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# Researchers develop novel, non-toxic approach to treating variety of cancers

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A team of researchers at Sylvester Comprehensive Cancer Center at the University of Miami Miller School of Medicine recently discovered a novel, non-toxic approach to treating a wide variety of cancers. The treatment approach is based on a combination therapy of the sugar 2-Deoxy-D-glucose (2-DG) and fenofibrate, a well-studied cholesterol medication. The study was published in the journal *Oncotarget*.

"Cancer cells found in the inner core of all solid tumors - due to the abnormally low levels of oxygen they are in - must rely on the process of glycolysis, the breakdown of glucose for energy, to survive," said Theodore Lampidis, Ph.D., a cancer researcher at Sylvester and lead author of the study. "These cells, by nature of their slow growth, have been found to be the most resistant to conventional cancer treatments such as radiation and chemotherapy. In this study, we showed that a false sugar such as 2-DG, which blocks glycolysis, selectively starves these slow-growing cancer cells while sparing normal cells, which can use other sources of energy, such as fats and proteins because they are fully oxygenated."

Although a Phase I clinical trial in which 2-DG was combined with a conventional anticancer drug proved successful, the toxic side effects of chemotherapy remained an issue. However, in this study, the team of scientists showed that by combining 2-DG with fenofibrate, a compound that has been safely used in humans for more than 40 years to lower cholesterol and triglycerides, the entire tumor could effectively be targeted without the use of toxic chemotherapy.

"We found that the unique combination of 2-DG and fenofibrate simultaneously provoked two types of stress, known as energy and ER stress, which most cancer types cannot overcome," said Lampidis, who is also professor of cell biology at the University of Miami Miller School of Medicine.

Due to uncontrolled growth and to the abnormal micro-environment in which cancer cells exist, they are under more stress than normal, healthy cells. In addition to 2-DG taking advantage of the universal cancer trait of increased glucose uptake, adding fenofibrate effectively exploits a second common feature of cancers - increased stress.

"We believe our findings effectively pave the way for using this combination to provide non-toxic treatments for a wide variety of cancers," said Lampidis.

Provided by University of Miami Leonard M. Miller School of Medicine