



# PSSRC @ Otago

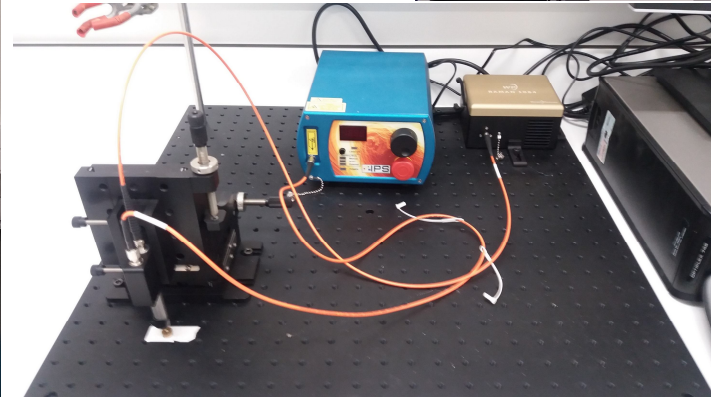
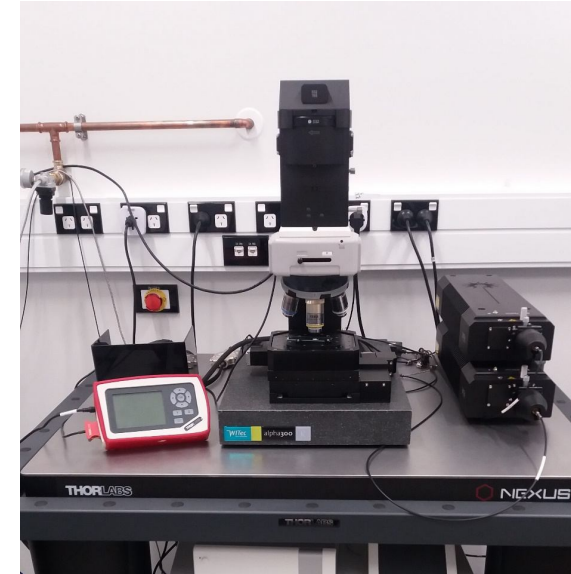
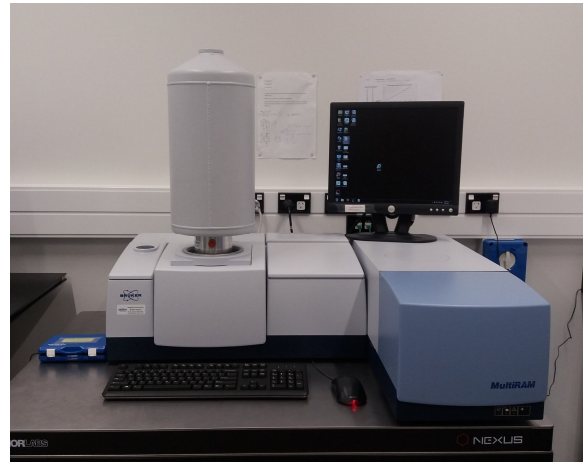
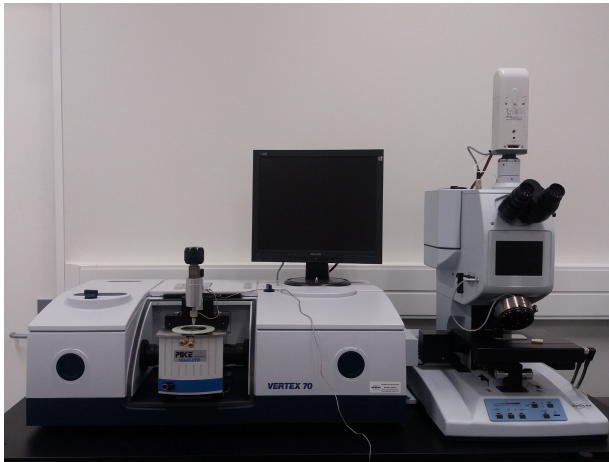


