MODELING CELL MOVEMENT IN ANISOTROPIC AND HETEROGENEOUS NETWORK TISSUES

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Abstract. Cell motion and interaction with the extracellular matrix is studied deriving a kinetic model and considering its diffusive limit. The model takes into account of chemotactic and haptotactic effects, and obtains friction as a result of the interactions between cells and between cells and the fibrous environment. The evolution depends on the fibre distribution, as cells preferentially move along the fibre direction and tend to cleave and remodel the extracellular matrix when their direction of motion is not aligned with the fibre direction. Simulations are performed to describe the behavior of ensemble of cells under the action of a chemotactic field and in presence of heterogeneous and anisotropic fibre networks.