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In The News

Curcumin Exhibits Strong Anti-Cancer Effects

Several chemical compounds based on curcumin have demonstrated very promising anti-cancer activity in the laboratory, according to reports from scientists at Emory University in Atlanta.* Curcumin is a bioactive compound present in turmeric, best known as the canary-yellow spice that forms the basis of Indian curry dishes.

Known to exhibit powerful anti-cancer, anti-inflammatory and antioxidant properties, curcumin may reduce the risk of cancer, heart disease, and Alzheimer's disease, among other disorders. In laboratory tests performed at the National Cancer Institute (NCI), at least nine of more than a dozen laboratory-created curcumin analogs showed "a moderate degree of anti-cancer activity," according to the Emory researchers. Three of the new curcumin derivatives "exhibited a high degree of cytotoxicity" in testing performed at NCI. These same analogs inhibited tumor cell growth better than cisplatin, a commonly used chemotherapy drug.

In laboratory tests performed at Emory, eight of the new compounds exhibited "a high degree" of anti-cancer activity, including effectiveness at preventing or interfering with angiogenesis, the process by which tumors supply themselves with nutrients that fuel their growth. Anti-angiogenic activity is of special interest to oncologists, because eliminating the vessels that supply blood to a tumor effectively strangles the tumor while preventing damage to surrounding tissues.

Of the numerous potentially effective synthetic compounds tested, the researchers deemed one especially promising. Tested on live mice bred to serve as human breast cancer models, the chemical was well tolerated by the rodents and effectively reduced the size of the animals' tumors. Researchers believe that this curcumin analog may be a candidate for development as a new anti-cancer drug.

—Dale Kiefer

Reference

* Adams BK, Ferstl EM, Davis MC, et al. Synthesis and biological evaluation of novel curcumin analogs as anti-cancer and anti- angiogenesis agents. Bioorg Med Chem. 2004 Jul 15;12(14):3871-83.

Lactoferrin Shows Unique Bone-Building Activity

Researchers in New Zealand have shown that the lactoferrin is uniquely able to increase the proliferation of human osteoblast cells, which are crucial to building bone.* Their findings may hold enormous significance in preventing and treating osteoporosis, a metabolic bone disease that is considered difficult to treat.

Lactoferrin, a secretory protein found in milk, saliva, nasal and gastrointestinal secretions, and other sources, is thought to provide broad-spectrum defense against bacteria, fungi, protozoa, and viruses. Lactoferrin exhibits immunomodulatory, anti-inflammatory, anti-tumorigenic, and anti-infective activity, and also promotes wound healing.

Osteoblasts are bone cells that promote bone growth, while osteoclasts counter osteoblast activity by regulating the resorption or breakdown of bone. Traditional treatments for osteoporosis inhibit bone resorption but do not stimulate bone growth. Researchers at the University of Auckland, New Zealand, have found that when nourished with lactoferrin at physiological concentrations in vitro, human osteoblast-like cells undergo increased proliferation and reduced cell death, while osteoclast proliferation is diminished. Lacto-ferrin also exhibits these effects more potently than other naturally occurring growth factors. Concen-trations of lactoferrin in excess of physiological levels stimulate osteoblast proliferation

even more, up to a factor of five times, and reduce cell death by up to 70%. Lactoferrin is a prominent component of whey protein and may also be obtained in synthetic form that is bioidentical to human lactoferrin.

The researchers believe that lactoferrin's role in promoting the physiological growth of bone holds important implications for preventing and slowing the progression of osteoporosis, which afflicts some 20 million American adults, often leading to crippling or fatal hip fractures.

—Linda M. Smith, RN

Reference

* Cornish J, Callon KE, Naot D, et al. Lactoferrin is a potent regulator of bone cell activity and increases bone formation in vivo. Endocrinology. 2004 Sep;145(9):4366-74.

Vitamin K2 Intake Reduces Heart Disease Risk

Researchers from the Netherlands have found that increased dietary intake of vitamin K2 is associated with a lower risk of coronary heart disease.

