

Abstract Submitted  
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**Quantifying Spatiotemporal Patterns in the Expansion of Twitching Bacterial Colonies** ERIN SHELTON, MAXIMILIANO GIULIANI, University of Guelph, LORI BURROWS, McMaster University, JOHN DUTCHER, University of Guelph — Type IV pili (T4P) are very thin (5-8 nm in diameter) protein filaments that can be extended and retracted by certain classes of Gram-negative bacteria including *P. aeruginosa* [1]. These bacteria use T4P to move across viscous interfaces, referred to twitching motility. Twitching can occur for isolated cells or in a collective manner [2]. We have developed experimental and data analysis techniques to quantify the expansion of *P. aeruginosa* PAO1 bacterial colonies at the glass-agar interface under well-controlled environmental conditions. By using particle image velocimetry (PIV) and Fourier analysis techniques, we have characterized the evolution of the advancing front of expanding colonies for a range of agar concentrations. This has allowed us to observe a transition in the collective motion of the bacterial cells as the agar concentration is increased. [1] Burrows, L.L. (2012) *Annu. Rev. Microbiol.* 66: 493–520; [2] Semmler, A.B., Whitchurch, C.B., Mattick, J.S. (1999) *Microbiology* 145: 2863-2873.

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