# Capabilities

Spectroscopy and chemometrics – solid-state species and identification

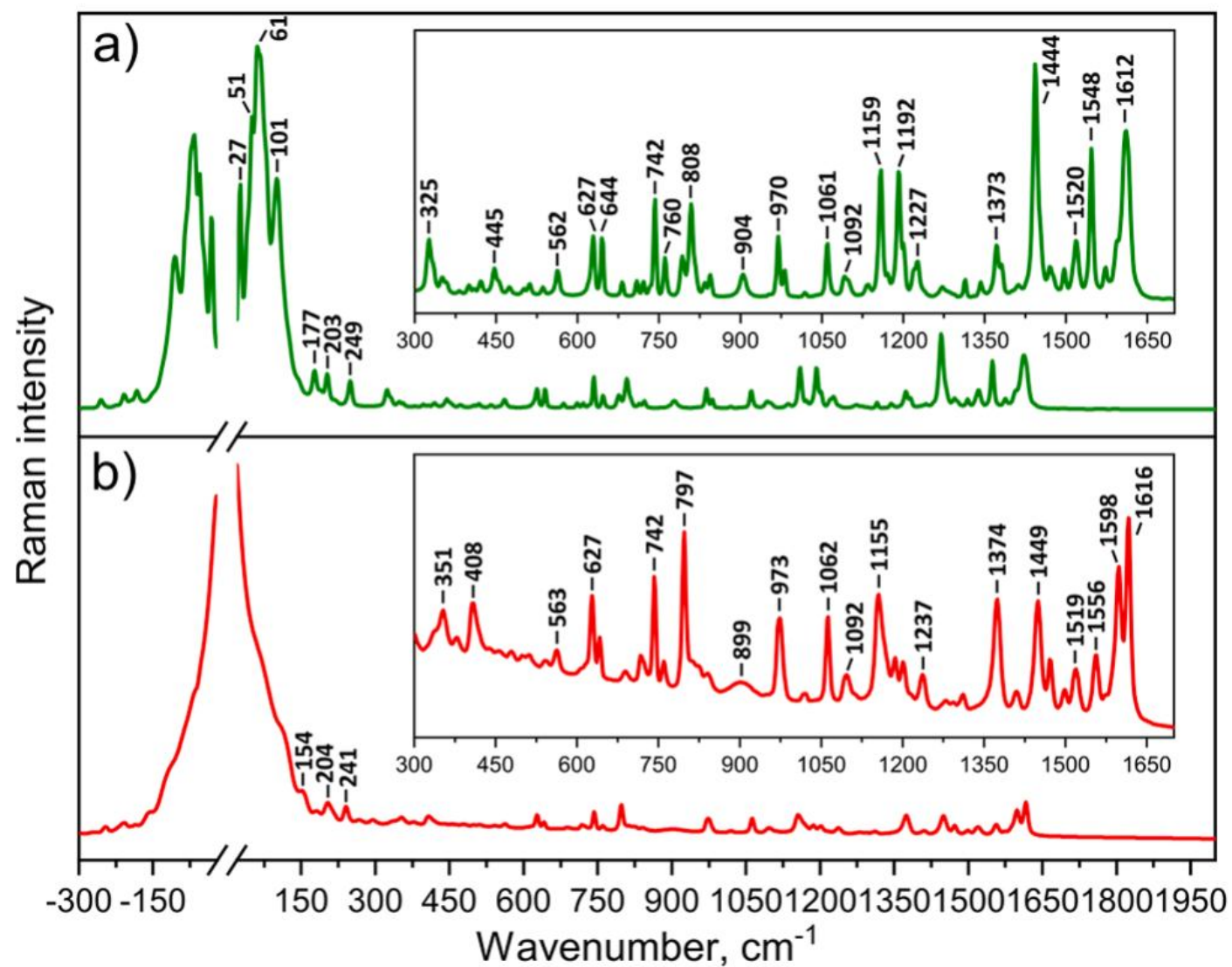
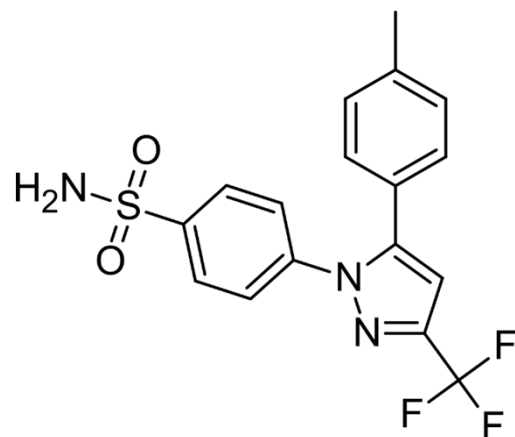
Computational chemistry

