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What You Need to Know Before Choosing an Anti-Oxidant Supplement

HOW RESVERATROL GOES WELL BEYOND FREE RADICAL PROTECTION



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DR. MERCOLA

Eons ago the Earth's primitive atmosphere was devoid of oxygen. Life back then was limited to a relatively sluggish energy-producing biochemistry known as fermentation...much like yeast still uses today. But then everything changed.

The atmosphere changed its composition from no oxygen to oxygen rich relatively quickly, and the immediate result was mass extinction.

Oxygen is such a highly reactive chemical that most anaerobic organisms couldn't handle it. Even today, anaerobes are quite restricted as to where they can be found.

But life has a way of balancing its chemistry and developing defenses. Plants especially had to evolve sophisticated molecules to protect themselves from oxygen, because they themselves were producing it as a by-product of photosynthesis.

So at the same time life was learning how to utilize the power of oxygen, it was also elaborating a robust family of protective chemicals.

In this Special Report, you'll learn about the dual power of oxygen and **HOW YOU CAN BE SURE YOU TAKE FULL ADVANTAGE OF THE WONDERFUL PROTECTIVE SUBSTANCES PRODUCED BY NATURE...** both the traditional antioxidants we've known about for decades, and the even more powerful phytochemicals we are only now discovering.

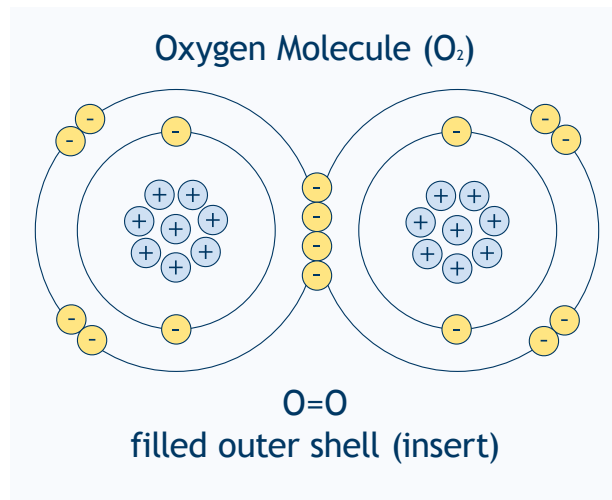
One of these new discoveries in particular, resveratrol, has protective properties that go well beyond the simple neutralization of free radicals.

OXYGEN...A DOUBLE EDGED SWORD

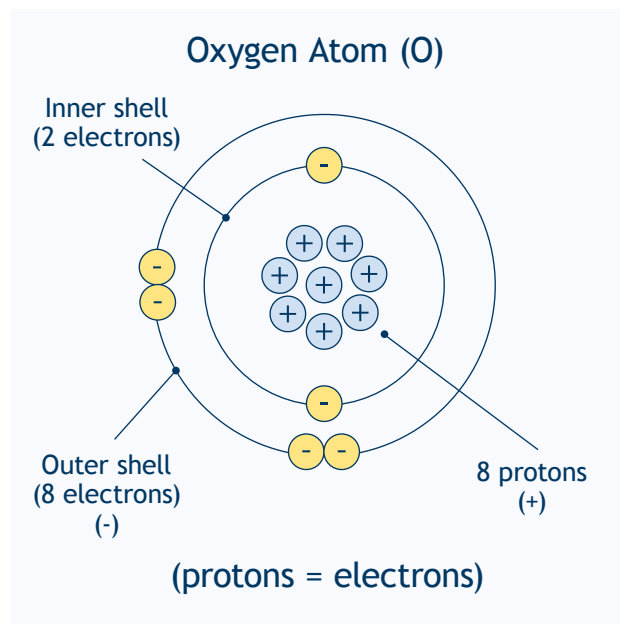
Without oxygen you would die, but excess oxygen or oxygen out of control can actually cause disease. Why do you store vegetables in oxygen free container? To extend their life.

Oxygen is the most common cause of free radicals. There are other causes...exposure to tobacco smoke or radiation, among other environmental factors. While these can lead to free radical formation, oxygen exceeds them by far.

Free radicals are molecules with incomplete electron shells, which make them more chemically reactive than molecules with complete electron shells.



