

Abstract Submitted
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Modeling metaphase to anaphase transition of budding yeast cell cycle SHANSHAN QIN, CHAO TANG, Center for Quantitative Biology, Peking University — One of the interesting questions in cell cycle is how the sister chromosomes separate in an abrupt and irreversible manner. Anaphase is initiated when the anaphase-promoting complex (APC) triggers the destruction of securin (Pds1), allowing separase (Esp1) to cut the sister-chromatid cohesion. In experiment, we observed the degradation timing were different among cycling protein Clb5, Clb2 and Pds1. Phosphorylation of these proteins by APC dramatically affect their degradation. To fully understand the role of activation and degradation timing and coordination these cell cycle associated proteins, we build a simplified ordinary differential equations model. Simulation results suggest that the phosphorylation of protein do delay its degradation by APC, which agree with our experiment results. The positive feedback loop between Cdc14 and Pds1 is responsible for the abrupt separation of sister-chromatid. When varying each parameter up and down for ten fold, similar results can still be produced, suggest that this network is robustly designed for its function.

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