

## REPORT

ACAM Convention 2002  
at Broward county convention center,  
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The American College for the Advancement of Medicine (ACAM) is an organization dedicated to combining the best of mainstream and alternative therapies. Through its conferences and special workshops, ACAM educates physicians about innovative approaches to the prevention and treatment of diseases.

The 2002 ACAM Spring conference in Fort Lauderdale on May 17-19, 2002 reflected a growing awareness of the mechanisms involved in chronic inflammation, brain cell damage, atherosclerosis, osteoporosis and a host of other aging-related degenerative disorders. As scientists gain a greater understanding of the aging process, the resources available to protect our health keeps growing. This article summarizes the highlights of the year 2002 ACAM Spring Conference.

Dr. Nicholas Gonzalez: pancreatic enzymes and autonomic balancing help fight cancer

The work of Nicholas Gonzalez, M.D., an alternative physician known mainly for his use of pancreatic enzymes as a crucial part of holistic cancer therapy, stems from the discoveries of a turn-of-the-century Scottish embryologist, John Beard. Beard observed similarities between tumors and the placenta. He also discovered that the placenta stops growing precisely when the fetal pancreas begins to secrete digestive enzymes. "Cancer is no longer a problem for the embryologist," Beard announced, putting forth the idea that proteolytic (protein-digesting) pancreatic enzymes are the body's chief defense against cancer.

Beard died in 1923, and his ideas were practically forgotten. In 1965, however, a researcher at St. Joseph Hospital in Arizona discovered that oral pancreatin completely prevented pancreatic cancer in mice carrying Bittner's virus. Meanwhile, control mice showed a 100% incidence of cancer. Mice receiving 2% pancreatin in their diet showed a 2.6 times increase in antibody production.

Gonzalez became interested in the use of pancreatic enzymes against cancer in 1981, while still in medical school at Cornell. He learned of the work of William Donald Kelley, a Texas dentist, who further developed the regimen proposed by Beard. Gonzalez was especially impressed by the fact that one of Kelley's patients was alive 10 years after being diagnosed with advanced pancreatic cancer with metastases to the liver. Such survival was unheard of in conventional medicine. Gonzalez developed the Beard-Kelley regimen even further, and established an alternative practice in New York-an act of great courage.

Needless to say, he has been denounced by "quack-busters." He would seem like an easy target-the very fact that his mentor was a dentist rather than an M.D. is bound to arouse skepticism. What is different about Gonzalez is that his success in treating cancer, especially pancreatic cancer, regarded as a death sentence, has made the FDA and the National Cancer Institute take notice.

Pancreatic cancer is so deadly that most patients treated with conventional treatments die within months. Only a quarter survive for one year. Only 10% live for two years. In a recent study using gemcitabine, not a single patient survived longer than 19 months, Gonzalez pointed out. But in a pilot study, 81% of Gonzalez's stage IV pancreatic cancer patients were still alive at the end of the first year, 45% after two years, and 36% after three years. Two of the patients have now lived longer than four years. In fact, outside of the study, Gonzalez has seen some of his pancreatic cancer patients survive for more than five years. Consequently, a controlled clinical trial is now being conducted at the Columbia Medical Center in New York to compare the effectiveness of his holistic regimen with that of the drug gemcitabine. Forty-five patients have been assigned to the holistic/enzyme treatment, and 45 to chemotherapy. Because pancreatic cancer is so lethal, results become apparent quickly, and the number of subjects in each group can be relatively small.

Dr. Gonzalez is being taken seriously at last. In fact, he sees a tremendous change in attitude on the part of agencies such as the FDA, National Cancer Institute, and National Institutes of Health. "There's change in the air," Gonzalez said; the FDA was

Interested and cooperative.

Unlike his predecessors, who relied on intravenous injections of pancreatic enzymes, Gonzalez uses an oral pancreatic extract. He explained that a Russian study found that pancreatic enzymes are not destroyed by stomach acid. In fact, he does not believe in enteric coating, since it produces unreliable absorption. His most interesting discovery, however, is that a less purified extract produces better results, suggesting that "other pancreatic products probably synergize with trypsin and chymotrypsin."

