HD11 - Liver and pancreas development

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Learning objectives

1. Pancreas and liver are derived from foregut endoderm
2. Pancreas forms from 2 independent anlagen
3. All pancreatic cell types are derived from a common progenitor cell
4. The pancreas forms two distinct functional compartments: exocrine and endocrine
5. Exocrine cells are the most abundant pancreatic cell type and secrete digestive enzymes
6. Endocrine cells form islets of Langerhans and secrete hormones for glucose regulation
7. Dorsal and ventral pancreatic buds induced by unique tissue interactions and regulatory signals
8. Complex epithelial-mesenchyme tissue interactions are required for appropriate pancreas development, cell differentiation and morphogenesis
9. Pdx1 is a critical regulatory factor for pancreas development AND beta cell function
10. Pancreas has low regenerative capacity
11. Pancreatic islet cells have very low replicative capacity
12. A pancreatic stem cell population has not been identified
13. Liver is induced primarily from signals from the cardiac mesoderm
14. Epithelial-mesenchyme interactions are important for all aspects of liver development
15. Hepatocytes are predominant liver cell type and have the ability to replicate
16. Liver has high regenerative capacity
17. Efficient tissue regeneration or tissue engineering for therapeutic purposes will require a greater understanding of the signals and regulation of embryonic developmental processes