

## Powerful Natural Antioxidant

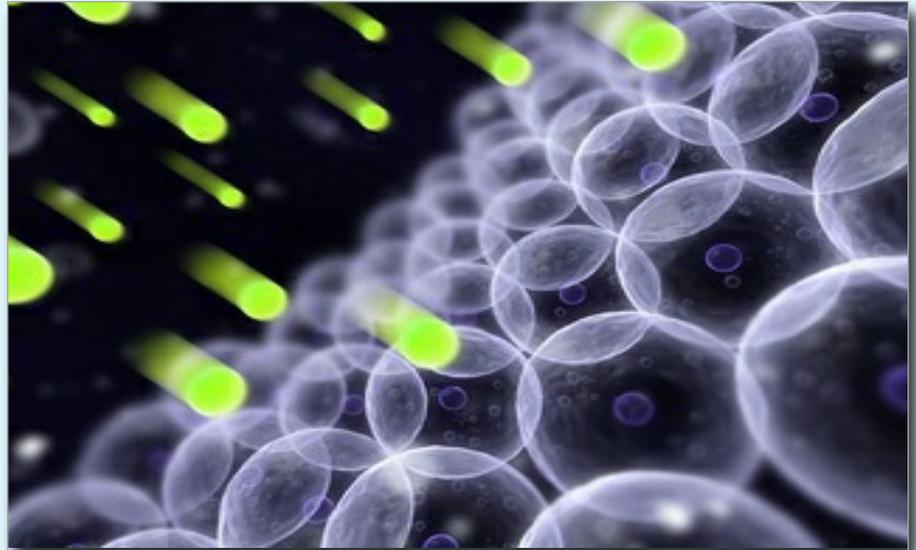
*"Polyphenols are like an antioxidant machine gun, quenching tens of thousands of free radicals; from an antioxidant perspective SOD dwarfs even polyphenols."*

As we all know, there is an antioxidant/free radical balancing act constantly going on in our bodies with antioxidants trying to quench free radicals. A statement by Barry Sears, author of "The Zone Diet", has been haunting me ever since I heard it. He said "Many of the antioxidants we talk about so freely, vitamins A, C, E, selenium, zinc, etc., are one and done. They quench one free radical then they must be re-generated before they can quench another, like shooting one bullet at a time and having to reload after each shot."

If antioxidants were like bullets in a gun, would you rather have an antioxidant pistol that would only shoot one free radical at a time, or an antioxidant machine gun that could shoot tens of thousands of free radicals at a time?

In terms of antioxidant potential, polyphenols are like the machine gun, quenching tens of thousands of free radicals. I've attached a link to the 100 richest dietary sources.

Basically, polyphenols give fruits, berries, and vegetables their vibrant colors and contribute to the bitterness, astringen-



cy, flavor and aroma of the food. In the plant, they protect against ultraviolet radiation, pathogens, oxidative damage, and harsh climate conditions.

As you would expect the antioxidant effects of polyphenols can have a powerful effect on cancer, cardiovascular disease and neurodegeneration. Polyphenols also reduce inflammation, and diabetes. They affect signaling pathways and recent research shows that plant polyphenols even influence and modulate your gut microbiota. Among other things, they exert a prebiotic effect by improving the nutrition of beneficial bacteria living in your gut.

I also have attached an article showing how polyphenols enhance mitochondrial function. Authors describe 5 different mechanisms how polyphenols inhibit oxidation.

One of the ways polyphenols work is to induce natural superoxide dismutase (SOD) production. SOD converts the highly active and destructive superoxide radical into hydrogen peroxide. Another primary antioxidant, catalase, converts hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) to water and oxygen. A direct benefit of quenching the superoxide radical is the limitation of the highly reactive and destructive hydroxyl radical.

