



UNIVERSITY OF MINNESOTA
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Department of Chemistry

Seminar

9:45 a.m. Thursday, February 17 • 331 Smith Hall



Assistant Professor

Penny Beuning

Department of Chemistry and Chemical Biology
Northeastern University, Boston MA

*Multiple Regulatory Modes
That Control Translesion DNA Synthesis*

Research interests:
understanding cellular responses to genotoxic stress.

Website: <http://www.dna.neu.edu/research/>

Abstract

DNA is constantly subject to damage from both exogenous and endogenous sources; unrepaired DNA damage can lead to mutagenesis and cancer. Thus, efficient and accurate systems to repair damaged DNA are essential for all organisms to maintain genomic integrity. Cells have multiple overlapping pathways to repair DNA; nonetheless, DNA damage can evade repair systems, persist in the cell, and lead to mutations. A specialized family of DNA polymerases, the Y family found in all domains of life, has the ability to copy damaged DNA, allowing cells to tolerate DNA damage. This process is sometimes error-prone; therefore these specialized but potentially mutagenic polymerases must be tightly regulated. Aberrant regulation of Y family polymerases is associated with tumorigenesis, whereas in bacteria Y family DNA polymerases may contribute to antibiotic resistance. Bacterial Y family DNA polymerases are regulated by the SOS response to DNA damage as well as by their protein-protein and protein-DNA interactions. We are probing the function and regulation of bacterial Y family DNA polymerases by analyzing their specificity for DNA modifications and their protein interactions. The multiple roles of a small, dimeric, intrinsically disordered protein, UmuD, in regulating mutagenesis via interactions with DNA polymerases will be presented.

Host: Associate Professor T. Andrew Taton
Refreshments will be served prior to the seminar.