chemical, biological & materials
college of engineering

Edgar A. O'Rear

RESEARCH INTERESTS

Surfactants, admicellar polymerization, application of admicellar polymerization for textile finishing; bioengineering—encapsulated plasminogen activators; secondary hypertension related renal artery anomalies; erythrocyte deformability; mechanical trauma to blood cells.

BIOGRAPHY

Dr. Edgar O'Rear joined the faculty of the University of Oklahoma in 1981 after completing his PhD at Rice University in Chemical (Biomedical) Engineering. He is the inventor and a leading authority on admicellar polymerization, a surface analogue of emulsion polymerization. His current work in this area involves the modification of cotton fabrics to impart water repellency and stain resistance while retaining the feel and breathability of the original material. In biomedical engineering, Dr. O'Rear and his students were the first to demonstrate and elucidate the mechanism of accelerated thrombolysis with encapsulated plasminogen activators. Recently, his group proposed a mechanism for secondary hypertension associated with renal artery aneurysm. His contributions to the literature include well over 100 archival publications and 7 patents.

Education
PhD, Chemical Engineering
Rice University, 1981
SM, Organic Chemistry
Massachusetts Institute of Technology, 1977
BS, Chemical Engineering
Rice University, 1975

Experience
Professor
University of Oklahoma
Affiliate Professor of Research
Department of Dental Materials, OU-HSC
Associate Dean for Research
University of Oklahoma
Program Director for Interfacial, Transport, and Separations Processes
NSF
Associate Professor
University of Oklahoma
Assistant Professor
University of Oklahoma

AWARDS, HONORS AND PROFESSIONAL ACTIVITIES

Member: BMES, AIChE, ACS, AAAS.
Fellow, AIMBE.
Advisory Board, *Journal of Biorheology*.
President, International Society of Biorheology, 2002-2005.
Service Award, International Society of Biorheology, 2005.
Governor's Cup, Inventor, 2008.
Innovator of the Year, 2009.
Regents Award for Superior Research and Creative Activity, 2010.

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SELECTED PROJECTS

Oklahoma Center for the Advancement of Science and Technology, "Oil, Water Repellent Fabric by Nanoscale Modification," $300K, Synthesized NanoCoatings, $76K, Feb. 2008-Jan. 2011.

U.S. Department of Education, "Graduate Assistance in Areas of National Need: Promoting Versatility in Doctoral Bioengineering Education," $507K, Aug. 2007-Aug. 2011.

DOT-FHA (sub-contract through OSU), "WMA Pavements in Oklahoma: Moisture Damage and Performance Issues," $91K, Apr. 2010-March 2011 (co-PI with Musharraf Zaman).

American Heart Association, "Transient Occlusions Associated with Renal Artery Aneurysms as a Cause of Renovascular Hypertension (Fellowship for Linden Down)," $25K, July 2010-June 2011 (PI with Dimitrios Papavassiliou).

SELECTED PUBLICATIONS

"Preparation and Comparison of Hydrophobic Cotton Fabric Obtained by Direct Fluorination and Admicellar Polymerization of Fluoromonomers," *Industrial Engineering and Chemistry Research*, Vol. 43, No. 19, pp. 6075-6079, 2010 (with J. Maity, P. Kothary and C. Jacobi).

"A Computational Investigation of the Geometric Factors Influencing the Severity of Renal Arterial Stenoses," *Journal of Biorheology*, Vol. 23, No. 2, pp. 102-110, 2009 (with L. Heflin, C. Street and D.V. Papavassiliou).

"Transient Stenotic-Like Occlusions as a Possible Mechanism for Renovascular Hypertension Due to Aneurysm," *Journal of the American Society of Hypertension,* Vol. 3, No. 3, pp.192-200, 2009 (with L.A. Heflin, C.B. Street, D.V. Papavassiliou, D.C. Kem and D. Wu).

"Effect of Sasobit and Aspha-Min on Wettability and Adhesion Between Asphalt Binders and Aggregates," *Transportation Research Record*, Vol. 2051, pp. 80-89, 2008 (with N.L.M. Wasiuddin and M.M. Zaman).

"Self-Extinguishing Cotton Fabric with Minimal Phosphorus Deposition," *Cellulose,* Vol. 15, No. 5, pp.731-737, 2008 (with A. Siriviriyanun and N. Yanumet).

"Admicellar Polymerization and Characterization of Thin Poly (2,2,2-Trifluorethyl Acrylate) Film over Aluminum Alloys for In-Crevice Corrosion Control," *Langmuir,* Vol. 20, No. 18, pp. 7802-7810, 2004 (with D. Le and M. Rieger-Kendrick).

"Thrombolysis in a Rabbit Model of Carotid Artery Thrombosis using Liposomal-Encapsulated and Microencapsulated Streptokinase," *Journal of Thrombosis and Haemostasis,* Vol. 90, No. 1, pp. 64-70, 2003 (with J.K. Leach, E. Patterson, Y. Miao and A.E. Johnson).