He isn't sure how the extract works. There are probably several mechanisms. The enzymes and cofactors probably enhance immune function, and inhibit the development of new blood vessels (angiogenesis) that feed the growing tumor. One of the mechanisms may be a direct attack on cancer cells: "pancreatic enzymes dissolve the cell membranes and the cancer cells spill their guts," as Gonzalez put it. He acknowledges that much is still not known, and that his is not the only way to treat cancer. Not once did he make the claim of "having the cure for cancer." He captivated the audience by stating, "I am a moderately good technician." He also readily admits that not all his patients survive. Some simply come too late. Some fail to comply with the rigorous program.

Gonzalez uses an extract of pork pancreas, since the pork pancreas is most like the human pancreas. The extract contains a mix of active enzymes and their precursors such as trypsinogen and chymotrypsinogen. Purified trypsin can cause gastritis, Gonzalez warned.

As for the imported freeze-dried porcine pancreatic extract he prescribes for his cancer patients, he cannot make it commercially available because of FDA restrictions against commercialization while being involved in an ongoing study, Gonzalez explained. He suggested that German-made Wobenzym could be used instead. The dosage varies, and is taken on an empty stomach in divided doses, including in the middle of the night, since Dr. Gonzalez believes in maintaining high blood levels of the enzymes round the clock. The patients also follow an individualized diet and supplement regimen. They take up to 160 pills a day. It does take dedication.

Dr. Gonzalez also places great importance on balancing the autonomic nervous system. Patients who have solid tumors tend to sympathetic dominance, Gonzalez claims. They are chronically geared for the "fight or flight" stress response, with relatively weak parasympathetic "rest and digest" functions. Sympathetic dominance can be assessed using the heart rate variability test, with high variability indicating excessive sympathetic activity; other markers can be used as well. The sympathetic nervous system can also be called excitatory; persons with high sympathetic activity come across as "excitable." Sympathetic-dominant patients tend toward excess acidity and calcium deposits in soft tissue.



The way to balance sympathetic-dominant patients' autonomic nervous system is through an alkalizing diet (lots of fresh vegetables and other potassium-rich foods), alkalizing supplements such as magnesium (Gonzalez emphasizes magnesium rather than calcium in the case of solid tumors), and relaxation and meditation (stress is acidifying). "The most important factor is the patient's state of mind," Gonzalez stated. Relaxation activates the parasympathetic system, decreasing stress-related chemicals, nourishing and detoxifying tissue, improving liver and pancreatic function. The levels of enzymes go up, and acidity decreases.

(Incidentally, the last speaker at the conference, JoAnne Whitaker, expressed the view that all healing takes place in the parasympathetic state of relaxation and regeneration. "For healing to happen, the person has to shift from sympathetic to parasympathetic dominance," Whitaker said. The idea of preventing acidosis with an alkalizing diet, magnesium supplements, and stress reduction has also been gaining ground.)

Dr. Gonzalez is also known for his success with colon, and breast cancer, as well as melanoma. One of his metastatic breast cancer patients is still alive 12 years after beginning the program. By contrast, life expectancy in stage IV breast cancer patients treated with chemotherapy and radiation is one to two years. Likewise, one stage IV melanoma patient who was given only six months to live is still alive after 14 years, and is working full-time in his second career.

Breast cancer patients should supplement with magnesium, vitamin K and vitamin D. Magnesium is a natural block against excessive influx of calcium ions into the cells, common when the sympathetic nervous system is overactive. Vitamin D has been documented to lower the risk of breast cancer. In its active form, called D3 or calcitrol, it is a hormone that regulates the absorption of calcium from the intestine into the blood and its deposition into the bone. Vitamin K has been shown to help keep calcium out of soft tissue. Dysfunctional calcium metabolism, and calcium deposition inside soft tissue rather than bone, are associated with aging and various aging-related disorders, including cancer.

Plant-derived enzymes such as bromelain and papain have anti-inflammatory activity, but they do not fight cancer, Gonzalez

warned.

Can pancreatin be used for the prevention of cancer? Dr. Gonzalez believes it can. He himself takes enzymes with meals, to decrease the burden on his pancreas and prevent aging-related enzyme deficiency.

Vitamin K helps prevent vascular calcification, improves bone quality

Richard Wood, Ph.D., is a researcher from Tufts University in Boston, where he directs the Mineral Bioavailability Laboratory at the USDA Human Nutrition Center on Aging. Dr. Wood presented an overview of the data concerning the newly discovered importance of vitamin K in regulating calcium metabolism and preventing both bone fractures and vascular and other soft-tissue calcification.

