

Contrast Enhanced Ultrasound: imaging beyond anatomy

Paul Dayton, Ph.D.

Professor of Biomedical Engineering

The University of North Carolina at Chapel Hill and North
Carolina State University, Raleigh, NC USA



Abstract — Ultrasound imaging has the potential to make a significant impact in diagnostic imaging. Whereas MRI, CT, PET, and other clinical imaging systems fill a room – modern ultrasound systems are now the size of laptops, and even smartphones. Ultrasound is one of the safest imaging modalities, operating without the need for ionizing radiation. Furthermore, portable ultrasound systems can now be purchased for less than \$10k, meaning that this technology can have broad reaching utility in underserved locations. Traditionally, ultrasound imaging has been limited to use as an anatomical imaging modality, but with the addition of the microbubble contrast agent– the capabilities of modern ultrasound expand widely to new diagnostic arenas. In this seminar, I will review new imaging approaches involving microbubbles which enable non-invasive assessment of blood perfusion, molecular markers, and microvascular morphology, features which are difficult to assess with standard clinical ultrasound systems. The relevance of these imaging approaches to disease diagnosis will be discussed.

Bio — **Paul Dayton** received his B.S. in Physics from Villanova University in 1995, his M.E. in Electrical Engineering from the University of Virginia in 1998, and his Ph.D. in Biomedical Engineering in 2001, also from the University of Virginia. He pursued post-doctoral research and was later research faculty at the University of California at Davis. Much of Dr. Dayton's training was under the mentorship of Dr. Katherine Ferrara, where his initial studies involved high speed optical and acoustical analysis of individual contrast agent microbubbles. In 2007, Dr. Dayton moved to the Joint Department of Biomedical Engineering at UNC Chapel Hill and NC State University, Raleigh, where he is now Professor and Associate Department Chair. Dr. Dayton is currently Associate Director for Education for the Biomedical Imaging Research Center, and his research interests involve ultrasound contrast imaging, ultrasound-mediated therapies, and medical devices. Dr. Dayton is a member of the technical program committee for IEEE UFFC, and a member of the editorial boards for the journals IEEE Ultrasonics, Ferroelectrics, and Frequency Control as well as Molecular Imaging, and Bubble Science, Engineering, and Technology.

Noon to 1PM on November 20, 2015

Tsurumai Campus: Central Consultation Building

7F Special Conference room

Higashiyama Campus: IB Building South No.462 Seminar room