

# What Are 'Free Radicals' and How Can the Human Body Defend Itself With Supplemental Antioxidant Enzymes?



## INTRODUCTION

Keeping current about health, fitness and life extension in the 1990's means adding some new terms to your vocabulary. This decade brings with it an explosion of research and writing about "Free Radicals" and "Free Radical Pathology", 'Antioxidant Enzymes and Live Enzyme Foods'. What follows is a primer on this burgeoning area of science to help you make sense of what you read in the future.

## WHAT ARE FREE RADICALS?

Like all matter, our bodies are composed entirely of tiny particles called molecules. Each molecule is made up of atoms, and each atom is made up of a center or nucleus and electrons which spin in orbits around it.

Ordinarily, the electrons occur in balanced pairs. This keeps the atom and molecule stable. Sometimes a molecule loses one of its electrons or gains an extra one. This causes the molecule to become unbalanced and highly reactive. Such a molecule is called a 'Free Radical'.

## WHERE DO FREE RADICALS COME FROM?

Some 'Free Radicals' occur as normal by-products of a healthy body's metabolic processes. Overproduction of "Free Radicals" occurs when the body is subjected 'Stress' in any of its forms:

- 1) Chemical
- 2) Emotional
- 3) Physical
- 4) Infectious

## Common Sources of 'Stress to the Body' are:

- Aging • Environmental Pollutants • Trauma •
- Disease • Pace & Pressure of Modern Life •

## HOW DO FREE RADICALS HURT THE BODY?

Having unpaired electrons is not an energetically favorable or stable state for a molecule. A 'Free Radical' will naturally try to return to a state of stability by taking an electron from some other molecule and restoring its own balance. It is this little act of thievery that causes the damage. The stolen electron may be from a molecule in a normal healthy cell. This process of 'Cell Damage' continues to multiply if not checked. The end result is that the healthy cells are damaged and the body's proper functioning is impaired.

Unfortunately today, the increased stresses of modern life combined with age and the nutritional inadequacies of a contemporary diet result in an excess of free radical activity in the body and a deficiency in the available supply of antioxidants to remove them. This negative state is known as 'Free Radical Pathology'.

## HOW DOES THE BODY DEFEND AGAINST FREE RADICALS?

Nature equips the body to produce special enzymes called 'Antioxidants' which catalyze the removal of the 'Free Radicals' before they can cause serious cellular damage. Under normal conditions these naturally occurring 'Antioxidant Enzymes' can handle the 'Free Radicals' produced by the body's own normal metabolic processes.

In addition, nature allows the body to acquire additional supplies of these antioxidant enzymes from certain raw foods.

## WHICH FOODS INCREASE LEVELS OF ANTIOXIDANT ENZYMES?

Certain whole, natural, 'Live Foods' which are rich in enzymes themselves have been shown to stimulate the body's own production of antioxidants.

However, it's not always convenient to eat fresh whole foods, and unless you grow your own, the nutritional value of those you do eat may be questionable. Modern agricultural practices have greatly depleted the nutritional value of the foods we eat, even raw fresh foods. Today, vegetables are bred for longer shelf life, convenience in shipping and high yield, not necessarily for high nutrition. Important trace elements and other co-factors which make the enzymes usable to the body often are missing. The nutritional content is even further reduced by the heat of cooking which destroys the live enzymes.

The 'Live Enzyme' foods that provide the best sources of antioxidant enzymes include; Raw Vegetables, wheat grass, barley grass, sprouts and blue-green algae.

## ENZYME 'RICH' SUPPLEMENTS PROVIDE A SIMPLE SOLUTION

Biotec Foods developed strains of specially blended sprouts which are 'Enzyme-Rich' and which have been shown to increase the body's endogenous production of antioxidant enzymes. These sprouts are dehydrated at very low temperatures to prevent damage to the live enzymes and then highly blend is concentrated and compressed into a convenient tablet form.



Cell Guard™ with IsoSproutPlex® offers a truly comprehensive solution to today's over-abundance of 'Free Radicals' caused by increased levels of stress and pre-processed foods.

Thanks to great work by Biotec, you don't need to have your own organic farm to enjoy the benefits of eating 'Live Enzyme Foods'. The good nutrition you need is as convenient as your local health food store, physician or pharmacy.

## Advanced Antioxidant Enzymes

**Biotec Foods • Biomed • BioVet Int'l.**  
5152 Bolsa Avenue, Suite 101 • Huntington Beach, CA 92649  
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# TEST STUDIES

## Effects of Whole 'Live' Foods on SOD Deficiency in 10 Adult Humans

### BLOOD TEST RESULTS

Of a study on natural Superoxide Dismutase (SOD) levels before and after addition of a 'IsoSproutplex®' blend by Biotec Foods.

