

CHEMISTRY COLLOQUIUM



WEDNESDAY

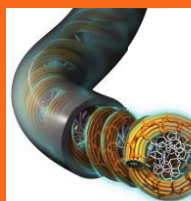
MARCH 29th, 2017

12:00PM

HUTCHISON HALL ROOM 140

University of Rochester

Department of Chemistry



Guest Speaker:
Professor David Beratan
Duke University



Department of Biochemistry and Physics

**Title: Engineering Nanometer-Scale
Electronic Coherence in Soft Matter:
Electron Transport Pathways in DNA**

Abstract:

Charge-transfer mechanisms in biomolecules are rich and varied. I will begin my seminar by presenting a conceptual framework to describe charge transport mechanisms in the soft-wet environments associated with proteins and DNA. Particular attention will be paid to emerging theories for charge transport in DNA. In certain nucleic structures, a transient resonance channel is found to play a particularly important mechanistic role, since energy fluctuations of the pi-stacked bases are correlated. We used this framework to analyze resistance oscillations in break-junction measurements on DNA, and designed novel sequences that provide critical tests of our predictions. Our findings indicate that orbital symmetry and the properties of correlated structural fluctuations may be used to engage coherent transport on the multiple nanometer length scale in soft-matter assemblies, dimensions comparable to those of small proteins. I will also describe studies of how transient infra-red excitation may be used to manipulate charge flow through electron donor-bridge-acceptor structures consisting of nucleic acid bridges.

Host: Professor Ignacio Franco email: Ignacio.franco@Rochester.edu