

## Characterization of YB1 in Hepatocellular Carcinoma Cells

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## Characterization of YB1 in Hepatocellular Carcinoma Cells

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**-Background:** The Rio Grande Valley's demographics show that the Hispanic population demographics exceeds more than 92% in The Rio Grande Valley. Being the most prominent ethnicity. Hepatocellular carcinoma (HCC) affects the Hispanic community greatly, and many factors impact the susceptibility. In 2022, liver cancer was predicted to be the fifth and seventh major cause for mortality in both males and females, respectively. Given its fast-growing rate and its aggressiveness, it is important to study the social, cultural, and most importantly the biogenetic factors that affect the prevalence of the disease. Unfortunately, in Texas, and specifically in the RGV, its prevalence rate has increased by 36% in recent years. One of the reasons for the high mortality of HCC, is drug resistance to first line drug treatment for the disease. According to TCGA data, YBox Binding Protein 1 (YBX1) is upregulated in HCC and is part of a super family of proteins that regulates mRNA translation. Further investigation of this protein could lead to a mechanism of drug resistance in HCC.

**-Methods:** Hepatocellular carcinoma cell line Skhep-1 will be obtained from ATCC and cultured as recommended. Stable overexpressing and knock-down cell lines of YB1 will be generated via plasmid transfection, puromycin selection, and FACS sorting. RT-PCR and western blot will be utilized to verify the overexpression of YBX1 at the mRNA and protein level in the recombinant cell lines. The resulting cell lines will be tested for oncogenicity through phenotypic assays, such as migration, invasion, proliferation, and colony formation.

**-Results:** Prior bioinformatic work done by the lab investigated YBX1 expression levels in the TCGA database, the structure and domain were also analysed. This protein has been reported to be linked to a worse survival rate and according to TCGA data it is overexpressed in HCC patients. The recombinant YBX1 overexpressed cells are sorted for GFP enrichment and validated via RT-PCRs and Western Blots. Preliminary data elucidates YBX1 protein overexpression has an increased proliferation, migration, invasion, and colony formation.

**-Conclusions:** The identification of this protein is important as it is linked with a lower survival rate. Further comprehensive research has revealed that oncogenic proteins, such as YBX1, can also play roles in drug resistance. Since one of the many hurdles of treating HCC is an unfavorable interaction with first-line drugs currently utilized to treat HCC, the future direction of this research will include further investigation of YBX1 overexpression and its relation to drug resistance.