

# Health Hunter<sup>®</sup>

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NEWSLETTER

JUNE 2005

## Does vitamin C act as an antioxidant or pro-oxidant?

by Nina Mikirova, Ph.D.

**H**igh doses of vitamin C are administered intravenously by complementary and alternative medicine practitioners. Studies, including studies at The Center, demonstrate that high doses of intravenous vitamin C may have a role in the treatment of cancer.

***Intravenous doses can produce blood plasma concentrations 30- to 70-fold higher than the maximum tolerated oral doses.***

According to the study at The Center, only intravenous vitamin C produces high blood plasma concentrations that might have antitumor activity. The intravenous doses can produce blood plasma concentrations 30- to 70-fold higher than the maximum tolerated oral doses.

An infusion of 15 g of vitamin C during 45 minutes usually produces a maximum blood plasma concentration of about 120 mg/dL. Infusion of 60 g of vitamin C over 160 minutes produces a maximum concentration in blood plasma near 300 mg/dL.

The level of cytotoxicity of vitamin C to tumor cells was determined *in vitro* (in the test tube). Vitamin C killed cancer cells at extracellular concentrations of 200-300 mg/ml for monolayer cells and at higher concentrations for a three-dimensional tumor model. The level of vitamin C that can produce tumor cell death can be reached only by intravenous administration.

In addition, we found that vitamin C is preferentially toxic to tumor cells. The main reason for this is the content of the enzyme catalase, which is 10- to 100-fold greater in normal cells than in tumor cells.

Another aspect of high doses of ascorbate treatment is the effect on lipids and proteins in human blood plasma. As blood plasma plays a central role in the transport and fate of lipids, the mechanisms that act to control oxidative stress represent a major line of defense regulating general health status. Typical damage resulting from the attack of free radicals in blood plasma is the oxidation of proteins and lipids. Free-radical damage and lipid peroxidation are present in several disease states, including cancer, rheumatoid arthritis, drug associated toxicity, as well as in the degenerative processes associated with aging.

Protection of the blood plasma against oxidative stress at low concentrations of vitamin C has been a subject of many investigations. These studies demonstrated that low concentrations of vitamin C do not act as a pro-oxidant towards lipids and proteins in human blood plasma, even under oxidizing conditions. Vitamin C can prevent lipid peroxidation induced by aqueous peroxy radicals, by activated neutrophils, and by other sources.

But the effect of high doses of vitamin C on antioxidant defenses and lipid peroxidation in human plasma has been the subject of debate. Discussions were about the danger of mega doses of

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## High fructose corn sweetener increases weight

Manufacturers of high fructose corn sugar and the Corn Refiners Association continue to place the blame for obesity on people eating more calories. The blame falls, in part, on them, too.

Meals high in fructose result in lower leptin concentrations than meals containing the same amount of glucose. Leptin is a hormone that tells your body that you are getting full. At the same time, fructose in the meal generates ghrelin, a gastric hormone which tells you that you are still hungry. Both the ghrelin increase and the leptin reduction tell you to keep eating, and the pounds increase.

Add to this drinking high fructose corn syrup sweetened soft drinks between meals and you have an increased need to snack with the drink.

High fructose corn sweetener is a major cause of weight gain, syndrome X (a diabetes precursor), and an increase in triglycerides, according to researchers. Use table sugar, if you must. [H]

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# Nutritional Medicine

by Ron Hunninghake, M.D.

## The preceptor/co-learner relationship

The first precept of The Riordan Approach is grounded in the healing power of relationship. I remember Dr. Riordan mentioning to me on several occasions: "It's all about *relationships*, you know."

The honorable profession of medicine is grounded in the doctor-patient relationship. Patients put their lives into the hands of their doctors. Faith in this relationship evokes the human healing response.

This form of the doctor-patient relationship works well in an acute care model where the patient passively surrenders to the active and authoritative will of their doctor. Trauma centers, surgical suites, and intensive care units demonstrate the power and effectiveness of the acute care model.

