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In vitro differentiation of mesenchymal stem cells from human umbilical cord Wharton's jelly into functioning hepatocytes

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Back ground: The human umbilical cord (UC) is non-invasive, primitive and abundant sources of mesenchymal stromal cells (MSCs) that have increasingly. Liver disease is a major cause of mortality and morbidity in Egypt. There are many inflammatory liver conditions for which treatments are not effective and often such patients will progress to end-stage liver disease and require liver transplantation. To prevent progression to end-stage liver disease, mesenchymal stromal cell (MSC) therapies have been considered and shown to have potential in such liver diseases.

Objectives: The aim of our study was to investigate the *in vitro* differentiation of human umbilical cord Wharton's jelly (HU-MSC) into hepatocyte lineage.

Materials & methods: Human umbilical cord Wharton's jelly (WJ) were separated by mixed explant & enzymatic method by use of trypsin. The time required for the primary culture range from 10-14 days. The isolated cells were characterized for expression of MSC-specific markers such as CD73, CD90 and CD105 & CD45. Also cells were counted by automated cell counter for stem cells (showing count, viability, cluster cells). After passage 4, the isolated cells induced to differentiate into hepatocyte-like cells by incubation in basal media with cocktail hepatocyte growth factors for 20 days.

Results: *In vitro* functional characterization of hepatocyte detectable by PAS staining for glycogen and immunofluorescent staining for albumin by anti-human albumin with FITC stain.

Conclusion: HU-MSC can differentiate into functional hepatocyte like cells & serve as a cell source for tissue engineering and cell therapy for hepatic tissues.

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