One of the reasons polyphenols are so powerful is they activate our SOD enzymes. But, as powerful as polyphenols are in their ability to quench free radicals, from an antioxidant perspective SOD dwarfs even polyphenols. The antioxidant capacity of SOD is like a weapon of mass destruction to free radicals. One author shared that one molecule of intracellular SOD can destroy 2 billion super oxide anions per second. Another author makes the point that extracellular SOD is not as reactive as the intracellular form. Still, a single unit of extracellular SOD quenches billions of free radicals.

To give you some perspective, each mcg of SOD contains 6.4 units of activity. There are 1000 mcg in a milligram. These are crazy numbers, tiny amounts creating major shifts. But the question is, will orally ingested SOD be absorbed? The answer to that is a resounding yes, but it comes with a caveat. The caveat is that many SOD products say they have SOD in them but when tested do not have the ability to quench the superoxide radical.

You see, there was a flurry of interest in oral SOD about 20 years ago until researchers started to report that SOD was not absorbable via the gut. At that point all interest in oral SOD stopped.

You may have heard that SOD is measured in McCord-Fridovich units. Biotics actually bought the lab from McCord-Fridovich to make SOD so they were confident their SOD product had physiological value. Then Biotics decided to check all the commercially available sources of SOD. At the time there were about 51 of them. Not surprising, few of them even came close to label claim. It's pretty hard to raise blood levels of SOD if there is no SOD in the product!

The next step was to see if the Biotic product Dismuzyme Plus Granules raised blood levels of SOD. Since SOD is stable in a pH of 2 to 11, we know it can survive our digestive juices. In a laboratory study, 10 grams of plant based SOD manufactured by Biotics Research Corporation called Dismuzyme Plus Granules were ingested orally. Blood levels of erythrocyte SOD were measured

pre and post. The study showed conclusively that plant based SOD as Dismuzyme Plus Granules did raise blood levels of erythrocyte SOD.

Interestingly, patients with arthritis, especially RA, have lower levels of SOD in their synovial fluid than controls.

One of SODs strengths is to protect the body from radiation. And we know new sources of radiation are added to our environment every day. As chemicals accumulate in our environment they generate free radicals and in effect create the same scenario as radiation.

So the take home message for your patients is eat more plants with a variety of color for polyphenols. But also consider as an adjunct to whatever stubborn inflammatory problem you are treating Dismuzyme Plus Granules by Biotics Research Corporation. Use 1 tsp - 1 Tbs, 1-2 times per day. Each tablespoon provides 1,200 mcg of SOD.

Also you may consider adding Dismuzyme Plus Granules to your morning protein smoothie to reduce your own inflammation and aging.

Remember, as I mentioned, that just one molecule of intracellular SOD quenches 2 billion superoxide anions per second. And one unit of extracellular SOD quenches billions over time.

Here's one last antioxidant clinical pearl. Many of the Biotics' products contain 20 mcg of SOD as part of their unique antioxidant tableting base. They also contain 20 mcg of catalase another primary antioxidant which is needed to convert hydrogen peroxide to water and oxygen. I think you can appreciate how even these seemingly tiny amounts can have huge physiologic benefits over time especially if you are taking 3 or 4 products three times a day. So not only does the tableting base provide and protect the longevity and integrity of the product, it adds secondary benefit as a profound antioxidant.

Thanks for reading this week's Tuesday Minute edition. I'll see you next Tuesday.

# Biotics' Tableting Base: Loaded With Antioxidants

***"He found that gram for gram, Biotics' tableting base had the highest antioxidant capacity of any one single herb."***

We all like to get more than we pay for, don't we? We like a good deal, which is one more reason why your patients should purchase their nutrients from you, a health care professional, instead of a discount store. Did you know that if a patient buys a 50 mg tablet of B6, they could also be getting as much as 450 mg of compressible sugar, starch, lactose, cellulose, or dicalcium phosphate?

