

Modelling tumor cell population dynamics based on molecular adhesion assumptions

Wieslaw Grygierzec, Andreas Deutsch, Lars Philipsen,
Manuela Friedenberger, Walter Schubert

Abstract: A model of cell population dynamics based on molecular adhesion is explained and discussed in this paper. We consider cancer cells experiencing interactions due to adhesion forces. In the cells' membranes there are proteins directly involved in adhesion. These proteins in the membrane are assembled in complex patterns called Combinatorial Protein Patterns (CPP). The goal of this work is to understand the mechanisms governing the adhesion process - in particular distinguishing CPPs involved in interactions. On the basis of experimental observation we have constructed an asynchronous cellular automaton (CA) model that simulates protein network dynamics in a population of cells.