

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

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## SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>This method makes use of</b>	Human derived cells / tissues / organs
<b>Specify the type of cells/tissues/organs</b>	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,  $5.0 \pm 1\%$  CO<sub>2</sub>/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)

#### **Associated documents**

### **PARTNERS AND COLLABORATIONS**

## 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

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