Conducted by Dr. Peter Rothschild M.D. Ph.D. et al. Testing by Smithkline Bio-Science, Honolulu, HI. Antioxidant enzymes supplied by Biotec Food, HI. Normal ESOD values: 9.4-13.4 units/mg. Hb.

### ABSTRACT

The erythrocyte Superoxide Dismutase (SOD) levels of 10 human adults were tested before and after addition of whole foods expected to enhance the endogenous production of SOD and Catalase (CAT).

### MATERIALS AND METHODS

Each person was in normal health with no diagnosed diseases. Written permission from each patients physician was required prior to participation. Each persons diet was supplemented with 6 tablets upon rising in the a.m., 1 hour before eating for the first two weeks; with 3 tablets daily for the second two weeks on a 4 week schedule. The product used was a whole food blend of sprouts developed by Biotec Foods, which in preliminary tests had the effect of enhancing endogenous production of SOD and CAT.

Patients Name	Age/Sex	Dates Tested	Test Results	% of Change
Robert Ronac	68/M	2/6/89	*2.23	61% Increase
		2/21/89	3.6 units/mg.Hb	
		3/30/89	11.3	
Curtis Bevins	67/M	2/14/89	*1.26	273% Increase
		2/28/89	4.7 units/mg.Hb	
		4/8/89	8.3	
Eugene Carson	65/M	1/30/89	*2.0	259% Increase
		2/13/89	7.18 units/mg.Hb	
		3/16/89	7.94	
Oral Mathews	69/F	2/10/89	*3.27	218% Increase
		2/21/89	10.4 units/mg.Hb	
		3/7/89	1.6	
Louise Bonner	76/F	2/9/89	*1.58	261% Increase
		3/8/89	5.7 units/mg.Hb	
		4/12/89	13.7	
Hildegard Bevins	67/F	2/14/89	*6.37	32% Increase
		2/28/89	8.4 units/mg.Hb	
		4/18/89	9.3	
Evelyn Giddings	65/F	2/9/89	*2.39	193% Increase
		3/8/89	7.0 units/mg.Hb	
		4/11/89	7.17	
Muriel Saito	70/F	2/22/89	*<1.0	730% Increase
		3/20/89	8.3 units/mg.Hb	
		4/13/89	3.3	
Lily Nishi	76/F	2/23/89	*4.1	188% Increase
		3/9/89	11.8 units/mg.Hb	
		3/24/89	4.4	
Maxine Lum	69/F	2/16/89	*4.78	76% Increase
		3/9/89	8.41 units/mg.Hb	
		4/7/89	9.53	

### CONCLUSION

The unique form of Superoxide Dismutase (SOD) and related essential co-nutritional factor CAT found in the products utilized in this study enhanced the endogenous erythrocyte levels of Superoxide Dismutase (SOD) by an average of 230% overall increase in each of the tested persons.

\* Pretest Blood Levels

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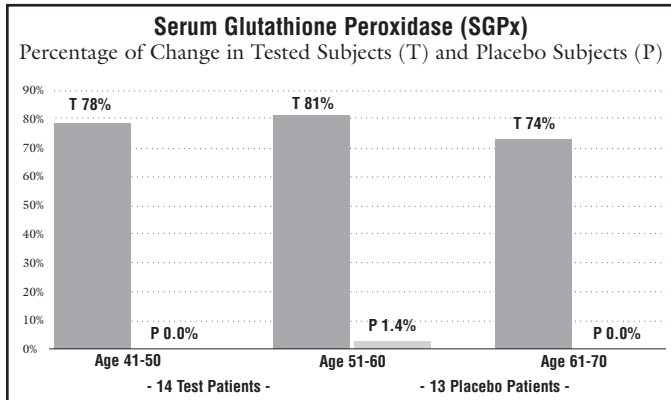
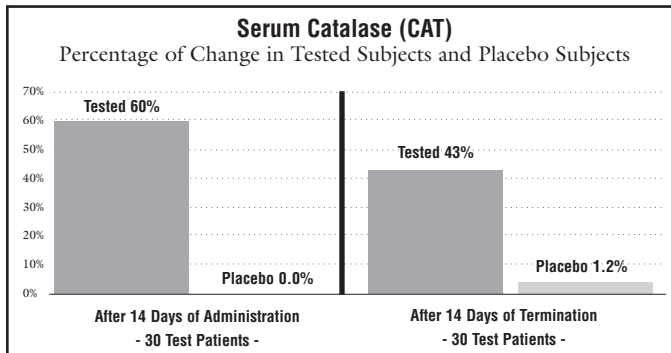
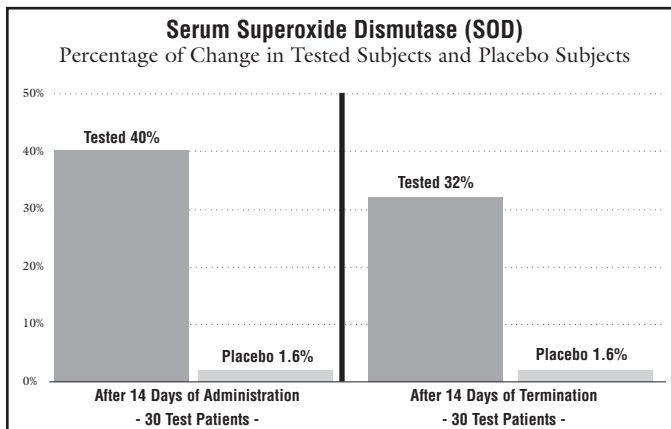


