



TRAILBLAZERS
IN ENGINEERING

Regenerative Engineering: Chemistry and Materials Science in Regeneration

JULY

Cato T. Laurencin

University Professor at the University of Connecticut and Chief Executive Officer of The Cato T. Laurencin Institute for Regenerative Engineering at the University of Connecticut

KEYNOTE LECTURE

JULY 26 | 8:30-9:30 a.m.

THE CONVERGENCE CENTER | 101 Foundry Dr., Suite 1200

ABSTRACT

We define the field of Regenerative Engineering as the Convergence of Advanced Materials Science, Stem Cell Science, Physics, Developmental Biology, and Clinical Translation for the regeneration of complex tissues and organ systems. Work in the area of musculoskeletal tissue regeneration has focused on a number of technologies. Polymeric nanofiber systems create the prospect for biomimetics that recapitulate connective tissue ultrastructure allowing for the design of biomechanically functional matrices, and next generation matrices that create a niche for stem cell activity. Polymer and polymer-ceramic systems can be utilized for the regeneration of bone. Through the use of inducers, small molecules fostering induction, the design of regeneration-inducing materials can be realized. Hybrid matrices possessing micro and nano architecture can create advantageous systems for regeneration, while the use of classic principles of chemistry, materials science, and engineering can lead to the development of three-dimensional systems suitable for functional regeneration of tissues. Work in the creation of synthetic artificial stem cells present prospects for joint restoration. Through convergence of a number of technologies, we believe the prospect of engaging future grand challenges is possible.

BIOGRAPHY

Cato T. Laurencin, M.D., Ph.D. earned his B.S.E. in Chemical Engineering from Princeton, his M.D., Magna Cum Laude, from the Harvard Medical School, and his Ph.D. in Biochemical Engineering/Biotechnology from M.I.T.

He is the pioneer of the field of Regenerative Engineering.

In receiving the Spingarn Medal, he was named the world's foremost engineer-physician-scientist. Dr. Laurencin pioneered the novel use of polymeric biomaterials for treating musculoskeletal conditions. In recognition of his breakthrough achievements, the American Institute of Chemical Engineers created the Cato T. Laurencin Regenerative Engineering Founder's Award.

Dr. Laurencin's work spans fundamental science, applied science, engineering and technology translation. He has received the highest honors in all areas including Chemistry (Priestley Medal), Materials Science (Von Hippel Award), Chemical Engineering (Founder's Award), Biological Engineering (Jay Bailey Award), Biomedical Engineering (Pritzker Lectureship Award), Medical and Biological Engineering (Pierre Galletti Award) and Surgery (Nicolas Andry Award).

In science, engineering, medicine, and innovation, he is an elected member of the National Academy of Sciences, the National Academy of Engineering, the National Academy of Medicine, and an elected Fellow of the National Academy of Inventors. He is the first surgeon in history to be elected to all four national academies. Dr. Laurencin received the Philip Hague Abelson Prize, the highest honor of the American Association for the Advancement of Science, for "signal contributions to the advancement of science in the United States" for his work in Regenerative Engineering. He is the first person to receive both the oldest/highest award from the National Academy of Engineering (the Simon Ramo Founder's Award) and one of the oldest/highest awards of the National Academy of Medicine (the Walsh McDermott Medal). In innovation, Dr. Laurencin was awarded the National Medal of Technology and Innovation, America's highest honor for technological advancement, by President Barack Obama in ceremonies at the White House.

Dr. Laurencin is the University Professor and Albert and Wilda Van Dusen Distinguished Endowed Professor at the University of Connecticut.

He is Professor of Chemical and Biomolecular Engineering, Professor of Materials Science and Engineering and Professor of Biomedical Engineering at UConn.

He is the Chief Executive Officer of the Cato T. Laurencin Institute for Regenerative Engineering at UConn.

His autobiography has been published by Elsevier. It is entitled "Success is What You Leave Behind".



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