Biomedical Engineering Seminar Series

2nd Semester, Academic Year 2017

Date: January 9, 2018
Time: 11.00 AM – 12.00 PM
Room R-114, 1st level, Building 1,
Faculty of Engineering; Mahidol University

Prof. Agata A. Exner

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"Nanobubbles and the Future of Ultrasound Molecular Imaigng "

The ability to formulate robust contrast agents able that penetrate deep into tumors (to detect cell surface markers, or molecules in the tissue) is critical to development of ultrasound as a molecular imaging tool. Yet the small size of highly echogenic agents has been elusive. We are developing unique lipid-surfactant and surfactant-polymer stabilized nanobubbles with a gas perfluorocarbon core which are clearly visible at 3-18 MHz and beyond, yet sufficiently small (~100-300 nm) to move beyond the leaky tumor vasculature. Subsequent surface functionalization of nanobubbles permits greatly expanded molecular imaging capabilities of ultrasound at clinically relevant frequencies. Nanobubbles can serve as a springboard for a number of new diagnostic and therapeutic applications. Using these probes, we have begun investigating specific applications: 1) Molecular detection of prostate specific membrane antigen (PSMA) for detection and biopsy guidance of prostate cancer, and 2) Targeted detection of ovarian cancer expressing the CA125 antigen. This lecture will present data supporting the formulation of echogenic nanobubbles, their biophysical and acoustic characterization and their application in cancer molecular imaging of prostate and ovarian cancers.

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