In Situ Chemical Imaging of Plant Cell Walls Using CARS/SRS Microscopy

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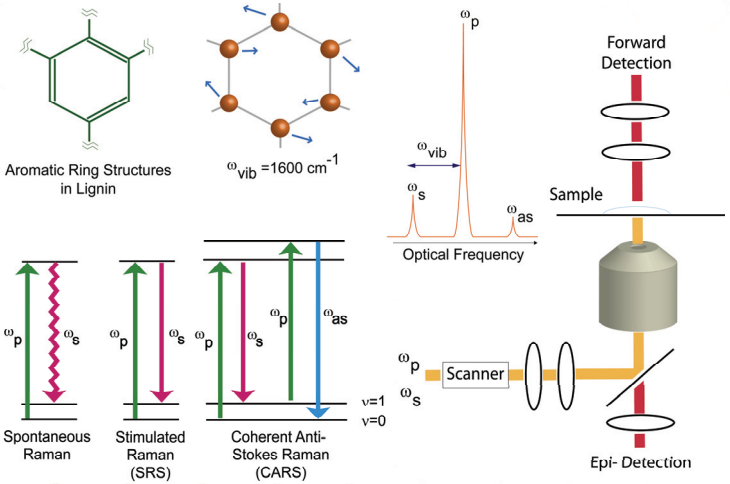
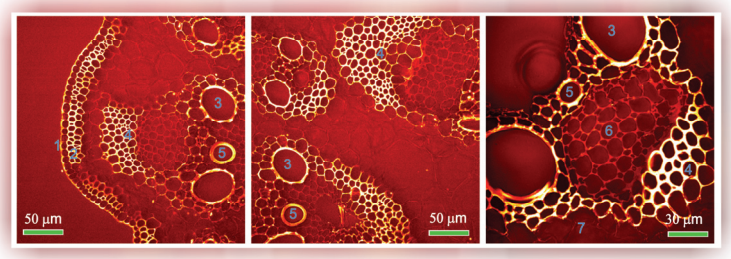
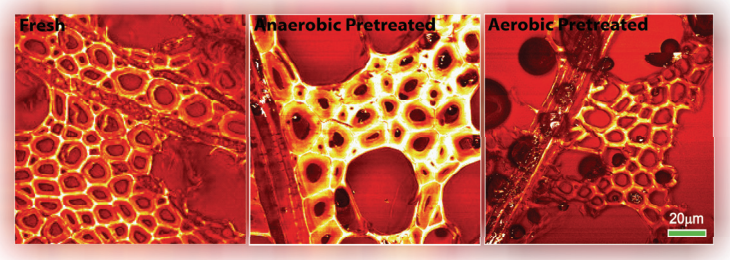
Coherent Anti-Stokes Raman Scattering (*CARS*)
Stimulated Raman Scattering (*SRS*)



- Hand-cut samples; sample treatment is not necessary
- Fast imaging rate

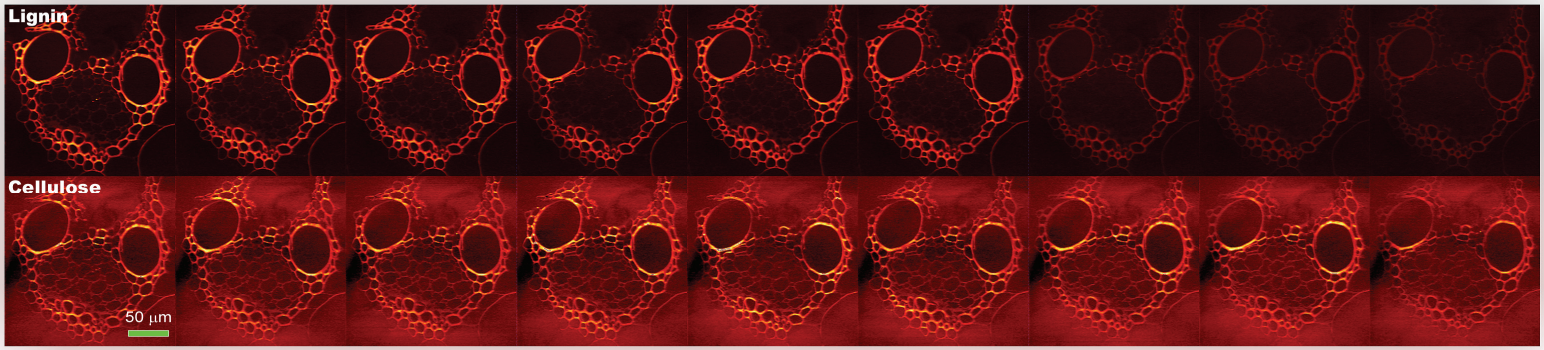
Imaging of Lignin in Plant Cell Walls





•CARS intensity reveals lignin content across corn stover cell wall in the order: Epidermis1, sclerenchyma fibers2 > Metaxylem3, Sclerenchyma4, Protoxylem5 >Phloem6 > Parenchyma7

Simultaneous Chemical Imaging of Lignin and Cellulose During Acidic Pretreatment (*Corn Stover*)



- Selectively chemical bleaching of lignin, while cellulose is preserved during the process. CARS microscopy provides a powerful tool to monitor real-time and *in situ* chemical changes during biomass conversion.

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