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Modeling malaria infected cells in microcirculation AMIR HOSSEIN RAFFIEE, SADEGH DABIRI, AREZOO MOTAVALIZADEH ARDEKANI, Purdue Univ — Plasmodim (P.) falciparum is one of the deadliest types of malaria species that invades healthy red blood cells (RBC) in human blood flow. This parasite develops through 48-hour intra-RBC process leading to significant morphological and mechanical (e.g., stiffening) changes in RBC membrane. These changes have remarkable effects on blood circulation such as increase in flow resistance and obstruction in microcirculation. In this work a computational framework is developed to model RBC suspension in blood flow using front-tracking technique. The present study focuses on blood flow behavior under normal and infected circumstances and predicts changes in blood rheology for different levels of parasitemia and hematocrit. This model allows better understanding of blood flow circulation up to a single cell level and provides us with realistic and deep insight into hematologic diseases such as malaria.

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