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Information propagation and nutrient flow in *Physarum polycephalum* GABRIEL AMSELEM, FRANCOIS PEAUDECERF, KAREN ALIM, School of Engineering and Applied Sciences, Harvard University, JACQUES DUMAIS, ANNE PRINGLE, Department of Organismic and Evolutionary Biology, Harvard University, MICHAEL BRENNER, School of Engineering and Applied Sciences, Harvard University — Basal organisms such as slime mold and fungi grow as extended networks that can reach several square meters in size. Despite lacking a central coordination center, these organisms are able to globally reshape their morphology in response to local cues, such as the presence of a patch of nutrient. How are local signals integrated in these organisms, and how do they lead to an overall response? To answer this question, we focus on the flow of nutrients in the slime mold *Physarum polycephalum*. This slime mold exhibits internal flow oscillations, as well as periodic contractions of its veins. Using plastic masks, we constrain network growth to simple geometries. This allows for an experimental characterization of the relationship between the contractions and the flow. We next describe the change in the overall oscillation pattern when a food source is presented locally to the slime mold, and its implication on the internal flow. Internal flows are both inferred from the contraction pattern and experimentally measured using fluorescent markers.

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