Department of
Biomedical Engineering
UNIVERSITY OF WISCONSIN–MADISON

Spring 2019 Seminar Series

Medicine and Mechanics: Toward the Understanding of how Mechanical Forces Affect Lung Development, Growth and Injury

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Assistant Professor of Pediatric Surgery
University of Wisconsin School of Medicine and Public Health

Many diseases are caused by changes in how mechanical forces are applied on the organs or tissues, either because of a congenital defect or an intervention. Although physicians carry out treatments with the hope to restore the normal bodily functions, many of these treatments alter mechanical forces that can have life-long consequences. The effects of these treatments are more pronounced in infants and children as their bodies continue to grow and develop. The underlying mechanisms of mechanical force-induced diseases remain largely unknown. In the past two decades, there has been an increased interest in cellular mechanotransduction, the molecular mechanism of how cells sense and respond to mechanical signals. The purpose of this talk is to introduce the principles of mechanotransduction from a clinician's perspective. I will then discuss how altered mechanical forces cause lung diseases in congenital diaphragmatic hernia and mechanical ventilation. Lastly, I will discuss our early works to determine how changes in the mechanical environment affect lung development and cause lung injury using our novel models.

ABOUT the SPEAKER

Dr. Le is an Assistant Professor with the Division of Pediatric Surgery at UW. He is certified by the American Board of Surgery in General Surgery and Pediatric Surgery. He emphasizes minimally invasive approaches to all types of pediatric and neonatal surgical disorders. As an active faculty member of the International Pediatric Endosurgery Group, he's always at the forefront in minimally invasive surgery. Although he practices in all areas of general pediatric surgery, Dr. Le has a special interest in thoracic pediatric surgery and pediatric surgical oncology. Dr. Le's research interests compliment his clinical interests as his laboratory is investigating the effects of mechanical forces on lung development, regeneration, and injury.

Monday, April 15, 2019
12 PM in Tong Auditorium (1003 Engineering Centers)