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**Causes of retrograde flow in fish keratocytes** THOMAS FUHS, Aarhus University, Denmark, MICHAEL GOEGLER, CLAUDIA A. BRUNNER, University of Leipzig, Germany, CHARLES W. WOLGEMUTH, University of Arizona, Tucson, Arizona, JOSEF A. KAES, University of Leipzig, Germany — Confronting motile cells with AFM-cantilevers serving as obstacles and doubling as force sensors we tested the limits of the driving actin and myosin machinery. We could directly measure the force necessary to stop actin polymerization as well as the force present in the retrograde actin flow. Combined with detailed measurements of the retrograde flow velocity and specific manipulation of actin and myosin we found that actin polymerization and myosin contractility are not enough to explain the cells behavior. We show that ever-present depolymerization forces, a direct entropic consequence of actin filament recycling, are sufficient to fill this gap, even under heavy loads.

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