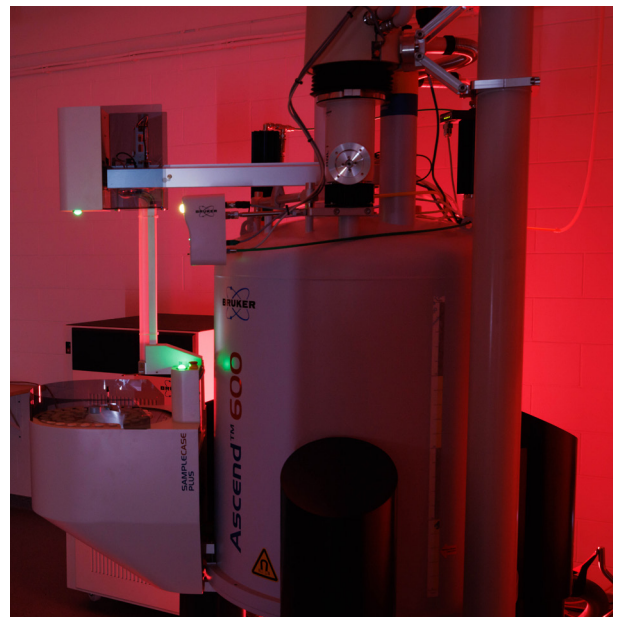




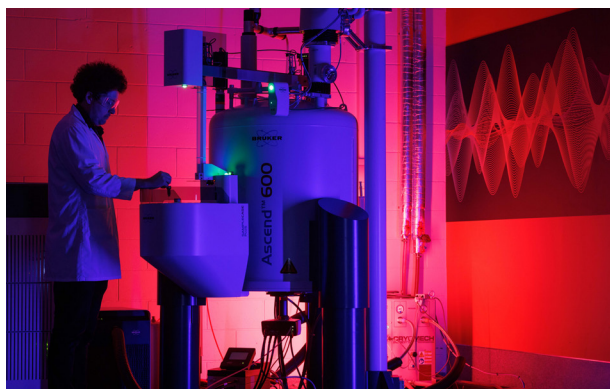
NMR Suite

Scion offers niche capability in the chemical analysis of plant and bio-based substances. Our suite of analytical equipment combined with our specialised skills enables us to offer a comprehensive service in one location.



Nuclear Magnetic Resonance

Scion has a range of Nuclear Magnetic Resonance (NMR) instruments to analyse natural products and materials made from plants. We offer the specialised capability needed to derive meaningful results for clients.



Scion offers two types of NMR spectroscopy: solid- and solution-state. Both our NMR machines are equipped with autosamplers to enable full automation and continuous running time. Each system also has a BNL nitrogen reliequifying unit attached. Our instruments are:

- Solid State NMR - Bruker Avance NEO 500MHz fitted with three different probes – 4 mm and 3.2 mm broadband dual channel H/X MAS, and 4 mm broadband dual channel H/X HR-MAS probe
- Solution State NMR – Bruker Avance NEO 600 MHz fitted with an H/X dual channel broadband 5 mm iProbe (with a H/X dual channel BBI 5 mm back-up)

These instruments are used to analyse the molecular composition of a wide range of samples including, for example:

- chemical composition and structure of plant materials
- wood genetic modification
- soil organic chemistry
- extractives
- bio-oils

Both systems can be used to analyse a variety of different nuclei. Standard nuclei are ^1H , ^{13}C , ^{31}P , ^{19}F , and ^{15}N but other nuclei can be analysed upon request. Examples include ^{27}Al and ^{29}Si in solid-state NMR. For many projects solution- and solid-state NMR can be used in a complementary fashion.

Samples can be sent to Scion for analysis and interpretation by our team of NMR analysts. Alternatively, for large projects, clients can be trained to run their own samples and book the relevant instrument when desired to enable flexibility from their work and analysis.

Solid-state NMR

Solid-state NMR spectroscopy is a powerful method for characterising solid materials. The solid-state instrument is used for materials that cannot be dissolved, such as wood and biopolymers.

Scion specialises in solid-state NMR techniques for the analysis of lignocellulosics and other bio-derived materials. This capability can be used for a range of functions including:

- checking the presence and functionality of additives
- analysing environmental samples e.g. soils
- analysing feedstocks for manufacturing
- identification of compounds resulting from biodegradation

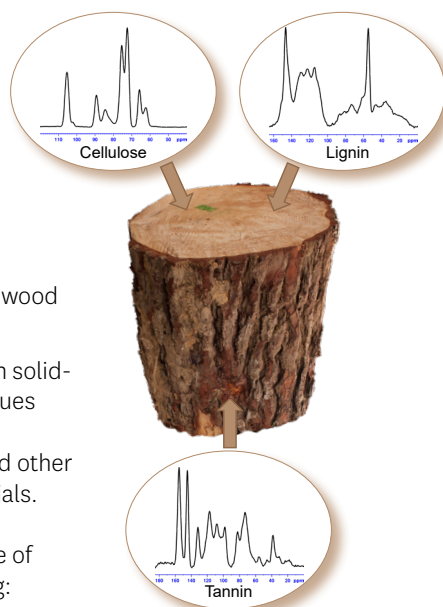
Scion's HR-MAS probe will allow analysis of samples that can be difficult by solution or solid-state NMR. These include gels, adhesives, emulsions, plant material, dairy and meat products.

Solution-state NMR

Solution-state NMR spectroscopy is a method for characterising the molecules within a liquid. This instrument is used for analysing samples in a dissolved state. Scion uses this capability to develop bio-based adhesives and plastics, and to screen for chemical composition (metabolomics). Analysis of complex mixtures e.g. bio-oils can be achieved using more advanced methods. Determination of chemical structure and purity of synthetic products can also be carried out.

Scion's NMR instruments and NMR spectroscopists fill a unique niche in New Zealand's science capability specialising in natural and manufactured biopolymers. We are among a small number of laboratories globally that specialises in forests, wood and wood fibre.

Get in touch with us if you are interested in getting your samples analysed in our suite or want to know more about training and booking the suite for your own use.



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Prosperity from trees *Mai i te ngahere oranga*

