

# Adult skin stem cell-derived in vitro model for investigating acute liver failure

*Commonly used acronym: hSKP-based ALF model*

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## Contact person

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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>	Basic Research, Education and training
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	human skin-derived precursors

## DESCRIPTION

### Method keywords

acute liver failure

in vitro

Stem cells

paracetamol

### **Scientific area keywords**

in vitro cytotoxicity

hepatic toxicity

hepatic in vitro model

hepatocyte-like cells

### **Method description**

This method uses human skin-derived precursors (hSKP) differentiated towards hepatic cells (hSKP-HPC) as a hepatic *in vitro* model. Exposure of these cells for 24 hours to sub-cytotoxic concentrations of acetaminophen, which is a reference hepatotoxicant, induced specific cellular responses in a comparable way to primary human hepatocytes in culture. APAP-induced gene expression modulation (the read-out of this method) pointed towards an activation “liver damage”, “liver proliferation” and “liver necrosis” and “liver steatosis” were found to be significantly enriched in both *in vitro* models. This *in vitro* model, may be used as a surrogate of primary human hepatocytes for the screening of compounds that might potentially induce acute liver failure.

### **Lab equipment**

Biosafety cabinet ;

Affymetrix microarray platform ;

Affymetrix Human Genome U133 plus 2.0 arrays ;

RT-qPCR ;

Cell culture equipment.

### **Method status**

Published in peer reviewed journal

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

### **Advantages**

Alternative for primary human hepatocytes ;

Fast method.

## Challenges

Microarray analysis are still expensive and not available in every lab.

## Modifications

QPCR analysis instead of microarrays: selection of specific gene list, that if modulated together would provide the same results.

## Future & Other applications

Other applications, besides drug-induced liver injury should be possible, i.e. for screening of other compounds than drugs.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Rodrigues et al., Stem Cells Dev. 23, 44–55 (2014)

### Links

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