FIU Engineering & Computing
Biomedical Engineering

Wallace H. Coulter Foundation
Biomedical Engineering Seminar Series

DR. XINMAI YANG received his PhD from Boston University in 2003, with a dissertation work focusing on cavitation effect during high intensity focused ultrasound, under the guidance of Glynn Holt and Ronald Roy. Upon graduation, he moved to National Center for Physical Acoustic at Olemiss as a postdoc under the guidance of Charles Church. Later, he did a second postdoctoral study in the area of photoacoustic imaging at Washington University in St. Louis with Dr. Lihong Wang from 2006 to 2008. Since 2008, Dr. Yang is with Mechanical Engineering department and Institute for Bioengineering Research at the University Kansas. Dr. Yang has also worked as a visiting scholar at Radiology Department of the University of Michigan in 2015 during his 6-month sabbatical leave.Dr. Yang's research extends from linear acoustics to non-linear acoustics and laser/ultrasound interaction, including acoustic cavitation, high intensity focused ultrasound, and photoacoustic imaging. Since 2015, in collaboration with Drs Xueding Wang and Yannis Paulus, Dr. Yang have been focused on developing a novel hybrid therapeutic technique, namely photo-mediated ultrasound therapy (PUT), and pursing its potential clinical applications. Dr. Yang's research has been primarily funded by the National Institutes of Health.

DR. XINMAI YANG

Professor Department of Mechanical Engineering Institute for Bioengineering Research

The University of Kansas

FRIDAY, NOVEMBER 12, 2021 / 9:00 AM

SHEDDING LIGHT ON ULTRASOUND: PHOTO-MEDIATED ULTRASOUND THERAPY

ABSTRACT: Photo-mediated ultrasound therapy (PUT) is a novel antivascular therapeutic method by applying synchronized laser pulses and ultrasound bursts. PUT takes the advantage of the high native optical contrast between different biological tissues and has the unique capability to self-target blood vessels without causing unwanted damage to the surrounding tissue. In addition, as a non/minimally-invasive technique, PUT is particle-free, and no contrast agent or photosensitizer is needed. The safety feature of PUT is further facilitated by the proper synchronization between laser pulses and ultrasound bursts. As a result, during PUT, the laser fluence required is much less than that needed for laser photocoagulation, and the ultrasound pressure needed is much smaller than the threshold value for acoustic cavitation in soft tissue, thereby significantly reducing the risk of damaging surrounding tissues. In this talk, I will review our recent work on PUT. While PUT can be applied to meet various clinical needs in areas such as cancer and skin disease, I will focus on two applications: 1) removal of abnormal microvessels in the eye, and 2) recanalizing blocked large blood vessels. Our results demonstrated PUT holds great promise as a non/minimally-invasive method to selectively treat vasculature with minimized side-effects.

Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

Friday, November 12, 2021
9:00AM-10:00AM | https://bme.fiu.edu/seminars