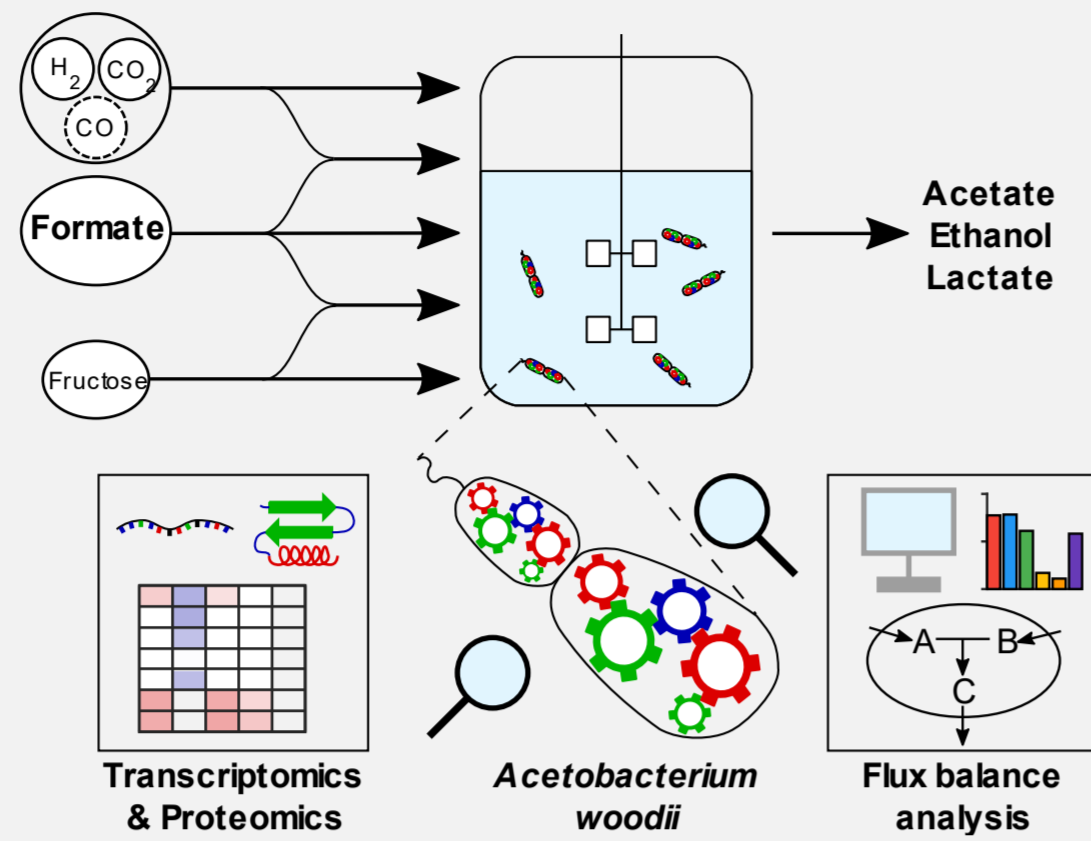


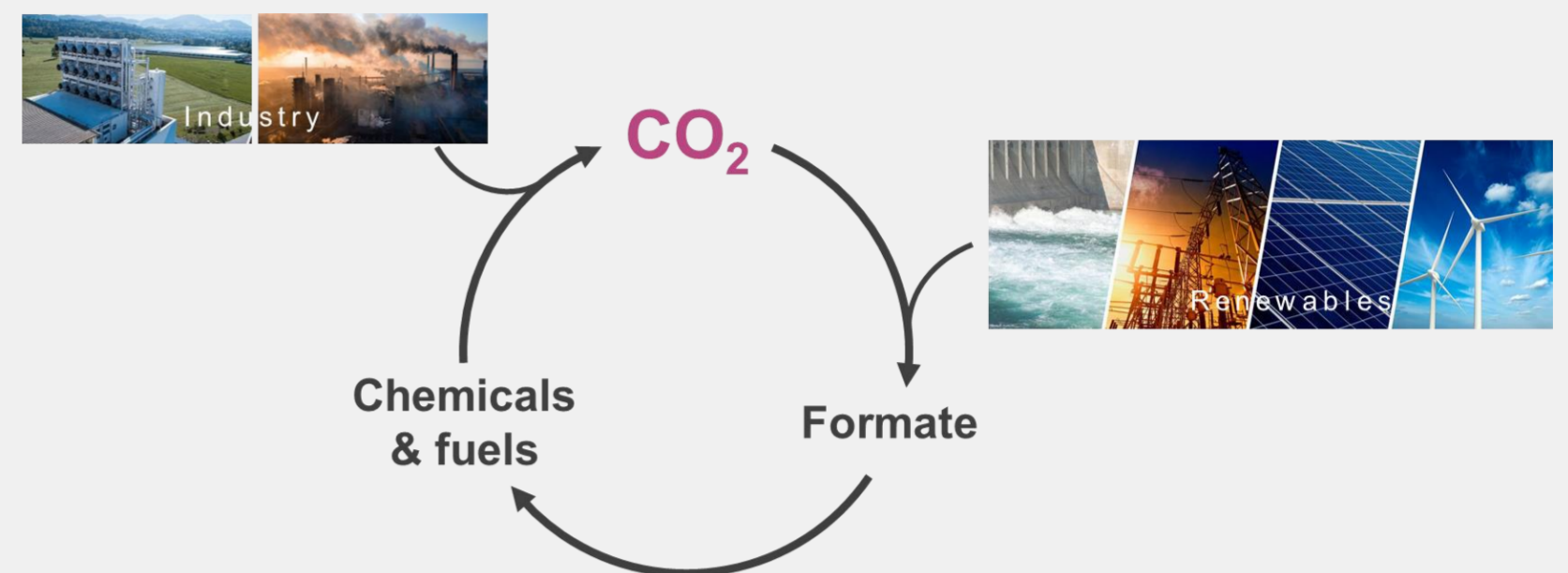
Objectives and approach

- Obtain a quantitative understanding of unithrophic and mixotrophic formate utilization by *A. woodii*
- Evaluate potential of *A. woodii* as host for formate-based bioproduction