Like most things in life, **SMALL AMOUNTS OF FREE RADICALS ARE HEALTH-PROMOTING BUT AT HIGHER LEVELS THEY HAVE POTENTIAL FOR CAUSING SERIOUS TISSUE AND ORGAN DAMAGE** and are believed to be one of the primary mechanisms of aging and chronic diseases.



Lone oxygen atoms are powerful free radicals because they are hungry for the missing electron in their outer shell. But when two of them get together, they complete each other's outer shell and form a stable oxygen molecule consisting of two oxygen atoms.

When we breathe in oxygen, it is the stable oxygen molecule that enters the body. But in order to use the power of oxygen our cells must risk using its radical nature.

The situation is similar to how we use fire inside our homes. We enjoy the heat from the fireplace... but we do need to take serious precautions to avoid burning down the house. Living organisms have developed rich defense

systems to prevent oxidative damage to our internal structures, including our DNA.

WHAT ARE ANTIOXIDANTS?

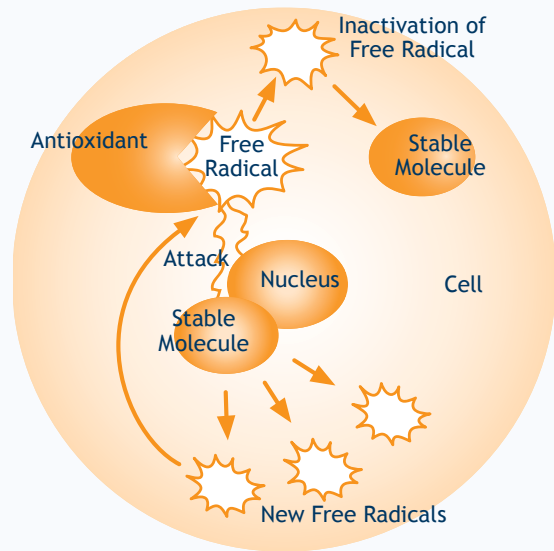
Antioxidants are substances that may protect your cells from the damage caused by these unstable molecules known as free radicals. Both free radicals and antioxidants occur naturally as part of normal cell processes.

HOW DO ANTIOXIDANTS WORK?

Antioxidants, when present, neutralize free radicals as they occur in normal cell processes. When an antioxidant is not present in sufficient quantity, oxygen molecules become electrically charged or "radicalized" and steal electrons from other molecules, causing damage to the DNA and other important molecules.

Over time, such damage may become irreversible and lead to disease, including cancer. The job of antioxidants is often described as “mopping up” free radicals, meaning they neutralize the electrical charge and prevent the free radical from taking electrons from other molecules.

But in order for the mopping up to be effective, you need to make sure you have plenty of antioxidants in your diet.



WHICH FOODS ARE RICH IN ANTIOXIDANTS?

Antioxidants are abundant in fruits and vegetables, as well as in other foods including nuts, grains and some meats, poultry and fish. For the most part, obtaining the nutrients from whole unprocessed foods provides the greatest benefits.

There have been a number of trials demonstrating that lone synthetic antioxidants, most notably beta-carotene, fail to provide expected benefits. Yet when the nutrients were provided as part of a balanced diet that offered naturally occurring antioxidants, the benefits were observed.

So ideally it would be **BEST TO OBTAIN YOUR ANTIOXIDANTS FROM WHOLE FOODS** because they deliver the antioxidants along with their balanced accessory micronutrients.

TRADITIONAL ANTIOXIDANTS

Vitamin C and vitamin E have many important functions in your body and they also function as water soluble (vitamin C) and fat soluble (vitamin E) antioxidants. There have been tens of thousands of articles over many decades supporting the use of these traditional antioxidants, so this report will focus on more recently discovered and more powerful antioxidants.

For example, the OPC component of grape seed extract is 50 times stronger than vitamin E and 20 times stronger than vitamin C.

NEWER ANTIOXIDANTS SPURRED BY THE FRENCH PARADOX

Nearly 200 years ago, it was observed that the French have a low incidence of heart disease despite having a large intake of saturated fat. Of course now we know that most of the problems with saturated fats are not related at all to saturated fats but to the trans fats that typically are associated with modern day highly processed fats.

