

Enzymatic isolation method for human umbilical cord-derived mesenchymal stromal cells

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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 | umbilical cord |

DESCRIPTION

Method keywords

umbilical cord
mesenchymal stem cell
human adult stem cells
standardized isolation method
enzymatic isolation

Scientific area keywords

liver embryogenesis
hepatic differentiation
Drug-induced liver injury (DILI)
human adult stem cells
hepatic in vitro model
hepatocyte-like cells
drug development

Method description

This method provides a new and easy to standardize enzymatic isolation protocol to obtain human umbilical cord-derived mesenchymal stromal cells (hUC-MSCs). hUC-MSCs are obtained within 3 hours and the isolation method provides a minimal risk of bacterial contamination. The so-obtained hUC-MSCs were characterized as MSCs according to the guidelines of the International Society of Cellular Therapy. Furthermore, these hUC-MSCs express a set of hepatic transcription factors (GATA4, GATA6, SOX9 and SOX17) and other hepatic markers (DKK1, DPP4, DSG2, CX43, KRT18 and KRT19), rendering them an interesting stem cell population for the development of human hepatocyte-like cells.

Lab equipment

Incubator ($37 \pm 1^\circ\text{C}$, $90 \pm 5\%$ humidity, $5.0 \pm 1\%$ CO₂/air);
Laminar air flow;
Water bath ($37 \pm 1^\circ\text{C}$);
Pipettes;
Pipettors;
Flow cytometer;
PCR Thermal Cycler;
Phase-contrast/fluorescence microscope.

Method status

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Fast, robust, standardized method;
Minimal risk for bacterial contamination.

Future & Other applications

Generation of human hepatocyte-like cells from hUC-MSCs for the development of a human-based *in vitro* liver model.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Evaluation of a new standardized enzymatic isolation protocol for human umbilical cord-derived stem cells. Buyl K., Vanhaecke T., Desmae T., Lagneaux L., Rogiers V., Najjar M.*, De Kock J.* (2015) Toxicology In Vitro, 29(6):1254-62. (*equal contribution)

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