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## Detection of pancreatic cancer biomarkers using a SERS-based immunoassay using gold nanoparticles and nanoshells

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Early diagnosis of pancreatic cancer (PC) is critical to reducing the mortality rate of this disease. Current biological analysis approaches cannot robustly detect several low abundance PC biomarkers in sera, limiting the clinical application of these biomarkers. Enzyme-linked immunosorbent assay and radioimmunoassay are two common platforms for detection of biomarkers; however, they suffer from some limitations. This presentation investigates a novel system for multiplex detection of pancreatic biomarkers CA19-9, MMP7, Mesothelin and MUC4 in sera samples with high sensitivity using surface-enhanced Raman spectroscopy. The gold nanoshell showed better Raman intensity compared to that of the gold nanoparticles. Measuring the Raman signals of these biomarkers in PC patients, pancreatitis patients and healthy individuals reveal the unique expression pattern of these markers in PC patients, suggesting the great potential of using this approach for early diagnostics of PCs. Advantages and feasibility of performing this platform on an integrated microfluidic device also will be discussed.

### Biography

Byung Kim is a Professor in the Department of Mechanical and Industrial Engineering at the University of Massachusetts in Amherst. His current research interests are micro/nano embossing and its application to obtain a cost-effective solution in the areas such as cancer detecting SERS substrate. He is on the editorial board of the Polymer-Plastics Technology and Engineering Journal. His professional affiliations include membership with the SPE, ASME, SME. He received his BS in Mechanical Engineering from the University of California at Berkeley in 1978 and MS and PhD from MIT in 1980 and 1983, respectively.

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