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Resveratrol from Berries: Agent for Lowering Risk of Cancer and Cardiovascular Disease?

Resveratrol Essay #1 of 3

Today, we begin a 3-part report on one of the most famous berry antioxidants -- a tongue-twister from the flavonoid family called resveratrol (easier to pronounce using syllables!).

Resveratrol has significance from scientific studies both in cardiovascular disease and in cancer. Let's have a look at each of these disease areas as examples of how antioxidant phytochemicals from berries may benefit human health.

One of the best known stories about the health benefits of eating colorful fruit is called the French Paradox – the condition of unexpected low incidence of cardiovascular disease in French citizens who regularly eat extraordinary quantities of high-fat foods and consume red wine. These people should have high rates of cardiovascular disease but seem protected by chemicals in wine.

Although we now recognize that high-fat diets are undesirable, the potential benefits of a diet rich in whole food phytochemicals are clear when combined with other healthy dietary and lifestyle practices, such as maintaining a regular exercise program.

Possibly the most publicized phytochemical in red wine is resveratrol found in the skin and seeds of red and purple grapes and dark berries like the blueberry. Resveratrol is chemically defined as a stilbene, viniferin or phytoalexin, a Greek-derived term meaning to “protect” (alexin) or to “ward off”.

This designation suits the function of resveratrol in the outer skin of plants as a primary fungicide and antiviral agent with potent antioxidant properties protecting against ultraviolet radiation, pests and injury. Resveratrol belongs to the general class of plant chemicals called phenolics or polyphenols, named from their composition of carbon, hydrogen and oxygen atoms in 6-carbon rings.

Benefits of Resveratrol

By consuming blue, red, purple and black-skinned plants rich in resveratrol, humans may gain protective benefits. Early medical research proves this to be true, as resveratrol has been shown in preliminary research on experimental animals to

- * increase blood flow and reduce the extent of brain cell damage following stroke
- * reduce the activity of brain inflammatory mediators in a model of Alzheimer's disease
- * reduce vascular plaque formation in rats given a high-fat diet
- * improve the rate of healing in skin wounds
- * protect against lipid oxidation in a model of pancreatitis
- * protect against cellular pathology in a model of diabetic kidney disease
- * protect against liver damage in a model of cholestasis or bile duct occlusion
- * protect against cartilage deterioration in a model of osteoarthritis
- * stimulate anti-clotting mechanisms in blood
- * suppress appetite and so may contribute to weight control or loss
- * enhance sperm production
- * inhibit formation of cataracts
- * inhibit proliferation of the herpes simplex virus
- * prolong the lives of yeast cells, worms, fish and fruit flies, possibly through mechanisms that affect aging via the rate of cell death

In Part 2 of this essay, I'll present specific anti-cancer evidence of resveratrol's probable health benefits.

Resveratrol Essay #2 of 3

In Part 1, I gave you a few examples of the broad-spectrum health benefits emerging from early research on the potent berry and grape antioxidant, resveratrol.

Here's more on the anti-cancer activity of this interesting phenolic antioxidant.

Before we begin, I'm sometimes asked: "If this research hasn't been applied yet in human clinical trials, should we wait for conclusive effects on humans before involving dark fruit more regularly in our diets?"

My answer is simple: dark berries, red grapes, grape juice and red wines are enjoyable to consume as they are, and we know they contain rich amounts of resveratrol and numerous other phenolic antioxidants. Why wait for the evidence?

Involve these fruits in your diet now, enjoy their variety of tastes and applications, and give yourself a fighting chance for gaining the protective benefits of berry antioxidants.

Anti-Cancer Effect

Resveratrol's most compelling health effect shown in laboratory studies to date is its broad-spectrum anti-cancer activity. The online database of medical literature for the US National Institutes of Health, PubMed, cites nearly 500 publications over the past decade of research on resveratrol as a cancer chemopreventive nutrient.

Experimental models of breast, prostate, lung, blood, skin, brain, kidney, bladder, tongue, esophagus and colon cancer show evidence for beneficial effects of resveratrol.

It appears also to sensitize cells toward cancer therapy agents, improving the benefit of these drugs.

Also, when combined with other plant-derived phenolics, resveratrol's anti-cancer actions seem to be enhanced, showing the potential benefits of antioxidant synergy from a mixed diet high in colorful fruits and vegetables rich in phytochemicals.

