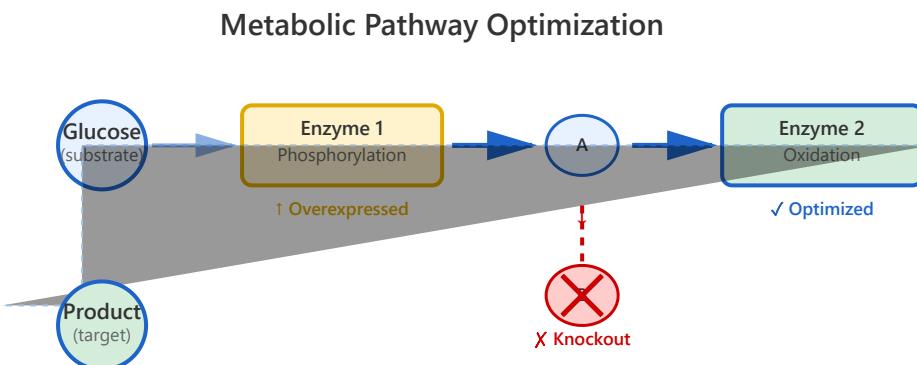


Metabolic Engineering



AI-Guided Metabolic Engineering

- Flux Balance Analysis (FBA)**
- Identify bottlenecks
 - Predict knockouts
 - Optimize expression levels

- Machine Learning Models**
- Enzyme activity prediction
 - Strain design
 - Growth prediction

Flux optimization

Balance metabolic flow

Enzyme engineering

Improve catalytic efficiency

Pathway design

Novel biosynthetic routes

Strain optimization

Host organism engineering

Scale-up prediction

Lab → production modeling