Until recently, vitamin K has been seen strictly as a pro-clotting factor, Wood pointed out. It regulates prothrombin, Factors VII, IX and X. But it is the newly discovered importance of vitamin K in regulating calcium deposition that makes it one of the key players in anti-aging protocols, especially in view of the fact that we tend to become increasingly deficient in vitamin K as we age. Postmenopausal women show lower levels of carboxylated osteocalcin compared to premenopausal levels, indicating a vitamin K deficiency.

Poor vitamin K status has been found to raise the risk of a heart attack 2.4 times-as much as smoking, Wood pointed out. The most likely reason is that vitamin K helps prevent vascular calcification. Wood explained that vitamin K is a limiting factor in the carboxylation of various bone-regulating proteins that help prevent bone formation in the wrong places, including the middle layer of the arterial wall.

Vitamin K was discovered to be a cofactor in the chemical reaction that adds the carboxyl group (COOH) to glutamate, making it possible for bone-regulating proteins such as osteocalcin to bind calcium. Osteocalcin is produced in the osteoblasts, cells that create new bone. It should be noted, however, that osteocalcin and related proteins have been found not only in bone, but also in soft tissue the brain, pancreas, and lungs. The speaker mentioned that one of the important vitamin K-dependent proteins is the matrix Gla protein, a potent inhibitor of soft-tissue calcification when it is sufficiently carboxylated.



In Japan, vitamin K has been approved for the treatment of osteoporosis, in combination with vitamin D3. Several epidemiological studies have found a significant increase in the risk of fractures associated with vitamin K deficiency. In particular, Wood cited the Framingham Heart Study. Those in the highest quartile of vitamin K intake showed a 65% reduction in hip fractures compared with those in the lowest quartile. In other words, those consuming the most vitamin K had only about a third of the hip fractures of those consuming the least vitamin K.

Wood emphasized, however, that studies have not found any effect of dietary intake of vitamin K on mineral bone density. A study of bone markers in Japanese children has strongly suggested that vitamin K, which increases levels of carboxylated osteocalcin, affects primarily bone quality, which translates into resistance to fracture, rather than mineral density.

Vitamin K intake was also found to be inversely correlated with aortic calcification, an important predictor of heart attack risk. Patients whose aortic calcification was evident in X-ray images had more undercarboxylated osteocalcin, indicating poor vitamin K status. Poor vitamin K status has been found to triple the risk of severe vascular calcification, Wood stated. Deficiency of vitamin K leads to undercarboxylation, and hence inactivity of bone-regulating proteins such as matrix Gla protein, resulting in soft-tissue calcification. And the greater the degree of calcification, the greater the risk of a heart attack.

Warfarin (Coumadin), an anticoagulant, depletes vitamin K and causes severe vascular calcification in rats. Bisphosphonate drugs can prevent this harmful side effect. Coumadin patients cannot take vitamin K supplements and are even told to avoid foods rich in vitamin K.

Though the speaker did not go into the neuroprotective role of vitamin K, it is worth noting that some researchers think that supplementing with vitamin K may help prevent Alzheimer's disease and ward off stroke. This is due to the ability of vitamin K to reduce neuronal damage by protecting the vascular system, guarding against inflammation and blocking excess infiltration of calcium into brain cells. Vitamin K is also involved in regulating important brain enzymes and growth factors. It seems that we are discovering more and more functions of this remarkable anti-aging vitamin.

Vitamin K from supplements is more bioavailable than dietary vitamin K, Wood pointed out. Since vitamin K is fat-soluble, it's a good idea to add olive oil (itself a source of vitamin K) or another healthy fat when you eat dark green vegetables such as spinach,

broccoli, kale, green cabbage, brussels sprouts or lettuce (even pale lettuce such as iceberg supplies some vitamin K). Green plants supply the form of vitamin K called phylloquinone, or vitamin K-1. Our intestinal bacteria convert K1 to K2, or menaquinone (actually there are several menaquinones), the active hormonal form. Some menaquinone is also found in fermented products such as cheese or natto, a fermented soybean product, and in liver, meat and egg yolk.

As has been jocularly observed, as we age, we turn to stone. We calcify. More accurately, our arteries and organs calcify, while our bones decalcify. Vitamin K is an essential resource against this pathology of aging.

