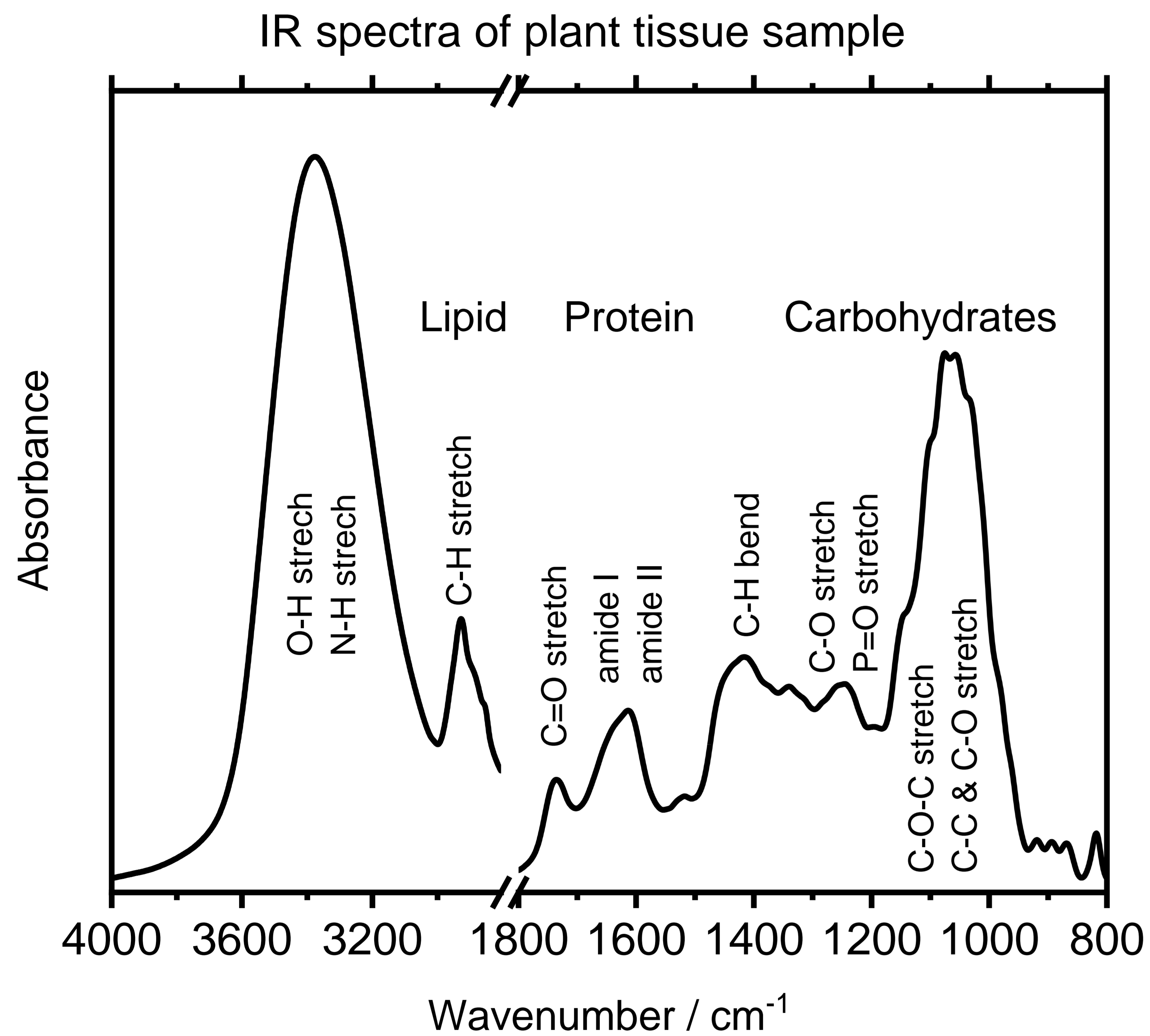


Opportunities for Agriculture Research at the Mid-IR Beamline

Kaiyang TU, Jarvis A. STOBBS, Miranda LAVIER, Scott ROSENDAHL, Stuart READ, Chithra KARUNAKARAN

