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A simulation study of flow dynamics of erythrocytes through diverging and converging bifurcations[1] TONG WANG, Nanjing University of Aeronautics and Astronautics, ZHONGWEN XING, Nanjing University — A numerical model has been developed to predict the cells deformation and motion in a symmetric diverging and converging bifurcation of a microchannel. Fluid dynamics and membrane mechanics are incorporated. The model was utilized to evaluate the effect of different biophysical parameters, such as: initial cell position, membrane stiffness and shape of the cells on deformation and motion of the erythrocytes in the bifurcating curved microchannel. The numerical results demonstrate that erythrocytes in microvessels blunt velocity profiles in both straight section and daughter branches, and the transit velocity of erythrocytes is strongly influenced by cell deformability, shape of the cells, and the vessel geometry. These results may provide fundamental knowledge for a better understanding of hemodynamic behavior of microscale blood flow.

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