Concentration, timing and interactions are key when it comes to dietary compounds

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Agricultural Research Service (ARS) chemist Thomas Wang, who specializes in cancer prevention research, has reported evidence that for some dietary compounds, length of exposure over time may be key to whether or not ingestion leads to a beneficial, or detrimental, effect.

Scientists do not know exactly why one person develops cancer and another does not. But they do know that certain nutrients might increase or decrease cancer risk. There are "layers" of factors involved in the development of cancer, and Wang is studying the layers involving peoples' diet complexity and gene expression.

Wang works at the ARS Diet, Genomics and Immunology Laboratory, part of the Beltsville (Md.) Human Nutrition Research Center. He published a complementary cell-culture and animal-model study showing that concentrations of resveratrol--a highly bioactive compound found in grapes and other plant foods--actually turned out to be a double-edged sword when it came to mitigating cancer risk.

First, Wang exposed human prostate cancer cells to resveratrol and found that it inhibited the cells' growth. He further tested the cells' gene expression. Then Wang tested the effects of resveratrol on a group of laboratory animals that had sex-hormone-dependent tumor cells.

Half of those animals were fed a daily diet that included 3 to 6 milligrams of purified resveratrol (equal to roughly the amount in five glasses of wine or grape juice). At first, the tumor cells in the resveratrol-

fed lab animals grew slower. But as the animals continued to consume resveratrol, there was an increase in blood vessels developing around the tumors of the resveratrol-fed animals, effectively setting up a system of feeding the tumors.

The study, published in the journal *Carcinogenesis*, showed that the concentration of the plant compound is important, but so is length of exposure, according to the authors.

More information: Read more about this and other research related to improving health through nutrition in the July 2010 issue of Agricultural Research magazine, available online at: www.ars.usda.gov/is/AR/archive/jul10/cell0710.htm

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