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Experimental Insights into Collective Effects in Eukaryotic Cell Proliferation in Dilute Suspensions CARL FRANCK, IGOR SEGOTA, ARIANA STRANDBURG-PESHKIN, XIAO-QIAO S. ZHOU, ARCHANA RACHAKONDA, BENJAMIN YAVITT, CATHERINE J. LUSSENHOP, SUNGSU LEE, KEVIN THARRATT, AMRISH DESHMUKH, ELISABETH SEBESTA, MYRON ZHANG, SHARON LAU, SARAH BENNEDSEN, DAVID FRANCK, VIYATH FERNANDO, JUNSEOK OH, Cornell Univ. — Physicists can look to dilute suspensions of apparently solitary cells in suspension for elegant realizations of multicellular behavior. In contrast to our earlier work (Phys. Rev. E v. 77, 041905 (2008)) with the amoeba Dictyostelium discoideum we are discovering that the vital intercellular communications responsible for the well-known but poorly understood slow to fast transition in a growing culture as a function of time might be due to the passage of chemical messages between transient cell clusters or throughout the entire system as opposed to binary collisions. In considering the observed variation in proliferation rates we have been surprised to discover that for best growth cultures are much more dependent on incubator geometry than previously suspected.

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