

Abstract Submitted
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Study of Microfluidic System for Mechanical Property Measurement of Fluid-cell Interface¹ JI YOUNG MOON, Yonsei University, The University of Sydney, JUNG SHIN LEE, SE BIN CHOI, HONG MIN YOON, Yonsei Univ, ROGER I. TANNER, The University of Sydney, JOON SANG LEE, Yonsei Univ — The system for measuring the mechanical properties of active cell is studied through an integrated microfluidic system for cell separation, alignment and measurement of mechanical properties. A highly efficient lattice Boltzmann method (LBM) was employed to optimize the micro-fluidic system to investigate the interrelations between mechanical properties and various surrounding fluid ingredients which are difficult to observe using current experimental techniques. A combination model of the three dimensional LBM and the immersed boundary method (IBM) were used to simulate these systems. The LBM was used to determine incompressible fluid flow with a regular Eulerian grid. The IBM was used to solve the deformation of cells and matrix fluid interaction with a Lagrangian grid. Highly non-linear results such as cell-cell interactions, fluid-cell interactions, and optical force-cell interactions is studied.

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