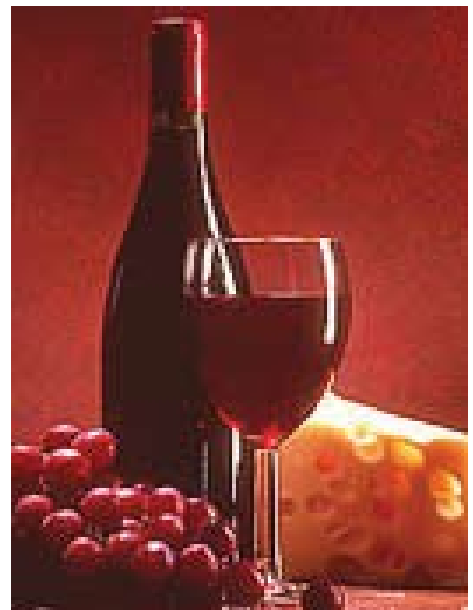
Nevertheless, many researchers now believe that a major factor in the French Paradox is the high consumption of red wine by the French.

More recent research does not attribute any of the benefit of red wine to its alcohol, which is toxic to most human tissues. Instead, **STUDIES POINT TO THE PROANTHOCYANIDINS AND POLYPHENOLIC COMPOUNDS THAT ARE PRESENT IN THE SKINS AND SEEDS OF THE GRAPES USED TO MAKE THE WINE.**

Previously, the proanthocyanidins were thought to be the primary source of the benefits of grape seed extract and have been popularized a number of years ago as pycnogenols, also extracted from pine bark.

Today, the more accurate term is oligomeric proanthocyanidin complexes, or OPCs. Pine bark contains 85% OPCs, while grape seed extract contains 95% OPCs.

However even more recent research suggests that the most powerful protective molecules may be the polyphenols, also present in the seeds and skins of the grapes. And one of the most potent of the polyphenols is resveratrol.



WINE IS NOT THE BEST SOURCE OF RESVERATROL

Resveratrol is found in grapes, wine, grape juice, peanuts, and berries. In grapes, resveratrol is found only in the skins. The amount of resveratrol in grape skins varies with the grape cultivar, its geographic origin, and exposure to fungal infection. The amount of fermentation time a wine spends in contact with grape skins is an important determinant of its resveratrol content.

Consequently, white and rosé wines generally contain less resveratrol than red wines. The predominant form of resveratrol in grapes and grape juice is trans-resveratrol. Red wine is a

source of resveratrol, but other polyphenols are present in red wine at considerably higher concentrations than resveratrol.

In order to understand how much resveratrol is in wine, one must realize that resveratrol is a natural substance made by grapes and other plants in response to fungal infection. How much resveratrol is in a glass of wine depends, first, on whether the grapes were grown organically, and, second, how the wine was made.



Grapes sprayed with pesticides that prevent fungal infection contain little, if any, resveratrol. Wines grown in dry climates have less resveratrol than those grown in humid areas do. Red wines contain more than white because of how red wine is made.

The end result of all of this is that organic red wines from certain areas of Europe contain the highest level of resveratrol. But most wines contain either no resveratrol at all or very little (less than a milligram per glass).

That is why **IT IS FAR BETTER TO OBTAIN THE OPCs AND POLYPHENOLS FROM WHOLE GRAPE SKINS AND SEEDS** that have been grown in conditions that are optimized to allow the grapes to produce the maximum amount of these beneficial compounds.

Additionally, it would make far more sense, **IF YOU WERE TO CONSIDER SUPPLEMENTING WITH THESE FOODS, TO SELECT ONE THAT CONTAINED CONCENTRATED GRAPE SKINS AND SEEDS—NOT JUST THE EXTRACTED AND REFINED RESVERATROL**, which will likely be far less beneficial if stripped of its naturally occurring synergistic compounds.

As with beta-carotene, there is clearly the possibility that other as yet unidentified compounds may be responsible for many of resveratrol's observed benefits.

