

Gold Nanoparticles and Nanotechnology for Cancer Biomarker Discovery and Research

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Nanotechnology is bringing ground-breaking tools and new capabilities to biomolecule research and medical diagnosis. Gold nanoparticles as one of the most extensively studied nanomaterials, have many interesting and unique optical properties. These properties make gold nanoparticles as excellent optical probes for biomolecular imaging and assay applications. Based on the light scattering property of gold nanoparticles, our group has recently developed a nanoparticle-enabled dynamic light scattering assay (NanoDLSay) technology for biomolecular detection and analysis. This technique detects proteins, DNAs and other biomolecular targets by monitoring the size change of the gold nanoparticles caused by target analyte binding. In the last few years, we have investigated heavily on the use of NanoDLSay technique for cancer biomarker research. From our study, we made several new findings: (1) a prostate cancer biomarker, prostatic acid phosphatase (PAP), is significantly more complexed or aggregated in prostate cancer tissue than in the normal and BPH (benign prostate hyperplasia) tissue; (2) the concentration of certain serum protein-complexed VEGF (vascular endothelial growth factor) in blood serum is decreased in prostate cancer compared to normal and benign prostate conditions; and (3) we discovered a new protein complex from the nucleus of a pancreatic cancer cell line, *Panc-1*. In this talk, we will explain the principle of NanoDLSay technology and its broad applications in cancer biomarker research.

Biography

Qun Huo received her Ph.D. from University of Miami in Chemistry in 1999. After completing a two-year postdoctoral work at University of Miami, she joined North Dakota State University as an assistant professor in 2001. In 2005, she became an associate professor in the NanoScience Technology Center at University of Central Florida. She has published more than 60 peer-reviewed papers and her research focus is gold nanoparticles and nanotechnology for biomedical applications. She received the prestigious National Science Foundation CAREER award, NIIRT (Nanotechnology Interdisciplinary Research Team) award and she is currently a New Florida 2010 Boost Scholar award recipient.