

## Human in vitro liver metabolism using HLM, HLCYT and Liquid Chromatography coupled to High-Resolution Mass Spectrometry

Created on: 04-10-2019 - Last modified on: 08-11-2019

### Contact person

Philippe Vervliet

### Organisation

**Name of the organisation** University of Antwerp (UAntwerpen)

**Department** Department of Pharmaceutical Sciences

**Country** Belgium

**Geographical Area** Flemish Region

## SCOPE OF THE METHOD

<b>The Method relates to</b>	Environment, Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	Human Liver Microsomes and Human Liver Cytosol

## DESCRIPTION

### Method keywords

HLM  
HLCYT  
Liquid chromatography  
mass spectrometry  
Metabolism  
liver  
in vitro

### Scientific area keywords

Toxicology  
analytical chemistry  
liver metabolism  
Drug metabolism  
Drug discovery

### Method description

A compound of interest (e.g. new psychoactive substance, endocrine disrupting compound, ...) is incubated with human liver microsomes and liver cytosolic fractions to

generate both Phase I and II metabolites. Samples are prepared for analysis using a simple method in order to avoid possible losses of biotransformation products. The extracts are analysed using liquid chromatography coupled to quadrupole time-of-flight mass spectrometry. Identification of the biotransformation products is performed using complementary screening workflows. These include a suspect screening based on *in silico* predictions and non-targeted screening using either vendor-specific or in-house developed open-source software protocols.

### Lab equipment

- Warm water bath (37°C) ;
- Temperature-controlled nitrogen evaporator ;
- Centrifuge ;
- LC coupled to high-resolution mass spectrometry (for identification).

### Method status

Published in peer reviewed journal

## PROS, CONS & FUTURE POTENTIAL

### Advantages

- Optimized assay with different timepoints, negative and positive controls and method blanks ;
- Tested for a variety of substrates (NPSs, EDCs, ...) resulting in multiple publications ;
- Custom data analysis possible, according to research question ;
- Besides analytical equipment (LC-HRMS) no need for expensive equipment.

### Challenges

- Possible over or underestimation of *in vivo* biotransformation ;
- Suspect screening dependent on strength of *in silico* predictions.

### Modifications

- No further optimizations are planned for the near future.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### Associated documents

2018 - Vervliet Mortelet et al - DTA - 5CI-THJ-018.pdf

2019 - Vervliet - Toxicology - HLM DEMO.pdf

Coordinated by



Financed by



Vlaanderen  
verbeelding werkt

