

Abstract Submitted  
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**A Computational Chemo-Fluidic Modeling for the Investigation of Patient-Specific Left Ventricle Thrombogenesis**<sup>1</sup> RAJAT MITTAL, JUNG HEE SEO, THURA ABD, RICHARD T. GEORGE, Johns Hopkins University — Patients recovering from myocardial infarction (MI) are considered at high-risk for cardioembolic stroke due to the formation of left ventricle thrombus (LVT). The formation of LVT is the result of a complex interplay between the fluid dynamics inside the ventricle and the chemistry of coagulation, and the role of LV flow pattern on the thrombogenesis was not well understood. The previous computational study performed with the model ventricles suggested that the local flow residence time is the key variable governing the accumulation of coagulation factors. In the present study, a coupled, chemo-fluidic computational modeling is applied to the patient-specific cases of infarcted ventricles to investigate the interaction between the LV hemodynamics and thrombogenesis. In collaboration with the Johns Hopkins hospital, patient-specific LV models are constructed using the multi-modality medical imaging data. Blood flow in the left ventricle is simulated by solving the incompressible Navier-Stokes equations and the biochemical reactions for the thrombus formation are modeled with convection-diffusion-reaction equations. The formation and deposition of key coagulation chemical factors are then correlated with the hemodynamic flow metrics to explore the biophysics underlying LVT risk.

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