Mini review surveys improvements in understanding relationship of lignin structure to biomass recalcitrance

U.S. DEPARTMENT OF ENERGY | Office of Science

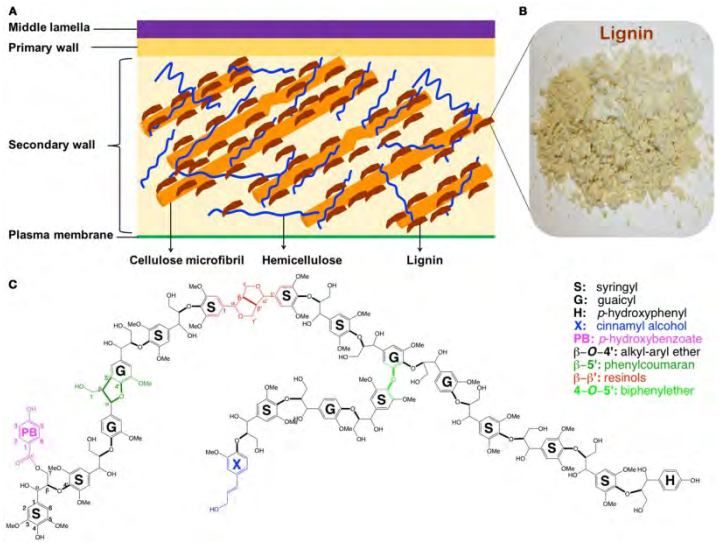
Background

- Advances in the application of biorefining to the production of biofuels, chemicals, and bio-derived materials necessitates a fundamental understanding of the relationship of lignin structure and biomass recalcitrance
- This review focuses on recent investigations on the influence of lignin chemical properties and their effect on biomass processability.

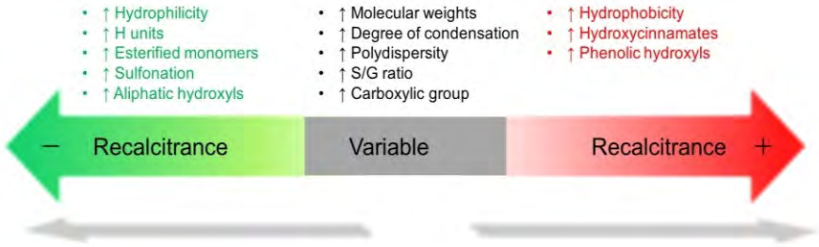
Approach

The review focuses on advances in understanding the specific roles of:

- Lignin properties during pre-treatment
- Lignin-Enzyme interactions
- Monolignol compositional units
- Hydroxycinnamates and hydroxyl and carboxylic groups in lignin



Simplified structure of plant cell walls (A), lignin isolated from poplar (B), and schematic structure of poplar lignin (C)



Schematic relationship of lignin properties to biomass recalcitrance

Significance

The documented improvements in the fundamental understanding of the relationship of lignin structure and biomass recalcitrance will help inform both the strategies used to engineer the next generation of low recalcitrant plants and the design of improved deconstruction technologies.

Li, M., Pu, Y., Ragauskas, A.J., "Current Understanding of the Correlation of Lignin Structure with Biomass Recalcitrance" *Front. Chem. (2016)4:45.* doi: 10.3389/fchem.2016.00045.

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