The role of dysregulated calcium metabolism in aging-related degenerative disorders, as well as the corrective role of magnesium, vitamin D and vitamin K, is finally beginning to get much-deserved attention. Supplementation with calcium alone is obviously not enough; some think it might even be harmful. It is critical to help the aging body control calcium. Vitamin K is the latest addition to our arsenal.

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### Stress and brain aging

David Perlmutter, M.D., the medical director of Perlmutter Health Center, is currently involved in research at the National Parkinson's Disease Foundation, studying the effectiveness of glutathione treatment in Parkinson's disease. He is also widely known as an author and lecturer on the broader subject of brain aging and regeneration. At this conference, he presented a lecture on the effects of chronically elevated cortisol on the hippocampus, an area of the brain important in the formation of memory, as well as in the regulation of the hypothalamic-pituitary-adrenal (HPA) axis.



In a dramatic slide, the audience saw the neuroprotective effects of cortisol reduction. Aged rats whose cortisol was kept down through adrenalectomy showed no more damage in their hippocampus than young rats, in sharp contrast to intact aged rats. Perlmutter also pointed out that dominant monkeys do not suffer the kind of hippocampal atrophy that is seen in subordinate monkeys. Humans with pathologically elevated cortisol, such as the victims of Cushing's syndrome, have overactive adrenals, and show much more cognitive decline than individuals with lower cortisol levels. Likewise, Alzheimer's disease patients show elevated levels of cortisol in their cerebrospinal fluid; in these patients, the degree of hippocampal atrophy accurately reflects cognitive decline.

How does cortisol damage the hippocampus? Perlmutter explained that glucocorticoids (cortisol is our main glucocorticoid hormone) increase levels of glutamate, an excitatory neurotransmitter. Excess glutamate causes neural mitochondria to produce defective ATP (ATP, adenosine triphosphate, is our energy molecule). This defective ATP eliminates the "magnesium block" guarding the neuron against excess influx of calcium ions, followed by generation of free radicals and cell damage or cell death.

Elevated evening cortisol indicates damage to the HPA axis. Evening cortisol elevation is related to sleep fragmentation (frequent awakenings) and less REM sleep. Even modest elevation in cortisol has been found to correlate with memory deficit. Unfortunately, our cortisol levels increase with aging, a problem that definitely needs to be addressed by anti-aging medicine.

Women who have been raped show higher cortisol, Perlmutter said. Likewise, stress in childhood may set the HPA axis at an over-reactive level, so that the individual reacts to even minor stressors with an exaggerated cortisol response.

Is there a remedy? Stress reduction has been much talked about, but Perlmutter thinks that we need to go beyond that, into positive feelings, including love. Supplements that have been shown to reduce cortisol levels are 4000 mg a day of vitamin C and DHEA.

We also need to stimulate neurogenesis in order to regenerate the brain. Dr. Perlmutter mentioned that lithium is both neuroprotective and neurotrophic. It inhibits neuronal death induced by beta amyloid. Lithium users were also found to have significant increases in gray matter. Stimulation of the vagus nerve also increases neurogenesis. On a practical level, physical exercise, which improves circulation and tends to lower emotional stress, also promotes neurogenesis.

Meditation, positive emotions and physical exercise are all effective tools in protecting the brain, and especially the hippocampus, against the deadly effects of chronic stress.

Magnesium, lipoic acid and flavonoids help protect against excitotoxicity

Russell Blaylock, M.D. assistant professor at the University of Mississippi Medical Center and a retired neurosurgeon, spoke about ways to protect the aging brain with diet and supplements. Because of its high (60%) content of polyunsaturated fat and high metabolism, the brain is especially vulnerable to damage. One mechanism of damage is called excitotoxicity. This term describes a process during which excessive extracellular glutamate promotes excessive influx of calcium ions into nerve cell, inducing a generation of free radicals, lipid peroxidation, and inflammation. This so-called excitotoxic cascade leads to damage and even cell death.

Fortunately, we know that magnesium is a natural calcium antagonist, and helps protect the neurons against excitotoxicity. Low levels of magnesium have been found in the hippocampus of Alzheimer's disease patients. Magnesium deficiency is extremely common.

Magnesium protects the brain in other ways as well: it lowers blood pressure and helps prevent atherosclerosis, and thus the risk of stroke. Magnesium also helps increase glutathione levels; magnesium deficiency has been found to cause a drastic decrease in glutathione. Glutathione, our key cellular antioxidant, is enormously important in defending neurons against free-radical damage. Besides magnesium, lipoic acid, acetyl-cysteine, vitamin C, and various flavonoids increase glutathione levels.

