

Liver cancer, including hepatocellular carcinoma (HCC) and intrahepatic cholangiocarcinoma (ICC), is one of the most frequent human cancers. Highest frequencies of HCC occur in sub-Saharan Africa and eastern Asia regions, where hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are endemic, and in regions where mycotoxin contamination of foodstuffs, stored grains, drinking water, and soil occurs. Other etiologic factors include chronic hepatitis and cirrhosis induced by excessive alcohol consumption, autoimmune chronic active hepatitis; and cryptogenic cirrhosis with unknown origin, metabolic disorders, including hemochromatosis, glycogen storage diseases, Wilson's disease, and galactosemia. ICC constitutes the second most common primary liver tumor and its incidence is increasing in Western countries. The most known risk factors for ICC are primary sclerosing cholangitis, hepatobiliary flukes, hepatolithiasis, and biliary malformations. In addition, cirrhosis, mainly secondary to chronic infection with HCV, represents an important risk factor for ICC.

Liver cancer is a fatal disease. Partial liver resection and liver transplantation are potentially curative. Ultrasonography is sufficiently sensitive to detect small liver lesions, which may be efficiently treated by resection or radiofrequency ablation. However, only a minority of cases is open to these treatments. Moreover, therapies with pharmacological agents (i.e. Sorafenib alone or in combination with other signaling inhibitors) or trans-arterial chemo-embolization or yttrium-90 microspheres, and percutaneous ethanol injection, do not improve substantially the prognosis of patients with locally advanced disease.

This situation arouses the interest of many researchers, in several countries, to the evaluation of the individual genetic predisposition to liver cancer, the molecular mechanisms involved, and the new treatments. Increasing efforts are devoted to “precision oncology” perspectives to identify personalized treatments taking into account individual genetic variability, environment, and lifestyle. A panomic approach to molecular biology analyses is necessary to discover the genetic content of individual patient's disease and then to utilize targeted treatments based on the context of patient's characteristics. To the pursuit of these goals is currently directed a large part of the research on liver cancer in various laboratories.

A peculiarity of the present book is the extensive collection of editorials and commentaries, made by experts, on a series of recent articles on the main aspects of research on HCC and ICC. Thus, various contributions, dealing with some new approaches to alterations of signal transduction in liver cancer, consider the conditions determining the double role of TGF β , as inhibitor or stimulator in these tumors, the dysregulation of the epigenetic regulator SETDB1 in human HCC, the role of EDFIL3 protein in the determination of HCC prognosis. Of particular interest the analysis of a “gene cloud” constituted by Sox12 transcription factor together different other genes to realize a gene signaling network in HCC. A multi-omic approach for the identification of prognostic biomarkers and for the management of HCC is also considered.

Different comments are reserved to microRNAs as regulators of HCC and ICC cell dissemination, as markers and targets of HCC or, in the case of circulating microRNAs, for early detection of HBV-related HCCs. Interestingly, the focal loss of long non-coding RNA-PRAL, is considered as a determinant of HCC cell function and phenotype. Finally, some contributions are specifically dedicated to ICCs, their preneoplastic manifestations, the signaling pathways involved and their role as targets for ICC therapy.

The complexity of studies on the different aspects of liver cancer, and the vastness of the literature dedicated to HCC and ICC cannot be included in a single treatise. However, this volume deals critically with many researches in this field and can be considered a valid means of spreading some excellent recent contributions to various aspects of liver cancer.

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