Resveratrol's actions to inhibit inflammatory mediators and the growth of new blood vessels in tumors (called anti-angiogenesis), plus its ability to accelerate the rate of cancer cell death (called apoptosis, "eh-po-toe-sis"), are synergistic in anti-cancer activity. In other experiments, resveratrol inhibited enzymes synthesizing nitrogen and oxygen radicals ("free radicals") that may be involved in cancer development.

Summarizing, resveratrol acts against mechanisms controlling the initiation, promotion and progression of tumor cell growth in laboratory models. It is considered one of the most promising natural anti-cancer agents.

Fortunately for providing benefits to human consumers, resveratrol is easily acquired in the diet by selection of foods having rich content, such as

- o Red grapes and dark grape juice
- o Red wines (and even white ones, but with lower resveratrol levels)
- o Blackberries, blueberries, cranberries and black raspberries (and their juices)
- o Pistachios

- o Peanuts with skins and peanut butter

Resveratrol, Essay #3 of 3

In Parts 1 and 2, we covered the numerous areas of lowered disease risk from dietary intake of resveratrol, one of the better-studied flavonoids from red grapes and dark berries.

Resveratrol is suspected as the primary beneficial agent in the French Paradox (Part 1) and is a potent anti-tumor agent in several forms of cancer (Part 2).

We conclude this series with a recently published news item about the positive benefits of resveratrol against colorectal cancer. From FoodNavigator.com, 23/10/2006.

Resveratrol in red wine could cut colorectal cancer risk

Drinking more than three glasses of red wine a week could cut the risk of colorectal cancer by almost 70 per cent, researchers told the 71st Annual Scientific Meeting of the American College of Gastroenterology in Las Vegas.

The potential benefits of the wine have been linked to the resveratrol content of the wine, and adds to an ever growing body of science involving resveratrol with a range of beneficial health effects, including brain and mental health, and cardiovascular health.

Colorectal cancer accounts for 9% of new cancer cases every year worldwide. The highest incidence rates are in the developed world, while Asia and Africa have the lowest incidence rates.

It remains one of the most curable cancers if diagnosis is made early.

The new research, by Joseph Anderson, and his colleagues from the State University of New York at Stony Brook looked at the drinking habits of 360 red and white drinkers with similar lifestyles and found that, while white wine consumption was not found to have any association with colorectal cancer incidence, regular red wine consumption was linked to a 68 per cent reduced risk of the cancer!

And the researchers told attendees that the active component in wine that may be behind the apparent benefits is most likely resveratrol, an anti-fungal chemical that occurs naturally under the skin of red wine grapes and other darkly-skinned berries.

“The concentration is significantly higher in red wine than in white wine, because the skins are removed earlier during white-wine production, lessening the amount that is extracted,” said Dr. Anderson.

However, grapes and wine are reported to contain more than 600 different phenolic components, including well-characterized antioxidant molecules from the flavonoid subclass of phenolics. Therefore, excluding the possibility that several compounds work in synergy with small amounts of resveratrol to protect against colorectal cancer seems premature.

Indeed, while resveratrol has been the subject of various studies, particularly in relation to heart health, recent studies have reported brain protecting effects from blueberries, red grape juice or red wine – an effect linked to a synergy between the various phenolics present.

A recent study using Concord grape juice by researchers led by Dr. Jim Joseph from Tuft's University reported that the combination of the phenolic antioxidants could decrease the effects of aging on the brain.

“It may be that the whole is greater than the sum of its parts,” lead author Barbara Shukitt-Hale wrote in the journal *Nutrition* (Vol. 22, pp. 295-302).

The amount of resveratrol in a bottle of red wine can vary between types of grapes and growing seasons, and can be between 0.2 and 5.8 milligrams per liter. But nearly all dark red wines – merlot, cabernet, zinfandel, shiraz and pinot noir – contain resveratrol.

The health implications of red wine consumption appear to be filtering through to the consumer. A report from analysts Euromonitor in 2004 predicted that red wines will exhibit by far the fastest growth in both volume and value terms through 2007.

Their study claims that red wine is forecast to record global value sales of \$82bn in 2007, a rise of some 31% from 2002.

However, experts are quick to warn that moderation is the key. A study from Harvard University last year reported that people who have three or more alcoholic drinks per day have a significantly higher risk of stroke.

Lowest risk and even health benefits were observed for those who had 6 to 10 glasses of red wine per week.

All the Berry Best!

Dr. Paul

The Berry Doctor