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YBX1 Modulates Drug Resistance in Liver Cancer

According to the Texas Cancer Registry, hepatocellular carcinoma (HCC) is the sixth most common cause of cancer death. In 2015, Texas had the country's highest incidence rate and the fourth highest mortality rate. Texas Hispanics (87% of Mexican origin) showed the highest incidence and mortality rates compared to the overall US Hispanic population, with individuals of Mexican origin having the highest rates. The Rio Grande Valley, which is predominantly Mexican, is extremely affected by this fact, which exacerbates the need to address this issue within our community.

A major challenge in improving patient therapy in liver cancer is Sorafenib resistance. Sorafenib is a tumor-suppressing drug that is used as a first-line treatment for late-stage liver cancer and is especially prescribed to patients presenting relapse and recurrence of HCC. In addition, we have identified a transcription factor, YB1, which is a common element in poorer patient outcomes across breast, colon, liver, and other types of cancer. We are proposing that YB1 plays an important role in the development of Sorafenib resistance in liver cancer.

Our models to study the mechanism of the development of Sorafenib resistance are HCC cell lines from the American Type Culture Collection, enhanced with overexpression of YBX1. We analyzed the Sorafenib IC50 by performing molecular assays to validate the upregulation of drug resistance by YBX1 in HCC. Additionally, we will show that overexpression of YBX1 increases cell viability, thus cancer progression, in the presence of Sorafenib, as well as overexpression of YBX1 in the Sorafenib resistant cell lines.