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The farnesoid X receptor (FXR) signaling pathways have been established to be involved in the pathogenesis of hepatocellular carcinoma (HCC) in prior studies and one proposed mechanism may be through regulation of the ubiquitin specific peptidase 2 (USP2) gene. As the mechanism has yet to be defined, more research is needed to identify the role of FXR and USP2 in HCC development. This study investigated the effects of FXR signaling activation on the transcriptional expression of USP2 promoter and explored their potential role in the pathogenesis of HCC. The first objective was to investigate the expression of USP2 in human hepatocellular carcinoma cells (HepG2) by looking at the circadian endogenous USP2 expression and then treating cells with FXR agonists and antagonists. The second objective was to characterize regulation of the USP2 promoter by transfecting cells with FXR and USP2 promoter, followed by looking at the USP2 promoter activity. The effects of treatments with FXR agonists and FXR antagonists on USP2 promoter activities were then examined. Findings from this study will provide a better understanding of the potential mechanism into development of HCC and be the basis for future research.