IR spectroscopy for plants

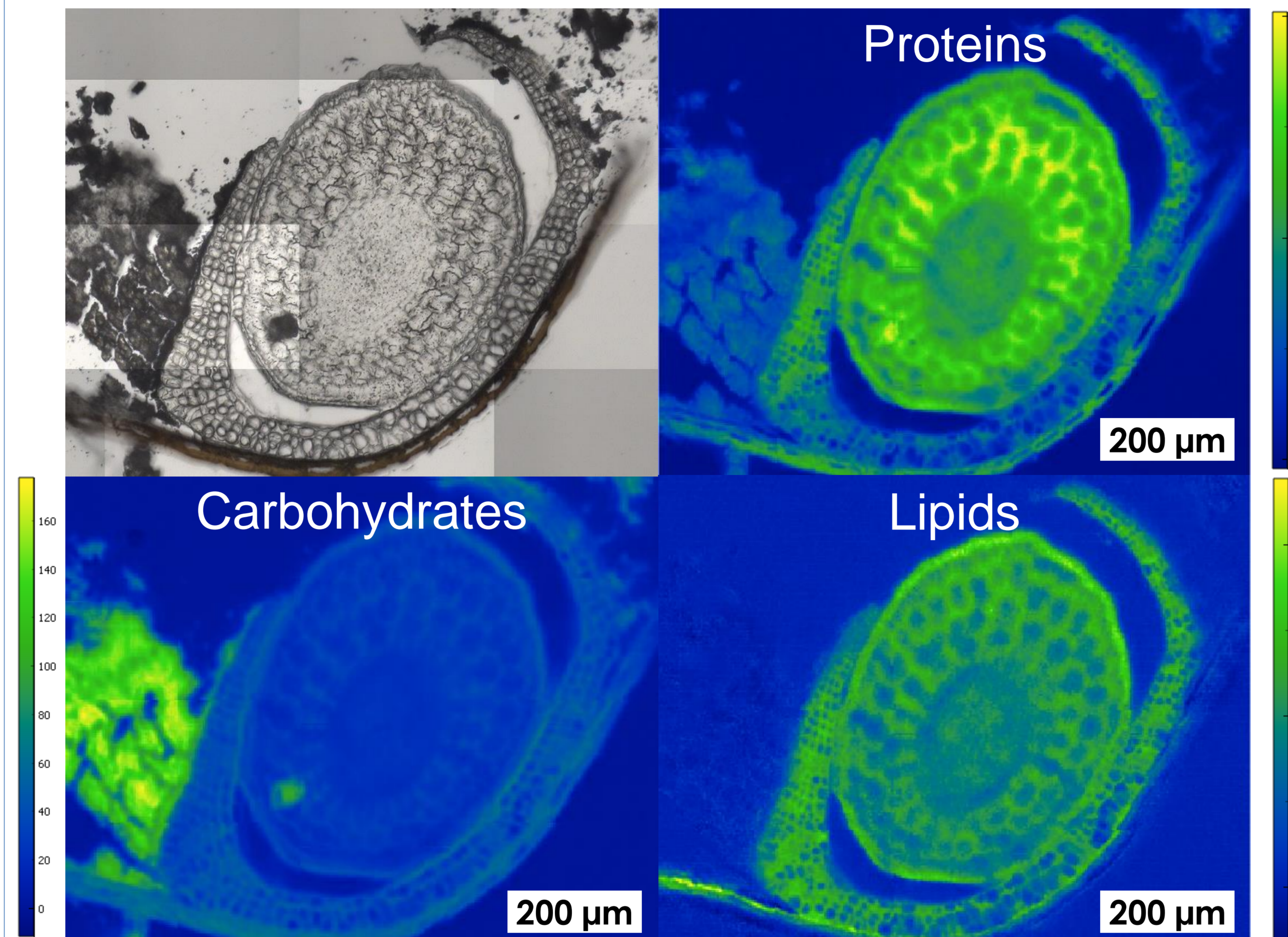
Infrared (IR) techniques is sensitive to a multitude of biomolecules within plant tissues



