APS March Meeting 2019

View Abstract

CONTROL ID: 3095282

TITLE: A web-based application of the Cellular Force-Inference Toolkit (CellFIT)

Abstract Body: Given an image of an epithelial cell sheet, CellFIT can infer cellular forces by segmenting the image into individual cells, constructing equilibrium equations for the points where cells meet at triple junctions, and finding a least-squares solution for the tensions at cell-cell interfaces. Similarly, cellular pressures can be estimated by constructing Laplace equations that relate the edge tensions, curvatures and cellular pressure differences. Despite these capabilities, the accessibility of CellFIT to scientists of all backgrounds is not yet optimized. We will present an updated web-based application of CellFIT that allows users to access the software from a browser. The updated version includes improved error handling and the implementation of additional functionality for reading and processing image stacks. Application of the web-based CellFIT to time-resolved image stacks of wound healing in Drosophila epithelia demonstrates spatial and temporal variations in cellular forces as the wounds close.

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