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Pattern formation in nonlocal mathematical models for cancer invasion

Cancer invasion is a complex process involving interactions between cancer cells, between cells and extracellular matrix, and between cancer cells and various immune cells inside the tumour microenvironment. These interactions are facilitated by different molecules (e.g., cytokines, chemokines), which can be produced by the cancer cells themselves, or by other cells in the microenvironment. Here we introduce a class of nonlocal mathematical models for cancer proliferation and invasion (models described by hyperbolic and/or parabolic PDEs), and investigate analytically and numerically the spatial and spatio-temporal patterns exhibited by these models.