

Antioxidant Advantage

Antioxidants protect us from damage caused by free radicals which can injure healthy cells and tissues. To control free radicals, one must maintain the antioxidant advantage, that is, an optimal balance between free radicals and antioxidants. This is possible by consuming adequate amounts of antioxidants in the form of food and supplements, as well as limiting exposure to 'pro-oxidants' in the environment.

Lester Packer (PhD), director of the Packer Lab, University of California, is regarded as one of the world's leading antioxidant research scientist. He sits on the Pharmanex Scientific Advisory Board of Nu Skin Enterprises and is the author of the book *The Antioxidant Miracle*. iSmile interviewed him when he made a stopover in Kuala Lumpur on July 21, 2003. His research in antioxidants has spanned over 40 years and he has written numerous papers which document scientific evidence on the healing properties of various types of antioxidants. Although in his 70s, the researcher still works in his lab and reveals that state-of-the art technology has helped to fine tune studies on the effects of antioxidants on cells and genes.



Dr. Lester Packer

After decades of research, Dr. Packer is convinced that antioxidants are needed to build up the immune system and slow the aging process. Antioxidants protect

us from damage caused by free radicals which can injure healthy cells and tissues. Free radicals are produced in the normal course of energy production, but certain chemicals, smoke, pollutants and solar radiation also trigger production of free radicals. Dr. Packer notes that the key is to control free radicals by maintaining the

Antioxidants in food

Apples	Lower cholesterol, protect against cancer
Berries	Good for vision, contain cancer-fighting compounds
Carrots	Protect against heart attack and stroke, contain cancer-fighting compounds
Citrus fruits	Protect against many different forms of cancer, a good source of flavonoids, which boost vitamin C
Cruciferous vegetables (broccoli, cauliflower, brussels sprouts, cabbage and kale)	Contain cancer-fighting indoles
Dried fruits	Contain cancer-fighting carotenoids
Garlic and onions	Lower cholesterol, contains cancer-fighting phytochemicals

Source: *The Antioxidant Miracle* by Dr. Lester Packer & Carol Colman

antioxidant advantage, that is, an optimal balance between free radicals and antioxidants. This is possible by consuming adequate amounts of antioxidants in the form of food and supplements, as well as limiting exposure to 'pro-oxidants' in the environment. (For more information on free radicals, please read iSmile's article on free radicals in pp38 - 40 in the July/August 2003 issue)

Antioxidants Network

From his research, Dr. Packer proposes supplements which contain a cocktail of various antioxidants. This is because antioxidants work better in a group, rather than separately. He calls it the antioxidant network. 'What makes them special is that they enhance the power of one another', he explains. The combination which works together to strengthen us and protect us from disease

include vitamins C and E, glutathione, lipoic acid and coenzyme Q10. When vitamin E disarms a free radical, it becomes a weak free radical itself. Unlike bad free radicals, this vitamin can be recycled back into an antioxidant by vitamin C or coenzyme Q10. These network antioxidants will donate electrons to vitamin E bringing it back to its antioxidant state. The same scenario occurs when vitamin C defuses a free radical and is recycled back to their antioxidant form by lipoic acid.

Vitamin E

The vitamin E family is made up of molecules composed of four different *tocopherols* and four different *tocotrienols*. Modern food processing routinely depletes our food supply of all forms of natural vitamin E. Dr. Packer notes

that to get the full range of benefits offered by this vitamin family, a supplement should include the entire spectrum of *tocopherols* and *tocotrienols*.

Vitamin E is the body's primary fat-soluble antioxidant. It can manoeuvre through the fatty part of the cell membrane, targeting and quenching free radicals in the process. This vitamin travels through the body in molecules called lipoproteins and protects from oxidation. The oxidation of lipoproteins is believed to be the first step in the hardening of arteries, which can lead to heart disease.

Antioxidants are micronutrients, meaning we only need to ingest a comparatively small amount to get maximum benefit. There are two kinds of antioxidants: water-soluble and fat-soluble. Water soluble means it is not stored in the body and excreted in urine while fat soluble means they are stored in the fatty tissue. Water soluble antioxidants are usually measured in either milligrams (mg) which are equal to one over one thousand of a gram or microgram (mcg) which is equal to one over one million of a gram. Fat soluble antioxidants are in either mg, mcg or in IU (International Units) and 1 IU is equal to 1 mg.

