. The second, by Zhou et al. from the Ebright lab, concerns the global transcription activator CAP (also known as CRP) and describes a genetic dissection of its activation function. What we will emphasize with this paper is screen design. Please be prepared to discuss the rationale for the study and the design of the genetic screen that was used to identify CAP mutants specifically defective for transcription activation. We will only cover Table 1.

### Papers for Discussion

1. Ross et al., (1993). A third recognition element in bacterial promoters: DNA binding by the  $\alpha$  subunit of RNA polymerase. *Science* 262: 1407-1413.

2. Zhou et al., (1993). Identification of the activating region of catabolite gene activator protein (CAP): Isolation and characterization of mutants of CAP specifically defective in transcription activation. *Proc Natl Acad Sci* 99: 6081-6085.

### Background Reading

3. Browning, DF., and Busby, SJ. (2004). The regulation of bacterial transcription initiation. *Nat Rev Microbiol* 2: 57-65.