A diet high in antioxidants is also highly recommended. The catechins found in green tea are highly neuroprotective, as are the flavonoids found in blackberries, blueberries, cranberries and berries in general, in prunes and raisins, as well as deep green vegetables such as kale and spinach. Quercetin, found in tea, onion and apples, has been found to inhibit the initiation of the inflammatory cascade. Quercetin also powerfully inhibits the production of peroxynitrite.

Ginkgo has also been found to be very neuroprotective, improving circulation and increasing glucose uptake.

Other vitamins and nutrients that protect the brain include CoQ10, acetyl-L-carnitine, vitamin C (which helps control brain glutamate), vitamin E, and the anti-inflammatory omega-3 fats, especially DHA, found in fish oil. Phosphatidylserine also helps block glutamate excitotoxicity.

Dr. Blaylock is the author of *Excitotoxins: the Taste that Kills*, a book warning the public about MSG and aspartate.

Flavonoids synergize with antioxidants to fight cancer and heart disease

Jeffrey Blumberg, Ph.D., Associate Director and Chief of the Antioxidant Research Laboratory at the USDA Nutrition Research Center on Aging at Tufts University in Boston, presented a fascinating lecture that explained the puzzling contradiction in many studies on phenolic compounds found in fruits, vegetables, tea, coffee, chocolate, red wine and other plant-derived food products.

Over 4,000 flavonoids have been identified, including anthocyanins found in fruits and flowers; flavans, also known as catechins and found in tea; flavones such as apigenin, luteolin and tangeretin; flavonols such as quercetin, myricetin, and kaempferol; and isoflavones, including soy isoflavones, genistein and daidzein, and equol, a metabolite of daidzein produced by the intestinal flora.

Certain flavonoids have been shown to have anti-viral as well as an anti-cancer activity. They can also suppress the growth of new blood vessels by tumor tissue (anti-angiogenic activity) and inhibit adhesion molecules. Many flavonoids chelate iron, help prevent blood clots, and show anti-inflammatory and antioxidant activity. In addition, certain flavonoids, such as those found in purple grape juice, can improve blood flow; pycnogenol has been shown to lower blood pressure in mild hypertension.

Epidemiological research has found that high consumption of phenolics is associated with lower cardiovascular disease, cancer, osteoporosis and Alzheimer's disease. Most notably, a well-known Dutch study found a 50% reduction in cardiovascular disease in subjects who consumed the most flavonoids, mainly those found in apples, onions and black tea. Likewise, Japanese studies found a 50% reduction in coronary stenosis (narrowing of coronary arteries) in patients who drank four or more cups of green tea a day. Some in-vitro studies on isolated flavonoids, however, have found no effect. The main reason for this, Blumberg argued, is that phenolic compounds act in synergy with other antioxidants such as vitamins E and C. The resulting synergy can provide powerful protection against disease.

To support his thesis, Blumberg presented the findings of studies done at Tufts University, investigating the protection of LDL cholesterol against oxidation. Oxidized LDL cholesterol plays a huge role in atherogenesis, Blumberg stated. It promotes inflammation and stimulates the proliferation of smooth muscle cells. Of the flavonoids tested, quercetin, luteolin, and epigallocatechin gallate (found in green tea) showed the highest ability to protect LDL cholesterol, especially when combined with vitamins C and E.

Blumberg also tested oat extract. It turned out that oat extract provided no antioxidant protection when used by itself. However, when vitamin E was added, its action was 20% to 36% more effective; there was even more synergy with vitamin C. Similarly, almond-skin extract, a rich source of quercetin and other polyphenols, was found to be an excellent LDL protector when combined with a small amount of vitamin E.



Actually, it has been known since the 1930s that flavonoids enhance the action of vitamin C. Yet, it is only now that we are beginning to grasp the essence of this synergy. In the body, antioxidants operate within networks rather than by themselves. The reason is that in the process of donating electrons to the harmful free radicals, antioxidant compounds themselves become oxidized, and need another antioxidant to restore them to the reduced state. Thus, the synergy of an antioxidant network comes from its ability to maintain its components in an antioxidant state much longer.

The idea of synergy in general has been gaining ground. More and more studies show that two or more compounds tend to be more potent than a single compound. This applies even to combinations of chemotherapy drugs and with natural anti-cancer compounds. Thinking in terms of a single "magic bullet" is rapidly becoming obsolete.