The scientists sought to test the hypothesis that vitamin K deficiency leads to increased calcification of atherosclerotic lesions, thereby raising the risk of heart disease. They examined data obtained in the Rotterdam Study, which enrolled 4,983 men and women aged 55 and older from 1990 to 1993. The current study analyzed the dietary data of 4,807 participants with no history of heart attack, and followed them until 2000.*

While levels of both vitamin K1 (phylloquinone) and vitamin K2 were associated with beneficial high-density lipoprotein (HDL), only vitamin K2 was also associated with a decrease in total cholesterol. Compared to those whose vitamin K2 intake was in the lowest third of all participants, subjects whose intake was in the top third had a 41% reduction in fatal and nonfatal heart attacks, sudden cardiac deaths, and other forms of ischemic heart disease. Mortality from both coronary heart disease and all causes was significantly reduced for those with the highest vitamin K levels. Additionally, severe aortic calcification was decreased in those with high vitamin K2 intake, while low vitamin K intake was associated with an increased risk of dying from coronary heart disease.

The study results suggest that vitamin K2 helps protect against coronary heart disease in older adults without increasing the risk of other diseases, as demonstrated by the decrease in all-cause mortality associated with higher vitamin K2 intake.

—Dayna Dye

Reference

* Geleijnse JM, Vermeer C, Grobbee DE, et al. Dietary intake of menaquinone is associated with a reduced risk of coronary heart disease: the Rotterdam Study. Nutr. 2004 Nov;134(11):3100-5.

Supplements Stop Muscle Wasting During Bed Rest

Research on ways to prevent the muscle wasting that plagues astronauts during space flight has led to a new treatment benefiting patients confined to bed rest. Scientists at the University of Texas Medical Branch at Galveston discovered that adding supplemental amino acids and carbohydrates to patients' diets during bed rest prevents loss of muscle mass and strength.*

For their current study, they recruited 13 young, healthy men and randomly assigned them to two groups. One group was fed a normal diet and liquid placebo three times daily, while the second group was fed a normal diet and three supplement-fortified beverages containing essential amino acids and carbohydrates. Both groups were confined to bed rest for 28 days.

By the end of the test period, those receiving supplemental nutrients had retained all of their leg muscle mass, while the control subjects lost an average of one pound of leg muscle. Although all subjects lost some muscle strength, those receiving supplements experienced only half as much loss as the control subjects. Despite nearly a month without exercise, supplemented subjects lost no muscle mass.

The findings may lead to better treatments for elderly patients confined to bed rest, who often lose strength and muscle mass that may be difficult or impossible to recover. Elderly patients usually have less muscle mass than younger, healthier adults, and can ill afford additional losses, which usually prevent a full recovery.

—Dale Kiefer

Reference

* Paddon-Jones D, Sheffield-Moore M, Urban RJ, et al. Essential amino acid and carbohydrate supplementation ameliorates muscle protein loss in humans during 28 days bedrest. J Clin

In The News

Artichoke Extract Relieves Irritable Bowel Syndrome

English researchers have re-ported that the administration of artichoke leaf extract showed impressive results in relieving symptoms of irritable bowel syndrome and dyspesia.*

As many as 20% of adults suffer from irritable bowel syndrome, which is characterized by abdominal discomfort and altered bowel habits such as constipation and diarrhea. Many of those with irritable bowel syndrome also experience functional dyspepsia, which is defined as upper abdominal pain without apparent cause.

Dietary and lifestyle changes remain first-line therapy for two thirds of patients with irritable bowel syndrome. Common treatments—such as bulking agents, anti-spasmodics, and gastric motility agents—may partially or temporarily relieve symptoms, but do not modify the disease itself. Though not a life-threatening condition, irritable bowel syndrome can significantly impact the quality of life in sufferers.

