Hepatic differentiation of human skin-derived precursor cells

Commonly used acronym: *SKP-HPC*

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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

The Method relates to	Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	skin-derived precursor cells

DESCRIPTION

Method keywords

skin
Stem cells
hepatocyte
differentiation

Scientific area keywords

stem cells
cellular differentiation
hepatic differentiation

Method description

Human skin-derived precursor cells (hSKP) between are cultivated at 90% confluency on 100 µg/mL collagen type I in base medium and sequentially exposed to hepatogenic factors. Base medium consists of Dulbecco's Modified Eagle Medium + GLUTAMAX / F12 Nutrient supplement (3:1), supplemented with 7.33 IE/ml benzyl penicillin, 50 µg/mL streptomycin sulfate, 0.1 mM L-ascorbic acid, 0.03 mM nicotinamide, 0.25 mM sodium pyruvate and 2.5 µg/mL fungizone. The procedure is as follows: day 0: base medium + 50 ng/mL activin A; days 1-2: base medium + 25 ng/mL activin A + 5 ng/ml FGF4 + 10 ng/mL BMP4; days 3-5: base medium + 10 ng/mL FGF4 + 20 ng/mL BMP4; days 6-8: base

medium + 5 ng/mL FGF4 + 10 ng/mL BMP4 + 30 ng/mL HGF + 0.5 x ITS; days 9-11: base medium + 30 ng/mL HGF + 0.25 x ITS + 20 µg/L dexamethasone; days 12-14: base medium + 20 ng/mL HGF + 20 µg/L dexamethasone; and from day 15 onwards: base medium + 20 ng/mL HGF + 20 µg/L dexamethasone + 10 ng/mL OSM. Unless otherwise defined, media are changed every 3 days.

Lab equipment

Biosafety cabinet level 2;
Cell incubator.

Method status

History of use
Internally validated
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Reproducible method to generate hepatocyte-like cells from skin-derived precursor cells.

Challenges

Cell culture heterogeneity.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

De Kock J, Rodrigues RM, Buyl K, Vanhaecke T, Rogiers V. (2015) Human Skin-Derived Precursor Cells: Isolation, Expansion, and Hepatic Differentiation. Methods Mol Biol. 1250:113-22
Rodrigues RM, De Kock J, Branson S, Vinken M, Meganathan K, Chaudhari U, Sachinidis A, Govaere O, Roskams T, De Boe V, Vanhaecke T, Rogiers V. (2014) Human skin-derived stem cells as a novel cell source for in vitro hepatotoxicity screening of pharmaceuticals. Stem Cells Dev. 23(1):44-55

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