Scientists develop mouse model that could lead to new therapies for liver cancer

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Researchers have created the first mouse model demonstrating the role of a cancer promoting gene, Astrocyte elevated gene-1 (AEG-1), in hepatocellular carcinoma, or liver cancer. The mouse model represents a critical step in understanding the molecular mechanisms of liver cancer progression and could lead to novel therapies for the disease.

Insights from the mouse model were recently published in the journal Hepatology by a team of researchers led by Devanand Sarkar, M.B.B.S., Ph.D., Harrison Scholar at Virginia Commonwealth University (VCU) Massey Cancer Center, Blick Scholar and assistant professor in the Department of Human and Molecular Genetics and member of the VCU Institute of Molecular Medicine (VIMM) at VCU School of Medicine. AEG-1 was originally cloned in the lab of the study's co-author, Paul B. Fisher, M.Ph., Ph.D., Thelma Newmeyer Corman Endowed Chair in Oncology Research and program co-leader of Cancer Molecular Genetics at Massey, professor and chair of the Department of Human and Molecular Genetics and director of VIMM.

"My colleagues and I have been researching the role of AEG-1 in cancer development for several years and have shown it is linked to a diverse array of cancers, including liver cancer," says Sarkar. "This mouse model represents a breakthrough in our ability to test and translate our laboratory findings."

The mouse model gave the researchers a deeper understanding of the role of AEG-1 in liver cancer. Sarkar and his team confirmed AEG-1

overexpression significantly accelerated the progression of liver cancer. It also caused steatosis, or fatty liver, a mechanism that promotes inflammation and cancer progression. In addition, the mouse model substantiated laboratory findings that suggested that AEG-1 plays a role in protecting liver cancer cells from chemotherapeutic drugs and alters tumor angiogenesis, or the way that new blood vessels are formed within the tumor.

The researchers plan to use the model to further explore the molecular mechanisms by which AEG-1 promotes liver cancer, including the role of AEG-1 in fat metabolism and obesity-related diseases.

"This model moves us forward in the research process by allowing us to test a variety of compounds that could inhibit AEG-1 and prevent the development and progression of liver cancer," says Sarkar. "Ultimately, we hope our efforts will lead to new therapies and save lives."

More information: The full manuscript of this study is available online at: onlinelibrary.wiley.com/doi/10.1002/hep.25868/pdf

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