

Opportunities for Food Science Research at the Mid-IR Beamline

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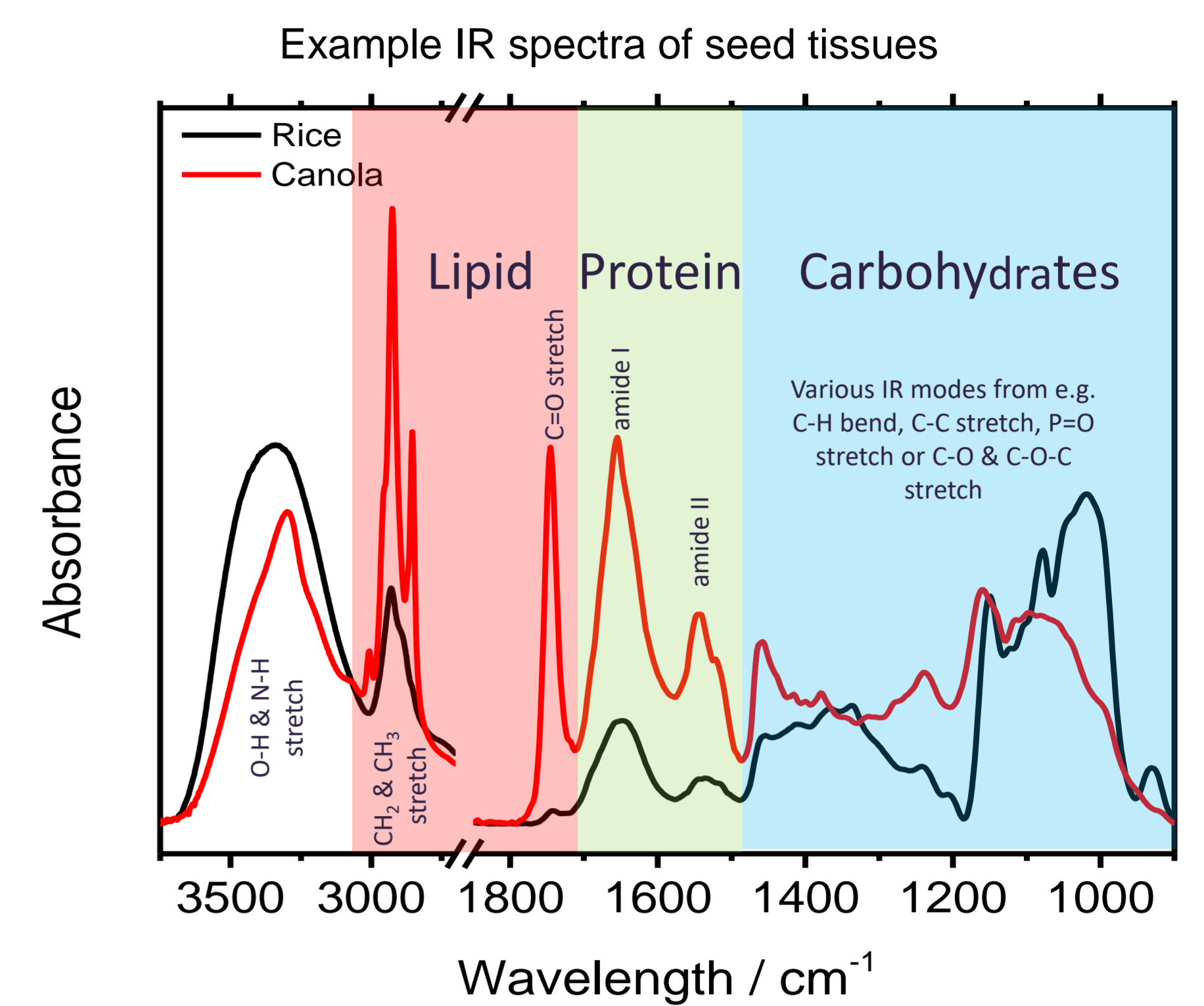
1. Canadian Light Source (CLS), 2. McMaster University, 3. Agriculture and AgriFood Canada (AAFC), 4. Swinburne University of Technology

IR spectroscopy for food science

Infrared (IR) techniques is a vibrational spectroscopy technique sensitive to a multitude of biomolecules within a wide variety of organic samples.

