

Organotypic Cultures of Hepatocytes with Cell Proliferation and Long Term Stable Gene Expression

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Technology description

A method is provided for long term culture of proliferating hepatocytes that retain hepatic function to produce a hepatic cell culture. Hepatocytes and nonparenchymal cells are co-cultured ex vivo on a matrix coated with a molecule that promotes cell adhesion, proliferation or survival, in the presence of growth factors, resulting in a long-term culture of proliferating hepatocytes that retain hepatic function. The co-culturing method results in the formation of matrix/hepatic cell clusters that may be mixed with a second structured or scaffold matrix that provides a three-dimensional structural support to form structures analogous to liver tissue counterparts. The method can be used to form bio-artificial livers through which a subject's blood is perfused. In an embodiment, the hepatocytes and nonparenchymal cells are derived from disaggregated liver tissue and are co-cultured in the presence of epidermal growth factor or hepatocyte growth factor and beads coated with extracellular matrix protein. Alternatively, the hepatic cell culture may be implanted into the body of a recipient host having a hepatic disorder. Such hepatic disorders include, for example, cirrhosis of the liver, induced hepatitis, chronic hepatitis, primary sclerosing cholangitis and alpha₁-antitrypsin deficiency.

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