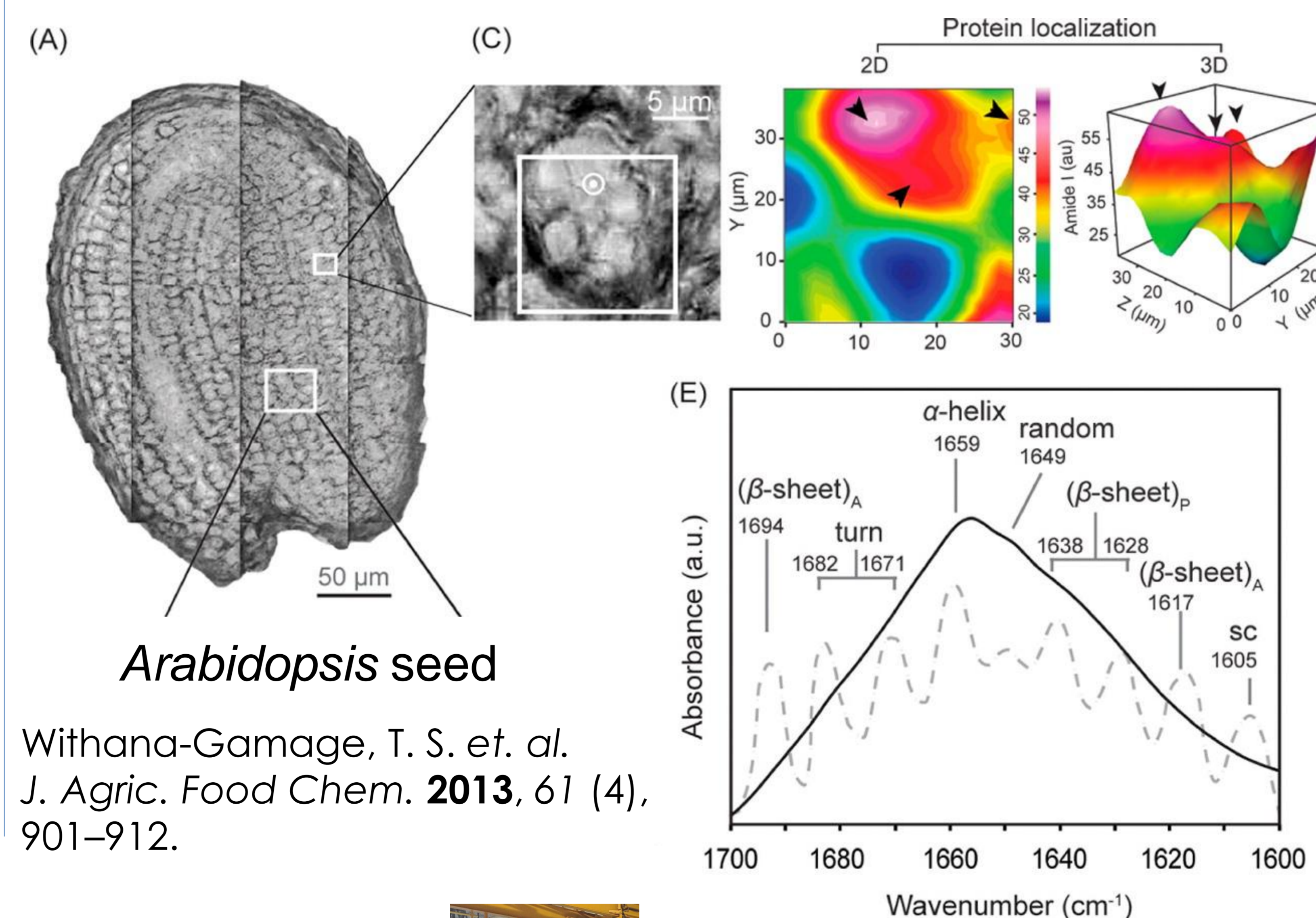
- Quantitative and qualitative composition information (e.g. lipids, proteins, carbohydrates...)
- Simultaneous acquisition for multiple chemical components

