



Christine O'Brien

(Washington University in St. Louis)

Focal dynamic thermal imaging for label-free detection of cancer in preclinical models

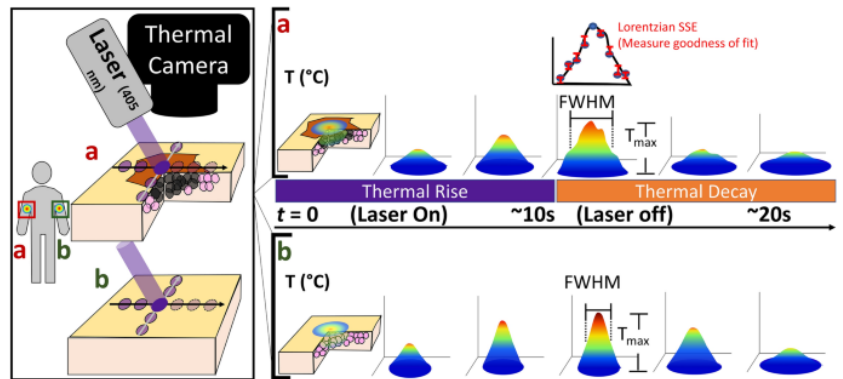
Abstract: Evolution from static to dynamic label-free thermal imaging has improved bulk tissue characterization, but fails to capture subtle thermal properties in heterogeneous systems. A label-free, high speed, and high-resolution platform technology, focal dynamic thermal imaging (FDTI), was developed for delineating material patterns and tissue heterogeneity. Stimulation of focal regions of thermally responsive systems with a narrow beam, low power, and low cost 405 nm laser perturbs the thermal equilibrium. Capturing the dynamic response of 3D printed phantoms, ex vivo biological tissue, and in vivo mouse and rat models of cancer with a

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thermal camera reveals finite structures of materials and delineates diseased from healthy tissue. The intuitive and non-contact FDTI method allows for rapid interrogation of suspicious lesions and longitudinal changes in tissue heterogeneity with high-resolution and large field of view. Portable FDTI holds promise to capture the heterogeneous nature of malignant, benign, or inflamed tissue in oncology.



Bio: Christine O'Brien is a postdoctoral research scholar at Washington University in St. Louis working under Dr. Sam Achilefu in the Optical Radiology Lab. She was an NSF Graduate Research Fellow, and her dissertation focused on developing optical spectroscopy tools for investigating biochemical changes in cervix tissue throughout pregnancy in animal models and patients. As a postdoctoral scholar she was awarded a W. M. Keck Postdoctoral Research Fellowship to develop high resolution dynamic thermal imaging for in vivo cancer detection. Her research interests are focused on using non-invasive optical spectroscopy and imaging for solving global problems in women's health.



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