

## Can pot fight cancer? UNC seeks the answer



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GREELEY – The University of Northern Colorado is one of the first schools in the state to begin investigating the cancer-fighting properties of marijuana, using a new partnership with biotechnology company PharmaCyte Biotech.

Silver Springs, Md.-based PharmaCyte Biotech (OTCQB: NVLX) launched the research project with UNC in May. Its goal is to determine whether the company's patented technology can be used along with medical cannabis to kill tumors and extend the lives of patients with advanced brain and pancreatic cancer.

The idea is to have patients take inactive cannabinoids, which are the active chemical constituent of marijuana. Once the inactive substance enters the body, it attaches to a special "encapsulated" cell that has been injected near the tumor site. When the inactive cannabinoids reach the site, they are activated by the cell. The test will be to determine how effective these substances, when coupled with this targeted cell-injection technology, are in fighting cancer and minimizing its side effects.

The technology, dubbed Cell-in-a-Box, is a live-cell encapsulation mechanism that allows a certain cell to be stored in a capsule and delivered into the human body, said Ken Waggoner, chief executive of PharmaCyte Biotech.

The first task of the research team, led by Dr. Richard Hyslop, a professor of chemistry and biochemistry at UNC, is to identify cells that are capable of activating the cannabis.

"The type of cell that we are going to incorporate will have a particular type of activity that is capable of converting a component of cannabis to an active anti-cancer drug," he said.

Cannabinoids are made up of several different compounds which have different characteristics, said physician Dr. Mark Rabe, a member of the Medical Marijuana Scientific Advisory Board at PharmaCyte Biotech. With legalization has come a wave of new research examining the cancer-fighting properties of these different cannabinoid compounds.

### How effective are cannabinoids in fighting cancer?

According to the National Cancer Institute at the National Institutes of Health, laboratory and animal studies have shown that cannabinoids have tumor-fighting capabilities, which can kill cancer cells. However, no clinical trials have been conducted in the United States.

"Cannabis and cannabinoids may have benefits in treating the symptoms of cancer or the side effects of cancer therapies, including nausea and vomiting, anxiety and loss of appetite," according to the NIH.

Despite the lack of human clinical trials, Hyslop said he has confidence in marijuana's ability to fight cancer.

An expert in drug metabolism, "I've been working with anti-cancer drugs since the mid-70s," Hyslop said.

Hyslop's work this summer is to begin screening a preliminary set of cells to determine which are the best candidates to use in the treatment protocol.

"We have some information that the type of activity that we need is located in several types of cells, and that's what we're screening," he said.

If cannabinoids really can reduce or eliminate tumors, the research will bring another benefit – helping patients avoid potential side effects by taking active medical cannabis.

As an active chemical, cannabinoids may create drug-like effects throughout the body, Hyslop said. Thus, if patients want to use cannabinoids to attack tumors, they have to use dangerously large doses, which can create side effects.

According to the American Cancer Society, "Marijuana overdoses do not cause death, but may cause mental impairment and distressing emotional states, such as paranoia, hallucinations and disconnection from reality. Overdoses can also cause fast or disturbed heart rhythm, sleepiness, clumsiness, dry mouth, dizziness and low blood pressure."

However, inactive cannabinoids don't have any druglike effects. Therefore, the technology may minimize side effects, Hyslop said.

PharmaCyte Biotech declined to disclose the ongoing cost for the research.

"The initial research could be completed as soon as September or October. It also may run into next year," Hyslop said, "PharmaCyte Biotech will eventually put it into clinical trials, which may take years."

More information about PharmaCyte Biotech can be found at [www.nuvilex.com](http://www.nuvilex.com). It can also be obtained by contacting Investor Relations.

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