Early in his career, Dr. Riordan noticed that more and more of the average doctor's time was being devoted to chronic degenerative illness care. He found that the acute care model with overly passive patients was less effective in this arena. Chronic illness care required the involvement of the patient in the diagnosis/discovery of underlying causes and the lifestyle changes required to correct these causes.


Dr. Riordan invented the word *co-learner*. Co-learners learn *with* one another. The idea that doctors *could* learn *with* their patients represented a huge shift in the doctor-patient relationship. Sickness care was no longer enough. The focus shifted back to true *health care*. Patients became co-learners who were actively involved in the search for

underlying causes that, once identified, could be modified with better lifestyles. Doctors became their preceptors, or health guides, to mentor their journey back to better health.

The preceptor/co-learner relationship represents a new incarnation of the doctor/patient relationship, one where patients are empowered to become actively involved in rebuilding their health, and doctors are freed to become what the word *doctor* actually means: teacher!

The 21<sup>st</sup> Century finds the practice of medicine embroiled in a multitude of seemingly insurmountable problems: astronomical costs and hyperinflation; rampant polypharmacy; the insidious breakdown of the doctor/patient relationship; rising rates of chronic degenerative illness with 8 of the top 10 causes of death being directly attributable to lifestyle and dietary indiscretions. The noble profession of medicine *itself* seems ill.

The first precept of The Riordan Approach represents a new beginning point, a paradigm shift that promises healing from within the body of medicine. Doctors who embrace co-learning listen to and *learn* from their patients. Patients who view their doctors as preceptors and co-learners find their faith in doctors restored, and the faith in their own ability to heal renewed.

Dr. Riordan saw the power of relationship as the essential secret to all healing. Through it, not only are patients healed, but the doctor's view of self and their profession are healed as well. 

### Vitamin C—Cont'd from page 1

vitamin C and the effects which ascorbate produce at high concentrations in blood plasma.

There are *in vitro* (test tube) studies which indicate that in the presence of redox-active transition metals vitamin C can act as a pro-oxidant. The combination of vitamin C, hydrogen peroxide, and transition metals forms a highly pro-oxidant mixture generating hydroxyl radicals. Although the pro-

oxidant role of vitamin C in the presence of ions or hydrogen peroxide was characterized in test tubes, it was uncertain whether vitamin C also acts as a pro-oxidant under physiological conditions.

First of all, the blood plasma has many different antioxidant components and defense systems so the availability of "free" redox-active metal ions in the

*continued on page 3*

blood plasma is very low.

The protective effect of blood plasma against oxidative damage is due to the presence of antioxidant molecules and to the presence of various metal binding proteins. In addition, the blood plasma is protected by the antioxidant systems, which include vitamin C, alpha-tocopherol (vitamin E), beta-carotene, uric acid, bilirubin, and trace amounts of antioxidant enzymes such as glutathione peroxidase and superoxide dismutase.

Exposure of blood plasma to aqueous peroxyl radicals leads to oxidation of endogenous vitamin C followed by the depletion of other antioxidants. When vitamin C is consumed completely, very small concentrations of hydroperoxides of blood plasma phospholipids, triglyceride, and cholesterol ester appear simultaneously even though some other antioxidants are present in blood plasma.

The goal of our research was to assess the effect of high doses of vitamin C supplementation on the antioxidant capacity of blood plasma and resistance of the blood plasma to oxidative stress. For this purpose, we determined the level of antioxidant capacity of blood plasma by incubation of plasma with a free radical initiator and measured the Total Radical-Trapping Antioxidant Parameter.

The study was performed *in vitro* (test tube) and *in vivo* (human body). *In vitro*, vitamin C was added in the blood plasma with concentrations of 50uM-5mM. This range includes a typical natural concentration of vitamin C in blood plasma (about 50 uM) and the level of vitamin C in blood plasma after 15 g of intravenous vitamin C treatment. According to our data, the addition of vitamin C in the reaction mixture protected blood plasma from oxidation.

The addition of vitamin C in blood plasma increased the antioxidant capacity of blood plasma for all analyzed concentrations of vitamin C.

