

# Faculty Excellence Speaker Series



## BIOMATERIAL MECHANICS AND MUSCULOSKELETAL REGENERATION

Presented by Dr. David Mooney

### DATE

Monday,  
April 18, 2016

### TIME

1:00 – 2:00 p.m.

### LOCATION

College of Optics  
and Photonics  
(CREOL), Room 103

### HOSTED BY

Faculty Excellence,  
the Office of  
the Provost, and  
the Department  
of Mechanical  
and Aerospace  
Engineering

While the role of chemical signals in regeneration has been a focus for many years, it has become increasingly clear that physical cues may also play key roles.

Dr. Mooney's team has been studying the impact of biomaterial stiffness and time-dependent behavior on stem cells, and found that stem cell fate and ability to promote bone regeneration is highly regulated by both signals. In parallel, materials that provide mechanical stimulation, on-demand, directly to damaged muscle have been shown to promote skeletal muscle regeneration even after severe injury. The ability of biomaterials, via their intrinsic mechanical properties or mechanical stimulation of injured tissues, to promote regeneration suggests new paradigms for regenerative medicine.

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**David Mooney, Ph.D.**, is the Pinkas Family Professor of Bioengineering in the Harvard School of Engineering and Applied Sciences, and a Core Faculty Member of the Wyss Institute. His laboratory designs biomaterials to make cell and protein therapies effective and practical approaches to treat disease. His team created the first biomaterial-based, therapeutic cancer vaccine, currently in a clinical trial for melanoma. He is a member of the National Academy of Engineering and the National Academy of Medicine. He is the recipient of numerous awards, has multiple licensed inventions, and is active on industrial scientific advisory boards.