

学术报告

Regulation of Gene Activation by Competitive Cross Talking Pathways

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Time: 15:00-16:00, September 9 (Wednesday), 2020

Venue: 腾讯会议 ID:817 970 762, 会议密码: 123456

Abstract: A central question in biology has been to understand how genes in single cells respond to environmental changes. Recent technological advances have generated massive amounts of data on expression dynamics and noise. Notoriously, achieving a theoretical fit to these data requires synchronous modulation of gene activation and inactivation, messenger RNA synthesis, and subsequent feedback in mathematical models. We integrated a typically neglected weak basal pathway into the classical two-state model, which competes with the signaling pathway to activate a gene. We revealed rich cross talk regulations of the two pathways that show good agreement with experimental data. This simple framework provides a new, to our knowledge, perspective on the factors that modulate gene activation, which may open new avenues for future biophysical studies.

欢迎大家参加!