## RESEARCH PROVES ANTIOXIDANT ENZYME LEVELS INCREASE

### BLOOD SERUM STUDIES

In this study, blood samples of 70 subjects were analyzed before they began eating the 'Live Enzyme' food supplement supplied by Biotec. Testing took place again two weeks after beginning to use the 'Live Foods' and a third time after stopping use of the foods.

In this study, serum levels of antioxidant enzymes increased significantly in those subjects taking the 'Live Enzyme' foods, while placebo control subjects showed "No Significant Change". These results demonstrate that taking 'Live Enzyme' foods can indeed enhance the endogenous production of antioxidant enzymes in the human body.



Results of serum Superoxide Dismutase (SOD) and Catalase (CAT) from Absorption Study with IsoSproutPlex®, Ordonez, L., Rothschild, P., Academia de Medicina, Francisco Villa 18, Las Palmas, Matamoros, Tamaulipas, Mexico, 1988. Testing procedures involved Fluorescence Fading Time and are described in detail by Rigo, a., Rotilo, G., *Determination of Superoxide Dismutase and Catalase in Biological Materials by Polarography*, Anal Biochem., 81 (1) 157-66/1977Jul/MO=7712. Results of serum glutathione peroxidase (GPx) levels from study with IsoSproutPlex®, A. Esquivel, P. Rothschild, et al., National Autonomous university, Dept. of Immunology, Mexico City, 1988. IsoSproutPlex® caplets were administered at 6 per day for 60 days. Enzyme levels were determined 30 days after termination as described by Pleban, PA, Munyani, A, and Becchum, J. *Determination of Selenium Concentration and Glutathione Peroxidase Activity in Plasma and Erythrocytes*. Dept. of Chemical Sciences, Old Dominion University, Norfolk, VA. Published in Clinical Chem., 28 (2) 311-6, Feb. 1982.

# What Customers Say About Products from Biotec Foods

## **ATHLETIC NUTRITION**

We at Bio Energetics, Inc. have been testing your enzyme products for some time now and can offer our opinions concerning usage and benefits.

There is an ever growing pool of research information relating to your enzyme products, so much so that to list all of the related benefits sounds rather unbelievable. None-the-less our main concern has been in the areas of human performance. We are pleased to report, improvements, ranging from reaction speed to recuperation.

Participating athletes have noted increases in overall energy levels, resistance to fatigue especially legs and lungs and strength improvements in the weight room. Typically the participating athletes have been involved with their sport for a number of years, so that their nutrition and training 'programs have been fairly consistent, and are maintained on a year long basis.

We then are assuming that improvements or variations in stamina, recuperation powers and overall performance during training cycles is due largely to nutritional factors. Individuals who used the product for one month only, received more modest but yet, in my view, significant improvements in energy levels upon arising, plus increased flexibility. Individuals who remained on the products for three months or more had more profound benefits, strength in the weight room, reaction speed, ventilation or breathing during peak output sessions.

The majority of the athletes used the enzyme compounds at prescribed dosages. Six tablets the first two weeks and three tablets thereafter.

We did, however, note the greatest improvements with the 30-plus year old athlete. Athletes' or individuals recuperating from injury, jet lag, or basically anyone under going high levels of stress noted perceived relief.