RESVERATROL AND CANCER

The National Cancer Institute states: **“CONSIDERABLE LABORATORY EVIDENCE FROM CHEMICAL, CELL CULTURE, AND ANIMAL STUDIES INDICATES THAT ANTIOXIDANTS MAY SLOW OR POSSIBLY PREVENT THE DEVELOPMENT OF CANCER.”** The number of studies has exploded in the past few years, with the depth of knowledge about this polyphenol increasing with each report.

Resveratrol is a broad-spectrum agent that seems to stop cancer in many diverse ways, from blocking estrogen and androgens to modulating genes. As of the start of 2007, there are over

500 studies in the published literature demonstrating a beneficial effect of resveratrol on cancer.

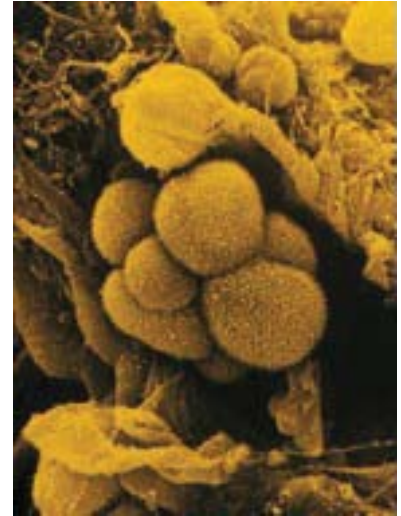
However, it is important to understand that this is preliminary research and nearly all of these studies were done in the test tube or in animals.

SOME OF THE LATEST INFORMATION ABOUT RESVERATROL SHOWS IT TO CAUSE A UNIQUE TYPE OF CELL DEATH. IT KILLS CANCER CELLS whether or not they have the tumor suppressor gene, p53. It also works whether cancer cells are estrogen receptor-positive or negative.

ANOTHER BENEFIT OF RESVERATROL IS THAT IT ACTS AGAINST A COMPONENT OF THE WESTERN DIET THAT PROMOTES CANCER CELL GROWTH: LINOLEIC ACID.

Linoleic acid is converted to arachidonic, which is converted to hormone-like substances (such as prostaglandin E2 and leukotriene B4). Such substances can promote inflammatory processes that stimulate cancer cell growth, among other things.

RESVERATROL WORKS AGAINST A WIDE RANGE OF CANCERS, BOTH AT THE PREVENTIVE AND TREATMENT STAGES. Its ability to stop cancer is connected to its capability, first, to distinguish a cancer cell from a normal cell.



Unlike chemotherapeutic drugs that attack normal as well as cancer cells, resveratrol does not damage healthy cells. Not only is it not harmful to normal cells, it protects them.

Second, resveratrol is sophisticated in its actions. It doesn't just scavenge free radicals; it activates and deactivates critical enzymes, genes, hormones and chemicals.

POSSIBLE CONCERN WITH RESVERATROL FOR ANYONE WHO HAS BREAST CANCER

Estrogens are steroid hormones synthesized by humans and other mammals that bind to estrogen receptors within cells. The estrogen-receptor complex interacts with unique sequences in DNA to modulate the expression of estrogen-responsive genes.

Any compound that binds to estrogen receptors and has an effect similar to natural estrogen is considered an estrogen agonist. On the other hand, any compound that binds estrogen receptors but prevents or inhibits the effect of endogenous estrogens is considered an estrogen antagonist.

The chemical structure of resveratrol is very similar to that of the synthetic estrogen agonist, diethylstilbestrol, suggesting that resveratrol might also function as an estrogen agonist.

However, in cell culture experiments, resveratrol acts as an estrogen agonist under some conditions, and as an estrogen antagonist under other conditions. At present, it appears that resveratrol has the potential to act as an estrogen agonist or antagonist depending on such factors as cell type, estrogen receptor and the presence of endogenous estrogens.

