FIU Biomedical Engineering
FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series

WALLACE H. COULTER Foundation

"High-Resolution Imaging of Brain Oxygen Delivery and Consumption"

Dr. Sava Sakadzic
Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital & Harvard Medical School

Friday, October 10th, 2014
LECTURE: 9:00 AM - 10:00 AM

ENGINEERING CENTER
ROOM EC 2300
10555 WEST FLAGLER STREET
MIAMI, FL 33174

Abstract:
What is the organization of cerebral microvascular oxygenation and morphology that allows adequate tissue oxygenation at different activity levels? We addressed this question in the mouse cerebral cortex using microscopic imaging of intravascular oxygen partial pressure and blood flow combined with numerical modeling. Surprisingly, our measurements show that parenchymal arterioles are responsible for 50% of the extracted oxygen at baseline activity and the majority of the remaining oxygen exchange takes place within the first few capillary branches. Most capillaries release little oxygen at baseline acting as an oxygen reserve that is recruited during increased neuronal activity or decreased blood flow. Our results challenge the common perception that capillaries are the major site of oxygen delivery to cerebral tissue. The understanding of oxygenation distribution along arterio-capillary paths may have profound implications for the interpretation of BOLD fMRI signal and for evaluating microvascular oxygen delivery capacity to support cerebral tissue in disease.

Biography
I completed my Ph.D. in Biomedical Engineering at Texas A&M University in the group directed by Dr. Lihong Wang and I did my postdoctoral training with Dr. David Boas at Massachusetts General Hospital. My research focuses on the development of novel optical neuroimaging technologies and their application to understanding brain normal functioning and pathophysiology. We recently developed a set of optical microscopy technologies for *in vivo* measurement of cerebral hemodynamic and metabolic parameters in small rodents at subcapillary scales, including a first practical two-photon microscopy imaging of oxygen partial pressure in cortical tissue and microvasculature.

Contact: claudia.estrada1@fiu.edu Office: 305-348-6717
Map: http://campusmaps.fiu.edu/Engineering Center