

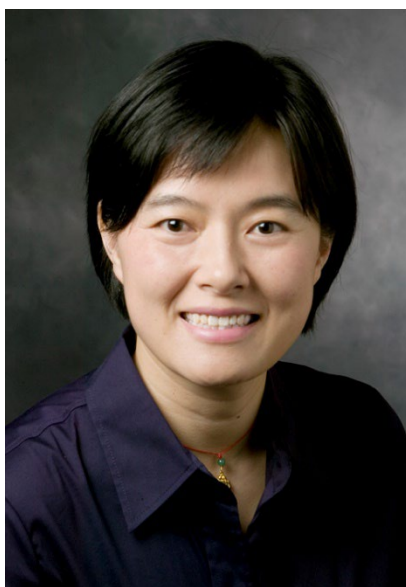


## **Analytical Chemistry Seminar**

**Tuesday, March 29, 2022**

**3:30 PM, WTHR 320**

***“Membrane Curvature-mediated Intracellular Signaling  
at the Nano-Bio Interface”***



**Dr. Bianxiao Cui**

**The Job and Gertrude Tamaki Professor of Chemistry  
Department of Chemistry and the Stanford Neuroscience Institute  
Stanford University**

### **Abstract**

Membrane curvature in the range of tens to hundreds of nanometers is involved in many essential cellular processes. At the cell-matrix interface, where the cells make physical contact with extracellular matrices, the membrane may be locally deformed by matrix topography or mechanical forces, and this deformation may actively regulate signal transmission through the interface. We explore nanofabrication to engineer vertical nanostructures protruding from a flat surface. These nanostructures deform the plasma membrane to precisely manipulate the location, degree, and sign (positive or negative) of the interface curvature in live cells. We found that the high membrane curvature induced by vertical nanostructures significantly affects the distribution of curvature-sensitive proteins and modulate mechanotransduction in live cells. Our studies show a strong interplay between membrane curvature and mechanotransduction and reveal molecular mechanisms underlying the connection.