In their study, researchers at the University of Reading, England, enrolled more than 200 adults who were asked about symptoms of irritable bowel syndrome and dyspepsia after two months of treatment with artichoke extract. Improvement in bowel function approaching “normal” occurred in 26% of the subjects, while marked improvements in dyspepsia and quality-of-life scores (41% and 20%, respectively) were also reported. While new drugs are being developed to treat irritable bowel syndrome, the study results suggest that artichoke leaf extract may be a safe, effective alternative to costly prescription medications.

—Linda M. Smith, RN

Reference

* Bundy R, Walker AF, Middleton RW, Marakis G, Booth JC. Artichoke leaf extract reduces symptoms of irritable bowel syndrome and improves quality of life in otherwise healthy volunteers suffering from concomitant dyspepsia: a subset analysis. J Altern Complement Med. 2004 Aug;10(4):667-9.

Glycine May Relieve Insomnia, Gastric Ulcers

A Japanese agricultural products firm, Ajinomoto Co., recently announced that it may develop an insomnia treatment based on the amino acid glycine. According to a report published by Asia Pulse news service, Ajinomoto researchers conducted studies on men and women with sleep difficulties that appear to show that glycine supplementation promotes deep sleep.

Subjects who took three grams of glycine within an hour of bedtime reportedly fell asleep—and exhibited brainwave patterns associated with deep, non-REM sleep—sooner than control subjects who did not supplement. Subjects reported feeling refreshed on waking, with no indication that glycine produced “morning hangover,” a foggy feeling often associated with the use of prescription sleep aids.

Glycine, an amino acid, is known to accumulate in the pineal gland of rodents during sleep,[1] and is believed to play an important role in “disconnecting” the brain from the body during REM (rapid eye movement) sleep cycles.[2] REM is a recurring sleep state characterized by rapid eye movements and vivid dreaming. Previous research has shown that glycine supplementation improves memory and attention in young, middle-aged, and older adults.[3,4]

Glycine has received attention recently as a potential treatment for other maladies. Japanese researchers, for instance, investigated its potential as an anti-bacterial agent for the treatment of antibiotic-resistant H. pylori bacteria, which often infect the stomach lining. H. pylori infection is believed to be an underlying cause of many gastric ulcers. In laboratory experiments, the scientists demonstrated that glycine acted alone to reduce H. pylori infection. When combined with amoxicillin, a common generic antibiotic, glycine reduced by a factor of 10 the amount of amoxicillin needed to kill the troublesome bacteria.[5]

—Dale Kiefer

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Vitamin C Restores Healthy Blood Flow in Smokers

Japanese scientists report that regular consumption of the powerful antioxidant vitamin C may help reverse vasoconstriction, or narrowing of the arteries, in smokers, specifically by targeting the impaired endothelial function that causes this condition.[1]

Smoking boosts oxidative stress and produces vasoconstriction,[2] which may increase the risk of related conditions such as coronary heart disease, heart attack, aortic aneurysm, and stroke.[3] The endothelium, a layer of cells lining the interior of blood vessels, produces coronary-related compounds that regulate vascular tone, such as nitric oxide.[4]

To test vitamin C's effects on coronary health, researchers at Chiba University, Japan, recruited 25 patients, 13 of whom were otherwise healthy smokers and 12 who were nonsmokers. Using a monitoring test known as transthoracic Doppler echocardiography, the team evaluated coronary blood flow in each patient, both while at rest and during moments of increased blood flow. Blood flow and levels of vitamin C were measured at baseline and then at two and four hours following intake of vitamin C.

At the study's onset, blood flow was greatly increased in nonsmokers compared to smokers. However, at the study's end, the smokers' blood flow rates had increased significantly, while the nonsmokers' blood flow was unchanged. The study authors concluded that vitamin C helps relieve the vasoconstriction that can occur in chronic smokers.

—Linda M. Smith, RN

References

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4. Maiorana A, O'Driscoll G, Taylor R, Green D. Exercise and the nitric oxide vasodilator system. Sports Med. 2003;33(14):1013-35.