

A coarse-grained elastic model for cell deformation.

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A broad range of *in silico* models (e.g., liquid or viscoelastic drop models) has been introduced to reproduce the complex mechanical properties of various cell types [1]. These models are used to understand and quantify experimental measurements. In this work, we employ a coarse-grained cell model which incorporates the membrane properties similar to the RBC-model [2] and an elastic inner mesh to include the cytoskeletal properties. The model is formulated in the framework of the dissipative particle dynamics simulation method and can include multiple cell compartments with different mechanical properties. We perform various mechanical tests that are similar to experiments [1] to determine the mechanical properties of a single cell. We also investigate the deformation of this cell in fluid flow. We expect that this model will help us better understand the contributions of different cell compartments to overall cell deformation.

[1] M. Rodriguez et al., Applied Mechanics Reviews (2013)

[2] H. Turlier, et al., Nature Physics in press (2015)