

## Synthetic cocoa chemical slows growth of tumors in human cell lines

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A synthetic chemical based on a compound found in cocoa beans slowed growth and accelerated destruction of human tumors in laboratory studies, and should be tested further for cancer chemoprevention or even treatment, say researchers at Georgetown University Medical Center.

"We have all heard that eating chocolate is good for you; this study suggests one reason why that might be true," says the study's lead author Min Kim, Ph.D., a research scientist in the Department of Oncology at Lombardi Comprehensive Cancer Center.

Published online today in Cell Cycle, the researchers describe how four different human tumor cells lines out of 16 tested were sensitive to the chemical, known as GECGC. The strongest response was seen in two different colon cancers; growth was cut in half and most of the tumor cells were damaged.

Normal cells were not affected by GECGC, which makes the chemical a candidate for cancer chemoprevention, says Kim.

"This chemical seems to be safe, which makes sense because it has a structure similar to a natural product in cocoa beans - the same beans that are used to make chocolate," he says.

The researchers have long studied the beneficial effects of flavanols, which are molecules in vegetables and fruits that exhibit potent antioxidant and, potentially, anti-tumor properties. As part of these studies,



investigators have been testing a new synthetic version of natural procyanidins, a class of flavanols, created and patented by the confectionery company, Mars Incorporated. (The company provided GECGC as a gift, and this project was funded in part by Mars Incorporated.)

In these studies, the scientists tested the effects of three different doses of GECGC on the cancer cell lines - the first time that a synthetic cocoa derivative has been used to screen human cancer cell lines. None of the doses tested were extreme, Kim points out. "The effective concentrations were considered similar to what a person might eat or use," he says.

They found sensitivity to GECGC in both colon cancer cell lines they tested, in cervical cancer cells and in one line of leukemia, tumor cells. Other cell lines were resistant, including ovarian and prostate cancer cells.

Overall, GECGC showed the most effect in treating cancer cells that are normally fast growing, Kim says. And the fact that it demonstrated the most killing power in colon cancer suggests the chemical "could serve as a promising therapeutic for colon cancer," he says. "So far, these data are very convincing."

The researchers do not yet clearly understand the mechanism by which GECGC disrupts tumor growth, but they think it inhibits the physical connections between cancer cells and blocks internal cell signaling pathways.

Kim says that animal studies testing the anticancer power of GECGC are currently underway. "While this work is indeed promising, we have much more study to do before we can say with authority that GECGC has anticancer properties."



## Source: Georgetown University

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