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**High performance lattice boltzmann method yield-stress calculations based on intravital images of clot formation in live mice.** VISHNU DEEP CHANDRAN, FEMI KADRI, ROMAN VORONOV, New Jersey Inst of Tech — Thrombo-embolic infarction is the major cause of mortality and morbidity in the United States. Conversely, deficiencies in these processes result in severe bleeding risks such as undesirable blood clotting (or thrombosis).Unfortunately, despite tremendous efforts in understanding thrombosis, the viscoelastic properties of thrombi that are responsible for embolism are not well understood. The ability to access hydrodynamics stresses at which thrombus structure yield to deformation in a blood vessel can provide meaningful information on when the thrombus is likely to embolize. Lack of an accurate method/model for estimating the stresses acting on a thrombus in vivo prompted us to develop a computational approach which combines intravital imaging and simulation. Interestingly, the viscoelastic behavior exhibited by the thrombus resembles that of a Bingham fluid - a material that behaves as a rigid body at low stresses but flows as a viscous fluid when it experiences stresses in excess for its "*critical yield stress*". Hence, a Lattice-Boltzmann method simulation of blood flow past a thrombus volume (obtained from 3D-reconstructions of microscopic thrombus images) was used to investigate this process and other associated events. Our simulation provides an estimate of the critical yield stress at which thrombi yield behavior occurs.

Femi Kadri
New Jersey Inst of Tech

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