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The HOWARD P. ISERMANN
DEPARTMENT OF CHEMICAL AND
BIOLOGICAL ENGINEERING

CBE Seminar Series – Fall 2021

Dr. You-Yeon Won

Professor
Davidson School of Chemical Engineering
Purdue University

Seminar: Wednesday, December 1, 2021

9:30 a.m. (ONLINE)

WebEx link: <https://rensselaer.webex.com/rensselaer/onstage/g.php?MTID=e37e95306c5c35fdd6bffa5aef309361>

Password: CBESeminar

“Polymer Lung Surfactant: A First-in-Class Therapeutic for ARDS Developed via Polymer Science Research”

Abstract:

Acute Respiratory Distress Syndrome (ARDS) is a life-threatening condition affecting about 200,000 patients in the United States each year. When ARDS occurs, the function of native lung surfactant becomes impaired, contributing to a severe decrease in blood oxygenation and eventually multiple organ failures. There are currently no therapeutic surfactant formulations which have been shown to be effective in treating this condition; all prior clinical trials testing animal-derived lung surfactants in ARDS patients were unsuccessful. Our laboratory has been exploring a radically different approach, in which, instead of conventional lipid/protein-based formulations, synthetic biocompatible polymers are used as the active therapeutic ingredient. This investigation led to the development of a treatment which uses an amphiphilic block copolymer formulation. This formulation has been shown to be more effective in ARDS mouse models compared to clinically available animal derived surfactants. The polymer formulation is a promising candidate for lung surfactant replacement therapy as it forms an insoluble monolayer at the alveolar air-water interface which is resistant to serum protein deactivation. This talk will present accounts of our polymer science research endeavors over the past few years that enabled the development of this first-in-class polymer lung surfactant therapy for ARDS treatment.

Biography:



Dr. Won earned a BS degree with top honors in Chemical Engineering from Seoul National University (1992). He received his PhD degree in Chemical Engineering from the University of Minnesota (2000), and Postdoctoral training in Applied Physics at Harvard (2001 – 2003) and in Materials Science and Engineering at MIT (2000 – 2001). Dr. Won joined the Purdue faculty as an Assistant Professor of Chemical Engineering in 2003, and was promoted to Full Professor in 2014. Dr. Won originally came from a background in polymer physics. Dr. Won’s current research focus is applying this polymer physics knowledge to developing (1) synthetic pulmonary surfactants for treatment of respiratory failure and (2) radio-luminescent theranostic agents for cancer treatment. Dr. Won founded two startup companies to commercialize these technologies.

Due to COVID-19, no refreshments will be available for this seminar.

For more information, please contact Lisa Martin (swishl@rpi.edu) or Helen Zha (zhar@rpi.edu)