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Potential Cholesterol-Lowering Drug Molecule Has Prostate Cancer Fighting Capabilities

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COLUMBIA, Mo. – Standard treatment for prostate cancer can include chemotherapy that targets receptors on cancer cells. However, drug-resistant cancer cells can emerge during chemotherapy, limiting its effectiveness as a cancer-fighting agent. Researchers at the **University of Missouri** have proven that a compound initially developed as a cholesterol-fighting molecule not only halts the progression of prostate cancer, but also can kill cancerous cells.

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Hyder proved that a compound initially developed as a cholesterol-fighting molecule not only halts the progression of prostate cancer, but also can kill the cancerous cells

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“Cholesterol is a molecule found in animal cells that serves as a structural component of cell membranes. When tumor cells grow, they synthesize more cholesterol,” said Salman Hyder, the Zalk Endowed Professor in Tumor Angiogenesis and professor of biomedical sciences in the MU College of Veterinary Medicine and the Dalton Cardiovascular Research Center. “Often, cancer patients are treated with toxic chemotherapies; however, in our study, we focused on reducing the production of cholesterol in cancer cells, which could kill cancer cells and reduce the need for toxic chemotherapy.”

Currently, treatment for primary prostate cancer includes systemic exposure to chemotherapeutic drugs that target androgen receptors located in the cancer cells, which normally bind with hormones such as testosterone. Anti-hormone therapies, or chemical castration, also may be used in the fight against prostate cancer.

“Although tumor cells may initially respond to these therapies, most eventually develop resistance that causes prostate cancer cells to grow and spread,” Hyder said. “Cholesterol also can contribute to the development of anti-hormone resistance because cholesterol is converted into hormones in tumor cells; therefore, these cholesterol-forming pathways are attractive therapeutic targets for the treatment of prostate cancer.”

Using a compound developed by Roche Pharmaceuticals for the treatment of high cholesterol called RO 48-8071, Hyder and his team administered the molecule to human prostate cancer cells. They found that the compound was effective in reducing human prostate cancer cell growth. Subsequent studies also found that the compound caused cancer cell death.

Armed with this information, Hyder and the team then tested the results in mice with human prostate cancer cells. Following injection of the compound, Hyder found that the molecule was effective in reducing tumor growth.

These findings suggest that the potential cholesterol drug, when used in combination with commonly used chemotherapeutic drugs, could represent a new therapeutic approach in the fight against prostate cancer, Hyder said.

Researchers involved with the study included Yayun Liang, a research associate professor at Dalton Cardiovascular Research Center; and Benford Mafuvadze, a post-doctoral fellow at Dalton Cardiovascular Research Center. Johannes Aebi from Roche Pharmaceuticals also contributed to the research.

The study, “Cholesterol biosynthesis inhibitor RO 48-8071 suppresses growth of hormone-dependent and castration-resistant prostate cancer cells,” has been accepted for publication in the journal, *OncoTargets and Therapy* with funding from the Department of Defense Prostate Cancer Program (W81XWH-14-1-0246), by a peer-reviewed COR grant from the MU College of Veterinary Medicine, and through the generosity of numerous donors to the Ellis Fischel Cancer Center at MU.

Editor’s Note: For more information about related MU research:

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