Lattice Boltzmann simulations of leukocyte rolling and deformation in a three-dimensional shear flow YE LUO, DEWEI QI, Western Michigan University, GUOWEI HE, LNM, Institute of Mechanics, Chinese Academy of Sciences, Beijing, 100080, China — Lattice Boltzmann simulation is used to simulate the motion of a leukocyte in fluid. The cell membrane is built by lattice spring model. The interaction between the fluid flow and the solid surface is treated by immersed boundary method. Stochastic Monte Carlo method is used to deal with receptor/ligand interaction. It is shown that the model can correctly predict the characteristic "stop-and-g" motion of rolling leukocytes. Effects of cell deformation, shear rates, bonding force, microvilli distribution on rolling are studied and compared with experiments.

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