Title:	Deconstructing the role of myosin contractility in force fluctuations within focal adhesions
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Keywords:	Deconstructing contractility Fluctuations Focal adhesions
Issue Date:	2022
Publisher:	Elsevier
Citation:	Biophysical Journal, 121(9), 1753-1764.
Abstract:	Force fluctuations exhibited in focal adhesions that connect a cell to its extracellular environment point to the complex role of the underlying machinery that controls cell migration. To elucidate the explicit role of myosin motors in the temporal traction force oscillations, we vary the contractility of these motors in a dynamical model based on the molecular clutch hypothesis. As the contractility is lowered, effected both by changing the motor velocity and the rate of attachment/detachment, we show analytically in an experimentally relevant parameter space, that the system goes from decaying oscillations to stable limit cycle oscillations through a supercritical Hopf bifurcation. As a function of the motor activity and the number of clutches, the system exhibits a rich array of dynamical states. We corroborate our analytical results with stochastic simulations of the motor-clutch system. We obtain limit cycle oscillations in the parameter regime as predicted by our model. The frequency range of oscillations in the average clutch and motor deformation compares well with experimental results
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1016/j.bpj.2022.03.025 (https://doi.org/10.1016/j.bpj.2022.03.025) http://hdl.handle.net/123456789/4516 (http://hdl.handle.net/123456789/4516)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

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