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Introduction

This special issue of *Gene Expression* focuses on timely topics relevant to liver development, hepatocellular carcinoma (the third leading cause of cancer-related death worldwide), and cholangiocarcinoma (cancer of the bile duct that has been rising steadily worldwide). These topics include Wnt/β-catenin signaling mechanism in liver development and regeneration, the function of Med1 subunit of a large multisubunit complex in nuclear receptor-regulated energy metabolism, liver regeneration, and hepatocarcinogenesis, insights into the role of microRNAs in cholangiocarcinoma and in energy metabolism in hepatocellular carcinoma, and the role of hepatic fibrosis and microenvironment in hepatocarcinogenesis.

The article on β-catenin signaling by Paul Monga reviews the temporal role and regulation of β-catenin in liver development, metabolic zonation in basal adult liver, and during liver regeneration process. It describes various mechanisms leading to Wnt/β-catenin activation and discusses how truncated β-catenin may have distinct functions relative to the full-length form during liver development.

The article by Reddy and colleagues describes the role of nuclear receptors in liver regeneration, the emerging role of Med1 subunit of the mediator (a large multisubunit complex that acts as molecular bridge between gene-specific transcription factors and pol II machinery) in embryonic development, and liver regeneration after partial hepatectomy. This review also discusses the role of Med1 in the expression of PPARα-regulated and CAR-regulated genes, and in glucocorticoid receptor function.

The review by Wallace and Friedman describes the role of fibrosis in liver cancer and how permissive microenvironment in the liver facilitates transformation of fibrotic liver to hepatocellular carcinoma. This article discusses mechanisms relevant to hepatic fibrosis that include oxidative stress and extracellular matrix alterations, and paracrine crosstalk between hepatic stellate cells, hepatocytes, and the extracellular matrix. The authors suggest the possibility of developing antifibrotic therapy to attenuate the risk of HCC.

The article by Reyes, Motiwala, and Jacob discusses the involvement of five distinct miRNAs in glucose metabolism in hepatocarcinogenesis. It focuses on the metabolic significance of these miRNAs in hepatoceullular carcinoma, their targets in glycolysis, gluconeogenesis, and pentose phosphate pathways, the mechanism(s) by which they modulate these pathways to facilitate initiation, progression, and maintenance of cancer cells, and provides an insight into the therapeutic potential of targeting specific miRNAs.

The review by Patel and colleagues provides an overview of recent studies on the involvement of miRNAs in cholangiocarcinomas. It discusses the deregulated expression of specific miRNAs and provides new insights into the potential contribution of these small noncoding RNAs in the pathogenesis of cholangiocarcinoma.

Samson T. Jacob, Ph.D.
Janardhan K. Reddy, M.D.
Co-editors