Cellular adhesion: modelling and numerical simulation.

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We describe a model of the evolution of cell densities in a dynamic tissue in the framework of diffusion-advection-reaction equations and focus on the effect of cellular adhesion. This leads to a spatially nonlocal term for the advection velocity. We employ a method of lines scheme to solve the PDE system numerically. Periodic boundary conditions allow for the use of Fourier techniques in the evaluation of the nonlocal term and hence allow for a particularly efficient scheme. For zero-flux and symmetry boundary conditions the technique can be suitably extended.

Joint work with K.J. Painter, M.A.J. Chaplain.