

ME 250 SEMINAR

Feel the Squeeze: The Role of Platelet Forces in Primary Hemostasis

Platelet biomechanics plays a critical role in bleeding. These cells are the first responders to injury for they attach to the damaged area and form a hemostatic plug that temporarily stops the loss of blood. Upon activation, platelets produce contractile forces through their actin and myosin proteins to form a strong and compact plug that can withstand the hemodynamic shear. Previous measurements of platelet forces have required bulk approaches, but they can be confounded by the effects of thrombin and fibrin generation. In this talk, I will discuss the microscale approaches my lab has developed to measure platelet forces and how this measurement is a strong indicator of their functionality in hemostasis. Specifically, I will discuss our findings using flexible, microfabricated substrates, microfluidics, and magnetic approaches. We have used these novel tools to evaluate the mechanobiology of platelets, bleeding risk in trauma patients, and improved storage conditions for platelet transfusions.

THURSDAY, NOVEMBER 19, 2020 | ZOOM | 11:00 AM - 11:50 AM



Nathan Sniadecki

Prof. Sniadecki is an expert in cell mechanics and the use of engineering and nanotechnology for understanding the mechanobiology of cells. He is the Director of the Heart Regeneration Program at UW Medicine and Associate Director of the Institute for Stem Cell and Regenerative Medicine. He received his B.S. in Mechanical Engineering from the University of Notre Dame and his Ph.D. in Mechanical Engineering from the University of Maryland with Prof. Don DeVoe. He was a NIH NRSA postdoctoral fellow in Biomedical Engineering at Johns Hopkins University and a Hartwell Fellow at the University of Pennsylvania in Bioengineering with Prof. Chris Chen. He is a recipient of the NSF's CAREER award, DARPA's Young Faculty Award, UW's Kobayashi Professorship, and ASME's Lloyd Hamilton Donnell Award.