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The deformed behavior of multiple red blood cells in a capillary flow[1] XIAOBO GONG, Organ and Body Scale Team, RPCS, RIKEN, SHU TAKAGI, Organ and Body Scale Team, RPCS, RIKEN and Dept. Mech. Eng., The University of Tokyo, KAZUYASU SUGIYAMA, YOICHIRO MATSUMOTO, Dept. Mech. Eng., The University of Tokyo — The detailed deformation of multiple red blood cells in capillary flows is investigated computationally and hydrodynamics in the capillary flow accompanied with the deformation of red blood cells are analyzed. The membrane of red blood cell is modeled as a hyperelastic thin-shell and the immersed boundary method is used for the fluid-structure coupling in the present simulations. Numerical results show that the apparent viscosity in the capillary flow increases with the increase of the shear coefficient in the membrane of red blood cell, while this change for the viscosity is not obvious when the stiffness of the membrane changes. The distribution of multiple red blood cells in a capillary with branches is also simulated which shows that the apparent viscosity in the flow and the distribution of the cells affect each other interactively.

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Xiaobo Gong
Organ and Body Scale Team, RPCS, RIKEN

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