



# CHEMISTRY & BIOCHEMISTRY COLLOQUIUM

## Mapping RNA sequence and Structure with Tunneling Spectroscopy

Date:  
11/18/2022

Time:  
1:30 PM - 2:50 PM

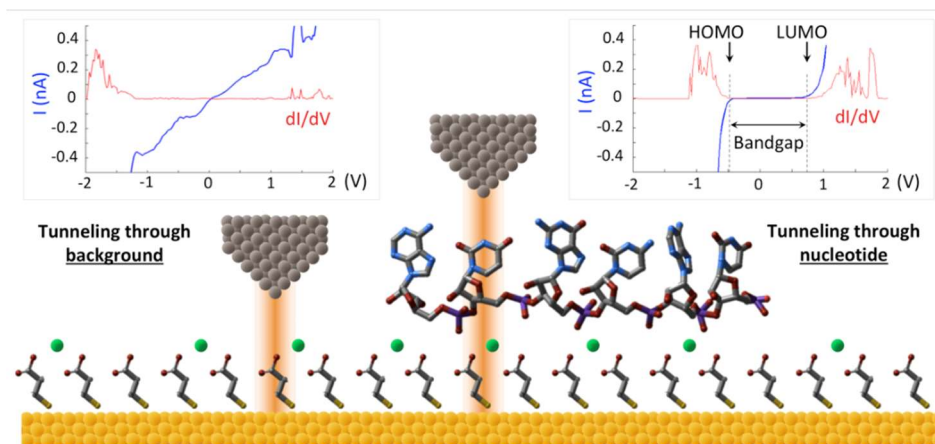
Location:  
COB 267

**Gary Abel**  
Manager, Surface Development  
Pacific Biosciences



### About The Speaker:

Gary Abel works at the interface of surface chemistry and molecular biophysics to develop new experimental and analytical tools for understanding how biomolecules behave. Gary received a Bachelor's degree in Physics from San Jose State University, and a Ph.D. in Chemistry and Chemical Biology from UC Merced under Prof. Tao Ye. During his postdoctoral work with Prof. Prashant Nagpal at the University of Colorado Boulder, he helped to develop nanoelectronic techniques for probing single DNA and RNA molecules. Currently he leads a team of surface scientists and engineers at Pacific Biosciences, where they are exploring new surface coatings and nanomaterials for high-accuracy sequencing.



### Abstract:

Next-generation sequencing technology is enabling breakthroughs in genomics, medical diagnostics, therapeutics, epidemiology, and synthetic biology, among other fields. Improvements in sequencing technology require increasingly precise control and interrogation of DNA and RNA molecules at the nanoscale, and surface chemistry can play a critical role by defining the local chemical environment of the molecules. In this talk I will discuss how we achieved successful nucleotide identification and structural mapping of individual RNA molecules using a combination of surface chemistry to control molecular orientation, tunneling spectroscopy to probe molecular orbitals, and machine learning to accurately classify nucleotides from noisy signals. I will also give a brief overview of my current work at PacBio, and talk about the transition from academia to a career in industry.

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