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# Mechanism of action of IQGAPs on Hep G2 cells by means of RNA interference of IQGAP1 gene

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IQ-domain GTPase-activating proteins (IQGAPs) are an evolutionary conserved family of multi-domain proteins that regulate distinct cellular processes. IQGAP1 is ubiquitously expressed while IQGAP2 and IQGAP3 are mainly restricted to liver. There is mounting evidence to suggest a role for IQGAP1 in cancer progression while IQGAP2 may be a tumor suppressor. Ribonucleic acid interference (RNAi) technologies are already widely used as a tool for reverse genetics in mammalian cells and their potential therapeutic applications are likely to come in the future. One exciting application has been the use of small interference RNA (siRNA) based gene silencing technologies in the inhibition of viral replication and infection. In the present study, the expression of IQGAP1 gene was partially silenced in hepatocyte carcinoma (Hep G2) cells at both the transcriptional and translational levels by RNAi-Ready pSIREN Vector. We found that IQGAP1 silencing significantly decreased IQGAP1 level and increased IQGAP2 and IQGAP3 level secreted by these cells. The results of flow cytometry analyses indicated that silencing of the IQGAP1 gene affected the S phase of the cell cycle and induced cell apoptosis. Furthermore, IQGAP2, IQGAP3 caspase 3 (Casp3), Bcl2-associated X protein (Bax) were up regulated, IQGAP1 and B-cell leukemia/lymphoma 2 (Bcl2) were down regulated and protein level of IQGAP2, IQGAP3 caspase 3 (Casp3), Bcl2-associated X protein (Bax) were up regulated after IQGAP1 gene silencing. These findings indicate that IQGAP1 has the potential to regulate expression of the IQGAPs and Bcl2 gene family's induction of the Casp3 dependent apoptosis pathway. Furthermore, IGGAP1 play a critical role in cancer progression.

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