Basic Antioxidant Cocktail

Morning	Vitamin E	
	(i) 100 mg tocotrienols	
	(ii) 200 mg tocopherols	
	CoQ10	30 mg
	Lipoic Acid	50mg
	Vitamin C	250 mg ester Vit C
	Folic Acid	400 mcg
Biotin	400 mcg	
Vitamin B6	2mg	
Evening	Vitamin E	200 mg natural alpha tocopherols
	Lipoic Acid	50mg
	Vitamin C	250 mg ester Vit C
	Ginkgo Biloba	30 mg
	Selenium	200 mcg

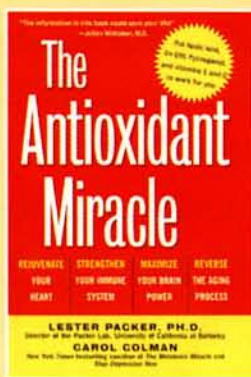
Source: *The Antioxidant Miracle* by Dr. Lester Packer and Carol Colman

Food and supplements

Dr. Packer stresses the importance of both food and supplements for good health. "Supplements can help enhance the health benefits of food, but they cannot do the job alone", he says. He notes that scientists around the world have discovered a wide array of compounds called phytochemicals in food, many of which are antioxidants. For example, broccoli has chemicals that can stimulate the production of anti-cancer compounds in the body while citrus fruits contain a cancer-fighting oil in their skins.

Dr. Lester Packer

- PhD in Microbiology and Chemistry, Yale University
- Professor and Senior Researcher, University of California, Berkeley
- Head of Packer Laboratory, antioxidant research centre
- Published over 800 scientific papers and 90 books on antioxidants and health
- President of the International Society of Free Radical Research (1997-1998)
- President of the Oxygen Club of California (1993-2002)
- Vice President of UNESCO's Global Network of Molecular and Cell Biology (1989-2001)



Naturally derived vitamin E is always described a '*d-alpha tocopherol*' while synthetic one is labelled '*dl-alpha tocopherol*'. The natural source is more potent as it plant-derived and preferred by the human body.

Vitamin C

Vitamin C is critical for a well functioning immune system, helping reduce the length and severity of colds and viruses and bolster the body's ability to resist cancer. Dr. Packer calls it the 'hub of the antioxidant network' because it is the link connecting the fat-soluble antioxidants and the water-soluble ones. The water-soluble vitamin C recharges the fat-soluble vitamin E when it becomes a free radical.

“Lipoic acid is versatile in that it is allowed into both the fatty and watery portions of the cell, enhancing its ability to trap free radicals wherever they may be. It is the only antioxidant that can recycle all the network antioxidants.”

Consumers are advised to take note that vitamin C in the form of ascorbic acid increase the production of stomach acid which can cause discomfort and increase the absorption of iron from food. Iron overload is a major risk factor for heart diseases. The other alternative is vitamin C from mineral salt of ascorbic acid called ester C.

Coenzyme Q10

Fat soluble coenzyme Q10 regenerates vitamin E in the antioxidant network to protect the fatty part of the cell from free

radical attack. It is present in all cell membranes and is found in the largest amount in the mitochondria, the energy-producing apparatus of virtually every cell. In the mitochondria, this coenzyme is essential for the production of energy. While producing energy, they are also creating free radicals. As such, coenzyme Q10 revs up energy production and also quenches troublesome free radicals.

Lipoic Acid & Glutathione

Lipoic acid is versatile in that it is allowed into both the fatty and watery portions of the cell, enhancing its ability to trap free radicals wherever they may be. It is the only antioxidant that can recycle all the network antioxidants. It can also recycle itself from its free radical form to its antioxidant form by tapping into the cellular energy production machinery.

Water-soluble glutathione is the most abundant antioxidant in the network and is produced by the body from three amino acids. Glutathione is a master antioxidant as it can recycle the oxidised form of vitamin C, restoring its antioxidant power. It is found in virtually every cell and is an important weapon in the battle against free radicals. Glutathione is the only antioxidant which Dr Packer does not recommend as a supplement as taken orally, it is not well absorbed by the body and most of it goes to waste. He suggests taking 100 mg of lipoic acid daily to boost the levels of glutathione.

In the world of cellular health, Dr. Packer reinforces the fact that we must spare our cells and tissues from the destructive path of a free radical out of control. Working towards attaining the antioxidant advantage, Dr. Packer says that one can track the antioxidant level in our bodies using a simple blood test. The results will show whether one is within optimal, average or poor range, and whether one needs to make dietary adjustments or increase dosage of particular antioxidants. 😊