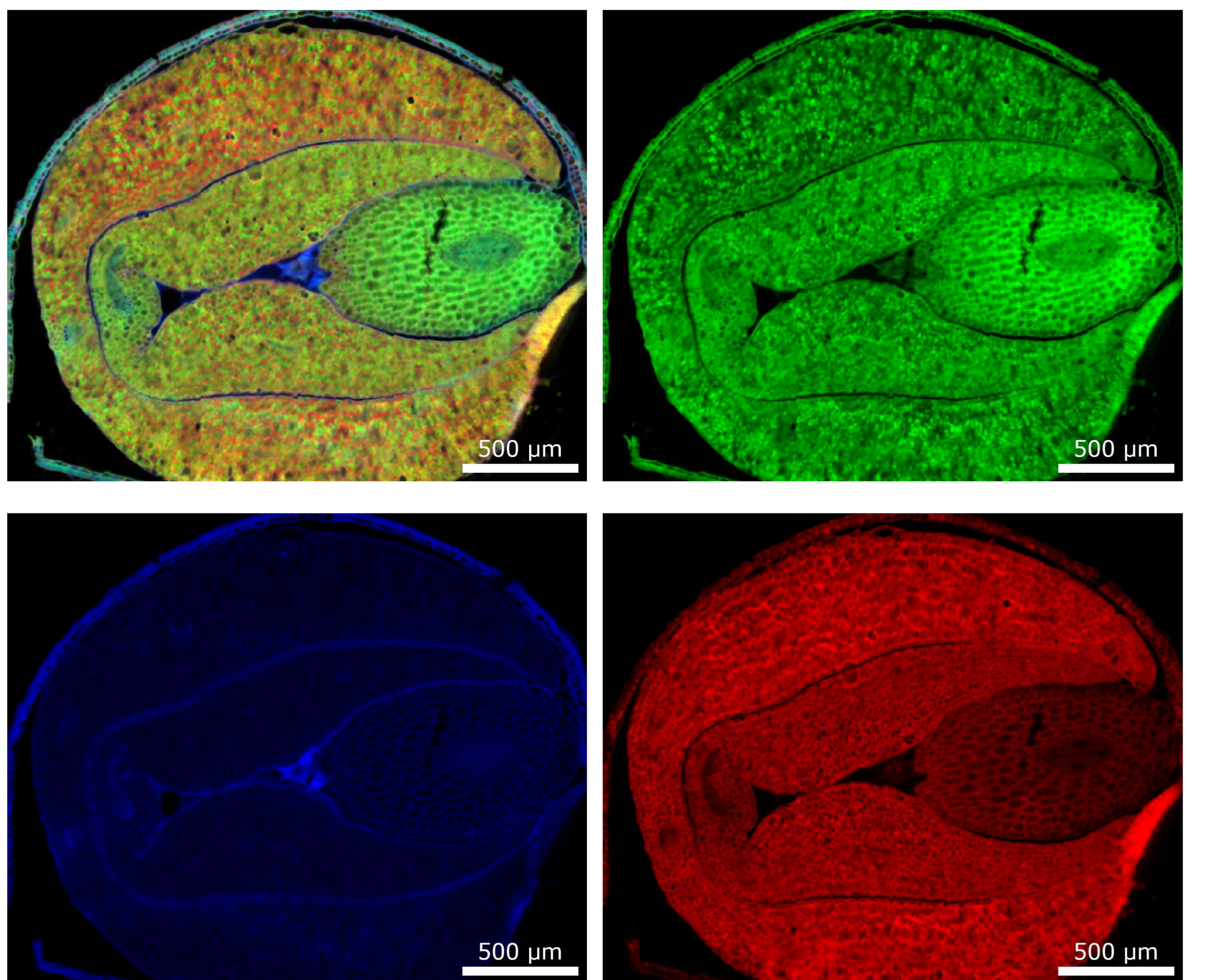
- Quantitative and qualitative composition information on organic molecules and macromolecules (e.g. lipids, proteins, carbohydrates...)
- Simultaneous acquisition for multiple components

The Mid-IR beamline offers a wide variety of IR spectroscopy setups ranging from transmission / transfection mode IR imaging or ATR IR imaging coupled with high brilliance synchrotron IR radiation to bulk IR spectroscopy options.