In closing, with our ongoing research in human performance nutrients, we occasionally run into a formulation that delivers, but we consider BIOTEC enzymes to be a sound and prudent addition to the pro or amateur athletes hightech nutritional program.

*Brian Russell  
Consultant*

*Product Testing Bio Energetics, Inc.*

## **RHEUMATOID ARTHRITIS**

My wife Estella began to suffer pain in her right knee in May of 1976. Finally, I sent her to an orthopedist who made a diagnosis, put her in a knee brace and she left on a 'two weeks' vacation. When she returned, she could not straighten her leg and an operation was required to keep her from being crippled. She had a mis-diagnosis with the operation, but she actually had a case of Rheumatoid Arthritis. Hard work and nine Ascriptan per day enabled her to walk again, but she was never without pain.

At the time I was introduced to Biotec's antioxidant enzymes on June 16, 1983, both her knees were inflamed and swollen to the extent that the slightest pressure brought tears to her eyes. Because of the severity, I immediately put my wife on six tablets per day for twenty-one days and then three tablets per day thereafter. Although she saw no improvement, she took them faithfully; and after a four-month period, she suddenly realized the inflammation and tenderness was disappearing from her knees. She continued on the three per day regimen for two years.

In 1985-86 winter bowling season, my wife bowled weekly in five leagues and plays golf and does all her own house and yard work. She goes for months with little or no pain. She is on a maintenance dosage of two tablets per day and when an occasional flare-up occurs, she returns to the six per day until it is brought under control.

Biotec's antioxidant enzymes have been a God-send to our family. The above is not a testimonial — It is the truth! How often I had bumped my wife's knees accidentally and brought tears to her eyes. This no longer happens. She has some bad times on occasion but never like in the past, and more often is pain free.

Personally I don't want anyone to take Biotec's antioxidant products unless they will take it for a four-month period. (This doesn't always happen.) Anyone who has arthritis will be looking for help the rest of their lives, and I feel if they quit before giving your products a chance, they may be missing out for the rest of their lives.

*Dr. Donald Marquetta, D.C.  
Holly Hill, FL.*

*The stories appearing on these pages are actual letters recieved from customers who have used the antioxidant enzyme products from Biotec Foods. We hope that if you choose to use our products, you will have similar results and write to us with your story.*

## **VIETNAM VET - AGENT ORANGE**

This is a long overdue letter regarding the phenomenal success that I have experience using your antioxidant enzymes.

Several years ago I was diagnosed as suffering from peripheral neuropathy due to my exposure to 'Agent Orange' while serving in Viet Nam. My feet and legs and hips were numb at times. I was simultaneously suffering chronic and severe pain in my knees, lower and upper back and the area just below the shoulders.

The Veterans Hopsital was not able to diagnose or treat the pain successfully over a ten year period. Unable to walk upstairs and sleep in my own bedroom, I had to convert my apartment for handicapped living on the ground floor and was eventually confined there. I could not walk without a cane. Let me assure you "Life was very painful and depressing."

A friend of mine told me about your enzyme products and of the good results he had experienced. So, I ordered a bottle of your Cell Guard antioxidant enzymes.

Within five (5) days most of pain simply went away. I was amazed and happy to say the least. And, though New York had some terrible winter conditions, I joyfully enjoyed being able to shovel snow from my front walk.

I hope that people will have an open mind about your products. I feel confident that they can and will help most people.

Again, thanks for a 'Great Product' and feel free to call me about he benefits that I have experienced from your product

*Fred Blasetti  
Viet Nam Veteran  
Greenville, NY.*

# What customers say about products from **Biotec Foods**

## **MUSCLE ACHES**

I started taking two of your products, with the IsoSproutPlex blend of antioxidant enzymes. I felt better in the first two weeks. I've been having muscle aches in my legs for over a year. I went to a specialist and even had a muscle biopsy. I felt relief after three weeks on your products. I also added the three amino acids L-Valine, Leucine, and Isoleucine.

We are so impressed with your products that we mentioned them all through our new book. The book will be out sometime in September. I must say having a publisher added a lot to our book, it's terrific! They changed the name to "Prescription for Nutritional Healing". Here's thanking you again. You may quote any part of this letter if you like concerning your products.

*Phyllis Balch C.N.C.  
Author*

*Prescription for Nutritional Healing*

## **SPRAINS AND BURSITIS**

As a medical doctor in general practice for a number of years, I have used S.O.D. in the form of Extra Energy Enzymes for the past several months with good results.

