

### How the famed fruit protects the brain

An apple a day keeps the doctor away, as the saying goes. And not just any doctor. An apple a day may help keep the neurologist away -- along with the cognitive decline that often accompanies ageing and neurodegenerative diseases like Alzheimer's and Parkinson's.

Food scientist Chang Y. Lee recently found that a nutrient in apples can protect rat brain cells from damage. The nutrient, an antioxidant called quercetin, provided even more protection than Vitamin C, which is known to combat neurodegenerative diseases in humans.

Quercetin belongs to a group of substances getting a lot of attention these days -- flavonoids. These are naturally occurring chemical compounds that help give plants their colour. Most flavonoids, as well as certain vitamins and minerals, are potent antioxidants; they neutralise harmful free radicals of oxygen, produced when cells burn oxygen for energy. If left unchecked, free radicals cause cumulative cell damage that may lead to cancer or, in the case of brain cells, Alzheimer's, Parkinson's or other age-related mental decline.

"Quercetin has much higher antioxidant activity compared to other flavonoids and Vitamin C," says Lee. His work has shown that not only may quercetin help brain cells, but also it may actually hurt cancer cells. In his lab experiments, quercetin blocked some of the pathways by which tumours grow out of control, and once again, in this task quercetin outperformed Vitamin C.

Apples are a primary source of quercetin. The same flavonoid is also found in onions, tea, blueberries and cranberries.

Other research suggests that quercetin may have a variety of benefits in combination with other nutrients. A Dutch study found that a high intake of black tea, which contains a variety of flavonoids in addition to quercetin, reduces the risk of heart disease, and a Finnish study found that people who ate the most whole apples had a lower risk of stroke than those who ate the least.

Substances that protect the heart and its circulation generally protect the brain as well. The common denominator is the network of blood vessels so crucial to both organs. Damage to blood vessels in the brain may impair the communication lines between nerve cells that underlie all mental activity.



# An Apple a Day

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