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“A geometric model for biological cells”

There is increasing need in modelling biological cells in silico. In many cases agent-based models are an important instrument, as the cells in various biological systems develop individually, which is covered by this class of models. However, most of these model types rely on effective rules as for example cellular automata or extended Potts-models and do not respect physical properties of the cells on a quantitative level. The lecture will introduce an agent-based model that is based on geometrical grounds: The Delaunay Triangulation combined with Voronoi tessellation. It provides explicit notions of cell contact surfaces and is therefore able of describing physical forces between cells and of including differentiated receptor expression. The model concept is explained and critically discussed. A first application to tumour growth data is presented.