Other researchers found a sequence of the antioxidant consumption and lipid peroxidation similar to ours in blood plasma exposed to other types of oxidative stress, such as activated neu-

*continued on page 4*

## HEALTH HUNTERS AT HOME

### Something you should read

As you may remember, Dr. Riordan started The Center in 1975—that was 30 years ago. Since he was a psychiatrist by background, he started The Center to use biochemistry to treat depression, schizophrenia, and bipolar diseases (also called manic depression) with natural processes.

His fellow physicians considered him a rebel or a quack, and when he entered a medical meeting back in the 1970's, the other physicians would begin quacking.

But the people he served with psychiatric diseases felt excellent and were free from disease, and so The Center quickly gravitated into other types of chronic or sustained illness. We continued to help these people as well.

With this introduction, let me get to the magazine article that is the subject of this "Health Hunter at Home." In the May issue of *Discover* magazine, there was an article that started out saying, "When pigs

are penned in close quarters, some become so irritable they savage their pen mates' ears and tails, a problem farmers call ear-tail-biting syndrome. David Hardy, a Canadian hog-feed salesman from the farmlands of southern Alberta, knew that behavior well. Years of experience had taught him something else: All it takes to calm disturbed pigs down is a good dose of vitamins and minerals."

Toby Stephen, an acquaintance of Hardy's, began to confide his troubles to Hardy in November of 1995. His wife killed herself after years of struggling with manic depression and after losing her father to suicide. Then two of his children began showing symptoms of bipolar disease.

The two men would buy vitamins at health food stores and work on a concoction at the kitchen table to find something that would work as well for humans as it did for pigs. Once they had what they felt would work well with humans, they started with Stephen's son. The son, who had been a very good young man, was showing signs of ex-

treme aggression. Within 30 days of starting the nutrient program the aggression was gone and he was back to his cheery self.

Then they worked with Stephen's daughter who had just been released from a hospital for suicide watch. She believed she had a gaping hole in her chest from which demons emerged. She was in bad shape.

After four days of treatment, her hallucinations went away, as did the mood swings. She doesn't believe she is cured, but "I feel I have something that allows me to have a normal life." Nine years later, both children remain symptom free.


Now Hardy's and Stephen's troubles began. They started a company to sell their multi-vitamins just as physicians and scientists began to attack them. The scientists said that the two men had no scientific proof of the results they claimed and the physicians said that they were practicing medicine without a license to do so.

Even scientists who were more interested in checking the two men's results were reluctant to do so because of the attacks by the medical associations. This was at the end of the 20th century and the beginning of the 21st century.

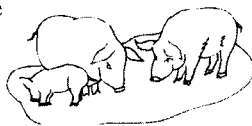
Dr. Riordan had been building The Center for 25 years when this happened and he had built a staff that used nutrients to treat psychiatric patients successfully as well as other types of chronic or sustained illnesses.

Dr. Riordan's secret for The Center's success with little interference from others—he kept The Center on a low key basis with recommendations for new patients coming from others who had success here.

The article closes with a quote from the two who started trying to find something to help their children. "It's like a new discovery—acceptance is slow to come. But that will change. It will come." It came for The Center and it will come for these two men as well.

Read the article. I think you will find it interesting. 

—Richard Lewis



## INFORMATION WORTH KNOWING

The standard definition of orthomolecular medicine is: "The practice of preventing and treating disease by providing the body with optimal amounts of substances which are natural to the body." Hugh D. Riordan, M.D. has written the latest in the trilogy, *Medical Mavericks* in which he features the lives of orthomolecular medical mavericks. Dr. Riordan said, "I prefer to think of it as practicing good medicine which is effective, has side benefits instead of side effects, is less costly than medication, and in many cases should be the first choice of therapy." If you have never heard of "orthomolecular medicine," this book will give you an understanding of how it developed and how it has been used. For Center personnel many of the people featured in *Medical Mavericks* are well known to us. They have spoken at our international conferences or have somehow touched The Center. This month the questions are taken from Dr. Riordan's book.

