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Modeling the Spatiotemporal Evolution of the Melanoma Tumor Microenvironment ALEXANDRA SIGNORIELLO, MARCUS BOSENBERG, Yale University, MARK SHATTUCK, City College of New York, COREY O'HERN, Yale University — The tumor microenvironment, which includes tumor cells, tumor-associated macrophages (TAM), cancer-associated fibroblasts, and endothelial cells, drives the formation and progression of melanoma tumors. Using quantitative analysis of in vivo confocal images of melanoma tumors in three spatial dimensions, we examine the physical properties of the melanoma tumor microenvironment, including the numbers of different cells types, cell size, and morphology. We also compute the nearest neighbor statistics and measure intermediate range spatial correlations between different cell types. We also calculate the step size distribution, mean-square displacement, and non-Gaussian parameter from the spatial trajectories of different cell types in the tumor microenvironment.

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