

Abstract Submitted  
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**Observation of Non-local Mechanical Responses to Locally Applied Forces in Cells using Magnetic Micropost Arrays** CORINNE LAMB, YAOHUA LIU, DANIEL REICH, Johns Hopkins University, NATHAN SNI- ADECKI, University of Washington, CHRISTOPHER CHEN, University of Penn- sylvania — The process of force transduction by living cells is linked to changes in cellular function. To study the cellular response to applied forces, we have developed a novel force detection device, which can also be used to apply external forces to a cell. Cells are cultured atop an array of micrometer scale elastomeric posts, which act as independent sensors to cellular traction forces. An external force is applied to the adherent surface of the cell via a magnetic torque on a cobalt nanowire embed- ded in a single post. Results measuring the spatially resolved forces exerted by the cell over time indicate two responses: a sudden or a gradual global relaxation of the cell in response to a single force actuation.<sup>1</sup> In both cases, the subcellular distri- bution of loss in traction forces was not concentrated near the point of stimulation but occurred instead at discrete locations around the cell's periphery. Observation of these adaptive non-local responses is potentially important in understanding how external forces are transduced into biochemical regulators of cell function.

<sup>1</sup>N. Sniadecki, et. al, "Magnetic microposts as an approach to apply forces to living cells," *Proc Natl Acad Sci*, 104, no. 37 (2007): 14553

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