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Non-local Models for Cellular Adhesion

Cellular adhesion is one of the most important interaction forces between cells and other tissue components. In 2006, Armstrong, Painter and Sherratt introduced a non-local PDE model for cellular adhesion, which was able to describe known experimental results on cell sorting and cancer growth. Since then, this model has been the focus of applications and analysis. The analysis becomes challenging through non-local cell-cell interaction and interactions with boundaries. In this talk I will present theoretical results of the adhesion model, such as a random walk derivation, biologically realistic boundary conditions, pattern formation and results on local and global existence of solutions. (joint work with A. Buttenschoen).