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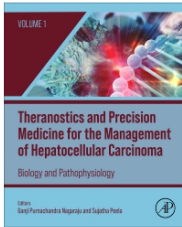
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Theranostics and Precision Medicine for the Management of Hepatocellular Carcinoma, Volume 1

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Theranostics and Precision Medicine for the Management
of Hepatocellular Carcinoma

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Chapter 14 - Glutamine metabolism in liver cancer: role in progression and potential
therapeutic targetingYashwant Kumar Ratre ^{1*}, Arundhati Mehta ^{1*}, Rajesh Sharma ², Vivek Kumar Soni ¹, Dhananjay Shukla ¹, Vibhay Nath Tripathi ³, Naveen Kumar Vishvakarma ¹[Show more](#) [Outline](#) | [Share](#) [Cite](#) <https://doi.org/10.1016/B978-0-323-98806-3.00025-8>[Get rights and content](#)

Abstract

The liver is a pivotal organ that acts as a metabolic hub for almost all essential biomolecules, including proteins, amino acids, lipids, and nucleic acids. Owing to its aggressive metastatic properties driven by modulation in cellular energetic pathways, liver cancer quite differs from other malignant disorders. These modulations ensure to achieve the requirements for growth and proliferation of hepatic cancer cells. Currently, hepatocellular carcinoma is still a global threat affecting the world population and still missing a gold standard therapy. Glutamine is among the most studied metabolic drivers for cancer cells. This is utilized for the biosynthesis of essential raw material required during liver cancer initiation and progression. It also acts as a pleiotropic agent and donates its metabolic intermediate to promote the tricarboxylic acid cycle for various biosynthesis purposes. The process of aberrant glutamine metabolism is regulated by several metabolic factors, including enzymes, transporters, abnormal gene expression, and dysregulated molecular signaling in liver cancer. Additionally, rewired glutamine bioenergetics does not only have a profound effect on cancer cells but also influences their surrounding microenvironment, chemoresistance, and immunosuppression. However, glutamine metabolism is not well touched in respect to liver cancer study but some recent preclinical studies gave a hopeful signal to target this pathway to combat liver tumor growth. This scenario opens a new window for the management and therapy of liver cancer by targeting glutamine transport and metabolism that is connected to various molecular as well as biochemical events in liver cancer cell physiology.

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Keywords

Cancer metabolism; glutamine; hepatocellular carcinoma; liver; therapeutic targeting

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* Yashwant Kumar Ratre and Arundhati Mehta contributed equally to this work as first authors.

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