

# Guidelines for Performing Lignin-first Biorefining

## Background

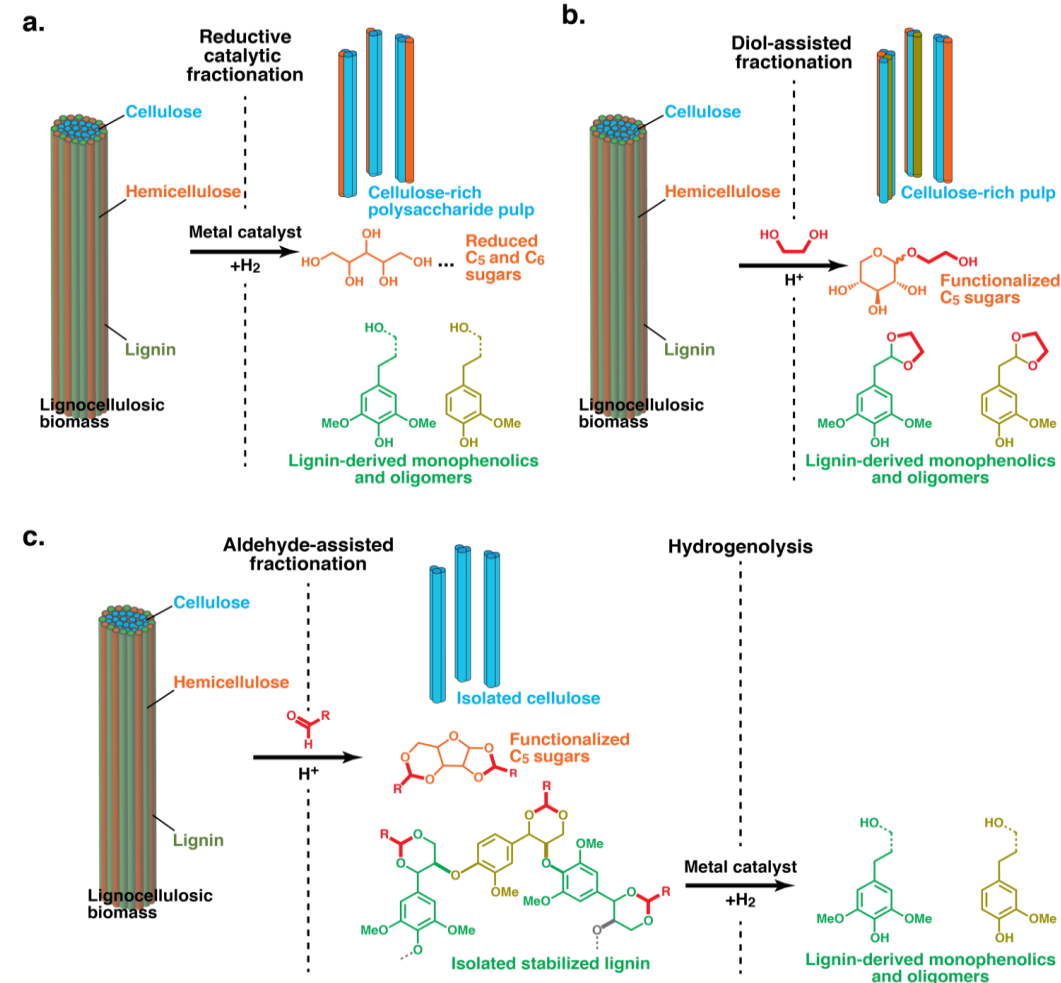
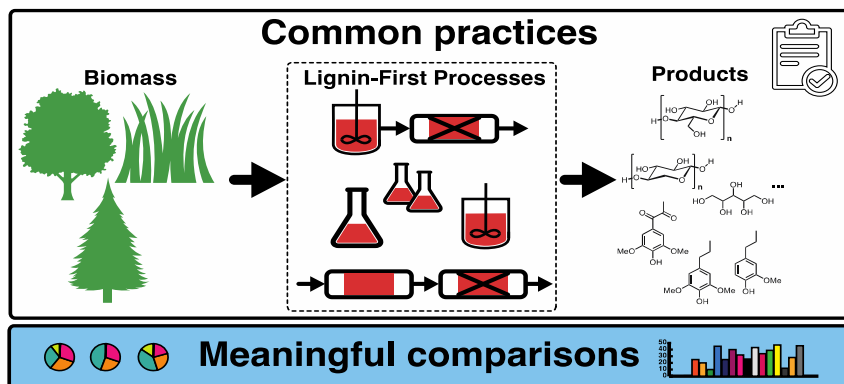
- Lignin-first biorefining considers lignin valorization on an equal footing to carbohydrate valorization in biomass conversion.
- Lignin-first methods are defined as “active stabilization methods that solubilize lignin from native biomass while avoiding condensation reactions in lignin.”
- Reductive catalytic fractionation (RCF) is a popular lignin-first biorefining method in the lignin valorization community because it is a catalytic funneling approach.

## Approach

- This perspective attempts to unite the growing lignin-first community around a common set of guiding principles by defining standards and best practices for conducting research and reporting process performance in this field.

## Significance

- After a century of lignin research, the goal of lignin valorization remains elusive, and yet is increasingly important.
- As the lignin-first biorefining field grows, this perspective should serve as a useful guide to allow easier inter-laboratory comparison and accelerate this field.



