Fall 2020 Virtual Seminar Department of Chemistry, Barnard College

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"Stimulated Raman Imaging for Complex Bioanalysis" Friday October 16, 2020, 3:00 pm (NYC time)

<u>Abstract</u>: Innovations in optical spectroscopy and microscopy have revolutionized our understanding in live biological systems at the sub-cellular levels. In this talk, I will present our recent advances in developing and applying stimulated Raman scattering (SRS) imaging, a nonlinear vibrational imaging modality that offers rich chemical information, for specific and highly sensitive investigations of complex biological (i.e. cancer- and neuronal-) systems. First, we integrated Raman spectroscopy and imaging with transcriptomics analysis for metabolic phenotyping in cancer systems. Our subcellular Raman-guided strategy revealed potential new druggable targets that are not present in bulk analysis. Our further integrations with lipidomics and transcriptomics suggest possible underlying regulatory pathways. Second, we devised a method that couples SRS microscopy with selective deuterium labeling for live-cell imaging, quantification, and spectral analysis of polyQ aggregates, a key feature in polyQ associated neurodegenerative disorders. We achieved specific polyQ imaging with subcellular resolution and without the need of bulk GFP labeling, which is commonly employed in fluorescence microscopy. Our method should fill the gap and serve as a suitable tool to study native polyQ aggregates. It may unveil new features of polyQ aggregates and pave the way for comprehensive in vivo investigations.

Host: Christina Vizcarra, cvizcarr@barnard.edu

Zoom ID: 996 1389 9354 password: entropy