**1** Dr. Linus Pauling is known for his many accomplishments.

Defining the nature of chemical bonds won him a Nobel Prize for Chemistry. He became one of only a very few individuals to receive two Nobel Prizes. He won his second Nobel Prize for Peace. He was the first person to coin the term

- a. make love not war
- b. orthomolecular psychiatry
- c. hippie
- d. antimolecular

**2** Dr. Pauling acknowledged that the doctor who had the most knowledge of the use of vitamin C for viral diseases was \_\_\_\_\_.

- a. Emanuel Cheraskin, M.D.
- b. Carl Pfeiffer, Ph.D., M.D.
- c. Hugh D. Riordan, M.D.
- d. Robert F. Cathcart III, M.D.

**3** Ruth Harrell, Ph.D. was a pioneer in the use of nutrition in the treatment of Downs Syndrome and other forms of mental retardation.

- a. True
- b. False

**4** Genetotropic disease was described by \_\_\_\_\_ as diseases which resulted from genetically determined nutritional metabolic needs not met by the individual and which results in poor gene expression.

- a. Roger Williams, Ph.D.
- b. Carl Ebnother, M.D.

- c. Carl Pfeiffer, Ph.D., M.D.
- d. Bernard Rimland, Ph.D.

**5** Dr. Roger Williams was an inspiration to many in the orthomolecular medicine movement. As well as bringing attention to biochemical individuality and genotrophic disease, he discovered

- a. hydrochloric acid
- b. ascorbic acid
- c. pantothenic acid
- d. lipoic acid

**6** Dr. Emanuel Cheraskin was both a medical doctor and a dentist. He understood the relationship between oral health and total health. He knew that the health of your mouth is an indicator of your general health.

- a. True
- b. False

**7** Carl C. Pfeiffer, Ph.D., M.D., was recognized for subdividing the schizophrenias into biochemical categories. Also, he was the first physician to use the combination of zinc and \_\_\_\_\_ in the effective treatment of mental disease.

- a. vitamin A
- b. vitamin B1
- c. vitamin B6
- d. vitamin C

### Vitamin C—Cont'd from page 3

trophils, the gas phase of cigarette smoke, and superoxide radicals or hydrogen peroxide generated by other sources. Under all these types of oxidative stress, vitamin C formed the first line of anti-oxidant defense.

To evaluate whether intravenous vitamin C infusion (IVC), which may have antitumor activity, does not have pro-oxidant effects on blood plasma lipids and proteins, the same assay was applied to measure the antioxidant capacity of blood plasma for several patients and volunteers before and after treatments by IVC.

We found a difference in the level of antioxidant protection before IVC for different patients. The lower level of antioxidant capability of blood plasma was found for patients with a higher level of oxidative stress. Oxidative stress was evaluated for these patients by measuring the level of hydrogen peroxide or the level of oxidative stress in red blood cells. An increased level of oxidative stress increases consumption of antioxidant molecules and enzymes.

The level of antioxidant protection after 15 g IVC was measured for several patients and healthy volunteers. According to these measurements, 15 g of IVC improved the antioxidant status of blood plasma and resistance to oxidative stress at least 5 times. The level of antioxidant protection of blood plasma depended on the dosage of IVC. To assess the effect of a dosage of IVC on blood plasma antioxidant status, we analyzed data from several patients treated by 15 g of IVC and patients treated by 25 g of IVC to find dependence of the antioxidant capacity of blood plasma on the level of vitamin C in the blood plasma. Upon incubation of the blood plasma from patients treated by IVC with a free radical initiator, vitamin C concentrations were positively correlated with the time of protection preceding detectable lipid peroxidation.

Our data suggest that in a state of acute or chronic oxidative stress, vitamin C supplementation could be helpful in preventing the formation of hydroperoxides, some of which cannot be detoxified by endogenous blood plasma activities and might cause damage to critical biomolecules. [H]

• FOR ANSWERS, SEE PAGE 7 •

## The Garden and the gardener


by Melvin D. Epp, Ph.D.

Finally the data were tweaked enough to conclude that fat people live longer than skinny people. I always assumed that was true. When *The New York Times* on May 3, 2005, ran an article by Timothy Egan entitled "With Potbellies Back In, Buffet Pots are Humming," it caught my attention. These new conclusions were based on the reworking of old data with new statistical assumptions and parameters by researchers from the Centers for Disease Control and Prevention and published in the April 20, 2005, issue of *The Journal of the American Medical Association*. What this study suggested was that people who are somewhat overweight are at less risk of early death than people who are thin.

