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Gold Nanostars as Structural Valency Probes

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Abstract: Anisotropic gold nanoparticles exhibit shape-dependent optical properties beneficial for optical sensing, biomedical imaging, and photocatalysis. Although different synthetic approaches can result in anisotropic nanoparticles, usually a desired shape requires the use of seed particles, where nucleation is followed by selective faceted growth. In contrast, Good's buffers can act both as nucleating and shape-directing agents for the synthesis of a new class of biocompatible anisotropic nanoparticles: gold nanostars (AuNS). This talk will discuss the fundamentals and applications of AuNS that support positive, negative, and neutral curvature. First, we will describe details of AuNS growth and mechanistic insight gained from unconventional analytical tools. Second, we will discuss the functionalization with biological ligands that can facilitate both nanoparticle assembly and single-particle imaging of their interactions with live cells. Finally, we will show how targeting nanoconstructs based on AuNS show distinct properties from their spherical counterparts when interacting with cancer cells, which opens prospects for a novel type of assay based on real-time dynamics.



Biography: Teri W. Odom is the Joan Husting Madden and William H. Madden, Jr. Professor of Chemistry and Chair of the Chemistry Department at Northwestern University. She is an expert in designing structured nanoscale materials that exhibit extraordinary size and shape-dependent optical and physical properties.

Odom is a Member of the American Academy of Arts and Sciences and a Fellow of the American Chemical Society (ACS), the Royal Society of Chemistry (RSC), the Materials Research Society (MRS), the American Institute for Medical and Biological Engineering (AIMBE), the American Physical Society (APS), and Optica. Select honors and awards include: the RSC Centenary Prize; the ACS National Award in Surface Science; a Research Corporation TREE Award; a U.S. Department of Defense Vannevar Bush Faculty Fellowship; a Radcliffe Institute for Advanced Study Fellowship; an NIH Director's Pioneer Award; the MRS Outstanding Young

Investigator Award; the National Fresenius Award from Phi Lambda Upsilon and the ACS; an Alfred P. Sloan Research Fellowship; and a David and Lucile Packard Fellowship in Science and Engineering.

Odom was founding Chair of the Noble Metal Nanoparticles Gordon Research Conference (GRC) and founding Vice-Chair of the GRC on Lasers in Micro, Nano, Bio Systems. She was an inaugural Associate Editor for *Chemical Science* and founding Executive Editor of *ACS Photonics*. Currently, Odom is Editor-in-Chief of *Nano Letters*.