

## Drug-induced phospholipidosis in hepatic cells derived from human skin-derived precursors

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### Organisation

**Name of the organisation** Vrije Universiteit Brussel (VUB)

**Department** Pharmaceutical and Pharmacological Sciences

**Specific Research Group or Service** In Vitro Toxicology and Dermato-Cosmetology

**Country** Belgium

### SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Translational - Applied Research
<b>Type of method</b>	In vitro - Ex vivo

### DESCRIPTION

#### Method keywords

toxicology  
in vitro  
drug testing  
Intracellular lipids  
phospholipids  
Phospholipidosis  
amiodarone

#### Scientific area keywords

hepatic differentiation  
Hepatotoxicity  
skin-derived precursors  
skin stem cells

#### Method description

Drug-induced phospholipidosis (DIPL) is a metabolic disorder characterized by an excessive intracellular accumulation of phospholipids caused by cationic drugs. Hepatic cells derived from human skin are evaluated as an *in vitro* model to investigate DIPL and its mechanisms. Human skin stem cells (hSKP) are isolated, under informed consent, from human circumcised foreskin samples of young boys and hSKP are differentiated for 24 days to obtain hepatic-like cells (hSKP-HPC), as previously described. hSKP-HPC are exposed to amiodarone, a drug known to induce phospholipidosis in humans. Upon exposure to amiodarone for 24, 48, 72h, hSKP-HPC retain intracellular phospholipids,

form lamellar bodies and show alterations at the gene expression level. Overall, these findings prove that hSKP-HPC might contribute to setting up an accurate *in vitro* platform for hepatotoxicity testing.

### Lab equipment

Laminar air flow;  
Flow cytometry;  
Transmission electron microscopy;  
Reverse transcriptase-polymerase chain reaction (qPCR) reagents.

### Method status

History of use

## PROS, CONS & FUTURE POTENTIAL

### Advantages

Applicability of hSKP-HPC for the quick assessment of drug-induced phospholipidosis *in vitro*;  
Different human donors can be tested to assess toxicity.

### Future & Other applications

In vitro toxicity testing in the drug development process

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

W. H. Halliwell, "Amphiphilic Drug-Induced Phospholipidosis," *Toxicol. Pathol.*, vol. 25, no. 1, pp. 53–60, 1997. [2] R. M. Rodrigues et al., "Human skin-derived stem cells as a novel cell source for in vitro hepatotoxicity screening of pharmaceuticals.," *Stem Cells Dev.*, vol. 23, no. 1, pp. 44–55, 2014

### Associated documents

[Article A Natale 2017.pdf](#)

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