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Shape Space Dynamics of Migrating MDA-MB-231 Cancer Cells

CHRISTOPHER EDDY, BO SUN, Oregon State University — Cancer cell migration is a central step in the metastatic process. Importantly, the plasticity of cancer migration mechanisms have confounded efforts to diminish invasion. Here, we study the morphological dynamics of cancer cells migrating in 3D collagen matrix. We characterize the ensemble distribution in addition to the temporal trajectories of cells in both position as well as shape spaces. We find that more exploratory cells will vary in elongation and protrusion formation during migration, indicating a more invasive phenotype. We also find that increasing matrix rigidity does not change the aspect ratio of the cell, but rather increases surface roughness by promoting protrusions.

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