Real-time bioenergetics in human and animal cell lines

Commonly used acronym: *respirometry*

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Contact person

Charlotte Grootaert

Organisation

Name of the organisation Ghent University (UGent)
Department Food Technology, Safety and Health
Country Belgium
Geographical Area Flemish Region

SCOPE OF THE METHOD

The Method relates to	Environment, Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Species from which cells/tissues/organs are derived	Human-derived cell lines
Type of cells/tissues/organs	Intestine, liver, lung, immune system

DESCRIPTION

Method keywords

respirometry
bioenergetics
Metabolism
mitochondrial respiration
glycolysis

Scientific area keywords

metabolism
toxicity
bioenergetics
Drug metabolism

Method description

Using respirometry (oxygen and pH, XF96 Analyzer), computer assisted cell analysis, and specific substrates and stressors, mitochondrial function and metabolic changes in a diverse set of cell lines can be measured. Relevant to study substrate preferences, acute and chronic effects of toxic substrates and contaminants, particles, as well as early events in the development of chronic diseases such as cancer and metabolic syndrome.

Lab equipment

XF96 Analyzer Agilent

Method status

History of use
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

On-line measurement on real cell systems early responses chronic responses strong support by the company.

Challenges

- Variability;
- One provider relatively expensive consumables.

Modifications

Optimisation for tissues instead of cells.

Future & Other applications

Can be used in metabolic, cancer, toxicology and bioactive compounds research.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Marlies Decleer, Jelena Jovanovic, Anita Vakula, Bozidar Udovicki,, Rock-Seth E. K. Agoua, Annemieke Madder, Sarah De Saeger, and Andreja Rajkovic. Oxygen Consumption Rate Analysis of Mitochondrial Dysfunction Caused by Bacillus cereus Cereulide in Caco-2 and HepG2 Cells. 2018, Toxins, 10, 266.

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