

## CSU-LSAMP HIGHLIGHTS

---

Dr. C. Makena Hightower: CSU-LSAMP Alumna brings an innovative interdisciplinary approach to the study of cardiovascular regulatory mechanisms and hemorheology and an opportunity for international collaborations on translational research leading to more effective treatment and prevention of cardiovascular disease.

Dr. C. Makena Hightower began her journey in higher education in 1998 at California State University, Sacramento, one of 22 campuses of the California State University (CSU) participating in an "Alliance" supported by the NSF's Louis Stokes Alliance for Minority Participation (LSAMP) Program. Like all LSAMP's, CSU-LSAMP supports the NSF's Strategic Plan goal ". . . to cultivate a world-class, broadly inclusive science and engineering workforce" through efforts designed to increase baccalaureate and advanced degree attainment in STEM fields, particularly among underrepresented populations. As an undergraduate, Dr. Hightower had the opportunity to participate in several LSAMP supported activities, including a Math Summer Bridge program, a specially designed LSAMP calculus course, academic excellence workshops in calculus, and mentored research. Although she was a major in Biological Sciences, her LSAMP activities supported her development as an interdisciplinary scientist through her academic and social integration in the LSAMP student community, which included students from diverse STEM fields. In addition, her nascent interest in cardiovascular research was nurtured by LSAMP support for her research project on "Classical Music's Effect on Biofeedback and Voluntary Heart Rate Reduction" (published in The California State University, Sacramento McNair Scholars Journal; Vol. 2, pp. 100-112).

Dr. Hightower earned her B.A. in Biological Sciences (Magna Cum Laude) from California State University, Sacramento in May, 2002, and entered the Bioengineering graduate program at University of California, San Diego (UCSD), where she was a Fellow in the NSF's Alliance for Graduate Education and the Professoriate (AGEP) Program from 2002-2007, earned her M.S. in Bioengineering in 2005 and her Ph.D. in Bioengineering, with a specialization in Microhemodynamics and Microcirculation, in 2007. Her dissertation research focused on the effects of ultrasound exposure on the microhemodynamics of the microcirculation during physiological and pathophysiological states. To further strengthen her interdisciplinary training and exposure to translational research, Dr. Hightower accepted a postdoctoral research appointment in the Department of Biomedical Sciences at Charles Drew University, School of Medicine, where, from 2007-2009, she conducted research on PPARdelta in cardiac and skeletal muscle and adipose tissue formation and preservation. She returned to UCSD in 2009 for a second postdoctoral research appointment (her current position), where, through observations of the microcirculation, she is investigating the effects of various plasma expanders in stored blood transfusions following hemorrhage and working on the development of clinical models for non-invasive observation of the microcirculation.

As will be evident from the list of Dr. Hightower's publications and presentations provided below, Dr. Hightower's innovative interdisciplinary research has not only contributed to an understanding of cardiovascular regulatory mechanisms and hemorheology, but has also generated international interest and collaborations, particularly in Mexico and the Democratic Republic of Congo, which are likely to hasten advancements in basic research and clinical studies leading to improved treatment and prevention of cardiovascular disease on a global scale.

# CSU-LSAMP HIGHLIGHTS

---

## Publications and Presentations

**Hightower CM**, Salazar Vázquez M, Salazar Vázquez BY, Intaglietta M. The Importance of Blood Viscosity in the Microcirculation. Invited speaker, presented at El Hospital Municipal del Niño, Durango, Mexico 2010.

Vázquez BY, **Hightower CM**, Sapuppo F, Tartakovsky DM, and Intaglietta M. Functional optical imaging at the microscopic level. J Biomed Opt. 2010 Jan-Feb;15(1):011102.

Hightower JD, **Hightower CM**, Salazar Vázquez BY, and Intaglietta M. A New Piece to the Puzzle: Type 2 Diabetes in the Democratic Republic of Congo. Lectern presentation given at the National Medical Association Annual Convention and Scientific Assembly, Las Vegas, NV 2009.

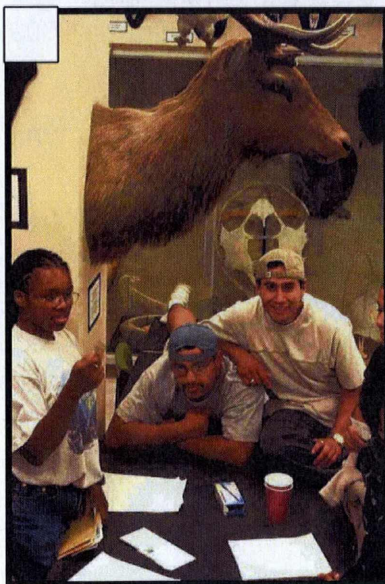
**Hightower CM**, Sapuppo F, and Intaglietta M. Bioengineering: The Evolution of Engineering to Life. Invited speaker, presented to the Facoltà di Ingegneria - Università degli Studi di Catania, Catania, Italy 2009.

**Hightower CM**, Hightower JD, Salazar Vázquez BY, and Intaglietta M. Seasonal hematocrit variation in the adult population of Kinshasa, Democratic Republic of Congo and health risks. Vascular Health and Risk Management 2009;5:1001-5.

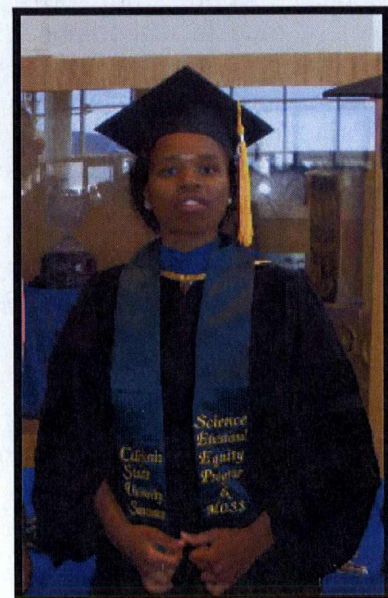
**Hightower CM**, Intaglietta M. Early iNOS impairment and late eNOS enhancement during reperfusion following 2.49 MHz continuous ultrasound exposure after ischemia. Ultrasonics Sonochemistry 2009 Jan;16(1):197-203.

**Hightower CM**, Intaglietta M. Diagnostic frequency continuous ultrasonography directly mitigates venular ischemia reperfusion damage. Journal of the American College of Surgeons 2008 Mar;206(3):540-7.

**Hightower CM** and Intaglietta M. The Use of Diagnostic Frequency Continuous Ultrasound to Improve Microcirculatory Function after Ischemia-Reperfusion Injury. Microcirculation 2007 Aug;14(6):571-582.



C. Makena Hightower (L) in 2000 with California State University, Sacramento undergraduate classmates Celso Espinoza (C) and Felix Perez (R).



Dr. C. Makena Hightower in May 2007 (wearing stole of her LSAMP Alma Mater) on the occasion of conferral of her Ph.D. in Bioengineering from UCSD,