

## Acquisition of Multidimensional NMR Spectra in a Single Scan (Yeda)

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### Summary

A method to significantly shorten acquisition times of high-quality MRI images. Multidimensional nuclear magnetic resonance (NMR) is used nowadays in many applications (e.g., discovery of new pharmaceutical drugs, characterization of new catalysts, and investigation of the structure and dynamics of proteins). One drawback of this technique is that, by contrast to one-dimensional spectroscopic methods, multidimensional NMR requires relatively long measurement times associated with hundreds or thousands of scans. This places certain kinds of rapidly-changing systems in Chemistry outside the scope of the technique. Long acquisition times also make this technique ill-suited for in vivo analyses and for clinical measurements in combination with magnetic resonance imaging (MRI). The current technology allows for the acquisition of multidimensional NMR scans using a single continuous scan, thereby shortening the time needed to acquire high-quality MRI images.

### Applications

- In vivo diagnostics
- High-throughput proteomics/metabonomics
- NMR of unstable chemical systems
- Metabolic dynamics
- High-resolution NMR in tabletop systems
- Extensions to non-MR spectroscopies

### Advantages


- Can shorten the acquisition time of any multidimensional spectroscopy experiment by orders of magnitude
- Compatible with the majority of multidimensional pulse sequences
- Can be implemented using conventional NMR and MRI hardware

### Technology's Essence

The outlined approach, called ultrafast multidimensional NMR, significantly expedites the analysis of the electromagnetic sounds produced, making it possible to acquire complete multidimensional NMR spectra within a fraction of a second. This technology "slices up" the molecular sample into numerous thin layers and then simultaneously performs all the measurements required on every one of these slices. The protocol then integrates these measurements according to their precise location, generating an image that amounts to a full multidimensional spectrum from the entire sample.

### Licensing Status

#### Contact for more information:

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