



MECHANICAL ENGINEERING SEMINAR

Wednesday, March 13 2024, at 11:00, D. Dan and Betty Kahn Building, Room 217

Molecular basis for surface initiated non-thrombogenic clot formation following viral infection

Miriam Rafailovich, Ph.D.

Distinguished Professor of Materials Science and Chemical Engineering
Stony Brook University

Email: miriam.rafailovich@stonybrook.edu

Hosted by: Prof. E. Zussman

We have developed a comprehensive molecular model explaining the origin of non-thrombogenic clot formation on hydrophobic surfaces due to alteration of the conformation of adsorbed fibrinogen. When these surfaces are in contact with blood plasma, soluble fibrin is recruited forming large fibers, expressing multiple platelet binding domains, resulting in surface anchored clots. In this work we show that a similar mechanism may be occurring on the endothelial tissue surface after viral infection. Even though the endothelium is not directly infected, inflammatory factors expressed by nearby epithelial cells such as the ubiquitous lipid shower, deposit a hydrophobic coating on vascular tissue, initiating large thrombi in the absence of thrombin. Using different human viruses, we show that this is a general phenomenon associated with viral infection. The molecular level detail we have obtained can be used to predict predisposition to thrombosis following infection as well as design of peptides that can prevent it.

.