Although the government continues to warn that excess weight is a major health threat to the 65% of adult Americans who are either overweight or obese, that is not the message that people are hearing from this new publication. The conclusions are not a license to pig-out, but rather a suggestion to relax and not get up-tight about developing a Twiggy physique.

If the study above draws you to the buffet line, consider filling your first plate full of non-starchy vegetables. By this I mean salad greens, green beans, marinated mixed vegetable salad, turnip greens—you got the picture. For the second plate, pick up lean meat and more non-starchy vegetables.

My other gardening thought deals with the utilization of calories after hitting the buffet line. The June 2005 issue of *Vegetarian Times* has a chart from caloriesperhour.com, which suggests that one hour of weeding or mowing lawn (or belly dancing or playing golf) requires 306 calories for a 5'5", 150-pound woman. General gardening requires 272 calories per hour.

The exercise opportunities that gardening presents, together with the delectable produce that a garden affords, makes the status of "somewhat overweight" readily attainable. When we garden, our lives will be rich and rewarded as we live a long time. 

## Herbal History


by Chad A. Krier, N.D., D.C.

### Eleutherococcus senticosus

Eleutherococcus senticosus (Siberian ginseng) is an adaptogenic herb (adaptogens are herbs that restore balance and conserve energy) that has historically been used to increase the length and quality of life, prevent infection, and improve memory and appetite. Eleutherococcus senticosus has a long history of traditional use for treating fatigue and stress-induced illness and is a glucocorticoid agonist (works in a similar fashion to glucocorticoids). Compared to Panax ginseng, Eleutherococcus is less stimulating, tends to have a more rapid action and has a more generalized effect on immunity.

Animal studies have shown that Eleutherococcus extracts can prevent

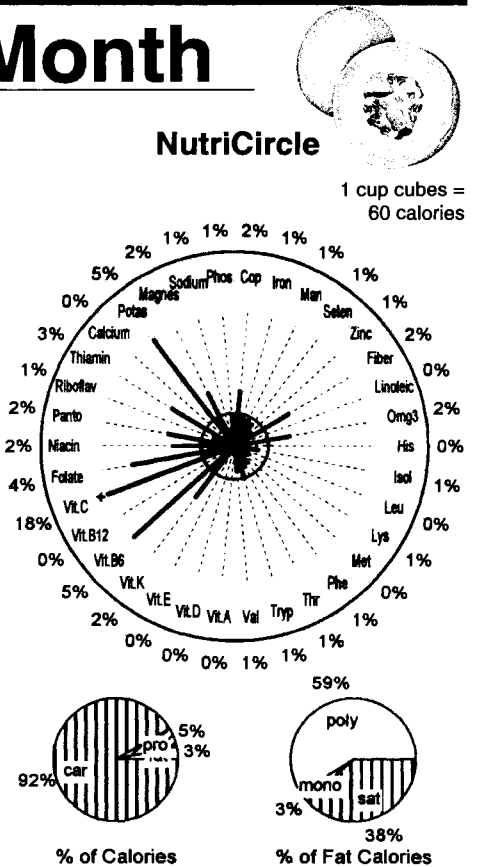
stress-induced adrenal gland changes and stress-induced disease. In cancer patients, Eleutherococcus has been shown to improve appetite, weight gain, shorten healing time, and increase lymphocyte activity. Additionally, Eleutherococcus also reduces the side effects of radiation and chemotherapy, including nausea, dizziness, and loss of appetite.

I often prescribe a solid extract of Eleutherococcus for those battling with chronic adrenal conditions. It is best to dose Eleutherococcus in the morning and around noon to match the diurnal rhythms of the adrenal gland. Recommendations for the solid extract are 1/2 teaspoon 1-2 times daily. 

## Food of the Month

by Donald R. Davis, Ph.D.

