

# Cancer Fighters Have New Weapon: Black Raspberries



Most widely known for being a key ingredient in cobblers and pies, black raspberries may soon gain a new reputation as the most promising form of cancer treatment. In the 1990s, Gary Stoner, professor of internal medicine at Ohio State University (OSU), began studying the effects of black raspberries on cancer, specifically colon and esophageal cancer. "There are a large number of compounds in berries that inhibit cancer in animals," said Stoner.

Upon close chemical examination of the raspberries, Stoner and other scientists found that anthocyanins, the compounds that gives the berries their color, play a crucial role in preventing the development of cancer. Scavenging free radicals, molecules that alter and destroy DNA, and inhibiting the inflammation process are among the ways scientists believe anthocyanins help prevent and treat cancer.

"The inflammatory process produces cytokines," said Stoner. "Cytokines stimulate cell growth and inhibit cell death – this drives the cancer process."

After seeing the success of Stoner, other Ohio State doctors became anxious to try the fruit compounds on other types of cancer, including oral and non-melanoma skin cancer. Dr. Susan Mallery, professor for the College of Dentistry at OSU, teamed up with Dr. Russell Mumper, associate director of the Center for Pharmaceutical Science & Technology at the University of Kentucky, who created a molecule-

adhesive gel from black raspberry extracts for the treatment of oral cancer. Mallery said that while oral cancer is not the most common type of cancer, it does have major side effects.

"Treatment is usually to cut the cancer out; it can be very disfiguring" said Mallery. "Even with the cancerous tissue out, many have recurrences."

During the first clinical trial at OSU earlier this year, 20 patients with pre-cancerous lesions, called dysplasia, were brought in to try out the gel before surgery to remove the lesions was performed. Mumper said that the patients were instructed to apply the black raspberry gel to their lesions four times a day over a period of 42 days. At the end of the trial, the patient's lesions were evaluated, and biopsies were used to determine what effect the gel had made at the molecular level. According to Mumper, half of the patients showed a clinical downgrade in their dysplasia. In some cases, the lesions went away completely. "The berry formulation is having a positive effect at the molecular level, changing enzymes and proteins," said Mumper. "It's very tantalizing. OSU is moving forward with phase two of the trial at several different cancer centers."

Hearing about the research of Stoner and others, Dr. Anne VanBuskirk, assistant professor of surgery at Ohio State University, decided to try the gel on animal's skin after UV exposure. While the results were successful, VanBuskirk said it is still not known exactly how the berries slow cancer growth. "We think the antioxidant activity of the extract helps to reduce inflammation," said VanBuskirk. "Chronic inflammation sets the stage for cancer in a number of ways."

Following suit of the Ohio State doctors is Dr. Ramesh Gupta,

professor of oncological research at the University of Louisville. Using a mixture of berries including blackberries, blueberries, strawberries, and black raspberries, Gupta has been testing their impact on lung and breast cancer in rats. Gupta explained that for the lung cancer trials, the rats were exposed to cigarette smoke five days a week for nine months. During this time, some of the rats were fed one pound of berries a day. At the end of the trial, Gupta observed that less than 30% of the rats who were fed berries developed tumors as opposed to the rats who were not fed berries.

A similar trial was conducted for rats that were fed chemicals that caused breast cancer, and corresponding results were experienced when the rats who ate berries produced less of the cancer-causing enzymes. Next up for Gupta is clinical trials in which the objective will be to see if compounds from the berries are absorbed into tissue and visible in the bloodstream. Gupta says that eventually the researchers want to test people who already have tumors to see if the berries can effectively combat the cancer.

With the rapid success of the berry trials, it is looking more likely to doctors that the black raspberry gel could receive FDA approval and hit drugstore shelves within the next few years. Mumper predicts that the berry gel could be available through prescription as early as 2009, adding that the gel might have other applications as a treatment for other topical diseases of the skin. "Maybe they could incorporate it into sunscreens," said Dr. Harry Carlross of Paducah, an oncologist. "It's always a big 'if,' but if you don't look at the big 'ifs,' you won't find what's important."

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