Preventing Heart Attacks with Compound Found in Green Tea

Scientists from Lancaster University and the University of Leeds have found that green tea could hold the key to preventing deaths from heart attacks and strokes caused by atherosclerosis. Their research has been published in the *Journal of Biological Chemistry*.

Scientists have discovered that a compound found in green tea breaks up and dissolves potentially dangerous protein plaques found in the blood vessels. Researchers found that epigallocatechin-3-gallate (EGCG), most commonly associated with green tea, binds to the amyloid fibers of apoA-1. This converts the fibers to smaller soluble

molecules that are less likely to be damaging to blood vessels.

The team is working on finding ways of introducing effective amounts of EGCG into the bloodstream without it being necessary to drink large and potentially harmful quantities of green tea. This could involve modifying the chemical structure of EGCG, making it easier to be absorbed from the stomach and more resistant to metabolism, or developing new methods to deliver the molecule to the plaques.

David Middleton, Professor in Chemistry at Lancaster University, said, "Our results show that this intriguing compound might also be effective against the types of plaques which can cause heart attacks and strokes." Professor Jeremy Pearson, Associate Medical Director at the British Heart Foundation, said, "By engineering the molecule slightly, we might be able to make new medicines to treat heart attack and stroke."

Study Shows Elderberry Compounds Help Minimizing Flu Symptoms

A study by a group of Chemical and Biomolecular Engineering researchers from the University of Sydney's Faculty of Engineering and IT has determined that elderberry fruit can help the fight against influenza.

Conducted by Professor Fariba Deghani, Dr. Golnoosh Torabian, and Dr. Peter Valtchev, the study showed that compounds from elderberries can directly inhibit the virus's entry and replication in human cells, and can help strengthen a person's immune response to the virus.

"Our study has shown that elderberry has a potent direct antiviral effect against the flu virus. It inhibits the early stages of infection by blocking key viral proteins responsible for both the viral attachment and entry into the host cells," said Dr. Golnoosh Torabian.

The researchers used commercially farmed elderberries which were turned into a juice serum and were applied to cells before, during, and after they had been infected with the influenza virus. The phytochemicals from the elderberry juice were shown to be effective at stopping the virus from infecting the cells; however, they were even more effective at inhibiting viral propagation at later stages of the influenza cycle when the cells had already been infected with the virus. "This

observation was significant because blocking the viral cycle at several stages has a higher chance of inhibiting the viral infection," explained Dr. Peter Valtchev. "In addition to that, we identified that the elderberry solution also stimulated the cells to release certain cytokines," said Centre Director, Professor Fariba Deghani. The team also found that the elderberry's antiviral activity can be attributed to its anthocyanidin compounds.

New Study Explains the Molecular Mechanism of Botanical Folk Medicines Used to Treat Hypertension

University of California, Irvine researchers explain the molecular mechanisms of lavender, fennel and chamomile used in treating hypertension. Published in *Proceedings of the National Academy of Sciences (PNAS)*, the study showed that these plants used to lower blood pressure activate a specific potassium channel (KCNQ5) in blood vessels. KCNQ5, together with other potassium channels including KCNQ1 and KCNQ4, is expressed in vascular smooth muscle. When activated, KCNQ5 relaxes blood vessels, making it a logical mechanism for at least part of the

hypotensive actions of certain botanical folk medicines. "We found KCNQ5 activation to be a unifying molecular mechanism shared by a diverse range of botanical hypotensive folk medicines. Lavandula angustifolia, commonly called lavender, was among those studied. We discovered it to be among the most efficacious KCNQ5 potassium channel activators, along with fennel seed extract and chamomile," said Geoff Abbott, Ph.D., professor of physiology and biophysics at the UCI School of Medicine and senior investigator on the study.

"Our discovery of these botanical KCNQ5-selective potassium channel openers may enable the development of future targeted therapies for diseases including hypertension and KCNQ5 loss-of-function encephalopathy," said Abbott.

