Low dose of aspirin keeps migraine away

One aspirin tablet taken every other day cuts the risk of migraine headaches, new research indicates. The finding supports earlier suggestions that aspirin, which reduces clumping of key blood-clotting components called platelets, might help block the debilitating and poorly understood series of events that produces migraine symptoms.

About 18 million people in the United States suffer these intensely painful attacks, which may begin with a period of tiredness followed by nausea, visual hallucinations and gripping pain that can last for hours. While migraine symptoms are well known, their cause remains baffling. Researchers believe migraines start when platelets clump together and release a neurotransmitter called serotonin. The serotonin causes arteries in the brain to constrict and dilate — a sequence that seems to produce migraine symptoms.

A team led by Julie E. Buring of Harvard Medical School and Brigham and Women's Hospital studied data from the U.S. Physicians' Health Study, in which 22,000 male physicians aged 40 to 84 took 325 milligrams of aspirin or placebo every other day for five years (SN: 1/30/88, p.68). The Boston researchers homed in on 1,479 migraine sufferers in the group, finding that 6 percent of those taking aspirin reported migraines during the study, compared with 7.4 percent of those on placebo. This represents a 20 percent reduction in migraine risk for those taking aspirin. Buring presented her results this week at the American Heart Association's 15th International Joint Conference on Stroke and Cerebral Circulation in Orlando, Fla.

"Given the number of people who suffer from migraine, it's quite an important finding," says Richard Peto at the University of Oxford, England, who collaborated with the Boston team. In 1988, Peto reported results from a smaller study of British male physicians, showing that a daily dose of aspirin cut migraine risk by about 29 percent.

Buring and her colleagues say the accumulating evidence suggests some migraine sufferers could benefit from aspirin therapy. Peto agrees, saying, "A migraine patient should consider taking a baby aspirin a day."

Arthur H. Elkind, director of the Elkind Headache Center in Mount Vernon, N.Y., says he believes aspirin may stave off some migraines, but like many physicians, he notes that aspirin can cause internal bleeding and other side effects in some patients. He and others in the field advise migraine patients to see a physician before embarking on long-term aspirin therapy. — *K.A. Fackelmann*

Venus: Galileo's first planetary flyby

As the spacecraft Galileo swung past Venus last week, getting a gravitational boost in speed on its way to a 1995 rendezvous with Jupiter, NASA officials expected the craft's camera shutter to click 16 times. The number had reached 56 when data showed the shutter still clicking, and it had progressed to 468 by the time commands sent by ground controllers and by Galileo's own computer stopped it.

Engineers controlling the mission from NASA's Jet Propulsion Laboratory in Pasadena, Calif., were relieved to discover that the problem resulted from a correctable software mistake rather than a malfunction in the camera itself or an incoming solar proton disrupting Galileo's computer memory. About 65 more photos remained on the week's shooting schedule at Venus, since the shutter is designed to operate 150,000 times.

Most of Galileo's scientific data will not reach Earth until the craft's tape recorder can play them back in October (when the proper antenna onboard deploys). But some results have reached Earth already, including three of the photos and a batch of near-infrared mapping data.

Galileo's two ultraviolet spectrometers have shown, as expected, that hydrogen atoms at Earth's distance from the sun last about 1 million seconds (almost 12 days) before ionizing, says Charles W. Hord of the University of Colorado in Boulder, and that a cubic centimeter of space contains an average of about 1 interstellar hydrogen atom.

Because Galileo follows a flight path that will let its ultraviolet instruments observe from both inside and outside Earth's orbit, scientists will have a unique chance to investigate the controversial theory that numerous small comets are being vaporized by running into Earth's atmosphere. If the theory is correct, more hydrogen should appear in data from Galileo's present "inside" position — looking through the presumed vaporized comets — than will show up after the craft has crossed beyond Earth's orbit.

Galileo is already reporting on the ultraviolet spectra of stars (the one measured so far is Kappa Velorum, says Hord) and on impacts by space dust. The largest piece yet detected weighed about one hundred-millionth of a gram and measured about 26 microns across.

— *J. Eberhart*

Computronium: The 'element' that imitates

In the 1956 film "Forbidden Planet," the long-extinct Krell civilization had left behind an amazing technology capable of materializing any mental image. Several months from now, two MIT scientists expect to unveil a less awesome yet uniquely powerful computer technology designed for carrying out the world's most detailed modeling of almost any material phenomenon conceivable.

By reconfiguring about the same amount of electronic hardware contained in today's best parallel-processing computers, computer scientists Tommaso Toffoli and Norman Margolus say they are improving upon their earlier versions of what they call cellular automata machines (CAMs). At last week's Artificial Life Conference in Santa Fe, N.M., Toffoli said the new "CAM-8" will represent the first generation of machines capable of mimicking physical processes with unprecedented detail and verisimilitude.

Like gases, crystals, animals and even globs of mayonnaise, computer-generated cellular automata are composed of particles or cells, albeit computational rather than material ones. Board-game-type rules reflecting scientific understanding of the real phenomena under study govern the simulated particles' starting arrangements, interactions and eventual transformation into static, oscillating or chaotic systems. As cellular automata "evolve" within the CAM circuitry, the patterns on the computer screen often resemble behaviors of complex physical and living systems (SN: 2/10/90, p.86).

Toffoli says he thinks of CAM-8 as "computronium" — a flexible "element" capable of mimicking all other elements and particles, real or imagined. CAM-8 thus "embodies the concept of 'programmable matter,'" the researchers suggest in a report to appear this summer in the Dutch journal PHYSICA D.

"In programmable matter, the same cubic meter of machinery can become a wind tunnel at one moment, a polymer soup at the next; it can model a sea of fermions [elementary particles], a genetic pool or an epidemiology experiment at the flick of a console key," they write.

In "Forbidden Planet," the same technology that filled the Krells' material needs also destroyed that civilization by creating "the monsters of their ids," as Walter Pidgeon put it in his role as Dr. Morbius. But since even CAM-8 simulations exist only as electronic patterns within a complex computer, Toffoli says they will merely help researchers to "domesticate physics" for a better understanding of natural processes. — *I. Amato*