On the practical level, Blumberg warned that iced tea is less potent than strong hot tea. The research at Tufts discovered that iced tea that has been left in the refrigerator for more than one day, and bottled tea that has been sitting on the shelf, have no health benefits. The flavonoids in these beverages have become oxidized and no longer have any antioxidant activity.

Blumberg was honored with an ACAM award for his work on flavonoids.

### **Arthritis update: Glucosamine doesn't cause insulin resistance**

Jason Theodosakis, M.D., Assistant Professor at the University of Arizona College of Medicine, presented an update on holistic treatment of arthritis. One important point was the effectiveness of anti-inflammatory enzymes such as bromelain and papain. Another was the speaker's rebuttal of the unfounded belief that glucosamine causes insulin resistance. An indirect proof that it does not was provided by a three-year study published in *Lancet*. Patients taking glucosamine actually had lower serum glucose than controls. Furthermore, rats given glucosamine showed no increase in insulin resistance, and had lower blood pressure than controls.

Glucosamine has a wide range of benefits, including suppression of interleukin-1 and interleukin-6. Glucosamine also suppresses the TNF alpha-induced production of nitric oxide in chondrocytes (cartilage-producing cells). It inhibits matrix metalloproteinases, enzymes that dissolve cartilage.

The popular COX-2 inhibiting drug Vioxx, according to Theodosakis, has been shown to lead to further joint deterioration. X-ray studies reveal dose-dependent cartilage loss with long-term use. A 25 mg dose produced greater damage than a 12.5 mg dose.

Theodosakis also mentioned the benefits of niacinamide, a form of niacin, in the treatment of arthritis. Niacinamide appears to inhibit pro-inflammatory interleukin-1.

The speaker also recommended exercise. "People who have good leg muscles have less knee arthritis; the muscles act as shock absorbers," Theodosakis explained. Also, the right exercise, such as working out on a stationary bicycle, stimulates chondrocytes to produce more cartilage.

Don't sit for long periods of time without taking a break, the speaker warned. He explained "the movie goer's knee"-When the knee stays bent for too long, there is insufficient blood flow to the knee, and insufficient circulation of synovial fluid.

As Dr. Gonzalez stated, "There is change in the air." Mainstream medicine can no longer afford to dismiss the ever-growing research on the effectiveness of natural therapies. Much more needs to be done; but at least the research has begun, as seen, for instance, in the excellent presentations of the speakers from Tufts University. Other outstanding presentations included Dr. Gonzalez's own lecture on the use of enzymes, nutrition, autonomic balancing and supportive supplements in the treatment of cancer. Dr. Perlmutter likewise excelled as usual, explaining how chronic stress and elevated cortisol levels lead to hippocampal atrophy and cognitive decline.

It is not easy to summarize a conference as rich in information as this Spring's ACAM convention. For one thing, the information tends to get more complex the more is discovered about human physiology, the aging processes and diseases such as cancer. It is important that both physicians and the public keep up with this growing body of knowledge. ACAM is a leader in providing this kind of education to physicians.

