University of Rochester
Department of Electrical and Computer Engineering
Colloquia Series

Sonic Estimation of Elasticity via Resonance (SEER): A novel method of characterizing hemostasis

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Founder and Chief Technology Officer of HemoSonics

Wednesday, November 18th
12:00PM – 1:00PM
Computer Studies Building (CSB) 209

Abstract: Uncontrolled bleeding threatens patients undergoing major surgery and in care for traumatic injury. While tissue and vascular damage contribute to blood loss, extensive bleeding is often the result of systemic clotting dysfunction. At HemoSonics we are developing the QuantraTM in vitro diagnostic platform to rapidly diagnosis the causes of critical bleeding and clotting, in order to inform rapid and accurate treatment. The QuantraTM system utilizes SEER (Sonic Estimation of Elasticity via Resonance) to repeatedly measure the shear modulus of a blood sample as it clots in vitro. By operating on whole blood, the QuantraTM system measures the complex interactions between coagulation factors, platelets, fibrinogen, and fibrinolytic enzymes. In this talk I will describe the clinical motivation for our product, key aspects of the underlying physiology, the physical impact of physiologic dysfunction, and the SEER method. I will present analytical models, computer models, and bench experiments showing that SEER has is able to measure shear modulus with a precision of 2% over nearly 5 orders of magnitude.

Bio: William F. Walker, Ph.D. is the Founder and Chief Technology Officer of HemoSonics, a Charlottesville, VA based in vitro diagnostics company dedicated to improving the management of critical bleeding and clotting. He previously served as HemoSonics' President, where his responsibilities included product vision, fundraising, and invention and implementation of core technologies. From 2003 to 2013 he served as Founder and Director of PocketSonics, the developer of a hand-held 3D imaging platform costing 1% of competing technologies. He originated the "Sonic Window" product concept, invented core technologies, and helped to negotiate a strategic partnership and acquisition of the company. From 1997 to 2013 he served as a professor of Biomedical Engineering at the University of Virginia. During that period he advanced from Assistant to Full Professor, built a world-class research lab, and led the creation of UVA's undergraduate Biomedical Engineering program. Dr. Walker received Ph.D. and B.S.E. degrees in Biomedical Engineering from Duke University.

Pizza and soda provided.