Dr. Bernard Choi, Assistant Professor, Department of Surgery, Beckman Laser Institute and Medical Clinic, University of California, Irvine

Laser Speckle Imaging for Characterization of Blood Flow Dynamics in In Vivo Microvascular Animal Models

A wide field, noninvasive, laser speckle imaging (LSI) instrument for measuring microvascular blood flow dynamics in response to therapeutic interventions has been developed. The instrument images laser speckle patterns with a relatively long image exposure time. Regions in which blood flow is present appear blurred in the acquired speckle images. This method is analogous to laser Doppler flowmetry, and has the advantage of considerably higher image temporal resolution. We have applied LSI to studies involving the in vivo rodent dorsal skinfold and cranial window models. I will present results on LSI instrument characterization, laser therapy monitoring, and image processing improvements to increase the velocity resolution, and discuss briefly an adjuvant chemical-agent based method under study to improve the image contrast of subsurface blood vessels. Our results suggest that the LSI instrument is well suited to studies of the above microvascular animal models, with implications for dermatology, neuroscience, and oncology applications.

Tuesday, August 30, 10:00am
Monsanto Auditorium, Life Science Center