Mid-IR Imaging

- Qualitative distribution maps



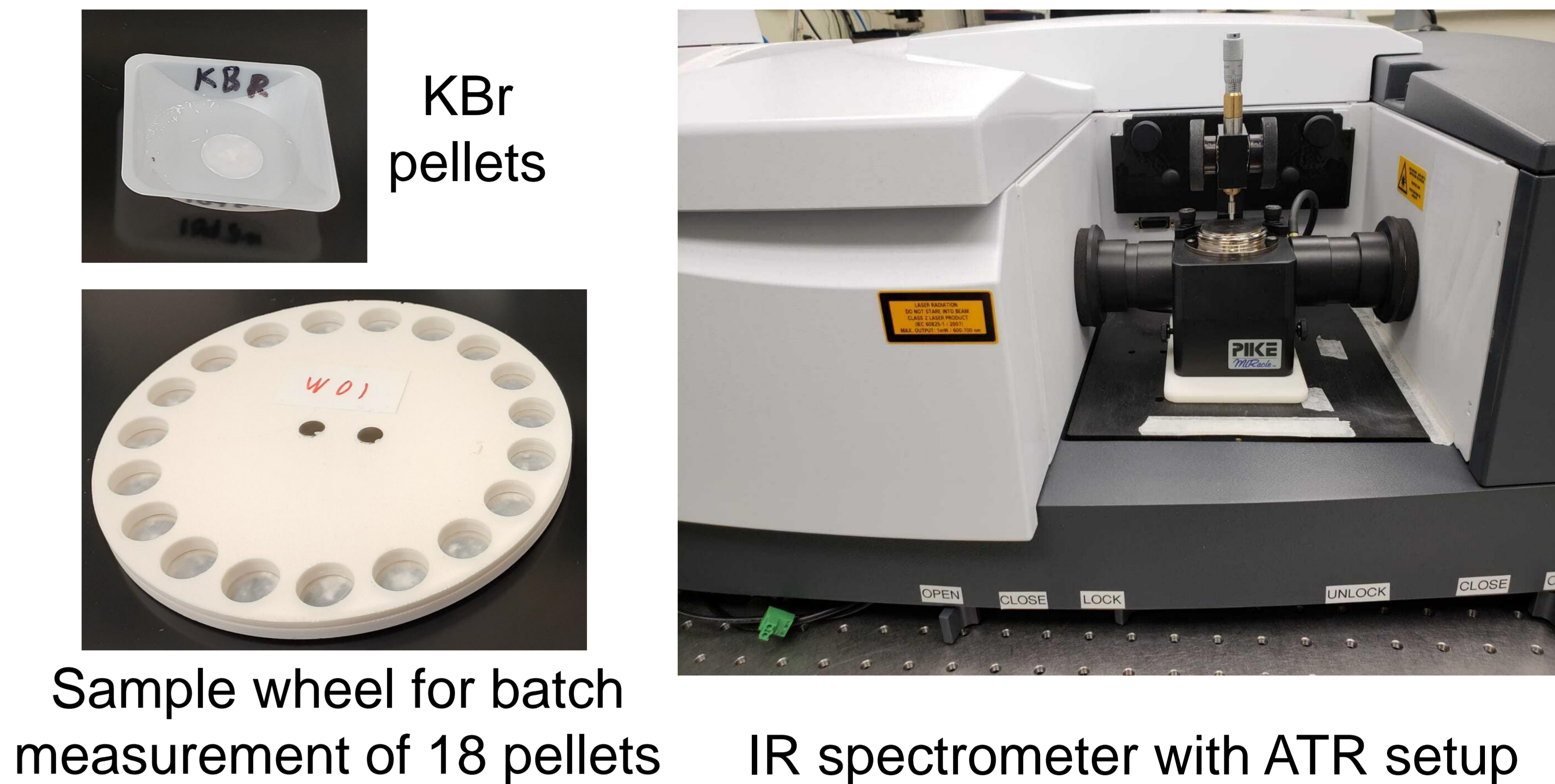
- Subcellular composition of protein quality determination in a seed



