سمینار هفتگی ماده چگال نرم

Reconciliation of controversial death pattern of starved cells

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Abstract

During carbon starvation of isothermal batch culture of E. Coli, viability of the cells as a function of time decreases exponentially for approximately 10 days. This behavior is the result of a collective behavior where living starved cells use the leaked nutrients from dead cells and can be explained by the balance of the nutrient flux of the leaking dead cells and the maintenance of the living starved cells. The single cell level study of isolated starved cells, however, indicates that the death rate of the cells follow the Gompertz law of mortality which relates the death rate to the age. The greater the time since a cell has received nutrients, the higher its death rate. The observation of Gompertz law of mortality in isolated starved cells with increasing death rate over time seems controversial with the observation of exponential decay with a constant death rate in isothermal batch culture. In this study we reconcile these two seemingly controversial results by the help of theoretical modeling.

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