

Liver stem cells - Methods and protocols
Takahiro Ochiya (ed), 2012
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The brief and concise preface written by Prof. Takahiro Ochiya is particularly well addressed to scholars belonging to different scientific fields: cellular and molecular biology, liver and cancer biology, tissue engineering and stem cell therapy. By a few lines prof Ochiya is telling us that we are getting exciting results, at the lab and the preclinical level, in treating liver injuries thanks to the unprecedented advances in our knowledge on liver stem cells biology. Noteworthy, I particularly appreciated the total refusal of the so frequently promoted hypes of the untruthful stem cell market while precisely presenting the results that open the door to legitimate hopes. Well done, a paradigmatic example of the ethics we (especially the Italians) must follow during these obscure days of unproven stem cell therapies being granted by the Italian government (see Nature editorials and Alison Abbott at <http://www.nature.com/news/italian-stem-cell-trial-based-on-flawed-data-1.13329#auth-1>).

Takanori Takebe and colleagues were able to generate vascularized and functional human liver from human iPSCs by ectopic transplantation of liver buds created in immunodeficient mice in vitro (Nature 499:481-484, 2013). This

shows how good scientists are in *specifying hepatic cells (immature endodermal cells destined to track the hepatic cell fate) to self-organize into three-dimensional buds by recapitulating organogenetic interactions between endothelial and mesenchymal cells.*

This book is properly arriving on the desks of those interested in the biology of this organ that already from the Greeks times, as the myth of Prometheus revealed, possess a very high proliferative capacity (after an injury). Five parts frame the content: part I consists of five chapters describing the several hepatic progenitor cells, part II explains the ways used to differentiate hepatic cells from stem cells.

Intriguing enough for anyone who is not *liver specialist* (as I am not) the chapter by Yuji Nishikawa on the transdifferentiation of mature hepatocytes into bile duct/ductile cells obtained within a collagen gel matrix. This last chapter composes part III and it illustrates what it is likely to be the major difficulty (the anatomical and functional co-presence of hepatocytes and duct/ductile cells) that has to be overtaken to obtain a liver organ generation. Part IV describes the identification of cancer stem cell-related microRNAs in hepatocellular carcinoma. Part V suggests the possible cell therapies by using liver stem cells, a welcome update since the ultimate treatment for hepatic failure is still liver transplantation which is based on, unfortunately, a skimpy availability of donors.

CarloAlberto Redi
University of Pavia