



KATHERINE W. FERRARA

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[Research Laboratory of Dr. Ferrara](#)
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PERSONAL EDUCATION

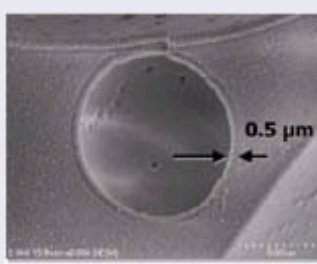
B.S. in Physical Therapy, 1976, University of Pittsburgh
B.S. in Electrical Engineering, 1982, California State University, Sacramento
M.S. in Electrical Engineering, 1983, California State University, Sacramento
Ph.D. in Electrical Engineering, 1989, University of California, Davis

AFFILIATION

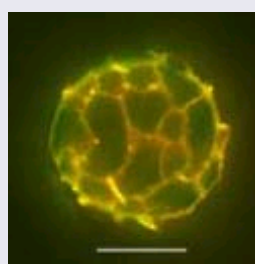
Biomedical Engineering Graduate Group

RESEARCH INTEREST

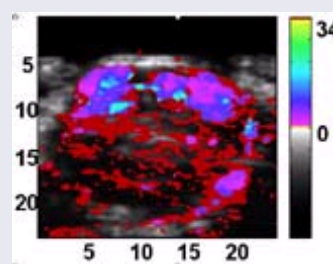
We have five major current projects, encompassing targeted imaging, the development of new drug delivery vehicles, the development of new very wideband transducers, and development of a 3D system for combined imaging and drug delivery. Members of our laboratory bring expertise in many areas including biomedical engineering, physics, electrical engineering, chemical engineering, mechanical engineering, material science, and biology. We work very closely with industrial partners to develop new translational technologies.



EM image of drug delivery vehicle with thick oil layer designed to carry hydrophobic drugs



Fluorescent image of targeted contrast agent



Dynamic contrast-enhanced ultrasound image of the perfusion time in a tumor in seconds

CURRENT PROJECTS

- [Ultrasound imaging and local drug delivery in tumors](#)
- [Contrast-enhanced quantitative ultrasound imaging of cancer](#)
- [Ultrasound-enhanced drug delivery across the BBB](#)
- [High resolution ultrasound cancer imaging](#)
- [Molecularly-targeted imaging](#)



MEMBERS OF
[DR. FERRARA'S LAB](#)

PUBLICATIONS

Charles F. Caskey, Dustin E. Kruse, Paul A. Dayton, Tyler K. Kitano, Katherine W. Ferrara. "Microbubble Oscillation in Tubes with Diameters of 12, 25, and 195 Microns," Applied Physics Letters 88, 033902, Epub ahead of print, 2006.

Aaron F H Lum, Mark A Borden, Paul A Dayton, Dustin E Kruse, Scott I Simon, Katherine W Ferrara, "Ultrasound Radiation Force Enables Targeted Deposition of Model Drug Carriers Loaded on Microbubbles," Journal of Controlled Release, Epub ahead of print, 2005. Shukui Zhao, Katherine W. Ferrara, and Paul A. Dayton, " Asymmetric oscillation of adherent targeted ultrasound contrast agents," Applied Physics Letters 87, 134103-1-3, (2005).

Mark A. Borden; Paul A. Dayton; Katherine W. Ferrara; " Physicochemical Properties of the Microbubble Lipid Shell ," IEEE Transactions on UFFC 25(11), November 2005, 1992-2002.

Y. Sun, D. Kruse, P. Dayton, K. Ferrara, " High-Frequency Dynamics of Ultrasound Contrast Agents ," IEEE Transactions on UFFC 25(11), November 2005, 1981-91.

Dustin Kruse, K. Ferrara, " A New Imaging Strategy Utilizing Wideband Transient Response of Ultrasound Contrast Agents ," IEEE Transactions on UFFC 52(8), August 2005, 1320-9.

S. H. Bloch, R. E. Short, K. W. Ferrara, E. R. Wisner, " The effect of size on the acoustic response of polymer shelled contrast agents ," Ultrasound in Medicine and Biology 31 (3): 439-44, 2005.

Amy R. Broumas, Rachel E. Pollard, Susannah H. Bloch, Erik R. Wisner, Steven Griffey, and Katherine W. Ferrara, " Contrast-enhanced computed tomography and ultrasound for the evaluation of tumor blood flow ," Investigative Radiology 40(3): 134-147, 2005.

Y.T. Hu, Shengping Qin, Ting Hu, Katherine W. Ferrara, Qing Jiang, " Asymmetric oscillation of cavitation bubbles in a microvessel and its implications upon mechanisms of clinical vessel injury in shock-wave lithotripsy ." International Journal of Non-Linear Mechanics 40(2-3): 341-350, 2005.

MAJOR RESEARCH INTEREST

Signal and imaging processing, medical imaging, ultrasound, acoustics, optics, fluid mechanics.

Biomedical Engineering

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