CENTER FOR FLUID MECHANICS
AND
THE FLUIDS, THERMAL AND CHEMICAL PROCESSES GROUP
OF
THE DIVISION OF ENGINEERING
SEMINAR SERIES

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Computational Modeling of Blood Clotting

Intravascular hemostasis and thrombosis occur under flow and this can profoundly influence the progress of clot formation. This talk will focus on two different aspects of our efforts to model and probe the interactions of flow and clotting. One involves the biochemistry of the coagulation enzyme network and how the behavior of this system is affected by flow-mediated platelet deposition on an injury and by flow-mediated transport of the enzymes and their precursors. The other involves a continuum model that describes platelet thrombosis initiated by a ruptured atherosclerotic plaque in a coronary-artery-sized vessel. This model includes full treatment of the fluid dynamics, and the aggregation of platelets in response to the plaque rupture and further chemical signals. Among the behaviors seen with this model are the growth of wall-adherent platelet thrombi to occlude the vessel and stop the flow, and the transient growth and subsequent embolization of thrombi leaving behind a passivated injured surface.

TUESDAY, SEPTEMBER 11, 2007
Barus & Holley, Room 190
3:00pm