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NEBRASKA CENTER FOR MATERIALS AND NANOSCIENCE
2014 SEMINAR SERIES PRESENTS

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Prof. Susan Margulies

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A Large Animal Model of Pediatric Traumatic Brain Injury

Animal models are used as surrogates for understanding mechanisms of traumatic brain injuries (TBIs) in humans, including understanding the biomechanics factors associated with tissue injuries, and the cascade physiological, functional and pathological responses at prescribed time-points after injury. Although they are our best substitute for humans, there are several challenges in using animal models to understand TBIs in children related to fidelity in the metrics and methods used to assess responses in animals. Can adult animals serve as models of the immature brain? Are focal lesions typically produced in animals informative about diffuse TBI in children? Are the metrics and methods used to assess responses in animals analogous to those used in humans? Finally, do the rodent and murine animal models for TBI have fidelity to human responses? We will discuss how large animal models provide a valuable platform for determining how head movements and impacts may produce a spectrum of brain injuries, for developing novel injury intervention strategies, and for testing new therapies.

Dr. Margulies is the George H. Stephenson Professor in Bioengineering in the School of Engineering and Applied Science at the University of Pennsylvania. She is an international leader in biomechanics of traumatic head injury in infants and toddlers, and in ventilator-associated lung injuries in adults. Dr. Margulies has over 30 years of experience in the area of traumatic brain injury research: integrating mechanical properties, animal models, instrumented dolls, patient data, and computational models to identify injury mechanisms that are unique to children and to develop clinical management and therapeutic strategies. With funding from NIH, NSF, CDC, and the Department of Transportation, she has published over 118 peer-reviewed papers. She has served or is on the editorial boards of the Journal of Physiology, the Journal of Biomechanical Engineering, the Journal of Biomechanics, American Journal of Physiology-Lung Cell and Molecular, and the Journal of Neurotrauma; she has served on grant review panels for NSF, NIH, and CDC, and has chaired the NIH RIBT study section, and on the 2013 IOM panel on Sports-Related Concussions in Youth.

Dr. Margulies received her BSE in Mechanical and Aerospace Engineering from Princeton University and Ph.D. in Bioengineering from the University of Pennsylvania. Dr. Margulies is a Fellow of the American Society of Mechanical Engineers, Biomedical Engineering Society, and American Institute for Medical and Biological Engineering.

Wednesday, April 16, 3:45 pm
Room 136 Jorgensen Hall

3:30 pm—Refreshments served in Jorgensen Atrium area

Host:
Prof. Linxia Gu
Department of Mechanical & Materials Engineering

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