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**Academic interests:** Protein and cell wall chemistry

**Research Focus & Techniques of Expertise:** Research involves the identification, characterization, and application of proteins and enzymes useful in health and agriculture. Primary focus is for generating valuable polysaccharide-based products from plant cell walls recovered from food and biofuels processing. In addition to protein chemistry, my laboratory also has strong capabilities in carbohydrate chemistry relevant to plant cell wall polysaccharides. Bioanalytical instrumentation provides the core of the Protein Chemistry Laboratory. This includes a Waters-Micromass MALDI micro MX mass spectrometer equipped with ProteinLynx Global Server software for analysis of proteins, peptides, and oligosaccharides, an Applied Biosystems Biocad 700E biochromatography workstation for purifying proteins and polysaccharides, a ThermoFisher Evolution 300 UV-Vis spectrophotometer with biokinetics software for enzyme activity analysis, and an array of preparative and analytical electrophoresis systems for proteins and carbohydrates. My laboratory also uses other ABI instruments including a Smith's Detection IlluminIR FTIR spectrometer with optics-based microprobe useful for rapid structure analysis of carbohydrate material and a PerkinElmer GC-MS, which is used for polysaccharide composition analysis.

**Current Research Projects: \*\*Seeking Collaborators\*\***

- Preparation of polysaccharide-modifying enzymes systems and their application to tailoring functional properties of polysaccharides
- Isolation of functional protein and bioactive polysaccharide components from rice bran and biobased material from AR biofuels production
- Root-specific cell wall biochemistry using sugar beet hairy-root cultures

\*\*New collaborative funding opportunities are sought for developing new MALDI-TOF mass spectrometry capabilities for plant-based protein production (e.g., therapeutic proteins) and for applying a large set of recombinant fungal enzymes (active against most known cell wall polysaccharide linkages) being produced by expression in *Pichia* cells. I am also seeking a biomedical cooperator for evaluating bioactivity of oligosaccharides isolated from plant cell walls.