Focused lab – multimodal approach, Raman, infrared, near-IR and low frequency Raman

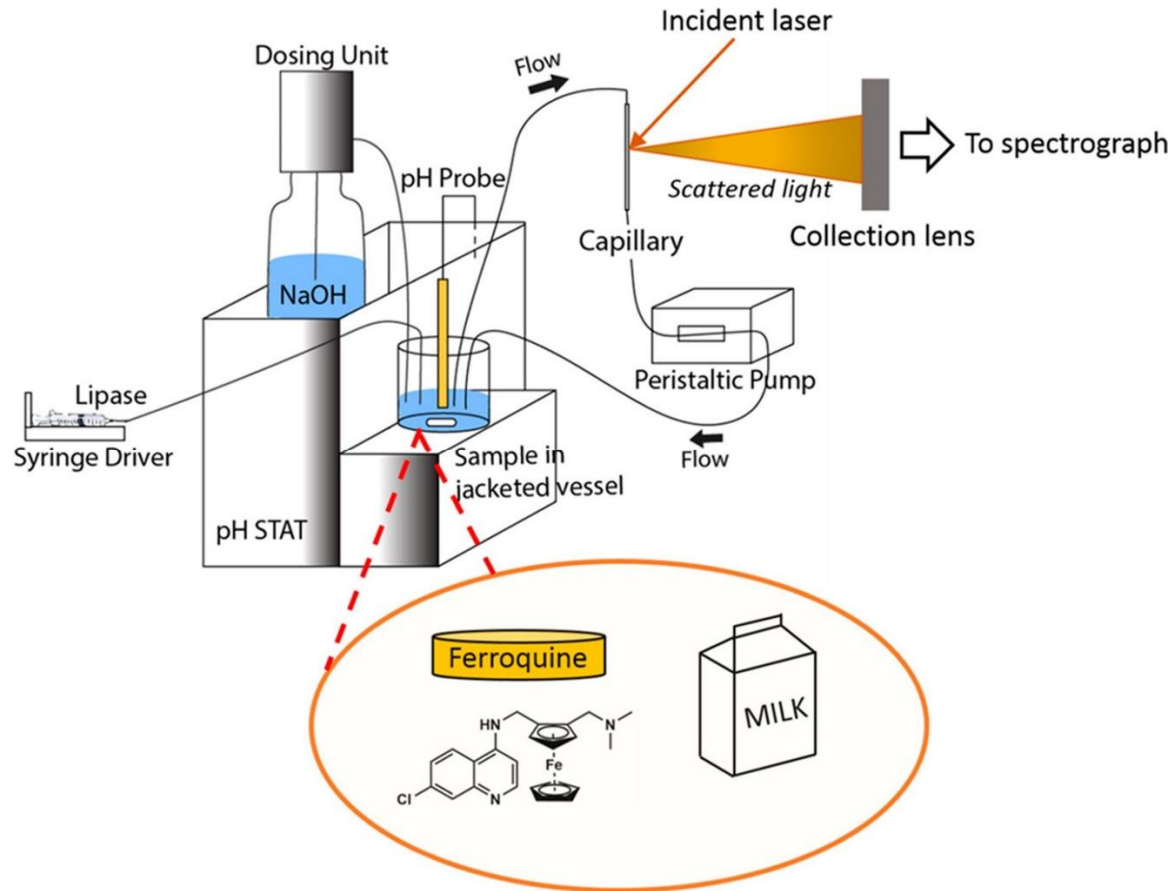




## Low frequency Raman spectroscopy

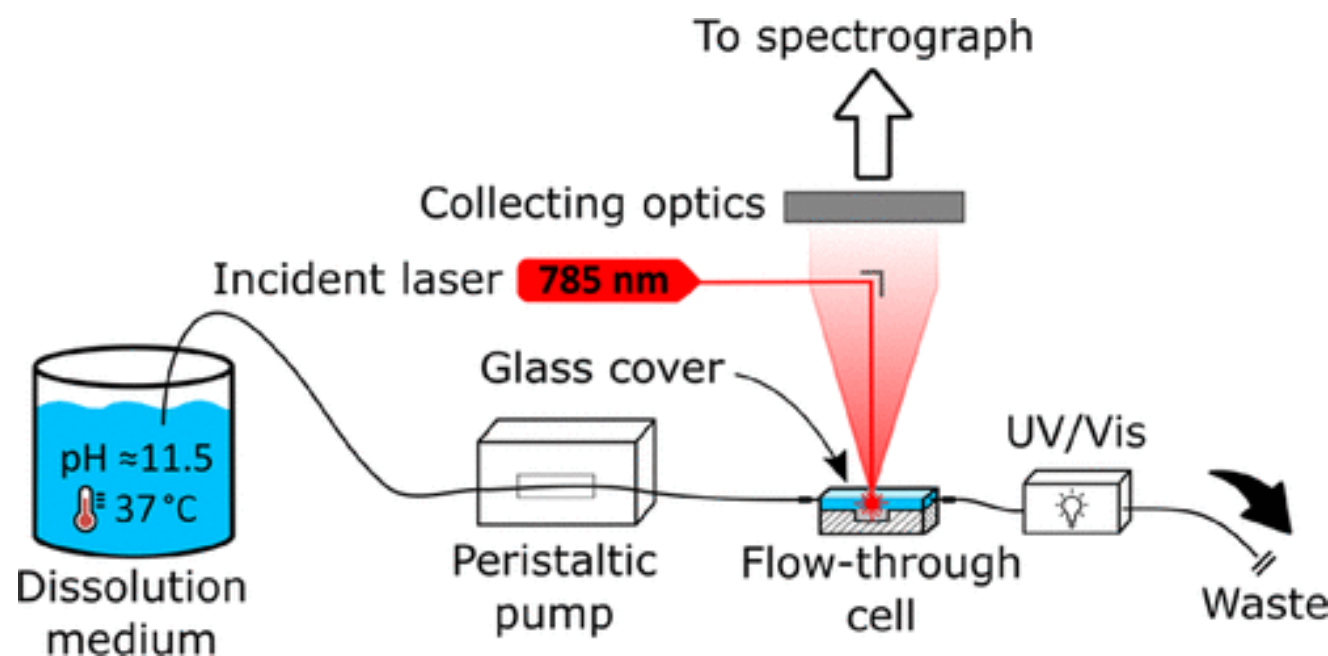


## Low frequency system



- 180 or ~130 deg backscatter
- 300  $\mu\text{m}$  spot or through microscope objective closer to micron
- Used for:
  - analysis of tablets and powders,
  - mapping tooth sections,
  - continuous monitoring of drug digestion (light focused on capillary with suspension flowing through)
  - Previous drug dehydration measurements.
  - Spatially offset low frequency Raman (SOLFRS)

- Downwards looking
- 300  $\mu\text{m}$  spot or through microscope objective
- Can use with stages to map, heating stage, flow through cell, anything needs measuring from above.



