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Hydrodynamic Contributions to Amoeboid Cell Motility OWEN LEWIS, ROBERT GUY, University of California - Davis — Understanding the methods by which cells move is a fundamental problem in modern biology. Recent evidence has shown that the fluid dynamics of cytoplasm can play a vital role in cellular motility. The slime mold Physarum polycephalum provides an excellent model organism for the study of amoeboid motion. In this research, we use both analytic and computational models to investigate intracellular fluid flow in a simple model of Physarum. In both models, of we are specifically interested in stresses generated by cytoplasmic flow which act in the direction of cellular motility. In our numerical model, the Immersed Boundary Method is used to account for such stresses. We investigate the relationship between contraction waves, ?ow waves and locomotive forces, and attempt characterize conditions necessary to generate directed motion.

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