Effect of freezing methods with UW solution on the porcine hepatocyte cryopreservation

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Abstract

Bioartificial liver support systems (BALSS), which employ freshly isolated primary hepatocytes, present severe logistic difficulties in the continuous supply of primary hepatocytes. Stored frozen primary hepatocytes that are thawed as required would answer this problem.[1)-3)] We investigated different concentrations of dimethyl sulfoxide (DMSO) with hormonally-defined medium (HDM), and various solutions (University of Wisconsin(UW) solution, FBS) were used as cryopreservation solutions. The result that UW solutions were good for the hepatocyte cryopreservation. Freezing methods had effects viability and specific functions of hepatocytes after thawing. In this study, initial dispersed hepatocytes and suspension cultured hepatocyte spheroids were cryopreserved. After thawing viability, plating efficiency, urea synthesis and albumin secretion were measured to assess the effects of freezing methods. About 80% of the cell viability could be obtained with an optimal computer programming method (-1℃ slow cooling rate with a shock cooling, UW with 15% DMSO).

References

1. L. Wu, Cryopreserved porcine hepatocytes in a liver biodialysis system(2001), Transplantation Proceedings, 33, 1950-1951.
2. Toshikazu Yagi, Caspase Inhibition reduces apoptotic death of cryopreserved porcine hepatocytes(2001), Hepatology, Vol. 33, No. 6.
3. Ragai R. Mitry, Progress in human hepatocytes: isolation, culture & cryopreservation(2002), Cell & developmental biology, Vol. 13, PP.463-467.