



*Antioxidant **Anti**-theories*

Part 2 of 3

Pro-oxidants



Muscadine grapes (*Vitis rotundifolia* L.),
one of Nature's richest sources of [resveratrol](#)

[follow the [Wikipedia](#) links]

We are interested in berry [phytochemicals](#) because they represent dietary options for obtaining antioxidant value from our food choices.

For background from the Berry Doctor's Journal, see this [8-part series on berry anthocyanins and their potential for antioxidant and anti-disease effects](#), *click!*

But in science, we want to hear all points of view, especially those that challenge a doctrine -- even the theory that health benefits can be provided by berry antioxidants.

This is the objective of the current 3-part series of essays -- present counterpoints to what we believe -- let's call them anti-theories.

Read part 1 here *(click!)* :

Our bodies see berry anthocyanins and other flavonoids as unwanted chemicals, so actively get rid of them

A 2nd surprising antioxidant anti-theory:

Antioxidants can be Pro-oxidants

In the plant, resveratrol is synthesized as a defensive chemical in outer layers of berry skin or the rind of other plants.

Its purpose is to be a **toxin** to invading pathogens like bacteria, fungi, viruses and insects -- all in defense of the seed intended to allow propagation of the plant's genes.

Despite being a toxin, among all fruit phytochemicals under study, resveratrol is one of the most developed for having potential to benefit human health.

About 250 research studies have been done on resveratrol just in the past 8 years.

[Read a 2007 report on resveratrol here from the Berry Doctor's Journal](#)

Currently, there are 6 clinical trials (advanced human studies) analyzing possible anti-disease effects specifically of resveratrol -- [click to review a list and summaries](#)



Red grapes (darker the better!), red wine, Concord grape juice and Thompson raisins are good sources of resveratrol

Pro-oxidant Actions of Resveratrol

The opposite of anti-oxidant activity is pro-oxidant, or in other words, *causing oxidation* -- > the effect we hope to prevent by eating antioxidant-rich foods like berries

1. in test tube studies, low doses of antioxidant phytochemicals are effective as antioxidants, but high doses act as pro-oxidants -- [click for an abstract](#)
2. if in sufficiently high concentration in test tube studies and in the presence of **copper ions (a normal dietary mineral)**, resveratrol acts as a pro-oxidant to break DNA strands, an effect that would injure or destroy a cell -- [click here for an abstract](#)
3. in cancer cells in a test tube, resveratrol acts directly on **mitochondria** -- cell organelles where energy is produced and used. Since this is like the toxin effect on plant pathogens (above), it is seen as a possible explanation for how resveratrol may be an anti-**cancer** agent against the fast-growing cells of a tumor -- [click for an abstract](#) and another here for [evidence of resveratrol causing tumor regression](#)

Interpretations and Summary

From research finding #1: our bodies may want to eliminate high consumed amounts of antioxidant phytochemicals ("**anti-theory**" #1, [click](#)) to regulate levels low enough to be optimal for antioxidant roles

From research findings #2 and #3: if sufficiently high in concentration inside cancer cells, resveratrol may be a pro-oxidant helping to destroy the tumor -- a partial explanation for why **resveratrol is a promising anti-cancer agent**, [click!](#)

For healthy people, using high supplemental doses of dietary antioxidants may tip the balance *toward pro-oxidant* effects.

Better to eat whole foods and follow the **Color Code!**



The choice is in our hands.

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