P-37

Human Adipose Tissue-derived Stem Cells Differentiate into Functional Hepatocyte-like cells

S. Park[1], H. M. Kang[1], J. Kim[1], J. Kim[1], H. Kim[1], S. G. Kang[2], O. Choi[3] and J. You[4]

[1]Department of Biology, Seoul Women's University, Seoul, Korea
[2]Department of Biology,School of Biotechnology and Biomedical Science, Inje University, Kimhae, Korea
[3]Dr. Choi's Aesthetic Clinic, 644 Shinsa-dong, Gangnam-gu, Seoul, Korea
[4]HurimBioCell Inc. 402 Umi Bldg., Nonhyeon-dong, Gangnam-gu, Seoul, Korea

Objectives

Liver organ transplantation is currently the only effective therapy for many hepatic disorders. However, the procedure is invasive and not widely available because of limited supply of donor livers. Human ESC, BM-MSC and UCB-MSC have been shown to be possible candidate cell sources for hepatocyte transplantation. We examined whether human adipose-derived stem cells (HAD) might differentiate into hepatocytes and what type of culture conditions might support functional hepatic differentiation *in vitro*.

Materials and Methods

HAD were isolated from adipose tissue donated from patients undergoing a plastic operation. Effect of FGF2 and FGF4 on the hepatic differentiation of HAD was examined. Effect of DMSO on the hepatic differentiation of HAD was also examined. After culture for 3 weeks, functional characteristics of hepatocytes were assessed by ELISA, immunoblotting and immunocytochemistryusing anti-human albumin antibody. PAS staining and urea assay were also performed.

Results

Initial fibroblastoid morphology of HAD changed into cuboidal shape typical of hepatocytes after culture in differentiation medium. Immunocytochemical analyses showed that all FGFs examined resulted in more

intense staining than the control. PAS staining also gave similar results to the results of immunocytochemistry. ELISA and immunoblotting analyses of HAD-conditioned media showed that addition of DMSO and FGF4 to the differentiation media induced HAD to release more amount of human albumin. Urea assay analyses of HAD-conditioned media demonstrated that treatment of both DMSO and FGF4 induced more urea secretion.

Conclusions

Treatment of both DMSO and FGF4 could induce a functional differentiation of HAD into hepatocyte-like cells which might be used as therapeutical cells for the certain liver disorders.

Key words) *Human adipose tissue-derived stem cells (HAD), Hepatocyte-like cells, Albumin secretion, PAS staining, Urea secretion*