## Georgia Institute for Electronics Tech and Nanotechnology

## Improving Our Vision of Nanobiology Professor Deb Kelly, Virginia Tech Carilion School of Medicine and Research Institute

## Thursday, December 8, 2016 @ 11:00am Marcus Nanotechnolgy Conference Rooms 1117-1118

**Abstract:** Understanding the properties of macromolecules is a common goal of physicians, biologists and engineers. Electron microscopes (EMs) are used to directly view the intricate details of molecular entities at the nanoscale. The revolution in EM phase-plates, direct electron detectors, and in-column energy filters offers premiere

technology to record pristine images of weak-phase objects. Correspondingly, the next generation of specimen support materials must also be developed to best utilize these new tools. New materials are being produced worldwide, which present a prime opportunity to test alternative substrates for EM support films. Such alternative substrates include, but are not limited to, graphene and silicon nitride (cryo-SiN). One recent example is the use of cryo-SiN to tether active viral assemblies while preserving them for cryo-EM and liquid cell imaging. Another major benefit of using alternative substrates, such as silicon nitride, is their versatile surface properties. By decorating microchips or other substrates with specific adaptor molecules, we can create new tunable devices. We have recently developed tunable microchips to capture and visualize native protein assemblies from the nuclear material of patient-derived cancer cells. Collectively, with these new tools in hand, the field is uniquely poised to peer

into the nanoworld of active molecules and cells.





## VISUALIZING THE NEXT