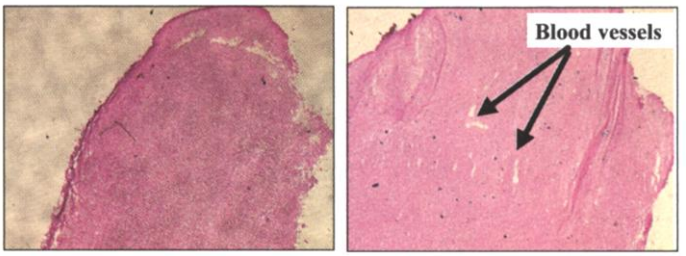
Nicotine Grows New Blood Vessels



Nicotine spurred new blood vessels in mouse tumors (*right*) whereas placebo (*left*) didn't.

Nicotine can help smokers kick the habit and perhaps even treat diseases such as Alzheimer's and Parkinson's by perking up brain function. But Stanford University researchers have spotted a downside: It might spur cancer growth by stimulating blood vessel formation.

In a study published in the July issue of *Nature Medicine*, cardiologist John Cooke and colleagues report that nicotine causes cultured human endothelial cells, those that line blood vessels, to form small, vessel-like tubes. The researchers also tested the effects of nicotine in mice with four induced conditions: inflammation, lung cancer, clogged arteries, and blocked blood flow to the legs. Nicotine caused angiogenesis (blood vessel growth) in every case, spurring the growth of the lung cancer and bringing nourishment to plaque-forming cells in the clogged arteries.

"We were surprised" at the result, because smoking has been shown to lead to blood vessel loss, Cooke says. But that may be due to one of the 4000 other chemicals found in tobacco. The nicotine-alone experiments "do raise concerns" about long-term therapeutic use of the substance, says Cooke.

On the bright side, nicotine may be useful for speeding up wound healing, when growth of blood vessels is just what's needed. "The results are intriguing," says cancer researcher Rakesh Jain of Harvard Medical School in Boston. But he cautions that studies with developing chicks have shown no effect from nicotine on blood vessel growth. He adds that there's no indication that nicotine patches are bad for people with heart disease.

Believe It or Not

More than 300,000 subscribers to Ray Owens's Joke A Day e-mail list last month got what looked like a serious warning: A new type of virus was on the loose, it said—one that uses up hard drive space and ruins your grammar. Recipients were urged to protect their minds by deleting a file called AOLexe. That, of course, is the program that allows one to use the services of America Online. Owens says he got a huge response to his little stunt, with many people amused and others taking him to task. A handful even took him seriously—and discovered they had deleted their own software. One lesson? Never assume a sense of humor—even in someone who subscribes to a joke list.

Music for Relactation

Cows prefer Beethoven to the Beatles. But it doesn't mean they're highbrows, it just means they prefer a soothing beat, say psychologists at the University of Leicester, U.K., who claim that exposing bovines to slow music increases milk yields.

Music researchers Adrian North and Liam MacKenzie involved 1000 Holstein cattle at two dairies in their yet-unpublished experiment, which exposed the milkers to fast (>120 beats per minute), slow (<100 beats per minute), or no music from 5 a.m. to 5 p.m. every day for 9 weeks. They found that cows hearing music such as Beethoven's Pastoral Symphony or Simon and Garfunkel's "Bridge Over Troubled Water" gave 3% more milk than those with no soundtrack. Fast, screechy music such as Bananarama's "Venus" actually caused a small decrease in production. "We believe that slow music relaxes the animals as it does humans," says North. The researchers now want to test their hypothesis by directly measuring how different musical diets affect cows' stress hormone levels.

Cows like a slow beat.

Animal-welfare specialist Lene Munksgaard of the Danish Institute for Agricultural Sciences in Foulum says that although acute stress will lower immediate milk yield, "whether the observed effect can be attributed to decreasing chronic stress is speculation."

North says they hope next to zero in on the active ingredients of music by controlling for factors such as instrumentation. MacKenzie says he wants to move on to chickens as well and see if music lowers poultry stress levels as measured by egg production.

Serotonin and Bulimia

Famous bulimia sufferer Diana may have been dealt a bad hand.

Researchers have spotted what could be a sign of susceptibility to the eating disorder bulimia: an abnormality in the way the brain processes the neurotransmitter serotonin.

Walter Kaye, Guido Frank, and colleagues at the University of Pittsburgh Medical Center used positron emission tomography with radioactive tracers to scan the brains of nine women who had been free of bulimia symptoms for several years. They also scanned 12 healthy age-matched volunteers.

The researchers knew from earlier studies that serotonin appears to bind—or latch onto—fewer neural cell receptors as people age. This they confirmed in the healthy women. But the former bulimics showed no correlation between age and binding of one important receptor—$5HT_{2A}$. The ex-bulimics also bound less serotonin in the medial orbital frontal cortex, a brain area intimately associated with impulse control as well as anxiety and depression.

The researchers, reporting in the July issue of the *American Journal of Psychiatry*, say a "disturbance" of $5HT_{2A}$ binding is consistent with mood problems and the impulsive (undercontrolled) and obsessive (overcontrolled) behavior seen in people with bulimia.

"This article gives us a new hypothesis" for the mechanisms involved in bulimia, says psychiatrist Cynthia Bulik of Virginia Commonwealth University in Richmond. Twin studies show that biological predisposition "plays an important role," says Bulik. But "until we can find people who are prebulimic, we're not going to know" whether serotonin disruption preceeds or is caused by bulimia.

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