

CHEMISTRY DEPARTMENT SEMINAR



Making Sense of Charge Transport in π -Conjugated Molecular Electronics with Help of Computational Simulations and Mathematical Models

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Host: Sally Pias, PhD

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Abstract

R-loops are RNA-DNA hybrids with a displaced single strand of DNA that arise naturally during transcription and are a potent source of DNA damage. Unresolved R-loops promote replication stress and DNA breaks that can lead to pathological conditions such as cancer, neurodegenerative diseases, and autoimmune disorders. At the cellular level, R-loops are tightly regulated by a large number of proteins and enzymes. DNA topoisomerase 1 (TOP1) is one of the major enzymes involved in R-loop metabolism. TOP1 prevents R-loop formation and consequent DNA damage by restoring the DNA topology. Our previous work identified a novel interaction of TOP1 with the small transcription termination factor Kub5-Hera (K-H) that is also known to regulate R-loops. However, the significance of this novel interaction remains unknown. In my presentation, I will discuss the potential cooperation of TOP1 and K-H in regulating R-loops and avoiding genomic instability.

Bio

Marat R. Talipov is an Associate Professor in the Department of Chemistry and Biochemistry at New Mexico State University, Las Cruces. He obtained his Ph.D. in Chemistry, specializing in Mathematical and Quantum Chemistry, from Bashkir State University, where he focused on the theoretical investigation of short-living molecules, nitroso oxides. Before joining New Mexico State University, Marat held a postdoctoral position at Marquette University and a researcher position at the Institute of Organic Chemistry in Ufa, Russia.

