



CEM SEMINAR

DEVELOPMENT AND APPLICATIONS OF GOLD-SILICA NANOHYBRIDS FOR BIOANALYSIS

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An easy, cost-effective, and fast method to synthesize silica nanomaterials has been developed. Desired shapes (hollow/solid spherical, wire-like, rod-like, tadpole-like, etc) can be obtained by simply changing the reaction conditions, which eliminates the risk of poor reproducibility and brings great potential for a large-scale synthesis. The silica nanomaterials with various shapes were applied in different fields. Take silica nanowire as an example. The length of the synthesized SiNWs has a typical length up to tens of micrometers and diameter ranging from 60 to 100 nm, which shows their excellent reservoir characteristics and high loading capacity for large molecules. By taking advantages of these properties, we modified the surface of SiNWs with gold nanoparticles and used them in the photothermal therapy. They showed great cancer cell killing efficiency with a low laser irradiation (0.3 W/cm2). We also applied gold nanoparticles modified silica nanorods (AuNPs-SiNRs) in a dry-reagent strip biosensor, which presented excellent protein detection ability. The limit of detection was 0.01 ng/mL and had a great linear range from 0.05 ng/mL to 2 ng/mL. The LOD was 50 times lower than that of pure AuNPs-based biosensors.

4:00PM on August 3, 2016 1080, Physics Research Building More information at cem.osu.edu