Cell Simulation Consulting

Accelerate and consolidate your research

Consulting

A research paper on cell biology by using simulation was published as early as 1961. Since then, computer simulation has been recognized as a tool for cell biology, but the community was small. Since 2005, however, there was an explosive increase in the number of papers, and more than 3,000 papers are published a year in 2014. In addition, many papers are being published in collaboration with wet experiments.

However, there still exist questions and uncertainties when you try to introduce or collaborate with simulation study. The most fundamental question is what we can get by cell simulation that cannot get by wet experiments. To answer these questions, we have been conducting cell simulation studies for 30 years showing that cell simulation is a powerful tool to make predictions. Because of the prediction by cell simulation, we can reach a conclusion that is not reached readily by wet experiments.

To acquire this advantage by cell simulation in your wet experiments, we support researches both in private company and educational and research institutes by our long-term experience and simulation software A-Cell.

Drug discovery

It is well known that the cost of drug development has been increasing reaching to more than US $1B. A primary reason is the uncertainty in the role and mechanism of a target protein. This is not surprising because it is almost impossible for wet experiments to reveal all complex interactions played by a protein in a cell. In addition, unexpected effect can emerge long after the administration of a drug. Thus, there is a limitation to know all possible effect of a drug only by wet experiments, and a novel approach is required.

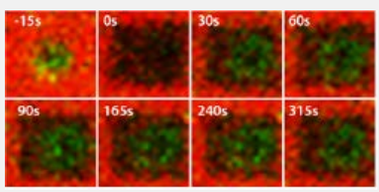
One advantage of simulation is that any parameters in a model can be changed enabling elucidation of hidden interactions between proteins.

In addition, even putative drugs can be added to a model enabling to test its effects in complex protein networks. Spatial parameters can readily be changed in the simulation, which is quite difficult in experiments. These advantages of simulation can lead to a finding of novel druggable targets with definite mechanisms. Required performance of a drug is also estimated. Thus cell simulation is essential for drug discovery research, and a great interest is focused on it.

If you try to start cell simulation research, however, you may feel difficulties as shown in “Consulting” section on the top left. So we support introducing cell simulation to drug discovery research by offering our long-term experience. A close communication between wet experiment and cell simulation is essential for success. We have been proceeding our simulation research by a close contact with wet experiments from the very beginning. Thus we have long-term experiences also in the collaboration with wet experiments. Open a new era of drug discovery research with cell simulation.

Cell biology

Elucidation of protein functions and their mechanisms is a major focus in recent cell biology and biochemistry. Interaction diagram between proteins is frequently used to show overall picture of the research result. Although this diagram is drawn based on experimental results, it is not shown whether this diagram can reproduce experimental results conversely. If this is confirmed, experimental results and the conclusion will be much more confident. Here, cell simulation exhibits its potency. A-Cell models are constructed according to a abstracted diagram with a help of existing knowledge. There is no need for getting values of all rate constants and concentrations. By running simulations with various initial conditions, a parameter set fulfilling experimental observations is elucidated. If simulation does not reproduce any consistent result with experiments, possible modification of the model can lead to a candidate mechanism, which is a prediction to be confirmed by experiments subsequently. We support cell biology and molecular biology research by our long-term experience in cell simulation.



When you have any question or uncertainty in the cell simulation, we are welcome your contact through email or phone shown on the right. We support your future of cell simulation.

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