WACBE WEBINARS

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SATURDAY: JANUARY 16, 2021

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DISTINGUISHED BIOMEDICAL ENGINEERING WEBINAR

"Design of Biomaterials to Modulate Inflammation"

Kam W. Leong, PhD
Columbia University

ABOUT THE WEBINAR

Inflammation plays an important role in responding to danger signals arising from damage to our body and in restoring homeostasis. Controlling the inflammatory response is a major strategy in managing diseases such as cancer, autoimmunity, and wound healing. While conventional drug therapies are the norm in tackling inflammation, biomaterials are increasingly proposed to join the battle. Through drug delivery strategies, biomaterials potentiate the efficacy of anti-inflammatory drugs by improving bioavailability and diminishing side-effects. Applied in inhibitory or scavenging strategies, they reduce inflammation by removing the pro-inflammatory factors. For instance, the scavenging approach may be applied to inflammatory diseases such as rheumatoid arthritis, psoriasis, multiple sclerosis and systemic lupus erythematosus, which are increasingly linked to inappropriate and chronic activation of inflammatory cells. A central event in the pathogenesis of these diseases appears to be an aberrant activation of innate immune sensors, most prominently the Pattern Recognition Receptors (PRRs), by nucleic acids that are released from dead and dying cells. In this presentation, I will discuss the application of nucleic acid-binding polymers in the configuration of either soluble polycation or cationic nanoparticle to scavenge these nucleic acids as a molecular strategy to combat inflammation.

ABOUT THE SPEAKER

Kam W. Leong, PhD
Samuel Y. Sheng Professor; Department of Biomedical Engineering, Department of Systems Biology, Columbia University Medical Center

Kam W. Leong is the Samuel Y. Sheng Professor of Biomedical Engineering at Columbia University. He received his PhD in Chemical Engineering from the University of Pennsylvania. After serving as a faculty in the Department of Biomedical Engineering at The Johns Hopkins School of Medicine for almost 20 years, he moved to Duke University in 2006 to focus on the design of nanostructures for therapeutic applications. After moving to Columbia University in September 2014, he continues to work on nanoparticle-mediated nonviral gene delivery and and gene editing. He has published ~400 peer-reviewed and holds more than 60 issued patents. His work has been recognized by a Young Investigator Research Achievement Award of the Controlled Release Society, Distinguished Scientist Award of the International Journal of Nanomedicine, Clemson Award for Applied Research of the Society for Biomaterials, and Life Time Achievement Award of CASNN. He is the Editor-in-Chief of Biomaterials, a member of Academia Sinica, the International Institute of Medical and Biological Engineering, the USA National Academy of Inventors, the USA National Academy of Engineering, and the USA National Academy of Medicine.