

Abstract Submitted
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Large scale spontaneous synchronization of cell cycles in amoebae IGOR SEGOTA, LAURENT BOULET, CARL FRANCK, Cornell University — Unicellular eukaryotic amoebae *Dictyostelium discoideum* are generally believed to grow in their vegetative state as single cells until starvation, when their collective aspect emerges and they differentiate to form a multicellular slime mold. While major efforts continue to be aimed at their starvation-induced social aspect, our understanding of population dynamics and cell cycle in the vegetative growth phase has remained incomplete. We show that substrate-grown cell populations spontaneously synchronize their cell cycles within several hours. These collective population-wide cell cycle oscillations span millimeter length scales and can be completely suppressed by washing away putative cell-secreted signals, implying signaling by means of a diffusible growth factor or mitogen. These observations give strong evidence for collective proliferation behavior in the vegetative state and provide opportunities for synchronization theories beyond classic Kuramoto models.

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