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

Commonly used acronym: *Steatosis model*

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Organisation

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SCOPE OF THE METHOD

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

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-steatotis 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

R. M. Rodrigues et al., Stem Cells Dev. 23, 44–55 (2014). R. M. Rodrigues et al., Arch. Toxicol. 90, 677–689 (2016)

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