

Effectively Treating Colorectal Cancer With Grape Seed Extract, Even As Cancer Gets More Aggressive

When the going gets tough, grape seed extract gets going: A University of Colorado Cancer Center study recently published in the journal *Cancer Letters* shows that the more advanced are colorectal cancer cells, the more GSE inhibits their growth and survival. On the other end of the disease spectrum, GSE leaves healthy cells alone entirely.

"We've known for quite a while that the bioactive compounds in grape seed extract selectively target many types of cancer cells. This study shows that many of the same mutations that allow colorectal cancer cells to metastasize and survive traditional therapies make them especially sensitive to treatment with GSE," says Molly Derry, doctoral candidate in the lab of Rajesh Agarwal, PhD, investigator at the CU Cancer Center and professor at the Skaggs School of Pharmacy and Pharmaceutical Sciences.

Derry notes this is an especially important finding in light of increasing colorectal cancer rates (due in part to increasingly high-fat diets and sedentary lifestyles) and a low screening rate; that means 60 percent of patients diagnosed have already reached the advanced stage of the disease.

"Finding a way to selectively target advanced colorectal cancer cells could have major clinical importance," Derry says.

The group performed their experiments on colorectal cancer cell lines representing various stages of the disease. Whereas it generally takes much more chemotherapy to kill a stage IV cancer cell than a stage II cancer cell, Derry saw that the reverse was true with grape seed extract.

"It required less than half the concentration of GSE to suppress cell growth and kill 50 percent of stage IV cells than it did to achieve similar results in the stage II cells," Derry says.

The group also discovered a likely mechanism of GSE's preferential targeting of advanced colorectal cancer cells: when cancer cells were treated with antioxidants the GSE induced cell death was reversed and so Derry and colleagues consider it likely that GSE targets colorectal cancer through inducing oxidative stress that leads to the programmed cell death known as apoptosis.

"A colorectal cancer cell can have upwards of 11,000 genetic mutations - differences from the DNA in healthy cells. Traditional chemotherapies may only target a specific mutation and as cancer progresses more mutations occur. These changes can result in cancer that is resistance to chemotherapy. In contrast, the many bioactive compounds of GSE are able to target multiple mutations. The more mutations a cancer presents, the more effective GSE is in targeting them," Derry says.

The Agarwal Lab continues its preclinical work studying the effectiveness and action of dietary compounds against cancer and encourages further exploration of their findings in clinical settings.