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## **Alberta Innovates grant facilitates joint research project on the hepatitis B virus**

Dr. Trushar Patel at the University of Lethbridge and Dr. Carla Coffin at the University of Calgary have secured Alberta Innovates funding worth \$639,000 to further research aimed at developing innovative strategies to combat hepatitis B virus (HBV) infection.

HBV is a global public health problem responsible for a million deaths every year, according to the Hepatitis B Foundation.

“Although we have a very effective vaccine against hepatitis B, there have been over two billion people worldwide infected with the hepatitis B virus,” says Patel. “The vaccine is not useful for people who have already been infected. Globally, over 250 million are chronically infected and at risk of developing liver cancer.”

HBV is transmitted through blood or other body fluids. The most common methods of transmission are from mother to child at birth or in early childhood from close contact with body fluids of an infected individual. Children born to HBV-infected mothers are at high risk of lifelong infection and developing serious liver disease like cirrhosis and liver cancer. Hotspots for HBV infection include Africa, Asia and the Middle East, largely due to sporadic vaccination programs in those areas. In Canada, HBV vaccination in childhood or early adolescence began in the mid-1990s. Most adults born before 1985 have not been vaccinated.

“Despite the significant public health impact, research on hepatitis B has been severely underfunded. We are grateful for this funding as it allows us to continue to contribute to the global efforts to achieve a cure by understanding how to prevent HBV multiplication,” say Patel and Coffin. “Our preliminary results from earlier research show we are already on a positive track.”

Current treatments for HBV include long-term, often lifelong, use of oral antiviral medications or interferon injections. Although interferon is given for one year, treatment has severe side effects and limitations. Patel and Coffin want to help pave the way for new treatments in the future and are pursuing a two-pronged approach.

They first want to identify new targets for treatment on the hepatitis B genome. Secondly, because viruses cannot survive on their own and require proteins from the body to help them replicate, Patel wants to understand how the body and the virus communicate and then block the communication so replication doesn't occur.

"We have already designed some therapeutic molecules based on our work that was done here in Lethbridge. Dr. Coffin's lab is currently testing if these molecules can inhibit HBV replication," says Patel.

Part of the project was supported by Patel's Canada Research Chair program through the Canadian Institutes of Health Research and the Cumming School of Medicine Clinical Research Fund. The preliminary results from that research were included in the Alberta Innovates grant application.

"Because the results are still preliminary, we can't make any promises until we have the fully developed story. But clearly the reviewers at Alberta Innovates liked our idea and approaches," says Coffin. "We hope to have pre-clinical work done at the end of the three years. Then we will move to the next phase of the research, which would mean applying for more funding to improve the molecules we are designing for animal studies."

"We take this opportunity to thank our collaborators, the U of L and the U of C, as well as Alberta Innovates for their encouragement, support and motivation for our interdisciplinary research work on understanding host-viral communications," says Patel.

Patel is an assistant professor and a Canada Research Chair (RNA & Protein Biophysics) in the U of L's Department of Chemistry and Biochemistry and an adjunct assistant professor at the U of C's Cumming School of Medicine. Coffin is an associate professor of Medicine and a hepatologist (liver specialist) at the U of C.

To view online: <http://www.uleth.ca/unews/article/alberta-innovates-grant-facilitates-joint-research-project-hepatitis-b-virus>

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