CHEMICAL ENGINEERING

SEMINAR SERIES

KEITH COOK

Monday, February 29, 2016

Associate Professor, Biomedical Engineering
Carnegie Mellon University (CMU)

Shiny New Lungs: Engineering to Repair or Replace Damaged Lungs

ABSTRACT: The lungs are one of the most fragile organs, and unfortunately, we don't always treat them well. My talk will focus on my lab's development of new means to repair or replace damaged lungs. In the first part of the talk, I will focus on our development of artificial lungs for destination therapy. This work includes device design for mass transfer and fluid mechanics, but largely focuses on eliminating blood clot formation through biomaterials approaches. In the second part of the talk, I will discuss the development of perfluorocarbon emulsions to deliver drugs directly to the lung. This therapy has a wide range of applications, but I will discuss treating chronic or recurrent respiratory infections and enhancing alveolar repair following lung injury. Lastly, although I'm not a Chemical Engineer, I will discuss how my collaborations with Chemical Engineers have been essential to developing these new therapies.

BIO: Dr. Keith Cook is an Associate Professor at Carnegie Mellon University (CMU) in its Department of Biomedical Engineering. Prior to his appointment at CMU, Dr. Cook was a Research Associate Professor in Biomedical Engineering and in Surgery at the University of Michigan. It was at the University of Michigan where Dr. Cook obtained his BSE in both Mechanical Engineering and Engineering Science. He received his MS and PhD in Biomedical Engineering from Northwestern University. Dr. Cook's research focuses on applying biomedical engineering to cardiovascular and pulmonary medicine. This work includes the design and

RECEPTION 3:30 • LECTURE 4:00 – 5:00
PHYSICS ASTRONOMY BLDG. (PAA) A110

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BIO, CONTINUED: development of artificial lungs for long-term respiratory support, blood-biomaterial interactions, and pulmonary drug delivery via perfluorocarbon emulsions. Dr. Cook is a member of the American Society of Artificial Internal Organs and the Biomedical Engineering Society and is the Editor of the Respiratory Support Section for the American Society of Artificial Internal Organs (ASAIO) Journal.