Abstract Submitted
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Probing eukaryotic cell mechanics via mesoscopic simulations IGOR V. PIVKIN, KIRILL LYKOV, USI Lugano, Switzerland, YASAMAN NEMATBAKHSH, MENGLIN SHANG, CHWEE TECK LIM, National University of Singapore, Singapore — We developed a new mesoscopic particle based eukaryotic cell model which takes into account cell membrane, cytoskeleton and nucleus. The breast epithelial cells were used in our studies. To estimate the viscoelastic properties of cells and to calibrate the computational model, we performed micropipette aspiration experiments. The model was then validated using data from microfluidic experiments. Using the validated model, we probed contributions of sub-cellular components to whole cell mechanics in micropipette aspiration and microfluidics experiments. We believe that the new model will allow to study in silico numerous problems in the context of cell biomechanics in flows in complex domains, such as capillary networks and microfluidic devices.

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