# Engineered Inorganic Nanoparticles as Photoacoustic Theranostics for Cancer and Inflammatory Diseases

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Functional inorganic nanoparticles feature interesting optical, magnetic, plasmonic, and catalytic properties as well as effective (bio) molecular recognition. Nanoparticles with imaging capabilities can be used as sensitive diagnostics to detect disease initiation and progression and to track therapeutic intervention. Upon loading therapeutic payloads into the nanoscale matrix or exploiting the intrinsic nanoscale properties, 'theranostic' nanoparticles can improve treatment specificity to offer image-guided targeted therapy. Photoacoustic (PA) imaging is an emerging non-invasive technique that combines the high spatiotemporal resolution of ultrasound with the excellent spectral contrast of optics. The powerful PA imaging can overcome the drawbacks of conventional imaging modalities to improve over the therapeutic potential of nanomedicine. In this seminar, I will present recent efforts in my lab to develop novel translational nanotheranostic agents for cancer treatment or managing inflammation in tandem with PA imaging. I will also emphasize our recent work in theranostic nanomedicine in uterine disease.

## ABOUT the SPEAKER

Dr. Taeho Kim is an Assistant Professor at the Department of Biomedical Engineering (BME), Institute for Quantitative Health Science and Engineering (IQ), Michigan State University (MSU). Dr. Kim completed his PhD in 2013 at Seoul National University, including two years of visiting research at Johns Hopkins School of Medicine. After finishing his postdoctoral training at UCSD, Dr. Kim joined as a faculty member (tenure-line) at MSU in Fall 2018 and successfully established his independent research program in molecular imaging and nanomedicine. Dr. Kim has a productive track record, yielding six patent applications and 44 publications (more than 6,900 citations; h-index of 27). He has received numerous grants and awards, including NIH R01 grant and SRI Early Career Investigator award.

**Monday, September 23 at Noon**
**1003 Engineering Centers (Tong Auditorium)**