

# Growth and efficiency principles of bacterial metabolism

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Bacterial metabolism is a complex non-equilibrium process shaped by resource allocation and environmental constraints. In this talk, I will present recent data and modeling suggesting that two key features organize bacterial responses to perturbation: growth rate and carbon efficiency. Using antibiotic and energetic perturbations as a case study, I will discuss how such perturbations can alter bacterial metabolism by shifting growth rate, carbon efficiency, or both. More broadly, this work motivates finite-resource descriptions of bacterial fitness, in which the relative importance of speed and efficiency is set by ecological context.