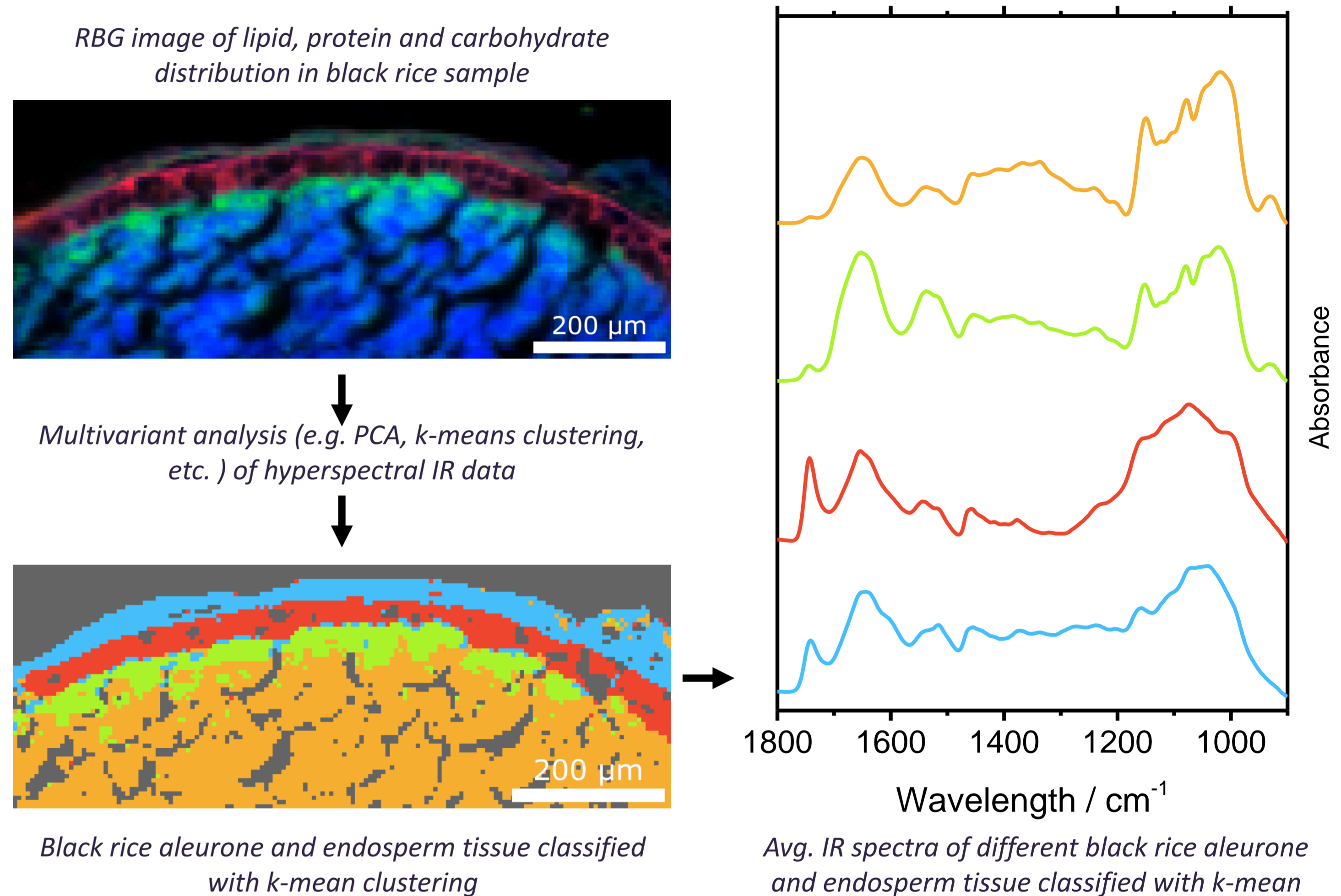


Mid-IR imaging

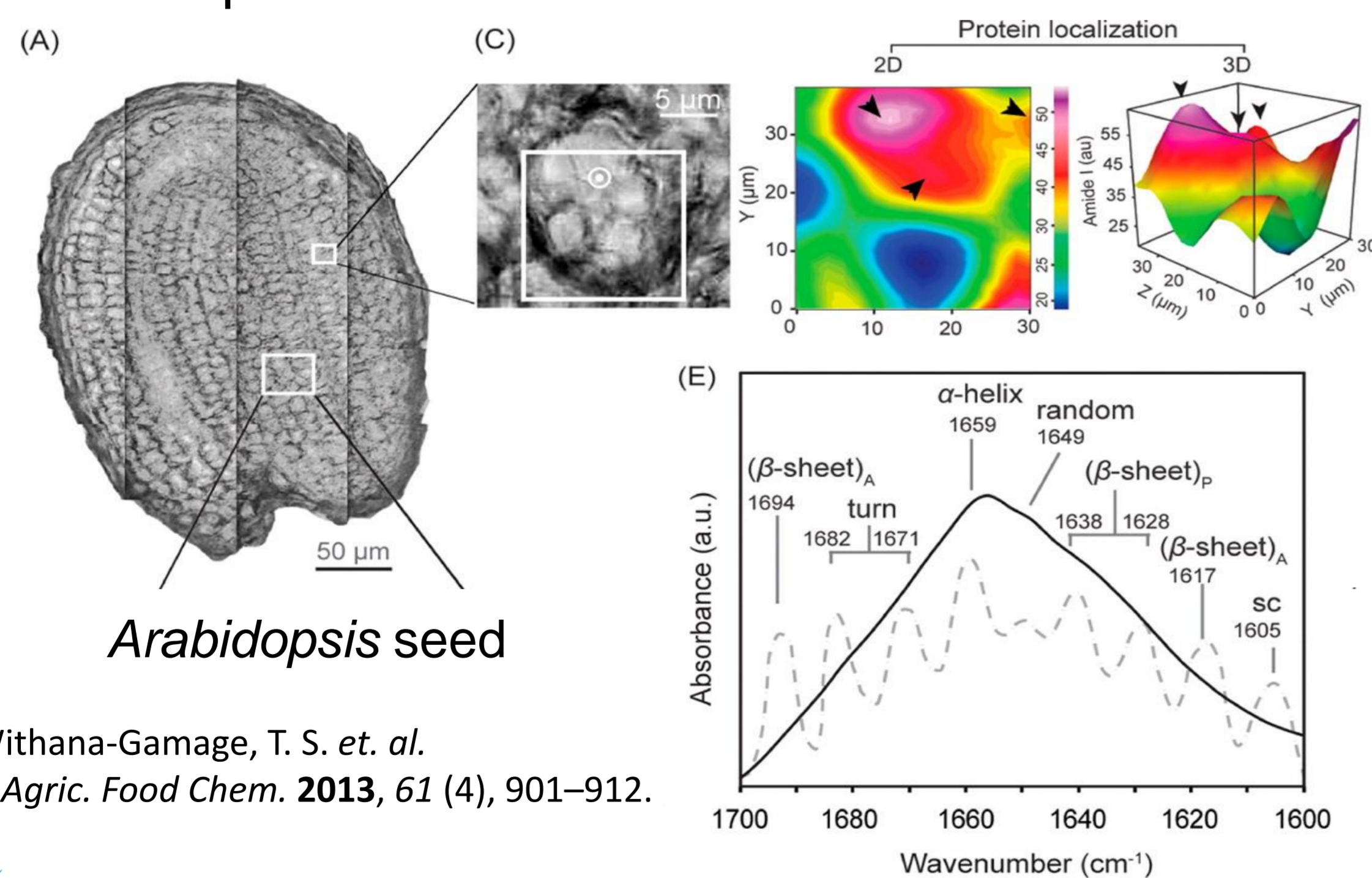
- Qualitative distribution maps of organic components (such as nutrient distribution in canola seeds)



- Hyperspectral imaging of black rice seed tissue for classification and composition analysis of different aleurone tissue types



- Synchrotron IR radiation imaging to determine protein secondary structure composition with subcellular resolution



Withana-Gamage, T. S. *et al.*
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Bulk IR Spectroscopy

- Mid-IR beamline facility offers some bulk IR option to collect complimentary information to IR imaging at Mid-IR beamline or x-ray measurements at other beamlines and options for quantitative analysis.

Sample requirement

- transmission / transfection IR imaging requires microtome thin section 6-10 μm
- ATR IR imaging can be utilized for thicker sample section or difficult to section sample with limitations (e.g. field-of-view, increase measurement time / complexity)

For any inquiries regarding IR spectroscopy or capabilities at Mid-IR beamline not covered here, please reach out:

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