Thursday, July 12th, 2012, 2:30 P.M.

Room No. 109, DASAN bldg. 1st Floor

(Host: Prof.Jae Gwan Kim / Language: English)

Engineering Optics from Benchtop to Bedside

Dr.Bruce J. Tromberg

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Quantitative characterization of tissue structure and function across spatial scales is one of the most challenging problems in Biomedical Imaging. Field of view, depth of interrogation, and resolution are critical features that dramatically impact image quality and information content. Optical methods provide a scalable platform that can be used to accomplish this aim by manipulating fundamental physical properties of the light source: wavelength (e.g. color), spatial features (e.g. focusing, scanning, etc.), and time (e.g. pulsed, modulated, or continuous illumination). This allows for non-invasive tissue functional imaging and tomography. Contrast derived from intrinsic signals can be used to determine tissue structure and biochemical composition. This talk presents optical methods used for intrinsic signal tissue optical imaging. Relationships between micro- and macroscopic optical contrast will be discussed using examples that highlight sensitivity to cellular metabolism, extracellular matrix composition, neovascularization, and hemodynamics. These capabilities will be placed in the context of conventional methods in order to assess the current and future role of optics in medical imaging and image-guided therapy.

Biosketch

Dr. Tromberg is the Director of the Beckman Laser Institute and Medical Clinic (BLI) at the University of California, Irvine (UCI) and principal investigator of the Laser Microbeam and Medical Program (LAMMP), an NIH National Biomedical Technology Center. He is a Professor in the departments of Biomedical Engineering and Surgery, co-leads the Onco-imaging and Biotechnology Program in UCI's Chao Family Comprehensive Cancer Center, and has been a member of the BLI faculty since 1990. His research interests are in Biophotonics and Biomedical Optics, including diffuse optics, non-linear microscopy, cancer imaging, and photodynamic therapy.