Motion of individual red blood cells in a concentrated suspension flowing through micro-channels

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Abstract

In this study, we use a confocal micro-PIV (Particle Image Velocimetry) system to investigate red blood cell motions flowing in micro-channels. This system enables us to visualize the individual RBCs even in the high Hct blood by exciting the labeled RBCs by the laser. We measure individual trajectories of RBCs in a micro-channel with stenosis or bifurcation under high Hct conditions. Our results clearly demonstrate that the trajectories of RBCs strongly depend on the hematocrit, the RBC property and the position in the micro-channel. This information is important for a better understanding of mass transport in the microcirculation.

Key words: Blood flow, Micro-circulation, Red blood cell, confocal micro-PIV, Visualization, Stenosis, Bifurcation