Abstract Submitted
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Developing Mesoscale Model of Fibrin-Platelet Network Representing Blood Clotting =[1] YUEYI SUN, SVETOSLAV NIKOLOV, SAM BOWIE, ALEXANDER ALEXEEV, WILBUR LAM, DAVID MYERS, Georgia Institute of Technology — Blood clotting disorders which prevent the body's natural ability to achieve hemostasis can lead to a variety of life threatening conditions such as, excessive bleeding, stroke, or heart attack. Treatment of these disorders is highly dependent on understanding the underlying physics behind the clotting process. Since clotting is a highly complex multi scale mechanism developing a fully atomistic model is currently not possible. We develop a mesoscale model based on dissipative particle dynamics (DPD) to gain fundamental understanding of the underlying principles controlling the clotting process. In our study, we examine experimental data on clot contraction using stacks of confocal microscopy images to estimate the crosslink density in the fibrin networks and platelet location. Using this data we reconstruct the platelet rich fibrin network and study how platelet-fibrin interactions affect clotting. Furthermore, we probe how different system parameters affect clot contraction.

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