

Micro 201

Dove Lecture 7, Class 25: Bistability and phase variation

April 30th, 2019

Overview

Within a population of bacterial cells certain genes can exist in one of two stable expression states (an on state and an off state), giving rise to heterogeneity in the cell population (i.e. some cells will express the genes whereas others will not). Such heterogeneity might provide a fitness advantage to the population as a whole. Our last class will consider mechanisms responsible for this rapid and reversible switch between on and off expression states. We will discuss a paper from David Low's laboratory that explains how differences in DNA methylation can generate on and off expression states for a set of pili genes in *E. coli*.

Paper for Discussion

1. Braaten et al., (1994) Methylation patterns in *pap* regulatory DNA control pyelonephritis-associated pili phase variation in *E. coli*. *Cell* 76, 577-588.

Background Reading

2. Dubnau D, Losick R (2006) Bistability in bacteria. *Mol. Microbiol.* 61, 564-572.

3. Low D, Casadesus J (2008) Clocks and switches: bacterial gene regulation by DNA adenine methylation. *Current Opinion in Microbiology* 11, 106-112.