

1109-92-5

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Qi Wang. *3D Mathematical Modeling and Simulations of Cell Mitosis by a Phase Field Approach.* Preliminary report.

During a cell cycle, mitosis is a process, in which a mother cell duplicates into two generically similar daughter cells. In the initial stage of mitosis, the mother cell, attached on a substrate, would undergo a dramatical shape change by detaching from the substance and forming a round surface. At the late stage of mitosis, a contractile ring would form in cell orbit and the mother cell would split into two daughter cells, which is known as cytokinesis for eukaryotic cells.

Recently, we have developed a series of three-dimensional hydrodynamic models by a phase field approach, studying cellular mitosis. Qualitatively patterns of cell rounding, blebbing and division process have been observed. In this talk, our preliminary study on the mechanism and controlling factors of cell mitosis would be present. 3D numerical simulations will be shown, as well. (Received September 10, 2014)