

Modelling the tumour microenvironment using an agent-based force-based approach

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My research is motivated by understanding how tumours grow, behave, invade and spread to glean insight into how the process(es) can be prevented or controlled. Cancer cells can arise from any type of cell in the body growing in or around any tissue or organ. Tumour cells proliferate and occupy whole areas of tissue; they interact with surrounding cells, tissue structures, vasculature and the extracellular matrix in a variety of ways. Mathematical modelling and simulation of the full "tumour microenvironment" complements traditional biological and experimental approaches to cancer research. My "in silico" Virtual Tumour model seeks to replicate cell behaviours in response to a variety of different environmental cues, be they chemical or mechanical. In this talk I shall present certain current aspects of my research.