## References

- Arif JM, et al. 2000. Inhibition of cigarette smoke-related DNA adducts in rat tissues by indole-3-carbinol. *Mutat Res* 452:11-18.
- Bell MC, et al. 2000. Placebo-controlled trial of indole-3-carbinol in the treatment of CIN. *Gynecol Oncol* 78:123-9.
- Bohlke K, et al. 1999. Vitamins A, C and E and the risk of breast cancer: results from a case-control study in Greece. *Br J Cancer* 79:23-9.
- Bosetti C, et al. 2000. Fraction of prostate cancer incidence attributed to diet in Athens, Greece. *Eur J Cancer Prev* 9:119-23.
- Caltagirone S, et al. 2000. Flavonoids apigenin and quercetin inhibit melanoma growth and metastatic potential. *Int J Cancer* 87:595-600.
- Chandra RK. 1984. Excessive intake of zinc impairs immune responses. *JAMA* 252:1443-6.
- Chaumontet C, et al. 1997. Flavonoids (apigenin, tangeretin) counteract tumor promoter-induced inhibition of intercellular communication of rat liver epithelial cells. *Cancer Lett* 114:207-10.
- "Do Not Use Celecoxib (CELEBREX) and Rofecoxib (VIOXX) for arthritis-the misnamed and overpriced 'super aspirins'". *Worst Pills, Best Pills News*. Washington, DC: April 2001; 27.
- Dubois RN. 2000. Review article: cyclooxygenase-a target for colon cancer prevention. *Alimet Pharmacol Ther* 14 Suppl 1:64-7.
- Duchateau J, et al. 1981. Beneficial effects of oral zinc supplementation on the immune response of old people. *Am J Med* 70:1001-4.
- Egner PA, et al. 2001. Chlorophyllin intervention reduces aflatoxin-DNA adducts in individuals at high risk for liver cancer. *Proc NY Acad Sci USA* 98:14601-6.
- Elkin AC, et al. 2000. Folic acid supplements are more effective than increased dietary folate intake in elevating serum folate levels. *Br J Obstet Gynaecol* 107:285-9.
- Fong LY, et al. 1987. Zinc-deficiency and the development of malignant lymphoma in rats given a single intragastric dose of N-methyl-N-nitrosourea. *IARC Sci Publ* 84:261-3.
- Fraker PJ, et al. the dynamic link between the integrity of the immune system and zinc status. *J Nutr* 130(5S Suppl):1399S-06S.
- Gann PH, et al. 1999 Lower prostate cancer risk in men with elevated plasma lycopene levels: results of a prospective analysis. *Cancer Res* 59:1225-30.
- Giovannucci E, et al. 1998. Multivitamin use, folate and colon cancer in women in the Nurses' Health Study. *Ann Int Med* 129:517-24.
- Guengerich F, et al. 1991. Cytochrome P-450 oxidations and the generation of biologically reactive intermediates. *Biological Reactive Intermediates IV*, 1991, Plenum Press, New York.
- Hatherill JR. *Eat to Beat Cancer*. Renaissance Books: Los Angeles. 1998.
- Regenstein L. *America the Poisoned*. Acropolis Books Ltd.: Washington, DC. 1983.
- Guyton KZ, et al. 1993. Oxidative mechanisms in carcinogenesis. *British Med Bull* 49:523-44.
- He YH, et al. 2000. Indole-3-carbinol as a chemopreventive agent in 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP) carcinogenesis: inhibition of PhIP-DNA adduct formation, acceleration of PhIP metabolism, and induction of cytochrome P450 in female F344 rats. *Food Chem Toxicol* 38:15-23.
- Holland MB, et al. 1995. Estrone-induced cell proliferation and differentiation in the mammary gland of the female Noble rat. *Carcinogenesis* 16:1955-61.
- Hsu JT, et al. 2000. Regulation of inducible nitric oxide synthetase by dietary phytoestrogen in MCF-7 human mammary cancer cells. *Reprod Nutr Dev* 40:11-18.
- Jacobsen BK, et al. 1998. Does high soy milk intake reduce prostate cancer incidence? *The Adventist Health Study (United States)*



[see comments]. *Cancer Causes Control* 9:553-7.

Jin Z, et al. 2002. Soy isoflavones increase latency of spontaneous mammary tumors in mice. *J Nutr* 132:3186-90.

Johnson PW, et al. 1987. Enhanced lytic susceptibility of Ha-ras transformants after oncogene induction is specific to activated NK cells. *J Immunol* 138:3996-03.

Kawaii S, et al. 1999. HL-60 differentiating activity and flavonoid content of the readily extractable fraction prepared from citrus juices. *J Agric Food Chem* 47:128-35.

Kawaii S, et al. 1999. Antiproliferative activity of flavonoids on several cancer cell lines. *Biosci Biotechnol Biochem* 63:896-9.

Liang Y, et al. Suppression of inducible cyclooxygenase and inducible nitric oxide synthase by apigenin and related flavonoids in mouse macrophages. *Carcinogenesis* 20:1945-52.

Li HC, et al. 2000. Green tea polyphenols induce apoptosis in vitro in peripheral blood T lymphocytes of adult T-cell leukemia patients. *Jpn J Cancer Res* 91:34-40.

Lu LJ, et al. 2000. Decreased ovarian hormones during a soya diet: implications for breast cancer prevention. *Cancer Res* 60:4112-21.

Mäkelä S, et al. 1998. Inhibition of 17 $\alpha$ -hydroxysteroid oxidoreductase by flavonoids in breast and prostate cancer cells. *Proc Soc Exp Biol Med* 217:310-16.

