

Polymerase Chain Reaction (PCR) is the one of most important method of molecular genetic studies nowadays. In order to estimate the some parameters of the PCR kinetics the dynamical characteristics such as the concentrations of working solutions and characteristics of the DNA polymerase, is required. Results of PCR dynamics simulation can be used for many practical applications include DNA sequencing problem.

In this paper a discrete numerical model of DNA replication dynamics is proposed. The model is based on a cellular automaton numerical circuit, representing by two-dimensional regular lattice of cells. The proposed model allows studying the dynamics of the process of DNA replication also as polymerase behavior in different PCR solutions.

The results of numerical simulation for test DNA fragments is presented and discussed. The possibility of DNA sequencing procedure based on detecting of the time delays in DNA assembly process is shown.