Antisense RNA therapy for liver carcinoma

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A GW researcher invented a nucleic acid based therapy for Hepatitis C Virus (HCV) infection associated hepatocellular carcinoma (HCC, liver cancer). Currently available antiviral drugs can only eliminate short term effects of the HCV. But liver damage, caused by chronic HCV infections, carries the very high risk of developing into hepatocellular carcinoma, sometimes even decades after the original HCV episode. About 3.2 million Americans are infected with HCV and the incidence is increasing. As this infected population ages, liver cancer becomes a serious concern.

The inventor identified the much needed protein biomarkers (HNF4α, PTEN and DLC1) and an antisense RNA (vmr 11) that is significantly up regulated in cases of HCV infection associated liver carcinoma. Preliminary data showed that vmr 11 targets the mRNAs of the protein biomarkers and perturbs their normal levels causing oncogenic progression. The inventors made use of this knowledge to design an antagonistic antisense RNA which binds vmr 11 and inhibits it’s interaction with the protein biomarkers. This is effective in inhibiting the epithelial to mesenchymal transition, a hallmark of metastasis.

The invention presented here offers the first ever non-coding RNA based therapeutic approach for HCV associated liver cancer. The therapy has already been validated in a human hepatocyte culture system. The next development step is testing in a humanized mouse model.

Applications:

- Prevention of liver cancer caused by hepatitis c virus infection

Advantages:

- First non-coding RNA therapy for HCV associated liver cancer

Inventors

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