

Multipotent stem cells reside in human extrahepatic bile ducts and can give rise to hepatocytes, cholangiocytes and pancreatic cells

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Background The biliary tree system shares a common embryological origin with ventral pancreas. The presence of multipotent stem cells (MSC) has been suggested in human extrahepatic biliary tree (in peribiliary glands) [1]. Our aim is to investigate the presence of MSC in extrahepatic bile ducts (EHBDs) and peribiliary glands (PBGs).

Materials and Methods Hepatic duct, gallbladder, cystic duct, bile duct and hepato-pancreatic ampulla were obtained from normal human adult livers or pancreas. Stem cells were isolated by immunoselection and/or culture selection strategies. Tissues or isolated cells were characterized by immunohistochemistry, immunofluorescence, flow cytometry, and RT-PCR for stem/progenitor and mature cell markers. Isolated cells were plated in Kubota's Medium and transferred to several differentiation media.

Results density of the PBGs is significantly higher in hepato-pancreatic ampulla, cystic duct and common hepatic duct with respect to bile duct. Cells within PBGs expressed several markers of endodermal precursors such as SOX17, EpCAM, CD56 with low levels of lineage markers of hepatocytes (albumin), cholangiocytes (secretin receptor), and endocrine pancreas (insulin). In culture, cells yielded colonies maintaining stem/progenitor markers profile. Cells transferred to distinct media yielded mature cells with the morphology and phenotype of mature hepatocytes, bile ducts or pancreatic islets.

Conclusion we have identified candidate endodermal stem cells in normal human EHBDs. They could be readily isolated by immunoselection and/or culture selection strategies and have a strong potential in cell therapy of liver and pancreatic diseases.

Reference

[1] Gaudio E, Carpino G et al. (2009) Dig Liver Dis. Jul;41(7):455-62

Key words

Human multipotent stem cells, biliary tree, liver, pancreas