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Characterizing tunable dynamics in an active gel GIL HENKIN, STEPHEN DECAMP, DANIEL CHEN, ZVONIMIR DOGIC, Brandeis University — We experimentally investigate dynamics of an active gel of bundled microtubules that is driven to far-from-equilibrium steady states by clusters of kinesin molecular motors. Upon the addition of ATP, the coordinated action of thousands of molecular motors drives this gel to an active, percolating state that persists for hours and is only limited by the stability of constituent proteins and the availability of the chemical fuel ATP. We extensively characterize how enhanced transport in emergent macroscopic flows depends on relevant molecular parameters, including ATP, motor, and depletant concentrations, microtubule concentration and length, as well as structure of the motor clusters. Our results show that the properties and dynamics of this active isotropic gel are highly tunable, suggesting that this is an ideal system for studying the behavior of active materials.

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