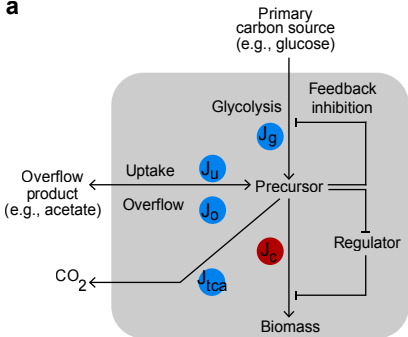
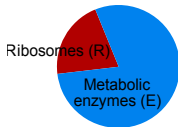


Build biophysical model of cell growth

a



Proteome resource allocation



Growth rate is limited by carbon or energy

$$g = \min(g_c, g_e)$$

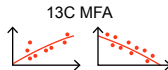
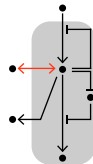
$$g_c \sim J_c$$

$$g_e \sim \underbrace{\frac{n_g J_g}{\text{substrate-level phosphorylation}}}_{\text{respiration}} + \underbrace{\frac{n_{tca} J_{tca}}{\text{respiration}}}_{\text{respiration}} + \underbrace{\frac{n_o (J_o - J_u)}{\text{fermentation}}}_{\text{fermentation}}$$

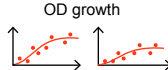
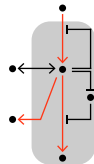
Fit kinetic parameters using data

b

Characterize overflow reaction



Characterize catabolic/anabolic reactions

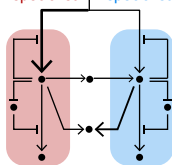


Coexistence study and model simplification

c

glucose specialist

acetate specialist



glucose specialist

acetate specialist

