PTS-1.4 BRG1 Promotes Hepatocarcinogenesis by Modulating CyclinB, D, E and Matrix Metalloproteinase 7 (B) (W)

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Background: The chromatin remodeler complex SWI/SNF plays an important role in physiological and pathological processes. The role of BRG1, a catalytic subunit of the SWI/SNF complex, that is known to be mutated in hepatocellular carcinoma (HCC) remains unclear. The aim of this work is to investigate the role of BRG1 on cell growth, cell invasion and its effect on the expression of target genes.

Methods: We examined the expression of BRG1 in human tissue samples and HCC cell lines by qRT-PCR and Western Blot. We used siRNA to down-regulate BRG1 in human HCC cell lines. Cell growth and cell invasion of siRNA-treated cells was analysed by growth curves, colony formation assay and invasion assay. The expression of target genes after BRG1 downregulation was investigated by qRT-PCR.

Results: BRG1 was found to be significantly increased in HCC samples compared to non-HCC samples. After BRG1 downregulation by siRNA, cell growth and cell invasion decreased in HuH7 and HepG2 cell lines. A positive modulating effect by BRG1 was shown for the expression of CyclinB, D, E and MMP7 in either HepG2 or HuH7 cell lines.

Conclusion: Our results support the hypothesis that overexpression of BRG1 increases cell growth and cell invasion in HCC. Furthermore, the data highlight genes promoting proliferation and invasion that are being regulated by BRG1 during hepatocarcinogenesis. In particular, CyclinB, D, E and MMP7 appear to play a major role in this context and might be an important link between BRG1 expression and HCC development.