

# Ex vivo high-resolution Magnetic Resonance spectroscopy ( $^1\text{H}$ & $^{13}\text{C}$ metabolic profiling) on intact tissues

*Commonly used acronym: HR-MAS-MR spectroscopy*

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## Organisation

**Name of the organisation** Université Catholique de Louvain (UCL)

**Department** Louvain Drug Research Institute, Nuclear and Electron Spin Technologies platform (NEST)

**Country** Belgium

**Geographical Area** Brussels Region

## SCOPE OF THE METHOD

<b>The Method relates to</b>	Animal health, Human health
<b>The Method is situated in</b>	Basic Research, Translational - Applied Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	tumor biopsies

## DESCRIPTION

### Method keywords

metabolic profiling

tumor

Magnetic Resonance Spectroscopy

biopsies analysis

$^1\text{H}$  &  $^{13}\text{C}$ -MRS

### **Scientific area keywords**

cancer research

tumor metabolism

metabolomics

cancer diagnosis

treatment monitoring

cancer treatment

### **Method description**

HR MAS analysis of intact tissues consists in the metabolic profiling of entire tumor biopsies using high resolution NMR (nuclear magnetic resonance) using  $^1\text{H}$  and/or  $^{13}\text{C}$  MRS (magnetic resonance spectroscopy). The technique allows combination of metabolomic data with genomic or proteomic data, and can therefore be used both for exploring the molecular biology of cancer and for clinical improvements in cancer diagnostics, prognostics, treatment planning, and treatment monitoring.

### **Lab equipment**

High Resolution NMR (600MHz magnet) equipped with a spinning system for HR-MAS (magic angle spinning) to allow study of intact tissues.

### **Method status**

History of use

Published in peer reviewed journal

## **PROS, CONS & FUTURE POTENTIAL**

### **Advantages**

One of the best nondestructive method for study of biopsies composition.

### **Challenges**

Signal is better when acquired on tissue extracts.

### **Modifications**

No modifications are planned in the near future.

### **Future & Other applications**

The technique will remain 'limited' to the analysis of tissue biopsies.

## **REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION**

### **References**

High-Resolution Magic Angle Spinning (HRMAS) NMR Methods in Metabolomics.  
Tilgner M, Vater TS, Habbel P, Cheng LL. Methods Mol Biol. 2019;2037:49-67. doi:  
10.1007/978-1-4939-9690-2\_4.

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