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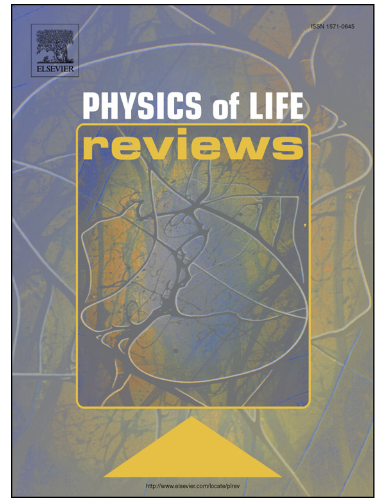

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How Can We Predict Cellular Mechanosensation?

Comment on "Cellular Mechanosensing of the Biophysical Microenvironment: A Review of Mathematical Models of Biophysical Regulation of Cell Responses" by Bo Cheng et. al.

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Introduction

In this issue Cheng et al. [1] presents a great review of cutting edge modeling approaches in mechanobiology. This field continues to expand at a fantastic rate and keeping all of the most recent work in perspective is advanced tremendously by this review. The authors review a wide variety of important areas in this article including the influence of mechanical force, matrix shape and rigidity, and fluid flow and shear stress on the cell. The discussion and presentation of the dynamics involved are very essential due to the rapidly changing nature of biological sensing from a biophysics perspective. Furthermore, the direction of feedback and response in biology is particularly important. While feedback is a concept that is designed into many man-made systems, biology has innate feedback mechanisms already embedded within its structures. If we are to ever fully exploit biology to our benefit we must first be able to model and predict its feedback behavior. Figuring out the sophisticated ways that biology accomplishes feedback and control requires mathematical modeling as the authors present. Therefore, in this commentary we highlight the wonderful advances in mathematical modeling in mechanobiology through a variety of methods presented by the authors. These models will impact a variety of fields from heart disease to traumatic brain injury.

Modeling Mechanosensing in Response to External Mechanical Forces

Cheng et al. [1] explores mathematical models related to cellular mechanosening that are essential to understanding how cells respond to its