In vitro Functions of Hepatocyte-HSC Co-spheroids Culture in Small BAL system

Hyun Kim¹, Hee-Hoon Yoon¹, Doo-Hoon Lee², Jae-Nam Ryu, Ji-Hyun Lee³, Sung-Koo Kim⁴, Young-Jin Kim², Jung-Keug Park¹

¹Department of Chemical and Biochemical Engineering, Dongguk University, Seoul 100-715, Korea ²Biomedical Research Center, Lifecord Inc., Suwon 442-721, Korea ³Samsung Biomedical Research Institute, Seoul 135-710, Korea ⁴Division of Food and Biotechnology, Pukyong National University, Pusan 608-737, Korea
Tel: +82-2-2260-3365, Fax: +82-2-2271-3489

Abstract

There are many investigations concerning improvement of hepatocyte function and survival that cultured in vitro. These attempts include use of cytokines, growth factors and other medium supplements. However, one of the most promising techniques in retaining hepatocyte functions and viability is co-culturing with nonparenchymal liver cells such as sinusoidal endothelial cells, bile duct epithelial cells and hepatic stellate cells. Hepatic stellate cells (HSCs) are nonparenchymal cells with stellate morphology present in the perisinusoidal space of Disse and contain vitamin A-rich lipid droplets.¹ When hepatocytes co-cultured with HSCs, hepatocytes expressed improved liver-specific functions like albumin secretion in monolayer culture.² In this study, primary pig hepatocytes were co-cultured in suspension with pig HSCs to investigate functional activities of hepatocytes. Spheroids were embedded in alginate bead to prevent formation of over-size aggregates. And then activities of ammonia removal, urea synthesis and albumin secretion were investigated in small size BAL system.

References