Liver Stem Cells: Isolation of hepatic progenitor cells from the human gall bladder

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Technology description

Background
Liver disease is currently the 8th leading cause of mortality in the US. Current treatments for liver disease remain limited in feasibility. Today over 17,000 people are on the waiting list for a liver transplant, many with chronic liver injury. However, only a third will undergo a transplant. Transplantation of mature hepatocytes is being explored as an alternative to orthotopic liver transplantation. Unfortunately, the number donor livers dedicated to isolation and transplantation of hepatocytes, is limited. In addition, because transplantation of hepatocytes is limited by their size and fragility, alternative sources for long-term engraftment are being explored as cell-based therapies. One such source is the liver stem/progenitor cell.TechnologyThe gall bladder and hepato-biliary systems share embryological origins; the gall bladder is part of the extra-hepatic biliary system, and is in some ways, an extension of its intra-hepatic biliary cousin. Previous studies with rodent and human liver cells have identified bipotent hepatic progenitor cells. In case of the rodent models, these cells have been localized to the terminal intra-hepatic biliary epithelium. This finding led to posibility that a putative hepatic progenitor population might be present in the gall bladder and could be prospectively isolated. This project attempts the foregoing isolation and characterization in adult human and fetal gall bladder. Cells from three adult and one fetal gall bladder were successfully expanded in vitro. All cultures exhibit morphological heterogeneity, from immature epithelial to mature cells, ranging from undifferentiated colonies of cells to organized glandular formations. These newly described progenitor cells represent good candidates to test for hepatic differentiation, and as cell-based therapies.

Application area

Potential alternative to liver transplantation

Institution

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