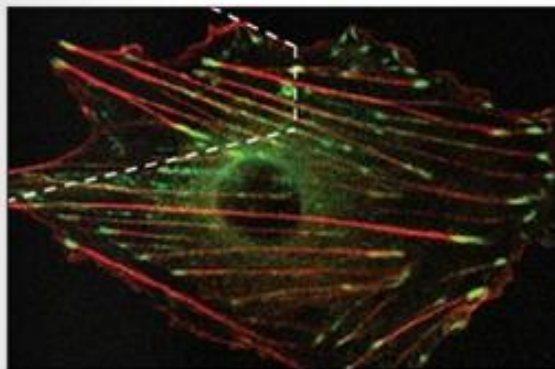


microscopy

AND ANALYSIS

Photometrics in Texas



Dr Andreea Trache, an assistant professor at the Texas A&M Health Science Center in College Station, Texas, has designed one of the first integrated microscopy systems that can simultaneously stimulate and image live-cell responses in real time (see *Journal of Visualized Experiments*, DOI: 10.3791/2072; or visit <http://bit.ly/AndreeaTrache>).

Andreea designed this setup to better understand the molecular mechanisms responsible for vascular cells remodeling in response to mechanical stimulation. The integrated system used an AFM tip coated with fibronectin to mechanically stimulate the cortical actin fibers beneath the apical cell surface. Simultaneously, the mechanically induced cytoskeletal reorganization throughout the cell was captured at high spatial and temporal resolution by either total internal reflection fluorescence (TIRF) microscopy or fast spinning-disk (FSD) confocal microscopy.



For a camera to synchronize with the spinning disk of the confocal scanning head, Trache relied on a pair of Photometrics Quant^{EM} EMCCD cameras, which provided the necessary synchronization as well as superior signal-to-noise sampling and sufficient dynamic range for both FSD confocal and TIRF microscopy. This resulted in 3-dimensional imaging over time of the adaptive responses of cells to mechanical force at high resolution.