**HONEYDEW MELONS** were considered sacred by the ancient Egyptians, and are said to have been favorites of Cleopatra, Pope Paul II, and Napoleon. They are smooth, round, and larger than cantaloupes, usually with green flesh. As they ripen, their skin color changes from light green to creamy white to yellow. In the store, look for as little green as possible and ripen the melon on a counter until it becomes slightly soft at the blossom end. Ripe flesh is soft and extremely sweet and juicy. Out of 34 nutrients shown here, 14 are adequate compared to calories, especially potassium, folate, and vitamins C and B<sub>6</sub>.



The length of each bar shows the amount of one nutrient. If a bar extends out to the inner circle, the food has enough of that nutrient to match the calories it contains. The numbers show nutrient amounts in RDAs per serving shown. The pie charts show the sources of calories (left) and the types of fat (right). 

# Mental Medicine

by Marilyn Landreth, M.A.

## Watch for the ridiculous

Life can be really interesting. As days, weeks, and years go swiftly past I am coming face to face with the fact that I am not as young as I used to be. This has been brought home to me in several ways this year.

The first happened on one icy, cold day when a staff member took my arm to help me across the parking lot. While in one way I appreciated his help in another way I wondered if he did it because I looked like a frail old woman.

The next thing that happened was when I went through a drive-through and ordered a small drink. I was quoted one price but when I got to the window I was charged only half price. When I inquired, the cashier said seniors get a discount. I thought it must be the gray in my hair that was giving away that I am now considered by some to be a senior citizen.

Family members had been suggesting for quite some time that I should

get the gray in my hair covered but I liked the silvery color. Now I was rethinking the whole process. I decided to get a reverse frost on my hair. Rather than getting it frosted with a light color it was "frosted" with a darker color. After it was done, it looked so dark surely everyone would notice the drastic change. I felt like I had a neon sign that flashed "dyed" or "fallen woman." Very few people noticed.

The real test came a few days later during a visit to the drive-through lane. Once again I ordered a small drink and was told the price and once again I was charged half price. I just had to chuckle.

The mental medicine I got from this whole episode was in realizing that I tend to take life too seriously. Finding the absurd in everyday happenings gives me the ability to laugh at myself as I go through this interesting and challenging life. [H]



## Case of the month

A 10-year-old young child came to The Center in March of this year. She had food allergies, constipation since she was very little, stomach pains, and bad breath.

The bad breath bothered her quite a bit, but it was the constipation that brought her to The Center. She said she had had a history of on and off hard stools. When she was in kindergarten the hard stools got worse. She has tried eating fruit, along with eating high fiber cereals, as well as drinking fruit juice. Nothing worked. Now, she has on and off stomach pain to go along with the hard stools. About three years ago she gave up drinking milk because it showed up on a food allergy test. Again, no help with the hard stools.

She loves candy! Her dietary preferences are pastas, bread, bagels, and cookies. She chews gum, as well.

At the end of the day, Dr. Krier recommended she take BioK+ along with brushing her tongue daily for her bad breath, magnesium citrate at bedtime with the goal of having a bowel movement the next morning, and Proantho-C to help with her congestion.

In early May, Dr. Kirby talked with her mother about the positive parasites indications that were in her stool sample. She started taking generic Flagyl, a parasite prescription, for ten days. She will repeat a urinalysis test after she completes the course of generic Flagyl to get rid of the parasites.

Two days later, her mother told Dr. Kirby that the child's breath was better since taking the BioK+ and from brushing her tongue daily. She said that her daughter is trying to avoid sugar in her diet. Her daughter's constipation is less since she started taking the magnesium citrate.

Later in May, her mother said that she is doing great. Her breath is sweet. "I ask her to breathe into my face so that I can enjoy it." Her bowel movements are normal and easy. She doesn't come home from school any more and say her stomach hurts and ask what she can do about it. She is, at last, back to a normal child for the first time in years. [H]

## CENTER UPDATE

### Dark chocolate is your friend

Dr. Ron Hunninghake has been extolling the values of dark chocolate for quite a while. He and other Center doctors have discussed dark chocolate in Lunch and Lectures and with individual patients during appointments.

