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Testing the differential adhesion hypothesis across the epithelial-mesenchymal transition STEVE PAWLIZAK, ANATOL FRITSCH, STEFFEN GROSSER, LINDA OSWALD, Leipzig University, LISA MANNING, Syracuse University, JOSEF KAS, Leipzig University — We analyze the properties of three epithelial/mesenchymal cell lines that exhibit a shift in cadherin levels characteristic of an epithelial-mesenchymal transition (EMT) associated with processes such as metastasis, to quantify the role of cell cohesion in cell sorting and compartmentalization. We develop a unique set of methods to measure cell-cell adhesiveness, cell stiffness and cell shapes, and compare the results to predictions from cell sorting in mixtures of cell populations. We find that the final sorted state is extremely robust among all three cell lines independent of epithelial or mesenchymal state, suggesting that cell sorting may play an important role in organization and boundary formation in tumours. We find that surface densities of adhesive molecules do not correlate with measured cell-cell adhesion, but do correlate with cell shapes, cell stiffness and the rate at which cells sort, in accordance with an extended differential adhesion hypothesis (DAH). Surprisingly, the DAH does not correctly predict the final sorted state. This suggests that these tissues are not behaving as immiscible fluids, and that dynamical effects such as directional motility, friction and jamming may play an important role in tissue compartmentalization across the EMT.

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