- This is used for:
  - Monitoring tablet/amorphous disk during dissolution,
  - Micro-SOLFRS,
  - Monitoring solid state form changes with a wider temperature range (enclosed temperature stage)

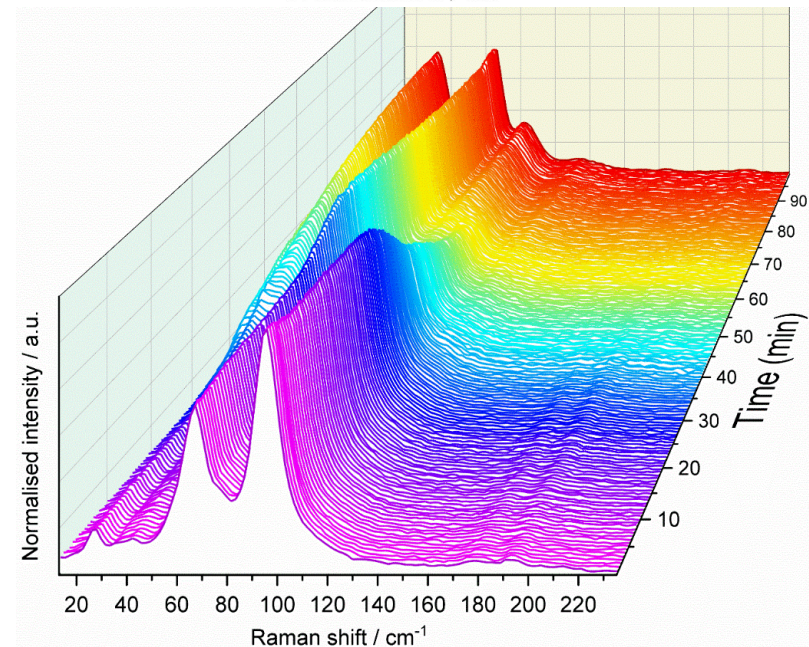
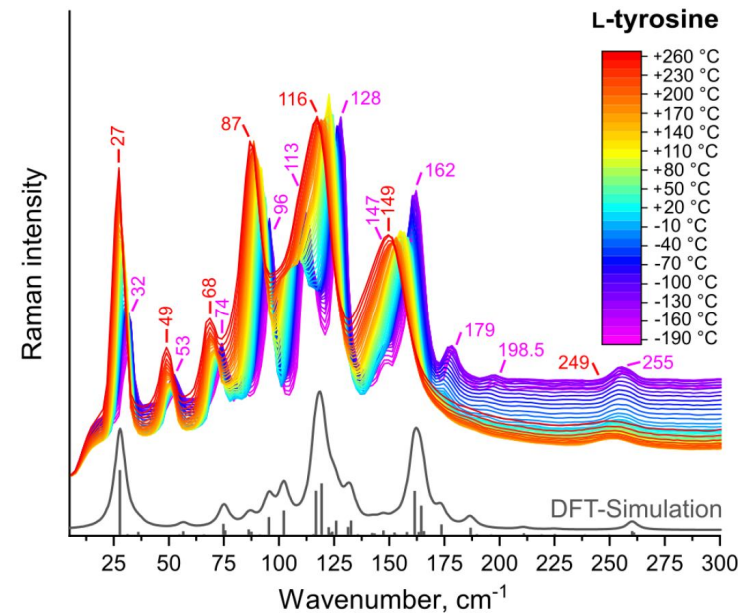
Measurements are rapid ( $< 1$  s) and may be completed at a range of temperatures

