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A Kinetic Model for Cell Movement in Network Tissues

Mesenchymal motion describes the movement of cells in biological tissues formed by fibre networks. An important example is the migration of tumour cells through collagen networks during the process of metastasis formation. We investigate the mesenchymal motion model proposed by T. Hillen (J. Math. Biol. **53**:558-616, 2006) in higher dimensions. We formulate the problem as an evolution equation in a Banach space of measure-valued functions and use methods from semigroup theory to show the global existence of classical solutions. We investigate steady states of the model and show that patterns of network type exist as steady states. For the case of constant fibre distribution, we find an explicit solution and we prove the convergence to the parabolic limit.