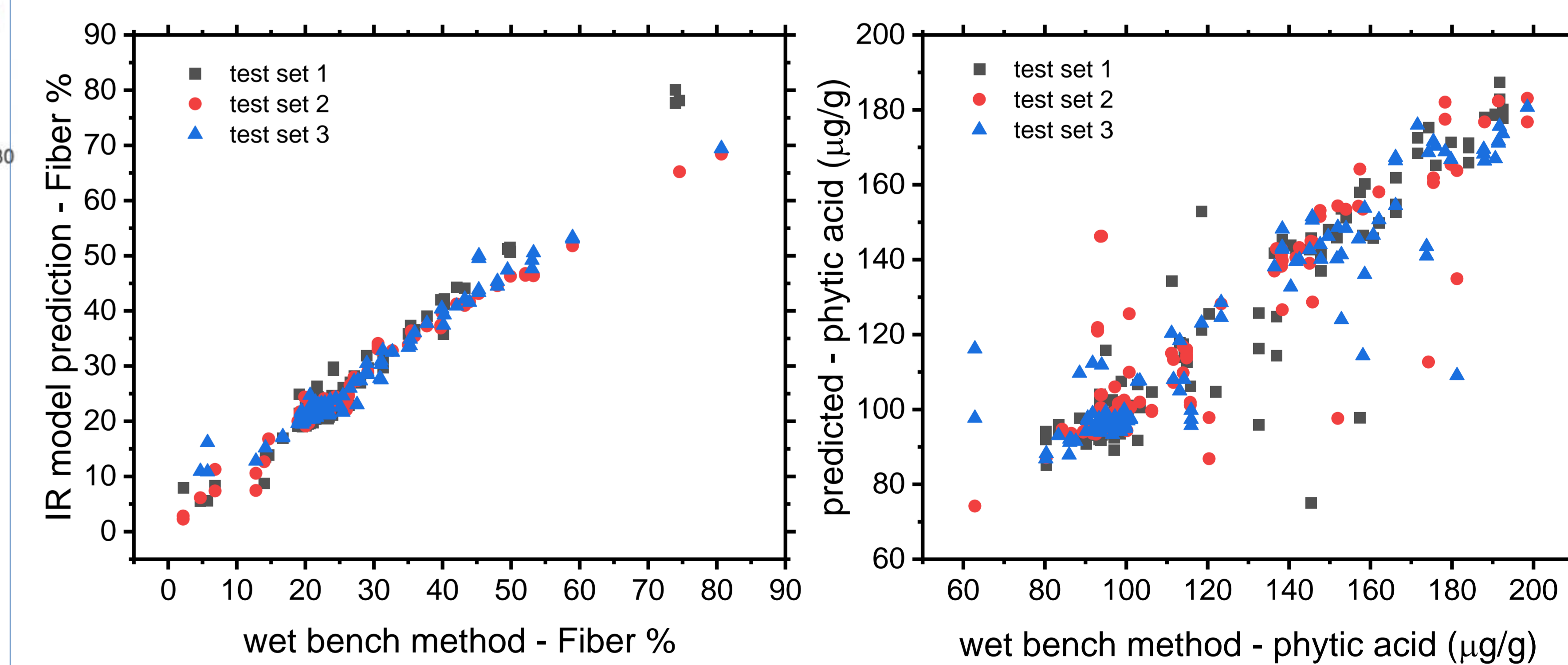
Withana-Gamage, T. S. et. al. *J. Agric. Food Chem.* **2013**, 61 (4), 901-912.

Bulk IR Spectroscopy

Bulk samples allow for high throughput analysis of plant tissue



- Evaluate compositional changes within large sample sets
- Quantitative information on chemical composition either using references spectra or prediction models



Correlation plot of prediction model for pea seeds

Karunakaran, C. et. al. *Food Chem.* **2019**, 309 125585.



KAIYANG TU
Associate Scientist, Plant Imaging
kaiyang.tu@lightsource.ca / 306-657-3710



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