

# METHODS IN MOLECULAR BIOLOGY™

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# **Liver Stem Cells**

## **Methods and Protocols**

Edited by

**Takahiro Ochiya**

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# Preface

## A Brief Outline of the Aims and Target Audience of *Liver Stem Cells*

The role of a putative stem cells and liver-specific stem cell in regeneration and carcinogenesis is reviewed in this book.

There is increasing evidence that there is a liver stem cell that has the capacity to differentiate into parenchymal hepatocytes or into bile ductular cells. These stem cells may be activated to proliferate after severe liver injury or exposure to hepatocarcinogens. Stem cell replacement strategies are therefore being investigated as an attractive alternative approach to liver repair and regeneration. In this book, we focus on recent preclinical and clinical investigations that explore the therapeutic potential of stem cells in repair of liver injuries. Several types of stem cells, such as embryonic stem (ES) cells, induced pluripotent stem (iPS) cells, haematopoietic stem cells, and mesenchymal stem cells, can be induced to differentiate into hepatocyte-like cells in vitro and in vivo. Stem cell transplantation has been shown to significantly improve liver function and increase survival in experimentally induced liver-injury models in animals. Furthermore, several pilot clinical studies have reported encouraging therapeutic potential of stem cell-based therapies. This book consists of five main categories: (1) Several hepatic progenitor cells; (2) Hepatic differentiation from stem cells; (3) Bile ductal cell formation from stem cells; (4) Liver stem cells and hepatocarcinogenesis; and (5) Application of liver stem cells for cell therapy. All these current topics shed light on stem cell technology which may lead to the development of effective clinical modalities for human liver diseases.

I believe this book will become the gold standard on this topic and will be widely distributed and read by people in many scientific fields, such as cellular biology, molecular biology, tissue engineering, liver biology, cancer biology, and stem cell therapy.

*Tokyo, Japan*

*Takahiro Ochiya*



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