Expertise in extracting data via multivariate methods

Modelling spectra (with Tim Korter, Syracuse) for interpreting data

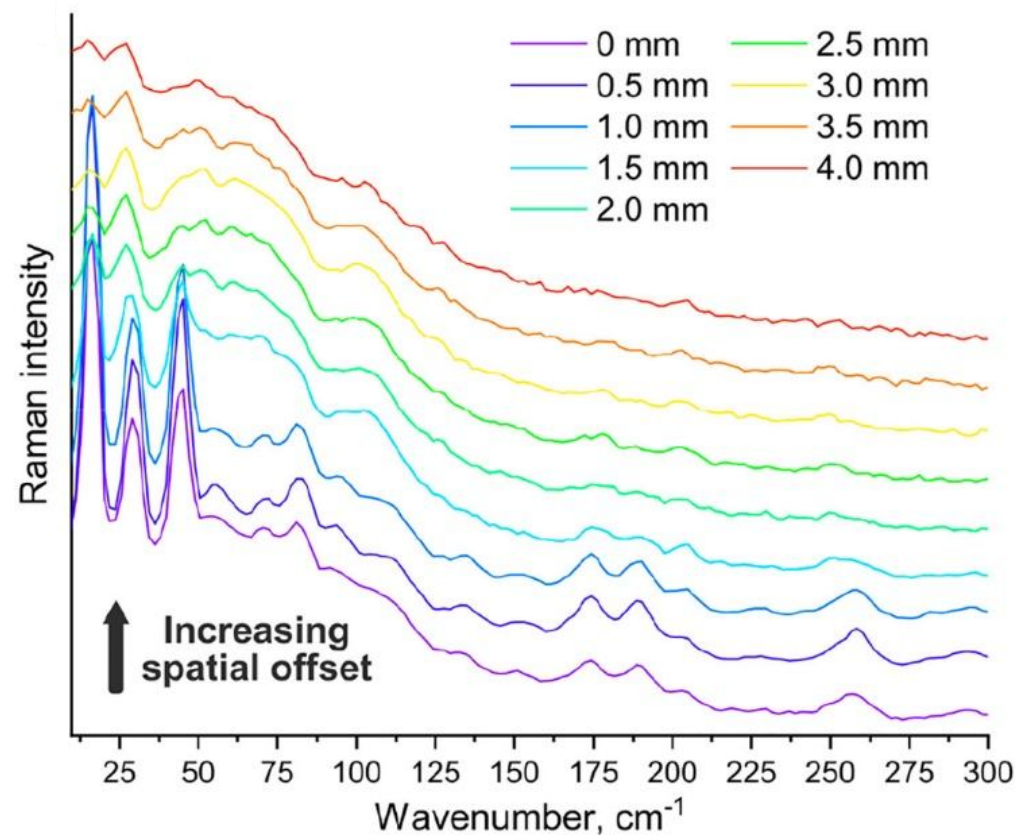
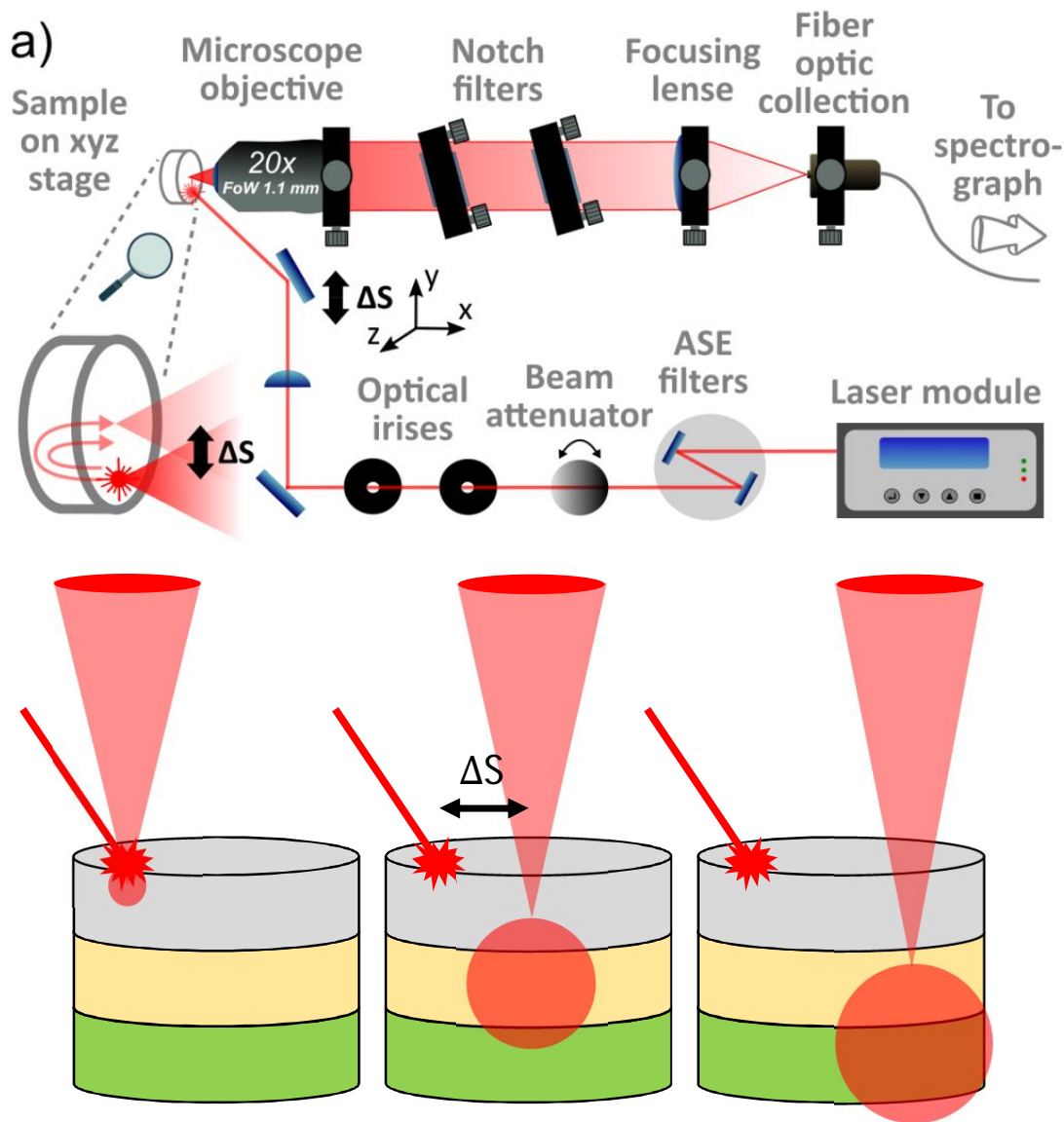
*Cryst. Growth Des.* 2020, 20, 10, 6947–6955

