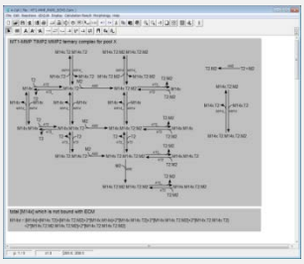
expanding utilization of cell simulation

A-Cell

software for 4D cell simulation

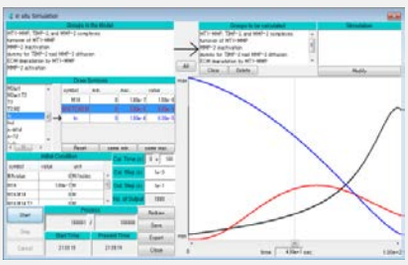
Pathway



A-Cell model is constructed by the same way as you draw biochemical reactions on a paper. Parameters in biochemical reactions are derived from wet experiments. This enables direct comparison of simulation results with wet experiments. In addition to pathways, models of equations, stimulations, and membrane potentials including action potentials are constructed by A-Cell.

In situ simulation

A program is required for running a simulation. But A-Cell can run simulations without program generation by "in situ simulation" method. Your model is simulated just after the construction. Although the simulation speed is not high enough, simulations will proceed with reasonable performance in many cases. If you need higher simulation speed, A-Cell automatically generates a simulation program. So you don't need any knowledge of computer programming.

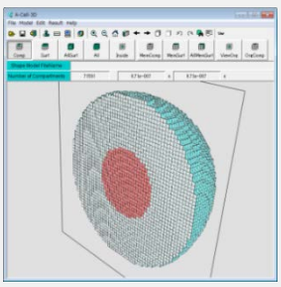


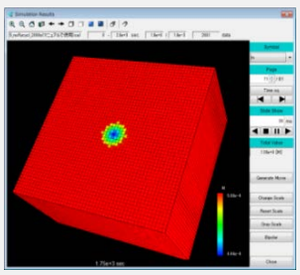
4D

Pathway simulation generates temporal change of concentrations of proteins. However, a cell is an entity extending through 3D space. A real cell generates spatial inhomogeneity (localization) of active proteins in addition to temporal change. This is important for cell function. Thus, 4D spatio-temporal simulation is essential for cell simulations. A-Cell provides easiest way to construct and run 4D cell simulation.

Shape

Modeling of spatial extent of a cell is required for 4D simulations. A-Cell provides means to construct spherical, columnar, cuboid shapes, and a dendrite and spines of neuronal cells. Nucleus is easily constructed by specifying its size and location. Constructed shape model is divided into many small cuboid compartments. This enables spatio-temporal simulation. Diffusion of a protein is automatically calculated. In addition, A-Cell provides means to embed specific reactions to a specific region, such as the nucleus, in a shape model.





Movie

Since simulation results of 4D simulation is complicated, it is not easy to grasp their whole picture. Movie representation of a simulation result helps to know it intuitively. A-Cell provides an easy way of movie representation leading to subsequent detail analyses.

Computer

A-Cell simulations can be run on a notebook computer. In case of a big model, run time is longer, and a use of a higher performance computer will be better. Run time of your simulation can be estimated by A-Cell. This helps you in selecting a computer.

Utilization

One major application of 4D cell simulation is drug discovery. You can find a novel druggable target and validate drugs under investigation. In addition, required performance of drugs and a protocol of administration can be pre-designed. Drug safety is an another important area of applications. In basic research, you can validate newly found function of proteins by 4D cell simulation. This also helps to validate hypotheses in your research. If you teach students, A-Cell is a useful tool for the research of your students.

A-Cell editions

Free	freely downloadable from our homepage
Entry	US $100
Basic	US $500
Standard	US $800

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