

# Everyday NMR

- Why infer when you can be sure?

# Only NMR gives you definitive answers, on your terms.

Over the past half-century, scientists have used nuclear magnetic resonance (NMR) to directly identify, quantify, and characterize molecules, from small organic molecules to large protein complexes. Highly valued for its unparalleled view into intact molecules, NMR reveals rich details of molecular dynamics and structural architecture, inaccessible by other analytical methods. NMR is a non-destructive technique requiring minimal sample amounts, so you can go on to do additional analyses.

Today's scientists often choose NMR as it offers a variety of methods for research and quality control in biology, chemistry, physics, medicine, and materials science. The range of applications is broad, including materials, environmental, and food science, medical and pharmaceutical research, and more. Whether for routine analyses or groundbreaking research, even small laboratories can now easily adopt NMR in-house for definitive answers to molecular questions, every day.

# Why Bruker NMR?

For more than 50 years, Bruker has been dedicated to providing the best solutions for analytical tasks. With more than 90 locations around the globe, Bruker is strongly committed to meeting customers' needs, and continuing to develop state-of-the-art, innovative technologies for today's most challenging questions.



Ascend™ 400

## ACCESSIBLE TECHNOLOGY

- Customizable operation and convenient automation
- Compact and robust magnets with minimal system size, easy installation, and low cost of operation
- Expandable with optional software packages and scripting for a custom fit to your lab

## HIGHEST QUALITY STANDARDS

- Constructed to deliver optimum performance and superior reliability
- Every instrument thoroughly tested before leaving production facilities
- Comprehensive customer service providing sales, applications, and engineering support for all Bruker products

## FOCUSED ON EASE-OF-USE

- Minimal sample preparation or separation needed
- Easy and fast sample loading
- Automated sample changing options
- Ability to evaluate mixtures

## STREAMLINED DATA ANALYSIS

- Ready-to-use analysis options that extract only essential data
- Industry-leading software, with predefined experiments and interactive, automated processing and reporting tools

# Everyday NMR Applications

## SMALL MOLECULE STRUCTURE AND QUANTIFICATION

Determine the detailed arrangement of and distance between atoms

Find out how much of a specific material is really present

## MACROMOLECULAR STRUCTURE

See how proteins fold and bind to ligands

Observe molecular structure of RNA, DNA, and even large complexes

Evaluate relationship between conformation and biological activity

## CHEMICAL AND MOLECULAR DYNAMICS

View how atoms move

Obtain insight into barriers to conformational change

Understand kinetics of chemical reactions and chemical ecosystems

## MIXTURE ANALYSIS

Evaluate complex mixtures to explore metabolism

Test the makeup and origin of natural health products

Confirm quality and safety in foods and beverages

## MATERIALS

Study polymers, porosity, and polymorphism

Explore physical properties

## IMAGING

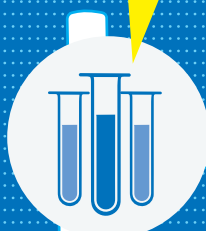
See inside living organisms

Evaluate candidate therapeutics

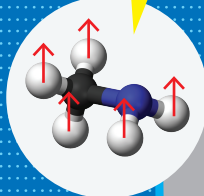
# How NMR Works

A step-by-step look inside NMR from sample to analysis

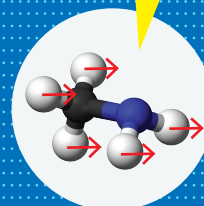
**STEP 1:** Samples are placed inside a powerful magnet



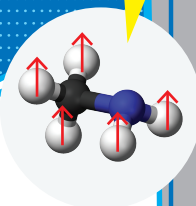
**STEP 2:** Atomic nuclear spins within the sample align with the magnetic field



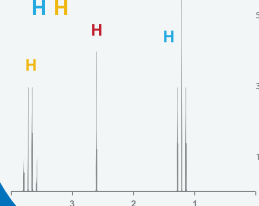
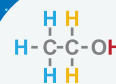
**STEP 3:** Electronic coil surrounding the sample generates a radio-frequency pulse that moves the nuclear spins out of alignment with the magnetic field



**STEP 4:** Electronic coil then detects tiny differences in response as nuclear spins return to their alignment with magnetic field



**STEP 5:** Differences in response reflect influences of nearby nuclei and electrons, providing detailed information about molecular makeup, structure, and more



# Bruker's Everyday NMR Portfolio

The best technology for your investment, low- to high-field

Get the features you need with a footprint and price that fit your lab. Only Bruker provides the world's most easy-to-own and easy-to-operate suite of NMR systems. With Bruker's accessible and user-focused technology, you can bring the confidence of NMR into your lab workflow easily and affordably, without sacrificing performance.

[BRUKER.COM](http://BRUKER.COM) // [info@bruker.com](mailto:info@bruker.com)



## Bruker Magnet Advantage

### Ascend™ Magnet Series

Advanced technology in the Ascend magnet series enables superior performance with low drift, outstanding field stability in a reduced size and weight, and with cryogen savings of up to 44%. The Ascend Aeon magnet series integrates Bruker's proprietary active refrigeration providing years of convenient and care-free operation with scheduled refrigeration maintenance service from Bruker.

## Bruker Console Advantage

### AVANCE™ Console and AVANCE System

For demanding applications, AVANCE consoles offer unprecedented speed, flexibility, and power. The most compact AVANCE consoles fit under any standard table, saving valuable lab space. Combined with an actively shielded Ascend 300 magnet, this spectrometer brings high-end technology and performance to every lab.

## Bruker Software Advantage

### Supporting Complete Workflow

Bruker provides a complete software portfolio for both casual and expert users, supporting a wide variety of applications and customer needs. Automated data acquisition, processing, and analysis provides high-quality, fast results for any user. Advanced users benefit from sophisticated tools to develop NMR experiments to push the edge of scientific discovery.

## Bruker Service Advantage

### Reliable Trustworthy Service

Bruker offers training courses worldwide. Skilled engineers explain the basics of all instruments. Application experts guide you through setting up experiments and interpreting results in an easy and straightforward way. Bruker specialists are only a call or email away, ready to help your lab leverage the power of NMR easily and quickly.