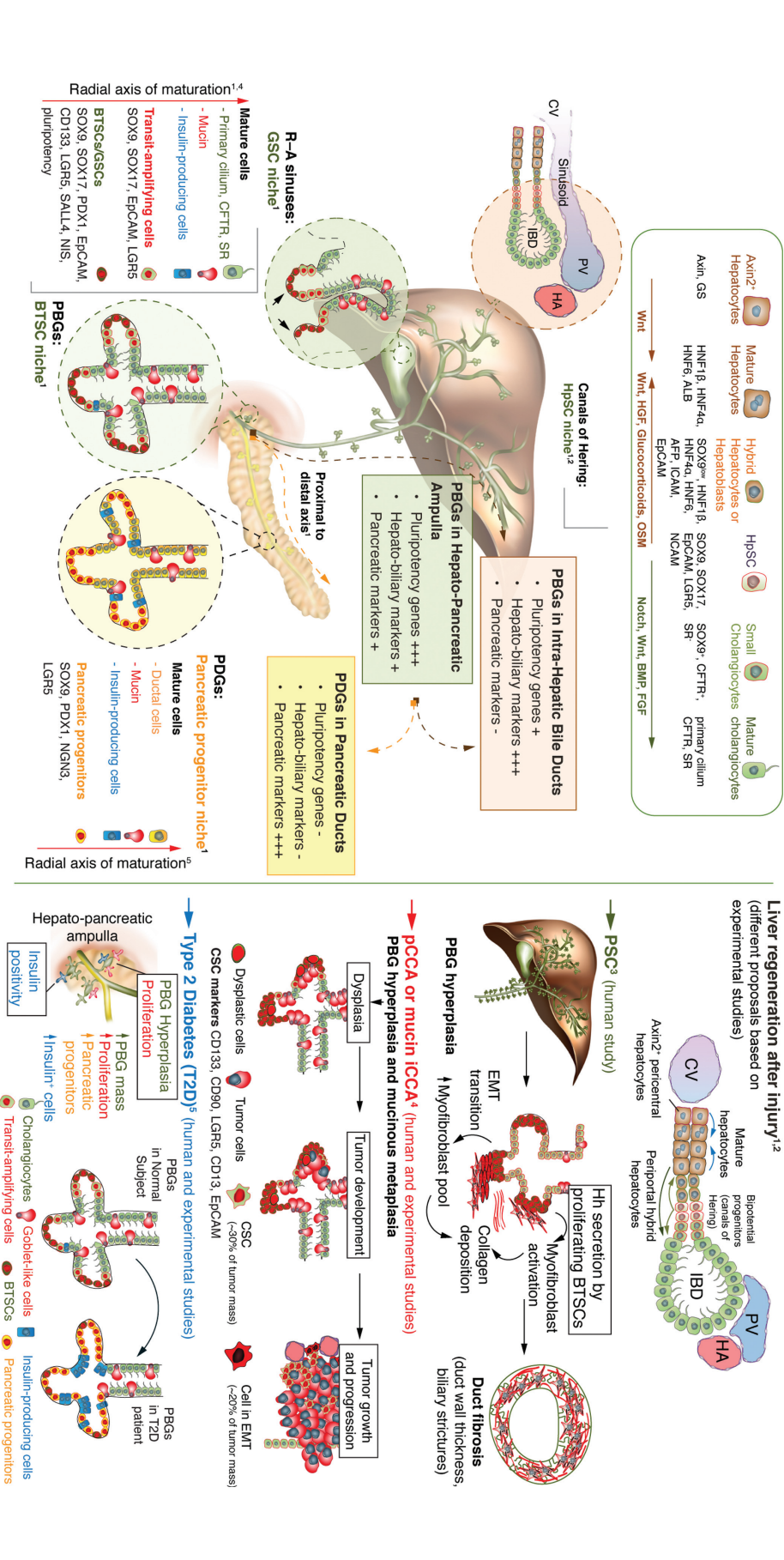


## Liver Capsule: BILIARY TREE STEM CELL SUBPOPULATIONS

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**FIG.** The left panel highlights the distribution, location, and composition of stem/progenitor cell niches in the biliary tree under normal conditions; the right panel illustrates changes in different pathologic conditions.

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**Abbreviations:** AFP, alpha-fetoprotein; ALB, albumin; BMP, bone morphogen-derived protein; BTSC, biliary tree stem cell, defined as cells that meet the criteria for stem cells and that express SOX9, SOX17, PDX1, EPCAM, CD133, LGR5, NIS, and SALL4; CD, cluster of differentiation; CFTR, cystic fibrosis transmembrane conductance regulator; CSC, cancer stem cell; CV, central vein; EPCAM, epithelial cell adhesion molecule; EMT, epithelial-mesenchymal transition; FGF, fibroblast-derived growth factor; GS, gliadinase; stem cell; HA, hepatic artery; HGF, hepatocyte growth factor; Hh, hedgehog; HNF, hepatocyte nuclear factor; Hpsc, hepatic stem cell, defined as cells that meet the criteria for stem cells and express SOX9, SOX17, EPCAM, LGR5, and NCM1 but not PDX1, ICAM-1, or AFP; Hybrid hepatocytes or hepatoblasts; diploin, express ICAM, EPCAM, HNF1 $\beta$ , HNF4 $\alpha$ , HNF6, SOX9, AFP, IBD, fibroblast bid duct, ICAM, fibroblast adhesion molecule; LGR5, leucine-rich repeat-containing G protein-coupled receptor; NCM, neural cell adhesion molecule; NGN3, neurogenin 3; NIS, sodium iodide symporter; OSM, oncostatin M; PBG, peribiliary gland; pCCA, perihilar cholangiocarcinoma; PDG, pancreatic duct gland; PDX1, pancreatic and duodenal homeobox 1; PSC, primary sclerosing cholangitis; PV, portal vein; R-A, Rokhsari-Aschoff sinus; SALL, Sall-like protein; Small cholangiocytes, unipolar biliary progenitors that are located in smaller interlobular bile ducts and are SOX9<sup>+</sup>, CFTR<sup>+</sup>, and SR<sup>+</sup>; SOX, Sry-related high-mobility group box; Sh, sevelin receptor; T2D, type 2 diabetes.

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