DNA Polymerases, Mutations, and the Evolution of Antibiotic Resistance

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Abstract:
Complete genome duplication requires the activity of multiple DNA polymerases that are involved in replication, repair and DNA damage tolerance. Our research is focused on determining the molecular structures and kinetic mechanisms of the essential DNA polymerases that replicate DNA rapidly and with high accuracy and the error-prone DNA polymerases that are allow cells to tolerate DNA damage. We also want to understand how these molecular machines influence the evolution of antibiotic resistance in *Staphylococcus aureus.*

Bio:
Janice Pata, Ph.D., is a Research Scientist at the Wadsworth Center, New York State Department of Health, and Associate Professor and Chair of Biomedical Sciences at the University at Albany School of Public Health. Her interests in genome replication began as an undergraduate at the California Institute of Technology, isolating the RNA replicase subunits from yellow fever virus, and as a graduate student at the University of Colorado at Boulder, characterizing the biochemical activities of the RNA-directed RNA polymerase from poliovirus. As a postdoc at Yale, she used X-ray crystallography to understand the structural mechanisms of HIV-1 reverse transcriptase replication initiation and inhibition. Since coming to Albany, her research has focused on the structure and kinetics of prokaryotic DNA polymerases, primarily those from *S. aureus*.