Adult skin stem cell-derived in vitro model of hepatic steatosis

*Commonly used acronym:* Steatosis model

**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
- **Geographical Area**: Brussels Region

### SCOPE OF THE METHOD

<table>
<thead>
<tr>
<th>The Method relates to</th>
<th>Human health</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Method is situated in</td>
<td>Translational - Applied Research</td>
</tr>
<tr>
<td>Type of method</td>
<td>In vitro - Ex vivo</td>
</tr>
<tr>
<td>Species from which cells/tissues/organs are derived</td>
<td>Human</td>
</tr>
<tr>
<td>Type of cells/tissues/organs</td>
<td>Skin-derived adult stem cells</td>
</tr>
<tr>
<td>Specify the type of cells/tissues/organs</td>
<td>Human skin-derived hepatic cells</td>
</tr>
</tbody>
</table>

### DESCRIPTION
**Method keywords**

Stem cells  
differentiation  
Gene expression  
in vitro  
Lipids

**Scientific area keywords**

Steatosis  
liver  
NAFLD  
metabolic syndrome  
lifestyle  
hepatology

**Method description**

Human skin-derived adult stem cells differentiated towards hepatic cells (hSKP-HPC) are used in this method (R. M. Rodrigues et al., Stem Cells Dev. 23, 44–55 (2014)). These cells are exposed to a cocktail of insulin and glucose at certain concentrations. After 24h of exposure, these cells exhibit a strong induction of lipogenic genes and accumulate neutral lipids. Using this model, potential new anti-steatosis and anti-non-alcoholic steatohepatitis (NASH) drugs can be tested for their anti-steatotic potentials. The read-outs for this in vitro disease model are (i) gene expression analysis and (ii) neutral lipids quantification.

**Lab equipment**

Biosafety cabinet;  
Flow-cytometer;  
RT-qPCR;  
Cell culture equipment.

**Method status**

Still in development
PROS, CONS & FUTURE POTENTIAL

Advantages

Fast (24h);
Human-relevant.

Challenges

Lipid load is only +/- 1.5 - 2 x fold higher in the steatosis condition vs the control condition

Modifications

Addition of other sugars

Future & Other applications

The main application is located in preclinical drug testing

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References