Proteomic Analysis of the Molecular Biological Changes Induced by Fatty Acid-Binding Protein-5 inhibitor in Hepatocellular Carcinoma

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Abstract

Introduction: Therapeutic outcomes for hepatocellular carcinoma are improving with the advent of molecular-targeted agents and the maturation of surgical techniques. However, the current effectiveness of drug therapy for hepatocellular carcinoma is limited. Therefore, novel therapies are required for the treatment of unresectable hepatocellular carcinoma. Fatty acid-binding proteins (FABPs) are a type of lipid chaperone family that transports fatty acids and other hydrophobic ligands within cells. FABPs have 12 isoforms with similar structures and are named after the organ or tissue in which they are found. Epidermal fatty acid-binding protein (Epidermal FABP/FABP5) is abundant in skin and eyes and is also highly expressed in hepatocellular carcinoma. Recent studies have also revealed that the FABP5 is a poor prognostic factor, leading to malignant transformation via epithelial-mesenchymal transition. This study aims to investigate whether the FABP5 inhibitor can be a novel therapeutic agent for suppressing the progression of hepatocellular carcinoma.
Methods: The response to SBFI-26, a FABP5 inhibitor, was assessed in four hepatocellular carcinoma cell lines (Li-7, HLE, HepG2, and Hep3B) by cell proliferation assay, cell migration and invasion assay, fatty acid uptake assay, and glucose uptake assay. In addition, changes in protein expression by the

FABP5 inhibitor were investigated using mass spectrometry.
Results: The assay's results showed that the inhibitory effects on hepatocellular carcinoma progression and the proteomic analysis revealed altered protein expressions by the FABP5 inhibitor. Further analysis is underway to identify these changes' specific effects on hepatocellular carcinoma progression and their molecular biological mechanisms.
Conclusions: The FABP5 inhibitor may be a promising new therapeutic candidate in hepatocellular carcinoma. Given the differential response of hepatocellular carcinoma cell lines to the FABP5 inhibitor, predictive diagnostic techniques for efficacy need to be developed.