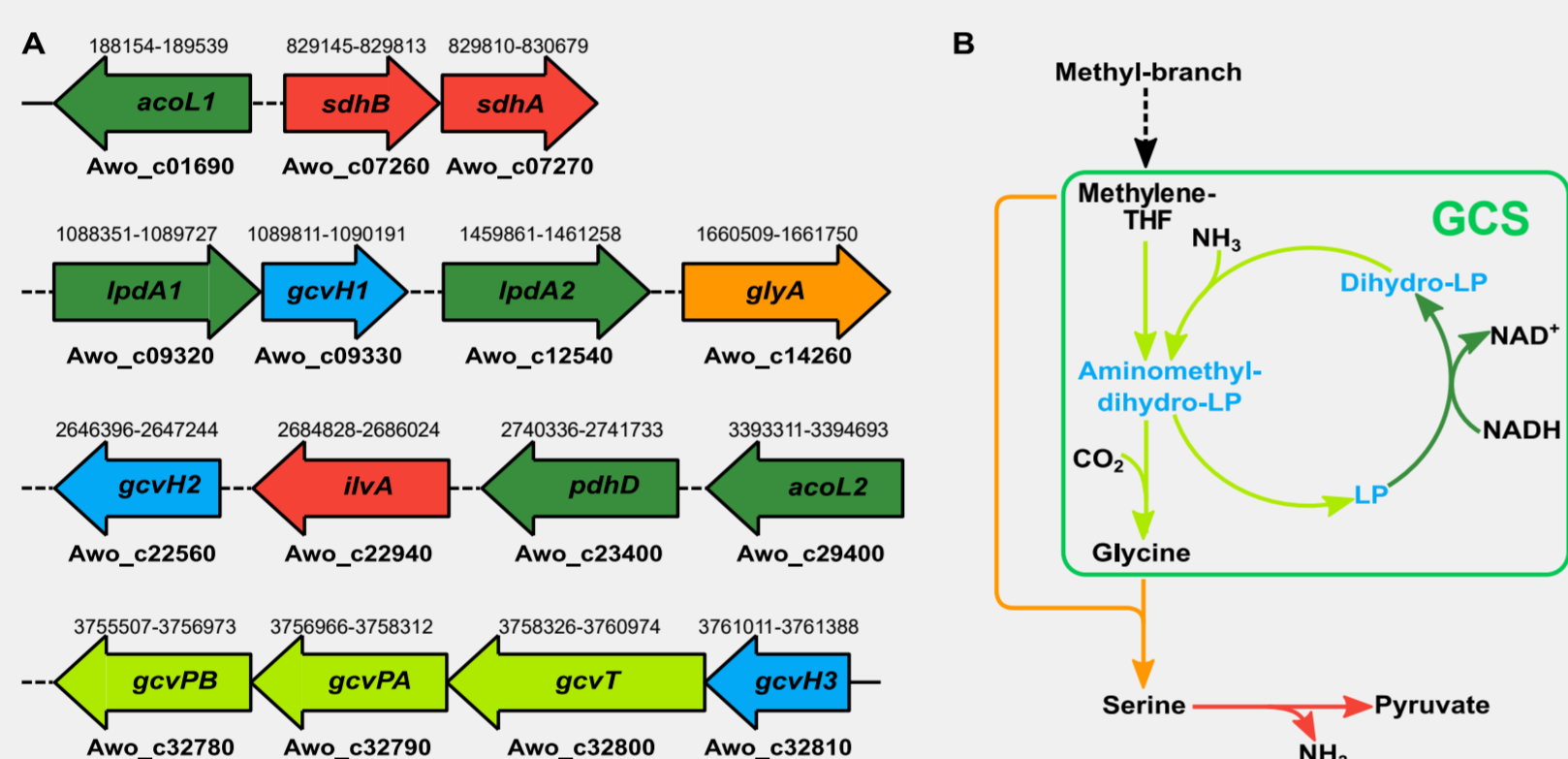
Background

- Circular bioeconomy requires sustainable feedstocks
- Formate is a promising mediator between chemical feedstock production and microbial upgrading into value-added products
- Acetogens utilize formate with high energetic efficiency