Three lignin-first strategies using solvolysis and catalytic stabilization of reactive intermediates to stable products or protection-group chemistry and subsequent depolymerization

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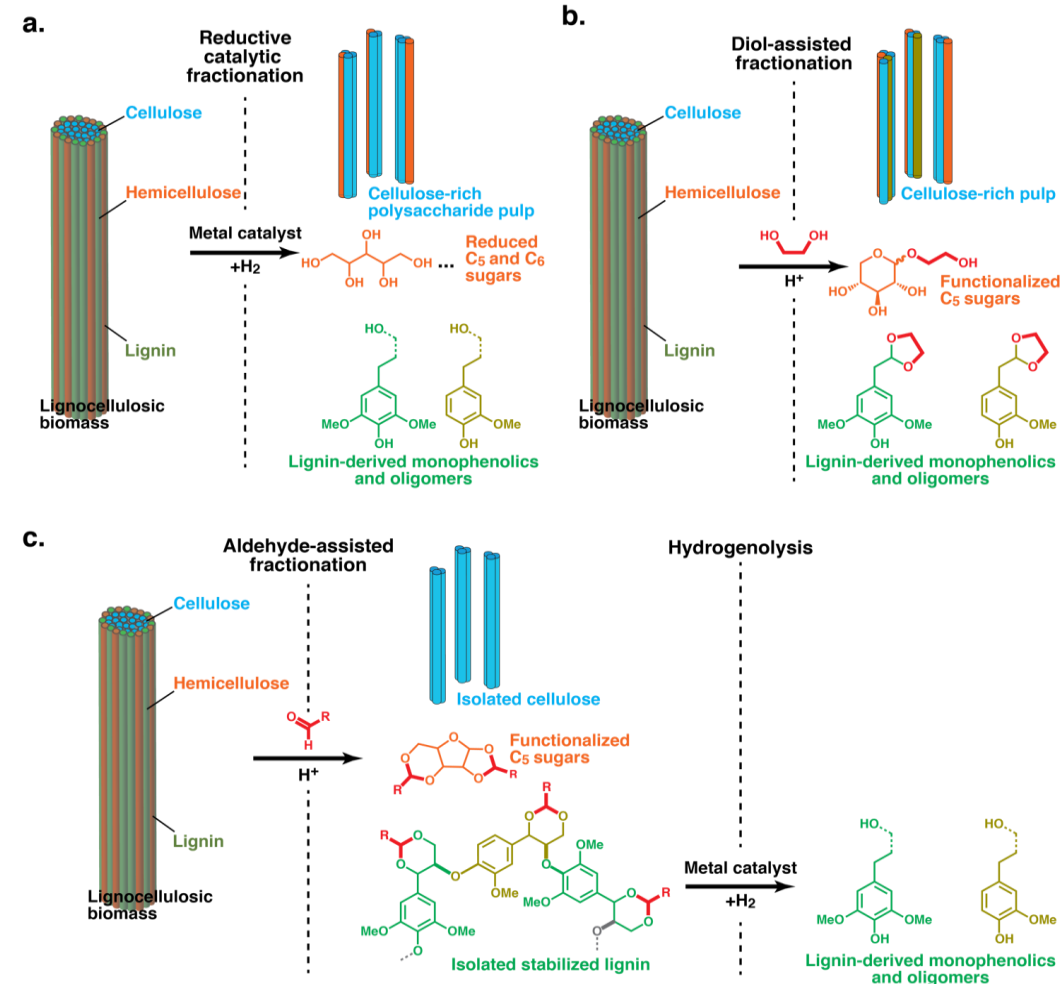
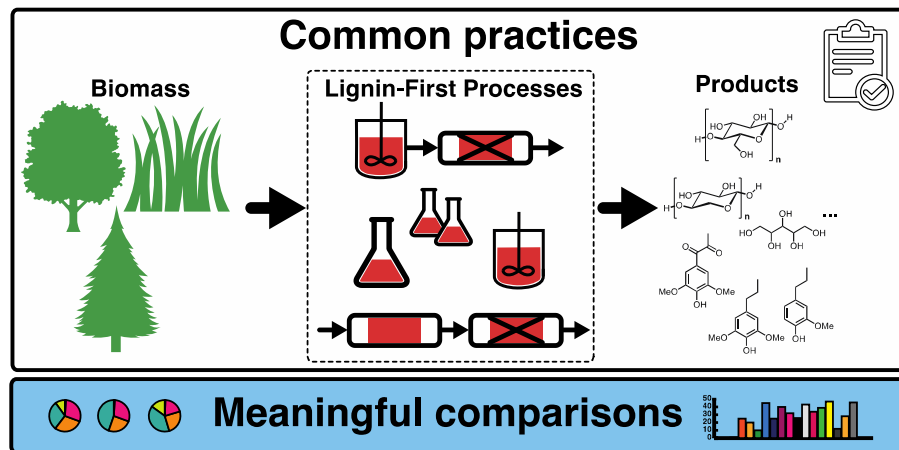
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## Significance

- As the lignin-first biorefining field grows, this perspective should serve as a useful guide for the community to follow common practices and report process performance data that can enable inter-laboratory comparisons



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