What if a patient was taking three products at a dose of 2, three times a day? The "inert" filler in the products could easily add up to 4 or 5 grams. But what if you could recommend a supplement that had "food" as the tableting base? Even better, what if therapeutic levels of nutrients were added to that food source while it's growing? This would give the product enhanced nutrient levels to support your clinical therapies yet the fillers used would be food.

If the food was processed at low temperatures, it could



have therapeutic value and may even enhance the value of the product. That was the thinking behind the Biotics Research vegetable culture tableting base, and the results have been beyond their expectations.

Due to the exciting research in the late 70's on superoxide dismutase, Biotics acquired a biotechnology division of a midsized pharmaceutical company that was the first to commercially prepare superoxide dismutase for the researchers McCord and Freidevich. McCord and Freidevich were the top people in the field, the top dogs you

might say, so the integration of this technology was a quantum leap of excellence for any supplement company. Superoxide dismutase, SOD for short, is a major player in our antioxidant system.

Glutathione is another antioxidant enzyme you are probably familiar with. We often supplement with vitamins but minerals are actually more important so that our bodies can synthesize these critical enzymes. Just as we need selenium to make glutathione, we need zinc, copper, and manganese to make SOD.

SOD is a major quencher of the superoxide radical. The superoxide radical is a byproduct of mitochondrial oxidative phosphorylation. It is essential that our bodies make SOD in the mitochondria as well as the cytoplasm to protect the inner working of the cell. Researchers estimate that SOD is the 3rd most prevalent enzyme in our body. SOD quenches or transforms the highly reactive superoxide radical into hydrogen peroxide and water. Catalase, another critical enzyme, changes hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) into oxygen and water.

Here are some of the applications for SOD clinically: free radical pathology, low white blood cells, rampant viral or bacterial infection, all forms of arthritis and inflammation.

A lot of the interest in SOD for the integrative community lost steam in the late 80's due to a lone study showing that SOD in tablets would not raise blood levels. But here's an interesting addition to this study. Knowing that their products did raise blood levels, Biotics went back to look at the tablets that were available on the market. As part of their sophisticated in-house phytochemistry lab, they can accurately measure SOD levels. They found that of the 50 available products on the market only, 10 actually contained SOD. Remarkably, Biotics made 8 of the 10 products.

As for the study from the late 80's, it didn't show raised SOD levels because the products tested didn't contain SOD. Biotics went on later to demonstrate that their product did raise blood levels. You can find the published study below.

Most of the tablets and capsules in Biotics line have both SOD and catalase as the filler, so rather than "inert sugars and powders," the Biotics tableting base provides real food. About 20 years ago Biotics expanded their

phytochemistry lab and hired additional biochemists with the express purpose to find out what else was in the tableting base they call the vegetable culture.

One of their scientists, who everyone refers to as Dr. Dave, worked for years with pharmaceutical companies in the jungles isolating plant compounds. Dr. Dave found Biotics' vegetable culture loaded with antioxidant compounds far beyond the SOD and catalase. He found gram for gram that the tableting base had the highest antioxidant capacity of any one single herb. That's amazing. The "filler" yields significant antioxidant activity. Now, that's a good deal.

As a clinician you can be confident that you are giving a biologically active tablet that will dissolve quickly and easily and therapeutically delivers far more than is what is on the label. That's the good news for you.

But which product do you think your patient would prefer to take if given the choice? Nutrients from a discount store with "inert" fillers or therapeutic nutrients integrated into a whole food base? Just looking at the rise in sales of organic foods will give you the answer. This doesn't take into consideration the purity and activity of the therapeutic product, we are just talking about the tableting base.

It's important to communicate to our patients the thoughtfulness that goes into our decision making process as we select nutrients. Not only will patients reach their health goals faster but they will refer their friends and loved ones to someone who is discriminating and knowledgeable in the field. Truthfully they will be getting more than they pay for, and you can't go wrong with that.

Thanks for reading this week's edition. I'll see you again next Tuesday.