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**Cell response to long term mechanical interaction with nanopipettes** ZULFIYA ORYNBAYEVA, Drexel University, RIJU SINGHAL, ELINA VITOL, MICHAEL BOUCHARD, JANE AZIZKHAN-CLIFFORD, BRADLEY LAYTON, GARY FRIEDMAN, YURY GOGOTSI, KECK INSTITUTE FOR ATTOFLUIDIC NANOTUBE-BASED PROBES TEAM — Traditional microinjection into cells is performed over a relatively short term. Pipettes are typically withdrawn following any kind of injection. On the other hand, there is growing interest in using nanopipettes for cellular and subcellular probing. This interest is partly due to new developments in nanopipette technology which employ carbon nanotubes and provide robustness, flexibility, and biocompatibility. However, as far as we know, no systematic study of physiological, biochemical, and biophysical processes associated with cell response to lengthy mechanical stimulations by nanopipette probing have been performed so far. We present a detailed investigation of a wide range of effects of long term pipette insertion into a cell. Both traditional glass micropipettes and the novel carbon nanotube-tipped probes were involved in this study. The mechanism of Ca2+ response to the mechanical stimuli introduced by the nanopipette, and the role of different organelles in this mechanism were studied. We hypothesize that the calcium response is a function of cytoskeleton integrity and the mode of coupling between the cytoskeleton and the plasma membrane domains.

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