So—until this is sorted out with additional studies, it would most likely be **WISE FOR ANY WOMAN WITH BREAST CANCER TO AVOID TAKING RESVERATROL.**

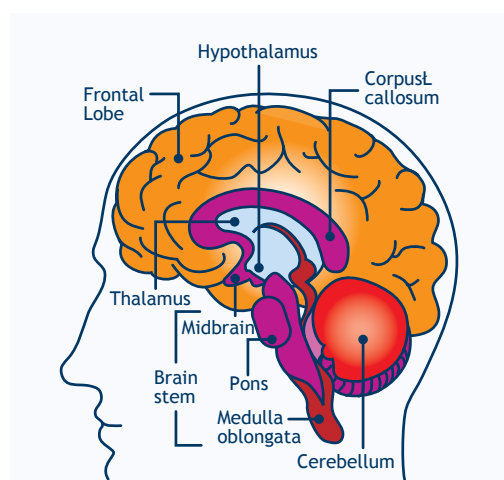
RESVERATROL AND HEART DISEASE

One of the serious complications of free radical damage is hardening and thickening of arteries. There is a “vicious cycle” of free radicals, artery damage, and narrowing due to scar tissue which, in turn, promotes more free radical activity and more damage.

Resveratrol’s antioxidant action helps stop free radical damage and also opens the arteries by enhancing nitric oxide. **IN ADDITION TO ITS ANTIOXIDANT EFFECT, RESVERATROL ALSO STOPS THE PROLIFERATION OF CELLS IN BLOOD VESSELS THAT NARROW THE ARTERIES AND KEEPS BLOOD CELLS FROM STICKING TOGETHER. BOTH ARE VERY IMPORTANT FOR PREVENTING HEART ATTACKS.**

Resveratrol has also been shown to inhibit platelet aggregation.

RESVERATROL AND ALZHEIMER’S



Since your brain is composed mostly of fatty acids, it needs to be protected against oxidized fat, as much or more than your heart does. Resveratrol may be particularly important for those at risk for Alzheimer’s, or those who have it. It is theorized that free radicals might initiate the process that leads to the disease.

While the role of resveratrol in Alzheimer’s disease is still unclear, some **RECENT STUDIES ON RED WINE BIOACTIVE COMPOUNDS SUGGEST THAT RESVERATROL MODULATES MULTIPLE MECHANISMS OF ALZHEIMER’S DISEASE.**

Alzheimer's patients produce an abnormal peptide (a piece of a protein) known as "beta-amyloid" in their brains. Beta-amyloid provokes oxidative stress, and eventually cells are killed because of the abnormally high levels of free radicals.

The killing of brain cells causes the gradual decline in Alzheimer's patients. It has been proven that resveratrol can protect the brain against oxidative stress, and keep cells alive.

Resveratrol also modulates mechanisms of other debilitating neurological disorders, such as strokes, ischemia, and Huntington's disease.

RESVERATROL AND LONGEVITY

In a widely publicized report, researchers at Harvard Medical School and BIOMOL Research Laboratories have demonstrated that resveratrol **ACTIVATES A "LONGEVITY GENE"** in yeast that extends life span by 70%. The effects mimic those of calorie restriction, the only proven way of extending maximum life span.

Resveratrol activates one of the same sirtuin "(SIR)" genes as calorie restriction. Initially this research had only been done in yeast, flies and worms but in September 2006, the effect was confirmed in a mouse model.

It is interesting to note that humans have their own version of the same life span-extending gene. Resveratrol's ability to activate the gene has to do with its chemical structure, not its antioxidant potential. It works by increasing the rate of a reaction known as "deacetylation."

Acetylation reactions affect whether a gene is "off" or "on." This is extremely important. In cancer cells, for example, genes are activated that aren't supposed to be, and vice versa.

By controlling deacetylation, and augmenting the longevity gene, resveratrol is able to confer some serious life extension benefits—at least in lower critters. Acetylation modulators are also being pursued for the treatment of cancer to restore the normal activation/deactivation of genes in cancer cells.

One of the known causes of aging and death is the loss in older cells of the ability to perfectly replicate DNA in every new cell. DNA "mistakes" accumulate and allow little pieces of DNA to become active and print themselves out...creating "DNA debris," which eventually stops a cell from functioning.



The situation is similar to printing out a report and having a couple of pages at the end not contain any relevant information—so you throw them away. But your cells can't throw away the extra “printed out” DNA. Instead it accumulates and clogs up the cell. This build up of “debris” is connected to aging, and the death of individual cells.

RESVERATROL APPEARS TO REDUCE THE FREQUENCY OF “DNA DEBRIS” BY 60% THROUGH THE LONGEVITY GENE THAT IT STIMULATES.

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