Ex vivo high-resolution Magnetic Resonance spectroscopy (1H & 13C metabolic profiling) on intact tissues

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

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Organisation

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Country Belgium

Geographical Area Brussels Region

SCOPE OF THE METHOD

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

DESCRIPTION

Method keywords

metabolic profiling
tumor
Magnetic Resonance Spectroscopy
biopsies analysis
1H & 13C-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 1H and/or 13C 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) equiped 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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