Hepatocellular cancer

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In this issue, Rajagopal N. Aravalli from Minneapolis contributes a comprehensive review updating our knowledge on cellular and molecular mechanisms of hepatocellular cancer (Aravalli et al. 2013; this issue). Hepatocellular cancer (HCC) is the most common primary malignant tumor, with approximately 600,000 new cases occurring each year. Although most cases are in developing countries, the incidence is rising in Western countries, due to hepatitis C, alcoholism and obesity. The normal liver lobule is composed of hepatocytes, sinusoidal endothelial cells, cholangiocytes, Kupffer cells, stellate cells and liver-specific natural killer cells, whereby complex cell–cell communications guarantee the maintenance of a functional architecture (Hoehme et al. 2010). Hepatocarcinogens or viral infections can cause abrupt changes in growth factor receptors, signaling factors or transcription factors and may initiate the multistep process of carcinogenesis, which differs between pericentral and periportal hepatocytes (Braeuning et al. 2010; Schreiber et al. 2011). Besides inflammation, the process of epithelial to mesenchymal transition (EMT) plays an important role that may be induced by an aberrant microenvironment and the extracellular matrix (Godoy et al. 2009, 2010). The review of Aravalli et al. addresses

- the pathophysiology of liver cancer, including the relevance of fibrosis and cirrhosis
- the relevance of the tumor microenvironment with the extracellular matrix and ‘cancer-associated fibroblasts’ as key components

- cancer stem cells
- inflammation and oxidative stress
- cellular signaling networks
- the contribution of micro-RNAs

Liver carcinogenesis in rodents (Morita et al. 2011; Tawfeeq et al. 2012; Okabe et al. 2011) and humans (Fang et al. 2012) represents a cutting-edge topic in toxicology. The current state-of-the art review of Aravalli is definitely recommended to those interested in the field of HCC, in addition to anyone with a general interest in carcinogenesis.

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