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Old cancer drug could have new use in fighting cancer

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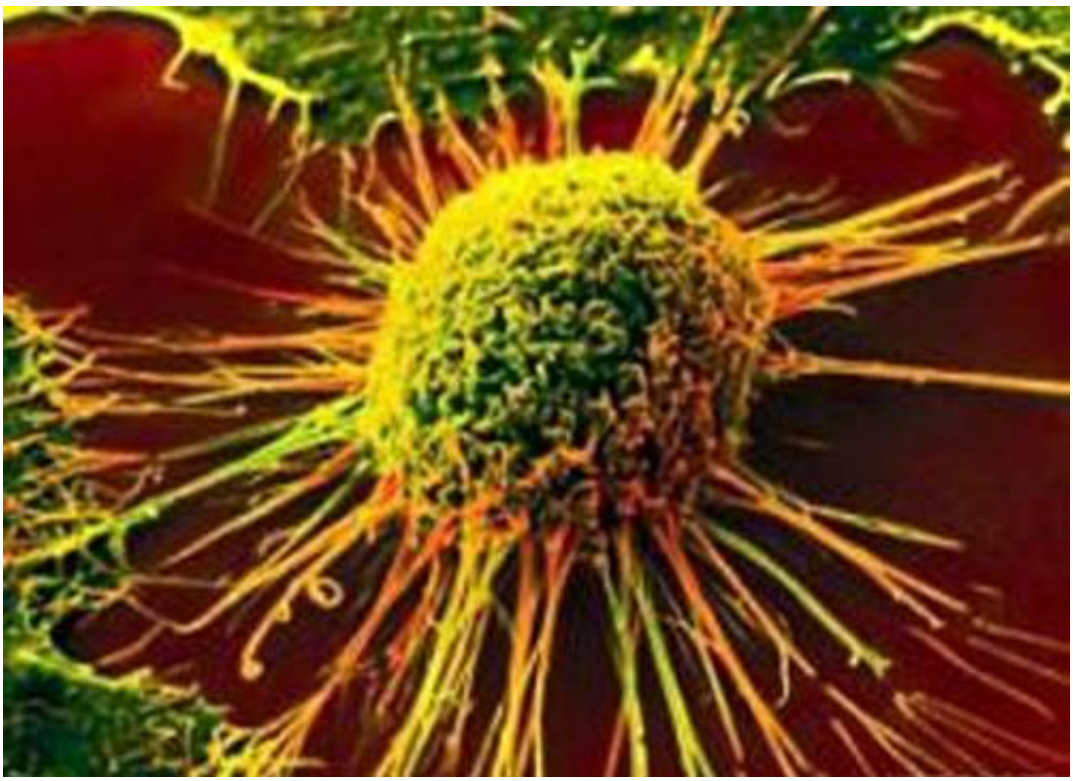

A drug used for decades to treat leukemia may have other uses in the fight against cancer, researchers at the University of Missouri have found. Previously, doctors used 6-Thioguanine, or 6-TG, as a chemotherapy treatment to kill cancer cells in patients with leukemia. In recent years, many doctors have shelved 6-TG in exchange for newer

drugs that are more effective. Now, Jeffrey Bryan, an associate professor of oncology at the MU College of Veterinary Medicine, and his colleagues found that 6-TG can not only kill cancer cells, but also works to change how certain cancer cells function, weakening those cells so they can be killed by other drugs.

Every cell in the body has certain genetic characteristics called epigenetic markers that give cells instructions on how to act, when to multiply and when to die. Cancer cells often have epigenetic markers that cause genes to be either turned off or out of control. This causes those cells to grow rapidly, become difficult to kill and ultimately damage the body. When testing the drug on cells from dogs with cancer, the MU researchers found that 6-TG can affect these epigenetic markers in cancer cells through a chemical process called demethylation. This process works to turn off damaging epigenetic markers and turn on markers that make the cells act in a healthy manner. Bryan says this discovery could lead to future cancer treatments using multiple drugs to fight the disease from different sides.

"While 6-TG is no longer one of the more powerful cancer-killing drugs doctors have at their disposal, we found that it could still be useful to fight cancer in conjunction with other drugs," said Bryan, who also is the director of the Comparative Oncology and Epigenetics Laboratory at MU. "If we can use 6-TG to turn off dangerous markers in cancer cells so that those cells become easier to kill, we then can use more powerful cancer-killing drugs to eliminate the cells for good."

Bryan says this research could potentially open doors for future research on other old cancer drugs that are no longer used by doctors. By re-examining other potential uses for these old drugs, Bryan says more effective treatments could be found. He also says that doing this research on dogs with cancer could translate well to human diseases.

"Epigenetic markers work similarly in dogs and humans, so we expect to see similar results with these drugs in humans as we do in dogs," Bryan said. "This is 'a one step back, two steps forward' approach to cancer research. Gaining approval from the Federal Drug Administration (FDA) to use new drugs to treat human diseases is a difficult, time-intensive process. By examining alternate uses of old drugs in dogs, we hope to be able to expedite that process down the road when we introduce these novel combination treatments in humans."

Provided by University of Missouri-Columbia

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