*Mol. Pharmaceutics* 2021, 18, 3, 1264–1276





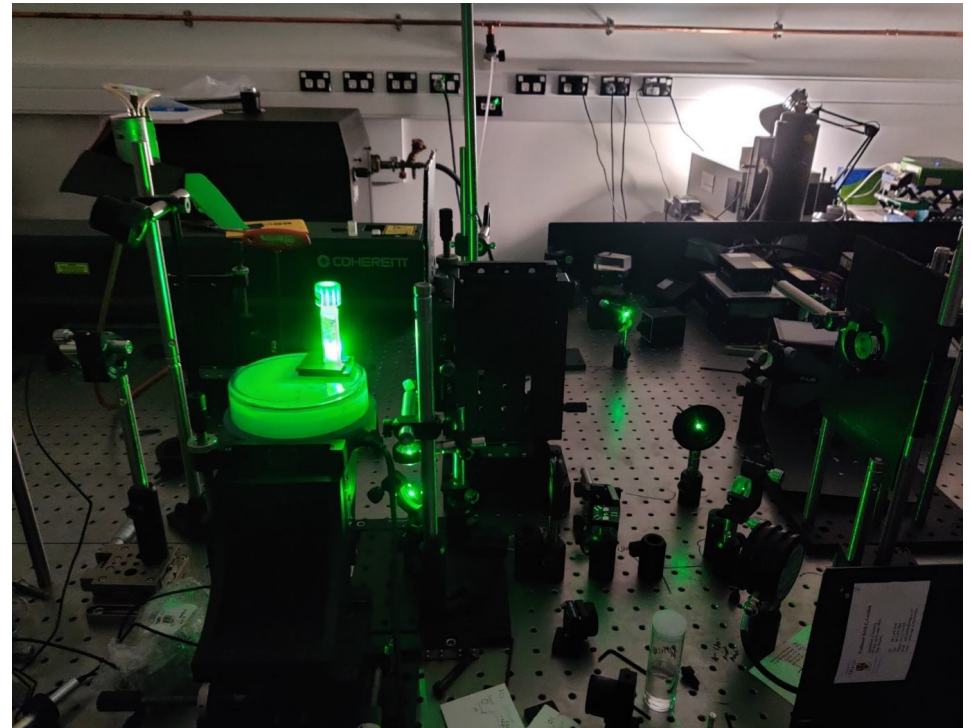
# Spatially offset Low Frequency Raman spectroscopy SOLFRS



