

Biomedicine

From Philadelphia, at the annual meeting of the American Association for Cancer Research

Drug combination slows colon cancer

Aspirin and other nonsteroidal anti-inflammatory drugs can retard the development of colorectal cancer. The medications appear to promote programmed cell death, a process that works against the runaway cell growth that is the hallmark of tumors. Two recent studies of patients have hinted that combining the drugs with cholesterol-lowering medication might enhance this effect.

A study of rats now confirms that suggestion. Researchers exposed 48 rats to chemicals that cause precancerous growths, then they divided the animals into four equal groups. One group received sulindac, a drug similar to aspirin, and a second got lovastatin, a cholesterol-lowering drug. The third group was given both drugs, and the fourth received no medication.

The sulindac group showed precancerous growth only 85 percent as extensive as in the rats with no medication, the lovastatin group 88 percent as much, and the rats treated with the combination 72 percent as much, says Banke Agarwal of St. Luke's-Roosevelt Hospital Center in New York. "The combination was highly potent," he says.

Both lovastatin and anti-inflammatory drugs are already used to guard against heart attacks and strokes. However, many anti-inflammatories can cause ulcers. Agarwal suggests that some of the anti-inflammatory medication might be replaced with cholesterol-reducing drugs. —N.S.

Antioxidants may limit key mutations

People with head and neck cancer who have been taking antioxidant vitamins regularly are less likely to have mutations in the cancer suppressor gene known as *p53*, a new study finds.

Cancer patients with impaired *p53* "appear to have lower survival [rates] and poorer response to chemotherapy," says Bruce Trock of Georgetown University Medical Center in Washington, D.C., who presented the findings. Trock and his colleagues examined 135 patients, average age 56, and found that those who had been taking vitamin A, C, or E supplements had only one-fourth the mutation rates in *p53* as those patients with no history of using these vitamins. All-purpose multivitamins that have low antioxidant content showed no protection against *p53* mutation, says Trock.

Head and neck cancer includes tumors of the mouth, throat, and larynx, which are usually associated with smoking or alcohol use. Four-fifths of the cancer patients had been tobacco smokers. Patients who had smoked less than 30 years and used antioxidant vitamins regularly had *p53* mutation rates one-twentieth of that seen in smokers who hadn't taken these supplements. This *p53* difference persisted after Trock accounted for confounding factors such as weight and lifestyle.

Trock says that it is premature to recommend popping vitamins to prevent cancer. The study "is a tantalizing bit of evidence that needs to be followed up," he says. —N.S.

Tomato compound fights cancer

Lycopene, the chemical that makes tomatoes red, appears to shrink prostate tumors, researchers report.

An earlier study had suggested that tomato consumption might prevent some cancers. To test the theory, scientists gave lycopene extract to 21 prostate-cancer patients for 3 weeks before surgery. Twelve others didn't receive supplemental lycopene.

After surgery to remove the cancerous prostate glands in these men, the researchers found that the tumors were smaller and the cancer had spread less in the patients getting lycopene, says Omer Kucuk, an oncologist at Barbara Ann Karmanos Cancer Institute in Detroit.

The findings suggest that lycopene may someday "play a role in the treatment [of prostate cancer], either alone or as an adjunct to other types of treatment," Kucuk says. —N.S.

Earth Science

Nuclear-monitoring system passes test

A global surveillance system set up to detect clandestine nuclear blasts performed well in an impromptu test, according to a team of British seismologists.

As part of the Comprehensive Test Ban Treaty, adopted in 1996, cooperating nations have linked up more than 140 seismic stations to form the International Monitoring System (IMS). On Aug. 22, 1998, 10 of these stations picked up vibrations emanating from a site in Kazakhstan where the former Soviet Union conducted nuclear tests.

The seismic waves recorded at these stations looked highly suspicious, report scientists from the Atomic Weapons Establishment (AWE) in Brimpton, England. The Kazakh event had the strength of a magnitude 3.8 earthquake, but the vibrations did not resemble earthquake waves, says AWE's Alan Douglas.

The stations recorded seismic waves that had passed through the planet but no waves that had rippled along the surface. This pattern is more typical of explosions than quakes, the scientists report in the April 8 NATURE. What's more, the seismic recordings indicate that the waves originated from a point extremely close to the surface, again consistent with an explosion.

That's what it was, in fact. On Aug. 22, engineers from Kazakhstan and the United States set off a small nonnuclear blast to close off tunnels at the test site. The yield of the explosion equaled a 200-ton nuclear shot, says Douglas.

The goal for IMS is to have at least three stations picking up vibrations from events down to magnitude 4.0 (SN: 5/11/96, p. 298). The system should be able to pinpoint these to within a 1,000 km² area, about the size of a circle with a radius of 18 km. In the Kazakh case, IMS picked up a smaller event and located it to within 12 km of the actual site.

Douglas and his colleagues note that this test case is artificial because they knew about the blast before it happened. It shows, nonetheless, that IMS can alert scientists to irregular vibrations, even from quite small explosions. —R.M.

Disappearing ice down south

The glacial shelves surrounding the Antarctic Peninsula lost large chunks of ice last year—an area roughly equal to the size of Rhode Island—accelerating a decades-long trend caused by increasing temperatures in the region.

The peninsula reaches out like an arm toward the tip of South America. Along its coast, glaciers flow into the ocean and form thick floating sheets, called ice shelves. Since the 1950s, several of the smaller ice shelves have disintegrated, and now larger shelves are starting to retreat.

Satellite images show that the Larsen B Ice Shelf shrank by 1,700 square kilometers during the past Antarctic summer, which runs from December through March. Recent analysis of satellite images taken on the other side of the peninsula has revealed that the Wilkins Ice Shelf lost 1,100 km² during the early part of 1998, according to Ted Scambos of the University of Colorado's National Snow and Ice Data Center in Boulder.

Although the loss of ice represents a significant change, some researchers are surprised that so much shelf area remains. A team of scientists last year predicted that the entire Larsen B shelf would rapidly disintegrate once its front edge retreated behind a theoretical line of stability—an event that happened in February 1998 (SN: 5/9/98, p. 303). "We're slightly surprised it hasn't collapsed entirely already," says David Vaughan of the British Antarctic Survey in Cambridge.

With winter now returning to the Antarctic, researchers expect no more ice loss until the next southern summer, when they will watch closely to see if Larsen B splinters. The collapse of ice shelves does not alter global sea level because these sheets are already floating in the ocean. —R.M.