Chocolate has been a favorite of many individuals for many years. A lot of manufacturers have produced several varieties from bars to peanuts wrapped in chocolate with a thin candy outer case. But one always has the nagging feeling that it is high in fat and sugar and you shouldn't be enjoying it.

Dark chocolate is different. Many doctors actually support it because there are at least five reasons for adding dark chocolate to a patient's list of prescriptions. For instance, dark chocolate lowers blood pressure. Cocoa powder is high in polyphenols called flavonol, which stimulates the production of nitric oxide (NO). When NO is produced in the arteries, it acts as a vasodilator

which relaxes the arteries causing them to open up and lower blood pressure.

Dark chocolate also improves insulin sensitivity, mediates inflammation, protects against heart disease, and, most importantly, make you feel good.

Doctors who are into dark chocolate for its healing values often recommend that you get a high quality dark chocolate bar sold in health food, specialty, and grocery stores. Look for bars that are 70 percent or more cocoa. Since dark chocolate is extremely bitter, expect to find some sugar. And also don't be put off when you see some fat in the bar. Try to eat 1.75 ounces, or half a bar, daily.

Dr. Julian Whitaker has gone The Center doctors one step better. Each of his patients now receives a weekly bar of dark chocolate. It not only brings a smile on the face of each patient, it is good for them. As Dr. Whitaker says, "Simply put, dark chocolate is a health food." [H]

Answers from page 4

- 1 b. Although Dr. Pauling did not get involved with nutrition until later in his life, he devoted the last quarter of his life to that field.
- 2 d. Dr. Cathcart was among the first to consider the physiochemistry of vitamin C in the regulation of antigen-antibody reactions.
- 3 a. She tested her belief that in many cases mental retardation was in part a genetotrophic disease.
- 4 a. Dr. Williams also described biochemical individuality. He said each person has different biochemical needs and that our internal organs vary from person to person.
- 5 c. Dr. Williams discovered, isolated, and named this nutrient in 1933 while he was professor of chemistry at Oregon State University.
- 6 a. If you do not eat you will die. If you do not eat properly, then you will partially die, as Dr. Cheraskin pointed out.
- 7 c. Thirty percent of schizophrenics who are identified with pyrroluria are treated with a combination of vitamin B6 supplementation and zinc.

## SPECIAL DISCOUNTS

### MEDICAL MAVERICKS, VOLUME 3

by Hugh D. Riordan, M.D.  
The word "maverick" is derived from an American pioneer, Samuel A. Maverick, who chose not to brand his cattle. Through usage the word "maverick," in addition to meaning an unbranded range animal, has come to mean an independent individual who refuses, because of what he or she has learned, to conform to prevailing group thought. Volume 3 highlights orthomolecular mavericks. Softcover book.

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This book could just as accurately have been titled "One person can make a difference." Often reviled by their contemporaries but revered by subsequent generations, these medical mavericks

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by Hugh D. Riordan, M.D.  
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# Upcoming Events. . .

## 6/17 - Garden Party Open House

Garden Gate Dedication —3:00 p.m. - 4:00 p.m.

Open House—4:00 p.m. - 6:00 p.m.

(Tours, Refreshments, & Music)

## Lunch & Lectures begin June 23.

The following are some tentative topics:

Plant Sterols & Cholesterol

Natural Prostate Cure

Healthy Secrets from Your Nine Liver Dwarfs

Eat, Exercise and Excel Program

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## Step aerobics makes healthy bones

For years, Dr. Riordan said that you need to move your body about because your muscles cause a very small peizo-electric stimulus to your bones that helps you build calcium in the bone to keep the bones strong.

Now research shows this to be true. Sara Arnaud, a retired NASA physician, co-authored a research project that showed that step aerobics boosts bone strength. Step aerobics boosts heel-bone density by as much as 3.3 percent and the bone density in the lower spine by 1.2 percent. Their sedentary control group showed no gain in bone density.

“The message here is that to improve bone, you want to do high-impact aerobics,” the other researcher said.

- Does vitamin C act as an antioxidant or pro-oxidant?
- High fructose corn sweetener increases weight
- Dark chocolate is your friend
- Step aerobics makes healthy bones

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