McMillan DC, et al. 2000. Changes in micronutrient concentrations following anti-inflammatory treatment in patients with gastrointestinal cancer. *Nutr* 16:425-8.

Michaud DS, et al. 2000. Intake of specific carotenoids and risk of lung cancer in 2 prospective US cohorts [see comments]. *Am J Clin Nutr* 72:990-97.

Mills PK, et al. 1989. Cohort study of diet, lifestyle and prostate cancer in Adventist men. *Cancer* 64:598-04.

Miodini P, et al. 1999. The two phyto-estrogens genistein and quercetin exert different effects on oestrogen receptor function. *Br J Cancer* 1150-55.

Nakachi K, et al. 1998. Influence of drinking green tea on breast cancer malignancy among Japanese patients. *Jpn J Cancer Res* 89:254-61.

Noroozi M, et al. 1998. Effects of flavonoids and vitamin C on oxidative DNA damage to human lymphocytes. *Am J Clin Nutr* 67:1210-17.

Ong T, et al. 1989. Comparative antimutagenicity of 5 compounds against 5 mutagenic complex mixtures in *Salmonella typhimurium* strain TA98. *Mutat Res* 222:19-25.

Otsuka T, et al. 1998. Growth inhibition of leukemic cells by (-)-epigallocatechin gallate, the main constituent of green tea. *Life Sci* 63:1397-403.

Parazzini F, et al. 2000. Population attributable risk for ovarian cancer. *Eur J Cancer* 36:520-4.

Porrini M, et al. 2000. Lymphocyte lycopene concentration and DNA protection from oxidative damage is increased in women after a short period of tomato consumption. *J Nutr* 130:189-92.

Post JFM, et al. 1992. Growth inhibitory effects of bioflavonoids and related compounds on human leukemic CEM-C1 and CEM-C7 cells. *Cancer Lett* 67:207-13.

Reddy KB, et al. 1999. Mitogen-activated protein kinase (MAPK) regulates the expression of progelatinase B (MMP-9) in breast epithelial cells. *Int J Cancer* 82:268-73.

Sadakata S, et al. 1992. Mortality among female practitioners of Chanoyu (Japanese "tea-ceremony"). *Tohoku J Exp Med* 166:475-77.

Schechter A, et al. 1997. Dioxins, dibenzofurans, dioxin-like PCBs, and DDE in U.S. fast food, 1995. *Chemosphere* 34:1449-57.

Seo YR, et al. 2002. Selenomethionine induction of DNA repair response in human fibroblasts. *Oncogene* 21(23):3663-9.

Sharpe CR, et al. 2000. Nested case-control study of the effects of non-steroidal anti-inflammatory drugs on breast cancer risk and stage. *Br J Cancer* 83:112-20.

Shao Z, et al. 1998. Genistein exerts multiple suppressive effects on human breast carcinoma cells. *Cancer Res* 58:4851-57.

Slattery ML, et al. 2000. Carotenoids and colon cancer. *Am J Clin Nutr* 71:575-82.

Smith ML, et al. 2000. The effect of non-steroidal anti-inflammatory drugs on human colorectal cancer cells: evidence of different mechanisms of action. *Eur J Cancer* 36:664-74.

Smith WA, et al. 2001. Effect of chemopreventive agents on DNA adduction induced by the potent mammary carcinogen dibenzo[a]pyrene in the human breast cells MCF-7. *Mutat Res* 480:97-108.

Solomons NW. 1996. Plant sources of vitamin A and human nutrition: renewed strategies. *Nutr Rev* 54:89-91.

Song J, et al. Chemopreventive effects of dietary folate on intestinal polyps in *Apc+/-Msh2-/-* mice. *Cancer Res* 60:3191-9.

Voorrips LE, et al. 2000. A prospective cohort study on antioxidant and folate intake and male lung cancer risk. *Cancer Epidem Biomarkers Prev* 9:357-65.

Zhang S, et al. 1999. A prospective study of folate intake and the risk of breast cancer. *JAMA* 281:1632-7.

Zhang S, et al. 1999. Dietary carotenoids and vitamins A, C, and E and risk of breast cancer. *J Natl Cancer Inst* 91:547:56.

Zhou J, et al. 2002. Inhibition of orthotopic growth and metastasis of androgen-sensitive human prostate tumors in mice by bioactive soybean components. *Prostate* 53:743-53.

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