Flavonoid-Rich Berries, Fruits and Tea Possibly Have Protective Benefits against Alzheimer's

Older adults who consumed small amounts of flavonoid-rich foods, such as berries, apples, and tea, were two to four times more likely to develop Alzheimer's disease and related dementias over 20 years compared with people whose intake was higher, according to a new study led by scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (USDA HNRCA) at Tufts University,USA.

The epidemiological study of 2,800 people aged 50 and older examined the long-term relationship between eating foods containing flavonoids and the risk of Alzheimer's disease (AD) and Alzheimer's disease and related dementias (ADRD). While many studies have looked at associations between nutrition and dementias over short periods of time, the study looked at exposure over 20 years. The findings of the study have been published in the *American Journal of Clinical Nutrition.*

The research team determined that a low intake of three flavonoid types was linked to a higher risk of dementia when compared to the highest intake. Specifically, low intake of flavonols (apples, pears, and tea) was associated with twice the risk of developing ADRD, low intake of anthocyanins (blueberries, strawberries, and red wine) was associated with a four-fold risk of developing ADRD and low intake of flavonoid polymers (apples, pears, and tea) was associated with twice the risk of developing ADRD.

The researchers analyzed six types of flavonoids

and compared long-term intake levels with the number of AD and ADRD diagnoses later in life. They found that low intake (15th percentile or lower) of three flavonoid types was linked to a higher risk of dementia when compared to the highest intake (greater than 60th percentile).

"Tea, specifically green tea, and berries are good sources of flavonoids. A cup of tea a day or some berries two or three times a week would be adequate" said first author Esra Shishtar, who at the time of the study was a doctoral student at the Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy at Tufts University in the Nutritional Epidemiology Program at the USDA HNRCA.

Magnolia Bark Compound Could Help Treat Drug-Resistant Epilepsy

Researchers have found a potential new treatment for epilepsy by turning to traditional Chinese medicine. Tests of extracts from plants used in these ancient remedies led the team to one compound, derived from a magnolia tree that could quell drug-resistant seizures in both fish and mice. The results have been published in *ACS Chemical Neuroscience.*

The team collected 14 plants used in traditional Chinese medicine anti-seizure remedies. They then tested the plants' extracts in two types of zebrafish with epileptic-like seizures, one of which could respond to conventional anti-seizure medications, whereas the other type could not. Only extracts from the bark of Magnolia Officinalis, a tree native to China, reduced seizure-like behavior in both types of fish. In tests with mice, the researchers found that the magnolia bark's most potent anti-seizure compound, magnolol, reduced the rodents' otherwise drug-resistant seizures. It and similar compounds in magnolia bark could provide a starting point for the development of treatments for resistant epilepsy, according to the researchers.

Coffee Consumption Can Potentially Slow Colon Cancer

A new research finds that a few cups of coffee a day can help in slowing the progression of colon cancer. Of the nearly 1,200 patients in the study, those who drank four or more cups of java daily had 36% higher odds of surviving during the 13-year study period. The findings were published in *JAMA Oncology.*

"Our study found that patients being treated with chemotherapy for metastatic colorectal cancers who drank coffee saw a long period of time before both growth of their cancer and before death," explained study co-lead author Christopher Mackintosh, a fourth-year medical student at the Mayo Clinic School of Medicine in Phoenix. All the participants were part of a larger cancer treatment study conducted between 2005 and 2018. During that time, food and beverage intake were noted.

Researchers found that the more coffee consumed, the greater the survival benefit. Mackintosh noted that patients who consumed up to a single cup of coffee per day tended to survive 30 months post-diagnosis. But those who drank two or three cups daily survived 32 months. And those who consumed four or more cups a day saw their survival shoot up to 39 months. Also, those who drank between two and three cups per day saw their disease status worsen more slowly than those who drank a cup or less. Similarly, disease progression slowed down even more among patients who routinely drank four or more cups of coffee daily.

"For the time being, I would suggest those who enjoy drinking coffee continue to do so, and I would not suggest that those who do not drink coffee begin doing so for perceived health benefits," Mackintosh said.