MedicalXpress

Pitt study finds NSAIDs cause stem cells to self-destruct, preventing colon cancer

November 1 2010

Nonsteroidal anti-inflammatory drugs (NSAIDs) prevent colon cancer by triggering diseased stem cells to self-destruct, according to researchers at the University of Pittsburgh Cancer Institute (UPCI) and the University of Pittsburgh School of Medicine. Their findings, reported in the early online version of this week's *Proceedings of the National Academy of Sciences,* could lead to new strategies to protect people at high risk for the disease.

Doctors have long known that NSAIDs, such as aspirin, can lower the risk of colon cancer, but it's not been clear how they do it, said senior investigator Lin Zhang, Ph.D., associate professor, Department of Pharmacology and Chemical Biology, Pitt School of Medicine, and UPCI.

"Our study shows NSAIDs target stem cells that have accumulated mutations that could lead to cancer development, and initiate a biochemical pathway that makes those cells undergo programmed cell death, a process called apoptosis," Dr. Zhang said.

The researchers studied mice that have a genetic defect similar to one that is present in patients with familial adenomatous polyposis, a condition that accounts for about 1 percent of all cases of colorectal cancer, and is typically present in non-hereditary colon cancer, too.

Mice that ate the NSAID sulindac in their feed had within a week markedly elevated rates of apoptosis in their intestinal polyps, and

specifically in stem cells that had accumulated some dangerous, precancerous changes causing abnormal cell signaling, the researchers found. If the mice also lacked a gene called SMAC, which makes a protein that is released during apoptosis, sulindac was less effective at killing the diseased stem cells.

"That leads us to think that SMAC is an important regulator of this process," Dr. Zhang said.

He and his team then took a closer look at polyps removed from patients and found higher levels of apoptosis in cells with stem cell features among those who were taking NSAIDs. The findings indicate that apoptosis measures could be a useful way of assessing the effectiveness of cancer-prevention drugs, as well as lead to the development of new agents to further sensitize abnormal stem cells to NSAIDs.

Provided by University of Pittsburgh

Citation: Pitt study finds NSAIDs cause stem cells to self-destruct, preventing colon cancer (2010, November 1) retrieved 3 May 2024 from https://medicalxpress.com/news/2010-11-pitt-nsaids-stem-cells-self-destruct.html