*Anal. Chem.* 2021, 93, 8, 3698-3705

## Other LFR systems

- 830 nm Ondax low frequency system (higher resolution, smaller spectral window, detector not well suited to the wavelength (poorer throughput – lower S:N)
- 532 nm LFR system, similar to 785 nm 130° backscatter setup.





PhD scholarships at Otago are open to all - fees stipends are included

Externally funded work is also at domestic rates

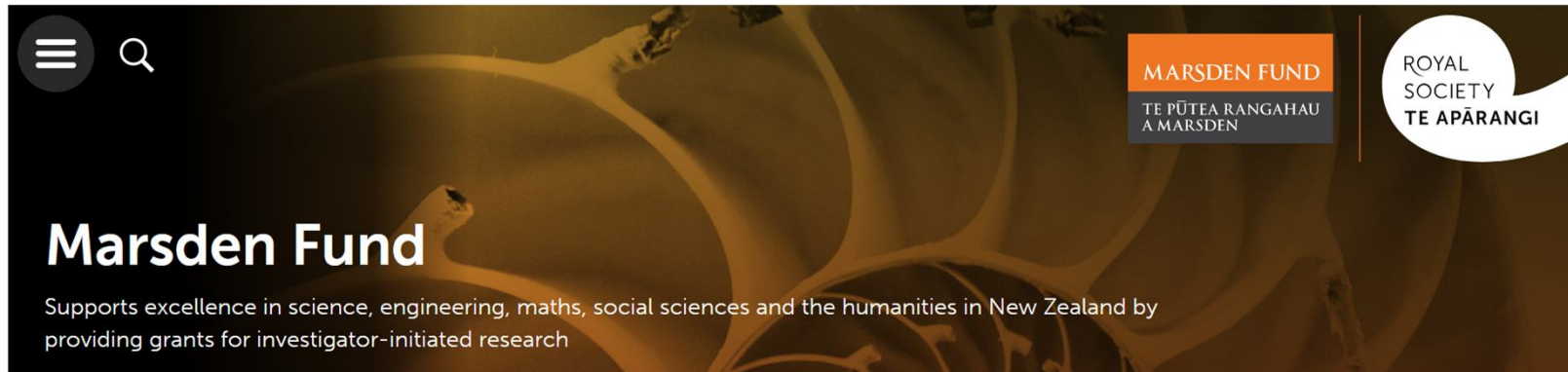
Dodd Walls funding for a PhD

MacDiarmid funding for a PhD

See us on <https://blogs.otago.ac.nz/keithgordon/>

## Funding

<https://www.royalsociety.org.nz/what-we-do/funds-and-opportunities/marsden>



**MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT**  
HĪKINA WHAKATUTUKI

<https://www.mbie.govt.nz/science-and-technology/science-and-innovation/funding-information-and-opportunities/investment-funds/endeavour-fund/>

Mostly directly in University and un-named

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