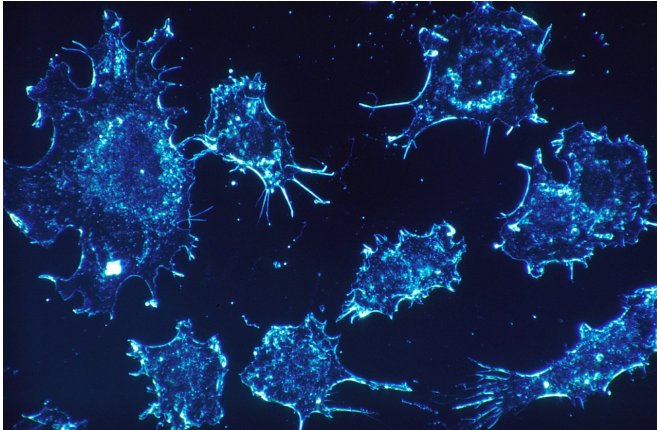


Cannabinoid compounds may inhibit growth of colon cancer cells

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Medical marijuana has gained attention in recent years for its potential to relieve pain and short-term anxiety and depression. Now, Penn State College of Medicine researchers say some cannabinoid compounds may actually inhibit the growth of colon cancer cells in the lab.

The researchers tested the effects of synthetic cannabinoid [compounds](#) on [colon cancer cells](#) in an experiment in [test tubes](#). While the compounds most commonly associated with cannabis—THC and CBD—showed little to no effect, 10 other compounds were effective at inhibiting [cancer cell growth](#).

Kent Vrana, chair of the Department of Pharmacology at Penn State College of Medicine, said the study—recently published in *Cannabis and Cannabinoid Research*—helped identify compounds that could be tested further to understand their anti-[cancer](#) properties.

"Now that we've identified the compounds that we think have this activity, we can take these compounds and start trying to alter them to make

them more potent against [cancer cells](#)," Vrana said. "And then eventually, we can explore the potential for using these compounds to develop drugs for treating cancer."

Colorectal cancer is one of the most common cancers diagnosed in the United States, according to the National Cancer Institute, with an estimated 140,250 newly diagnosed cases and 50,630 deaths in 2018. While [medical cannabis](#) has largely been used in recent years for [palliative care](#), the researchers said some previous studies suggested that certain cannabinoid compounds may have the potential to inhibit or prevent the growth of tumors.

To explore how effective cannabinoids were at reducing the viability of colon cancer [cells](#) specifically, the researchers tested how 370 different synthetic cannabinoid compounds affected seven types of human colon cancer cells.

"There are many different ways cells can become cancerous," Vrana said. "Each of the seven cells we tested had a different cause or mutation that led to the cancer, even though they were all colon cells. We didn't want to test these compounds on just one mutation or pathway to cancer."

The researchers incubated the cancer cells in a lab for eight hours before treating them with the cannabinoid compounds for 48 hours. Any compounds that showed signs of reducing the viability of one kind of cancer cell was then used to treat all seven kinds of cells.

After further screening and analysis, the researchers identified 10 compounds that inhibited the growth of almost all seven types of colon cancer types tested. But while the researchers were able to identify these compounds, Vrana said they are still unsure about how exactly the compounds worked to reduce the viability of the cancer cells.

"The 10 compounds we found to be effective fall into three classes, so they're similar to each other but with small changes," Vrana said. "We know how one of them works, which is by inhibiting the division of cells in general. We also found that the most potent and effective compounds don't seem to work through traditional marijuana receptors, although we're not sure of the exact mechanism yet."

Vrana said certain types of cells, like skin and colon cells, are more susceptible to cancers because they divide very frequently

"Every time a cell divides, there's the chance that it will mutate and keep dividing when it shouldn't, which is how cancers can start. So if we block that signal that's telling cancer cells to continue to divide, that could be a way to stop that cancer."

Vrana said that because the other compounds did not seem to be working through traditional [cannabinoid](#) signaling pathways, future research will focus on better understanding how the compounds interact with cancer cells and whether researchers can make the compounds more potent and effective.

More information: Wesley M. Raup-Konsavage et al, Synthetic Cannabinoid Activity Against Colorectal Cancer Cells, *Cannabis and Cannabinoid Research* (2018). [DOI: 10.1089/can.2018.0065](#)

Provided by Pennsylvania State University

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