Department of Biomedical Engineering - USC Viterbi School of Engineering

The Fred S. Grodins Keynote Lecturer: Dr. Cato T. Laurencin

University Professor
Chemical and Biomolecular Engineering
Materials Science and Engineering
Orthopaedic Surgery (Medical School)
Reconstructive Sciences (Dental School)
at
University of Connecticut

Friday, January 14, 2022

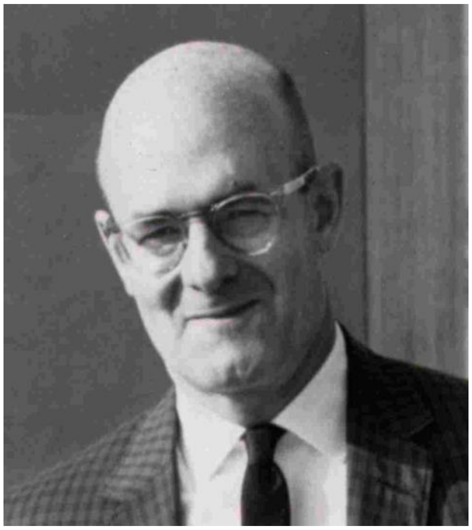
12:30 pm to 1:30 pm via ZOOM

Regenerative Engineering of Bone and Other Musculoskeletal Tissues

The treatment of injuries to bone that necessitate bone regeneration continues to be a major challenge for the orthopaedic surgeon. This burden is compounded by the constraints of supply and morbidity associated with autograft tissues, the gold standard of repair. The use of allografts, xenografts, or metal and ceramic implants overcomes many of the limitations associated with autografts but fails to provide a viable solution. We have worked in the area of engineering of bone with a focus on biomaterial selection, scaffold development, cell selection, cell/material interaction, growth factor delivery, and more recently developing inducible materials.

This entire body of work over more than thirty years has made matrix-based musculoskeletal engineering a viable clinical alternative, and has motivated the establishment of a new field: regenerative engineering. Regenerative Engineering involves new technologies harnessed over the past decade: advanced materials science including nanotechnology, advanced stem cell science, morphogenesis and developmental biology cues, the knowledge and appreciation of physical forces, and clinical translation. Our work has encompassed many aspects of these new technologies and heralds a bright future for the regeneration of bone and other complex tissues.

Bio: **Cato T. Laurencin, M.D., Ph.D.** is the University Professor at the University of Connecticut (one of only two at the school). He earned his B.S.E. in Chemical Engineering from Princeton, his Ph.D. in Biochemical Engineering/Biotechnology from M.I.T., and his M.D., *Magna Cum Laude*, from Harvard Medical School. Dr. Laurencin is a pioneer of Regenerative Engineering. He is an expert in biomaterials science, stem cell technology, nanotechnology and morphogenesis and has worked in the convergence of these areas. The American Institute of Chemical Engineers created the Cato T. Laurencin Regenerative Engineering Founder's Award recognizing his pioneering efforts. In receiving the Spingarn Medal, he was celebrated for his exceptional career that has made him the world's foremost engineer-physician-scientist. The American Association for the Advancement of Science awarded Dr. Laurencin the Philip Hauge Abelson Prize given 'for signal contributions to the advancement of science in the United States'. He received the National Medal of Technology and Innovation, the nation's highest honor for technological achievement, in ceremonies at the White House. Dr. Laurencin is an elected member of the National Academy of Engineering, the National Academy of Medicine, the National Academy of Sciences, and a fellow of the National Academy of Inventors, the American Academy of Arts and Sciences and the American Association for the Advancement of Science. Renowned internationally, he is a fellow of the National Academy of Sciences India, the Indian National Academy of Engineering, the African Academy of Sciences, The World Academy of Sciences, and is an Academician of the Chinese Academy of Engineering.



Grodins Keynote Lecture

Fred S. Grodins (1915-1989), joined the faculty at USC in 1967 as Professor of Physiology and Electrical Engineering. He established Biomedical Engineering at USC as a Graduate Program in 1969 and as an independent Department in 1976. Dr. Grodins served as Professor and Chairman of the BME Department from 1976-1986.

Acknowledged as one of the pioneers in the field of biomedical engineering, Dr. Grodins made profound and lasting contributions in the areas of control and communication in physiological systems. His famous monograph on "Control Theory and Biological Systems", published in 1963, is considered a landmark publication on the application of engineering control theory to physiological systems. Dr. Grodins published extensively in the areas of respiratory physiology, cardiovascular control, mathematical modeling and computer simulation. Throughout his career, Dr. Grodins was responsible for the training numerous graduate students and postdoctoral fellows. Through his legacy as the founding chair of the Department of Biomedical Engineering at USC, generations of undergraduate and graduate biomedical engineering students will contribute to advancing human health and well-being.

Dr. Grodins served on numerous governmental panels and advisory committees for the NIH, NSF and NASA, and was on the editorial boards of the American Journal of Physiology, the Journal of Applied Physiology, Circulation Research and Physiological Reviews. A past president and member of the board of directors of the Biomedical Engineering Society, Dr. Grodins was also a member of the American Physiological Society, Phi Beta Kappa, Sigma Xi, and the American Association for the Advancement of Science.

Dr. Grodins received his B.S., M.S., M.D. and Ph.D. (Physiology) degrees from Northwestern University. He served in the U.S. Air Force from 1944 to 1946. He was Abbott Professor of Physiology at Northwestern until his move to USC in 1967.

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