

Abstract Submitted  
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**Stall Force and Response of Lung Cilia** RICHARD SUPERFINE, DAVID HILL, VINAY SWAMINATHAN, E. TIMOTHY O'BRIEN, University of North Carolina, RIC BOUCHER, BRIAN BUTTON, ASHLEY ESTES — We report on the response of lung cilia to applied forces. We have applied magnetic forces to magnetic beads attached to individual human lung cilia in cell cultures. Our magnetic system is capable of generating large forces ( $\sim 1$  nanoNewton on 1 micron beads) with a 3kHz bandwidth. We record the cilia beat motion using video microscopy to record beat frequency and amplitude as a function of applied force. We present three major findings. First, the stall force is approximately 150 pN. Second the frequency is unchanged by the application of forces up to the stall point. Third, the speed of the beat motion slows down according to the diminution of the beat amplitude while maintaining a constant frequency and the speed of the motion is the same whether the beat direction is in the same direction as the applied force or against the applied force.

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