

Abstract Submitted
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Grow with the Flow: A Dynamic Tale of Blood Clot Formation

KARIN LEIDERMAN, AARON FOGELSON, University of Utah — The body heals injured blood vessels and prevents bleeding by clotting the blood. Clots are primarily made of blood-borne cells and a fibrous material that is assembled at the site of injury in flowing blood. Clot composition and structure change with local chemistry and fluid dynamics, which in turn alter the flow. To better understand this fluid-structure coupling, we have created a mathematical model to simulate the formation of a blood clot in a dynamic fluid environment. The growing clot is represented as a mixed porous medium whose permeability is dependent on the coagulation chemistry within it. The flow field resulting from a clot with specific calculated permeability and size can then be recovered by solving the Navier-Stokes equations with an added friction term. We report on how this complex fluid-structure interaction affects the limiting factor(s) of blood clot growth.

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