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High Local Curvature Reduces Migration Rate in Multi-Layer Tissue.[1] HOLLEY LYNCH, SHIRLEY YANCY, LANCE DAVIDSON, University of Pittsburgh — Both embryonic development and human disease, e.g. cancer metastasis, involve migration of tissues composed of multiple cell types. The mechanics of these movements remains largely unknown despite progress in understanding the migration of single cells and confluent monolayers. To expose these mechanics we study migration in amphibian embryonic tissues composed of mesenchymal and epithelial cells. Spreading rates in explants ranging in area from 0.12 to 2.63mm^2 increase with explant size from 22$\pm$5 to 45$\pm$5 μm/hour. Possible explanations for these differences include edge curvature and cell count. Low curvature could lead to cooperative forces along the tissue edge, leading to a faster spreading rate. However, if spreading is driven by local cell rearrangement or shape change we would expect increased spreading rates in explants with more cells. To distinguish between these, we examined spreading in shaped explants with variable curvature, e.g. triangular explants. We found that regions of high curvature had lower spreading rates even with a greater distance between the edge and center of the explant. Thus, our results indicate that tissue migration rate depends on the local curvature.

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