

Drug reduces fat by blocking blood vessels

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Researchers have long known that cancerous tumors grow collections of abnormal blood cells, the fuel that feeds this disease and keeps it growing. Now, new evidence in an animal model suggests that blood vessels in the fat tissue of obese individuals could provide the same purpose—and could provide the key to a new way for people to lose weight. When researchers Jian-Wei Gu, Kristina L. Makey, Edmund Chinchar, Carissa Howie, and Lucio Miele, all from the University of Mississippi Medical Center, gave obese mice a cancer drug that works by inhibiting the growth of blood vessels, these mice lost about 70 percent of their fat mass.

The team will discuss an abstract of their study entitled, "Angiogenesis Inhibitor, Sunitinib, Significantly Reduces Adipose Tissue Mass in High Fat Diet-Induced Postmenopausal [Obese Mice](#)," at the [Experimental Biology](#) 2013 meeting, being held April 20-24, 2013 at the Boston Convention and Exhibition Center, Boston, Mass. The poster presentation is sponsored by the [American Physiological Society](#) (APS), a co-sponsor of the event. As the findings are being presented at a scientific conference, they should be considered preliminary, as they have not undergone the peer review process that is conducted prior to the data being published in a scientific journal.

Treating Fat and Cancer the Same

Dr. Gu, who led the research team, notes that there are only three drugs currently approved in the United States to treat obesity. Unfortunately, he says, these few drugs are only minimally effective and come with a

host of undesirable side effects.

"Right now," he says, "we don't have good drugs that lead to very significant weight loss, and none that don't cause other problems."

More than a decade ago, Judah Folkman of Harvard Medical School, whose primary research focus was the growth of [blood vessels](#) in [cancerous tumors](#), discovered that fat tissue in mice can be regulated by angiogenesis inhibitors—drugs that restrain the growth of blood vessels. However, Gu explains, Folkman never pursued this line of research further before his death in 2008.

Building upon Folkman's single paper published on this topic in 2002, Gu, who studies the role of fat tissue in cancer, decided to test whether a drug already developed to inhibit blood vessels for cancer treatment might also reduce fat.

He and his colleagues administered the drug, known as Sunitinib and approved to treat kidney and gastrointestinal tumors, to a mouse model of postmenopausal obesity. These animals, which had their ovaries removed at a young age to put them in premature menopause and fed four weeks of a high fat diet to promote obesity, received Sunitinib daily for two weeks either orally or through abdominal injections. These animals were compared to those of the same model who didn't receive the drug.

Shrinking Blood Vessels, and Fat

After this treatment, researchers found that the mice who received Sunitinib lost significant amounts of weight, with an average loss of 70 percent fat mass. However, notes Gu, their lean mass remained unaffected. Both mice who received the drug orally and those who received abdominal injections lost similar amounts of fat.

In addition to fat loss, Sunitinib also seemed to curb the animals' appetites, with those receiving the drug eating less food once treatment was complete—possibly a side effect of losing the fat and the hormones it sends to the brain to stimulate food intake, Gu explains.

Gu emphasizes that more research is necessary before this drug can be tested for human weight loss. Because many angiogenesis proteins exist for various purposes throughout the body, Sunitinib may cause off-target effects that weren't immediately evident in the mouse models, he notes. Additionally, he and his colleagues plan to test whether this drug is also effective with other types of animal models for obesity.

However, according to the researcher, the findings suggest that Sunitinib holds promise for reducing [fat](#) mass. "This could be a very good strategy for treating obesity, at least in the short-term," he says.

Provided by American Physiological Society

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