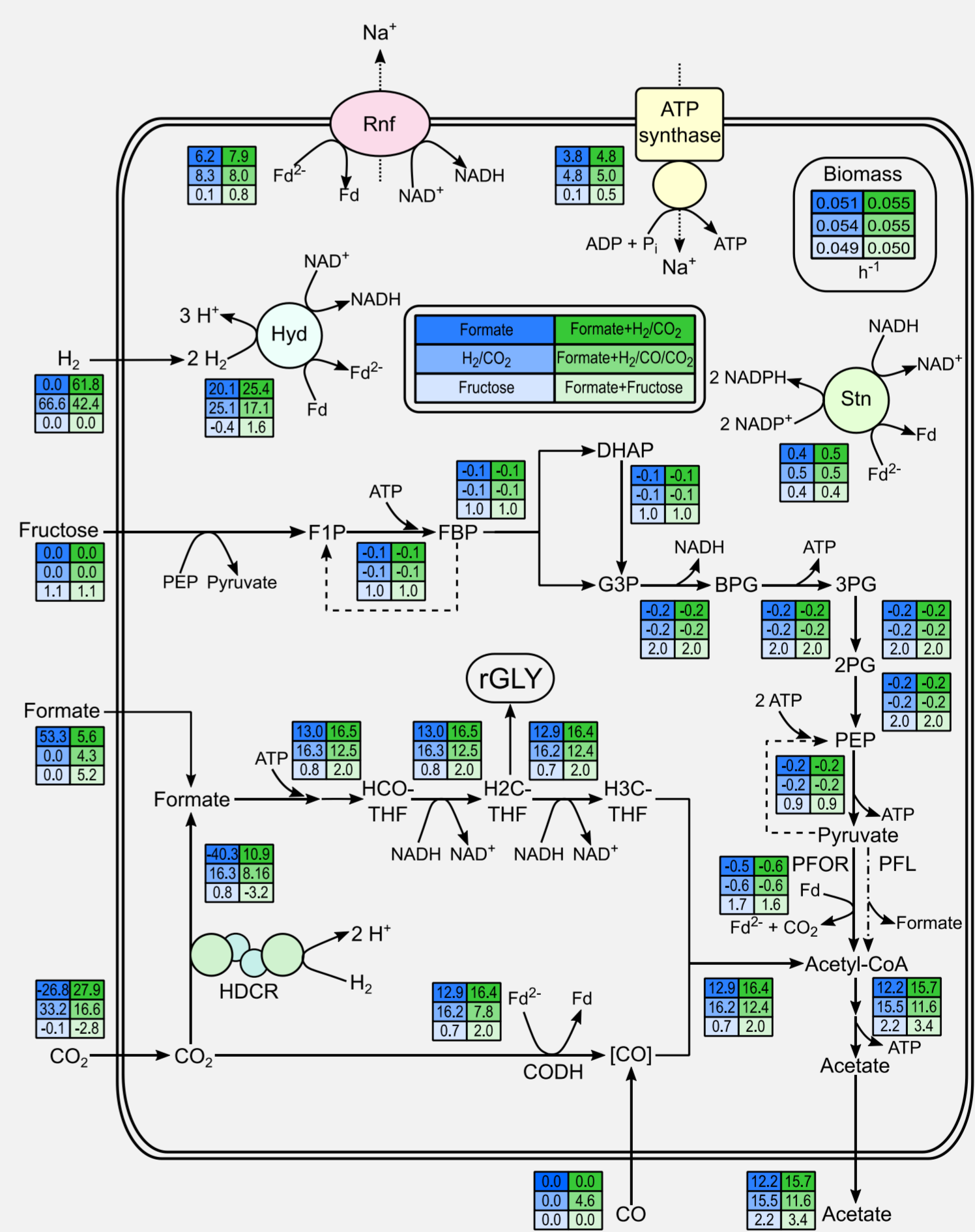
-omics analysis

- RNAseq and shotgun proteomics (~1800 proteins detected) showed no significant difference between autotrophic (H₂/CO₂) or formatotrophic growth
- Strong up-regulation of glycine cleavage system during growth on formate (*gcvPB*, *gcvPA*, *gcvT*, *gcvH3*)
- Likely due to increased uptake of glycine from medium



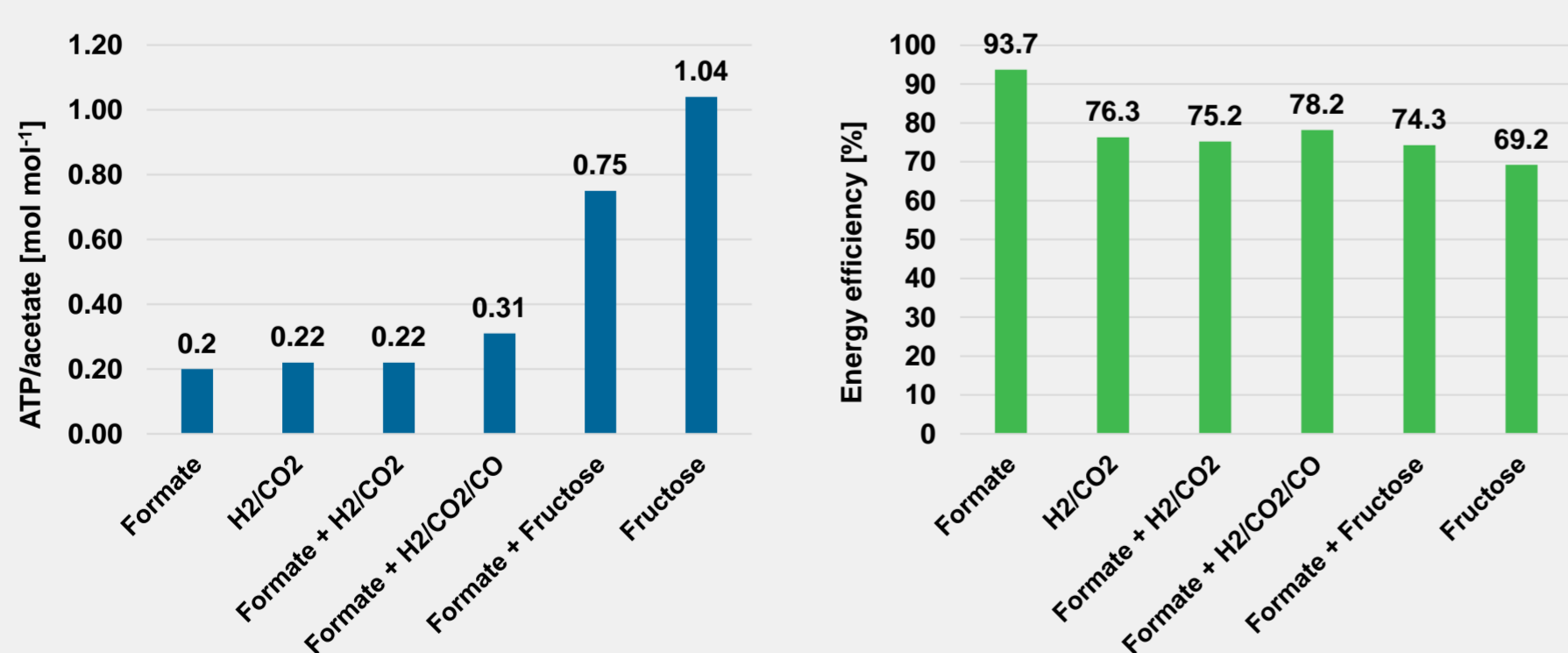
Computational metabolic analysis

- Physiological data from chemostats used as input for flux balance analysis (FBA) (with *A. woodii* core model)



Bioenergetics and energy efficiency

- Physiological data and FBA results used to calculate energy availability and efficiency



Bioenergetics

Energy efficiency

Conclusions

- A. woodii* shows efficient and robust formate utilization
- High energetic efficiency of formate utilization
- Bioenergetics of formate utilization can be improved by substrate co-feeding



Paper

Group website

