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Subtle exchange model of flow depended on the blood cell shape to enhance the micro-circulation in capillary[1] IATNENG CHAN, Physics Group, Faculty of Science and Technology, University of Macau — In general the exchange of gases or other material in capillary system is conceptualized by the diffusion effect. But in this model, we investigate a micro-flow pattern by simulation and computation on a micro-exchange model in which the blood cell is a considered factor, especially on its shape. It shows that the cell benefits the circulation while it is moving in the capillary. In the study, the flow detail near the cell surface is mathematically analyzed, such that the Navier-Stokes equations are applied and the viscous factor is also briefly considered. For having a driven force to the motion of micro-circulation, a breathing mode is suggested to approximately compute on the flow rate in the blood capillary during the transfer of cell. The rate is also used to estimate the enhancement to the circulation in additional to the outcome of diffusion. Moreover in the research, the shape change of capillary wall under pressure influence is another element in the beginning calculation for the effect in the assistance to cell motion.

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