This product is specially useful in inflammatory conditions such as musculoskeletal sprains and bursitis. I also use the product in general as an antioxidant and in this way, I think it promotes healing in a variety of conditions, giving the body more energy in cases of inflammation or fatigue. This has been the feedback I have received from patients and I do recommend your product frequently.

*Gary Ross, MD.  
San Francisco, CA*

## **MULTIPLE SCLEROSIS**

Recently an individual who has come here for consultation has advised me that your product containing Superoxide Dismutase and Catalase (in combination) helps her to walk better. She says she has proved this to herself by going on and off the product and observing her symptoms.

Her diagnosis is Multiple Sclerosis. While this is certainly not in the category of a Multiple Sclerosis "cure", it certainly is an interesting observation, and one that might be worth pursuing.

*Dr. Jonathon V. Wright M.D.  
Author*

*Dr. Wrights Guide to Healing with Nutrition*

## **ARTHRITIS & CANCER**

My wife and myself have been prescribing Biotec Enzymes to patients with arthritis and cancer for approximately two years now.

We have noticed excellent results with arthritis patients and also with cancer patients. We use your enzymes in conjunction with a total program of dietary modification and other antioxidant vitamins, minerals and amino acids.

Our arthritic patients notice rapid reduction in swelling and pain with increased joint mobility. Our cancer patients have had remarkably few adverse side effects from chemotherapy or radiation treatments. Many patients have no hair loss or nausea while on our program, which is heavy on antioxidant immune modulating enzymes. Their allopathic medical doctors are usually perplexed.

*Dr. David B. Wood, N.D.  
Dr. Cheryl L. Wood, N.D.  
Edmonds, WA.*

## **ENERGY**

'Better energy. Not nearly as tired after a game of racquetball.'

*S. C., Businessman, Honolulu, HI.*

"I have more energy and am not sleepy after lunch."

*A. Y., Retiree, Kailua, HI.*

'When I first started taking 6 tablets in the morning, I noticed myself 'awakening' more quickly, being less subject to my usual 'early morning blues', and having a much higher 'energy level.'

*L. H., St. Petersburg FL.*

'I have maintained a much higher level of flexibility in my physical performance; plus warm-ups and stretching does not hurt.'

*B. H., Phoenix, AZ.*

'My ability to concentrate at work appears to have increased, and I notice I don't tire by the afternoon as I previously have.'

*T. L., Athlete & Employee, Honolulu, HI.*

"I am sleeping better at nights. I feel calmer...not as nervous. I seem to have more energy."

*M. T., Housewife, Honolulu, HI.*

## **FASTING AND ENERGY**

Recently, I went on an extended fast. Around the same time I had purchased a bottle of "Cell Guard" and set it aside. After about 5 days into the fast I was having will-power problems and was about to break down and start eating. At that time I took four Cell Guard tablets and was pleased to discover that they gave me as much energy as a meal would have. I think that their main contribution must have been to act forcefully against the "Free Radical" activity which is so great when one is in the midst of such a house cleaning activity as a prolonged fast. For several days I made use of this "Meal Substitute" until I felt it was time to end the fast.

Now I take Cell Guard on a regular daily basis (2 tablets upon rising; 2 in the late evening). Thanks for a good product. There are so many supplements out there which fail to live up to their hype. NOT CELL GUARD!

*Blake Conley  
Princeton, NJ*

## **TUMORS**

In 1986 I was diagnosed with a tumor in the lower lobe of my left lung. I opted to try alternative means of possibly keeping it in check rather than have immediate surgical or chemo/radiation intervention.

By alternative means I am referring to my use of a cadre of herbal remedies which were long established to have anti-carcinogenic benefit; chapparal, red clover, comfrey, horsetail, yarrow, garlic, etc.); to my use of several vitamin regimes (i.e. vitamin A, beta carotene, vitamin C, vitamin E, etc.); to major chiropractic adjustments; and to major liver flushes/detoxification.

This latter experience, of a detox regime, is where I first learned of Cell Guard and its benefits. Throughout my use of these alternatives I feel that Cell guard did indeed help in assisting my body in clearing out the toxins and residues which resulted for example from the use of the deep cleaning herbal remedies such as chapparal. A year after the initial diagnosis of the tumor some minor problems remained so I broke down and went in for the X-Ray which I feared. Lo and behold; there was no evidence of the tumor or of other scar tissue.

*Dan Morris  
Thibodaux, LA.*

**Biotec Testimonials**

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\* This information has not been reviewed by the Food and Drug Administration (FDA). These products should not be used to diagnosis, cure, prevent or mitigate disease.