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Substrate properties affect collective cell motion ADRIAN PEGORARO, MING GUO, ALLEN EHRLICHER, DAVID WEITZ, Harvard University — When cells move collectively, cooperative motion, which is characterized by long range correlations in cell movement, is necessary for migration. This collective cell motion is influenced by cell-cell interactions as well as by cell-substrate coupling. Furthermore, on soft substrates it is possible for cells to mechanically couple over long distances through the substrate itself. By changing the properties of the substrate, it is possible to decouple some of these contributions and better understand the role they play in collective cell motion. We vary both the substrate stiffness and adhesion protein concentration and find changes in the collective cell motion of the cells despite only small differences in total cell density and average cell size in the confluent layers. We test these changes on polyacrylamide and PDMS substrates as well as on structured substrates made of PDMS posts that prevent mechanical coupling through the substrate while still allowing stiffness to be varied.

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