

## Health benefits of another vitamin E

References to antioxidants often use vitamin E and alpha-tocopherol interchangeably. Yet Nature makes a host of structurally similar tocopherols and generally packages them together. In these mixtures, gamma-tocopherol usually dominates.

Now, Stephan Christen of the University of California, Berkeley and his colleagues report that gamma-tocopherol provides valuable protection from nitrogen oxides, a broad class of reactive compounds that alpha-tocopherol largely ignores. That's important, Christen argues, because the vitamin E sold as a dietary supplement contains primarily alpha-tocopherol.

Christen's team focused on the ability of tocopherols to defuse nitrogen oxides. Outdoors, these compounds play a role in producing acid rain. In the body, many serve as destructive oxidants that can alter DNA and trigger some of the damage caused by inflammation.

Working with simulated cell membranes and low-density lipoproteins from people who had taken different vitamin E supplements, the scientists tested the tocopherols' ability to detoxify peroxynitrite, a nitrogen oxide that appears to be associated with inflammation. Though alpha-tocopherol "eliminates the

oxidant character of the molecule," Christen says, it leaves behind a reactive nitrogen component. "And that's where gamma-tocopherol comes in."

During a follow-up reaction, he observes, "it permanently traps what's left over and still reactive." This tocopherol exhibits a special affinity for reacting with and inactivating nitrogen oxides, he says.

In an as-yet-unpublished study, Christen's team induced inflammation in animals and then watched what happened to tocopherols in the blood. Concentrations of the gamma form dropped quickly, they found. At the same time, certain nitrogenous compounds increased, suggesting that the gamma-tocopherol was trapping nitrogen oxides.

Because consumption of large amounts of alpha-tocopherol appears to push gamma-tocopherol out of the system, both forms should be consumed together, Christen's team argues in the April 1 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

Anders G. Olsson, a physician who studies lipids and atherosclerosis at University Hospital in Linköping, Sweden, agrees. In the March 1 BRITISH MEDICAL JOURNAL, he and a team of European colleagues described their investigation into risk fac-

tors that might explain why Lithuanian men face four times the heart disease mortality of Swedish men the same age.

Neither conventional risk factors—such as blood pressure or cholesterol—nor alpha-tocopherol concentrations differed substantially between the groups. The Lithuanian men, however, did possess significantly lower gamma-tocopherol concentrations in their blood than the Swedes did.

"The new paper [by Christen's group] could explain our findings," Olsson concludes.

Heart disease isn't the only degenerative condition linked to low gamma-tocopherol. Robert V. Cooney's team at the Cancer Research Center of Hawaii in Honolulu has shown in test-tube studies that "gamma-tocopherol pretty well blocks the formation of tumor cells at high doses. It's much more effective than alpha-tocopherol."

On the basis of such findings, Christen's group now suspects that "gamma-tocopherol may be as important as alpha-tocopherol in the prevention of degenerative diseases."

Adds Cooney, "the fact that 75 years after its discovery we still don't understand what vitamin E really does says a lot about the state of this research." Moreover, it "argues that we need to get our vitamin E from natural sources," not synthetic supplements. — J. Raloff

## Historical cache of medicinal plants

To piece together a picture of the way people lived in the past, archaeologists and anthropologists have to do just that—pull together remains and artifacts that have been scattered by animals and the elements. That's why researchers at a meeting of the Society of Ethnobiology in Athens, Ga., last week were impressed to hear a report about a 17th-century medicine kit from the U.S. Southwest: The kit had survived in a dry rock crevice with most of its botanical contents intact.

Mollie S. Toll, an ethnobotanist at the Museum of New Mexico in Santa Fe, and her colleagues scrutinized the unusual collection of bundled stems, roots, and other plant parts contained in a pair of woven baskets. They identified at least 26 different types of nonedible plants, some of which grow far from the baskets' resting place in the Galisteo Basin southeast of Santa Fe.

"It's unusual to have so many plant materials together," says Toll. "Somebody had a list of plants and made sure they got them from a wide range of places."

Whoever it was also seemed to have specialized knowledge of the plants' properties. The baskets included roots from two plants with strong, potentially toxic ingredients: wild iris and what appears to be jimson weed.

Carbon dating of the baskets suggests that the contents are about 350 years old, says Toll. Cultural and historical records suggest how some of the items were used. The baskets held pieces of oshá root (*Ligusticum porteri*), an important multipurpose medicinal plant in the region, skewered on a stick. Bundled leaves of silvery scurf pea (*Psoralea argophylla*), tied with a split yucca leaf, could have been used as a deodorant. A tea from the roots of gayfeather (*Liatris punctata*) is supposed to be good for throat ailments.



Several pieces of bark and root could not be identified, and other items remain a mystery. The baskets included two corn husk packets, one wrapped like a party cracker with most of its contents missing, the other a tamalelike mass of clay and sand.

"It's impressive as a finding," says Richard I. Ford, an ethnobiologist from the University of Michigan in Ann Arbor who specializes in the Southwest. Ford says the baskets probably belonged to native Tewa-speaking people of the region, although Toll says the material could be Spanish in origin. — C. Mlot



Old kit bag: Oblong baskets (left) could have been carried over the shoulder, bandolier-style. A distinctive plaited cap (right) kept the end closed. The baskets contained a diverse assortment of medicinal plants, including large amounts of potent iris root (inset) and conifer bark.