

Abstract Submitted
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Flagellar waveform analysis of swimming algal cells¹ HUSEYIN KURTULDU, KARL JOHNSON, JERRY GOLLUB, Haverford College — The twin flagella of the green alga *Chlamydomas reinhardtii* are driven by dynein molecular motors to oscillate at about 50-60 Hz in a breaststroke motion. For decades, *Chlamydomas* has been used as a model organism for studies of flagellar motility, and of genetic disorders of ciliary motion. However, little is known experimentally about the flagellar waveforms, and the resulting time-dependent force distribution along the 250 nm diameter flagella. Here, we study flagellar dynamics experimentally by confining cells in quasi-2D liquid films. From simultaneous measurements of the cell body velocity and the time-dependent velocities along the center lines of the two flagella, we determine the drag coefficients, and estimate the power expended by the body and the flagella, comparing our findings with measurements² based on the induced fluid flow field. We contrast the results for the quite different beating patterns of synchronous and asynchronous flagella, respectively.

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²J.S. Guasto et al., Phys. Rev. Lett. 105, 168102 (2010)

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