
Biomedicine

Dietary attack on cancer

Sometimes, what seems to be miraculously, cancer retreats in patients with terminal cancer. There is now reason to believe that such spontaneous regression may, in some instances, be caused by a biochemical imbalance in the body, and intentionally creating such an imbalance may make tumors retreat.

During the 1950's and 1960's investigators noted that tumors seemed to regress in a few patients with genital or urinary tract cancer. The regression appeared to be linked with a biochemical imbalance in the body, so they tried, by dietary measures, to simulate the biochemical imbalances in some patients. Regression occurred in two patients after their blood levels of potassium and magnesium had been lowered. Then techniques for hemodialysis made possible the controlled depletion of potassium and magnesium in cancer patients. F. M. Parson and his team at the General Infirmary at Leeds, England took up the challenge in 1971.

They report in the Feb. 16 LANCET that when they kept the blood levels of magnesium and potassium below specific levels, either by diet alone, or preferably combined with dialysis, some regression of tumor, gain in weight and relief of symptoms usually occurred. This improvement was not accompanied by decreased immunological activity, a drawback to conventional therapy for terminal cancer.

Transplant rejection villains

When a tissue or organ is transplanted from one person to another person who is not his twin, the recipient regards certain proteins in the tissue or organ as foreign and rejects them immunologically. These proteins are called histocompatibility antigens and are a major problem in tissue and organ transplants. So biologists are anxious to understand the antigens better.

Human histocompatibility antigens are located mainly, if not exclusively, on the cell surface membrane, D. Snary and his team at the National Institute for Medical Research in London report in the Feb. 15 NATURE. All surface-membrane histocompatibility antigens, they've found, are sugar-proteins and can be separated from the majority of the membrane proteins. They believe that their technique will allow the separation of whole histocompatibility antigens in amounts sufficient for structural studies.

FDA licenses assay for cancer

In 1965 a protein known as carcinoembryonic antigen (CEA) was reported to be present in certain human cancers. Then Hoffmann-LaRoche Inc. developed a radioimmunoassay to detect the antigen in incredibly small amounts in the blood. During the past three years LaRoche, with a hundred medical institutions, has run the assay on 10,000 persons to see whether it might be used to diagnose cancer or to indicate the success of cancer treatment. They obtained promising results (SN: 6/9/73, p. 367), so the Food and Drug Administration has now licensed the assay as an adjunctive aid for the detection and management of cancer. This is the first such assay to be so licensed.

Specific limitations of the assay, however, became clear during the study. The assay is not recommended as a screening test for cancer. Higher-than-normal CEA levels have been found in some healthy people, in heavy cigarette smokers and in patients with a variety of nonmalignant disorders.

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Public Health

Possible fluorescent light hazards

Most people recognize the dangers of sitting too long in the sun or staring at an electric welding torch. The powerful "hard" ultraviolet radiation (wavelengths less than 3,000 angstroms) from these sources can burn the skin, destroy sensitive retina tissue and, after long exposure, produce cancerous tumors on the skin surface. But far less is known about possible hazards from "soft" ultraviolet rays (wavelengths from 4,200 down to 3,000 angstroms), which come from sunlamps, "black" lights and ordinary fluorescent lamps.

Recent research, conducted at the University of Missouri-Columbia and reported in Jan. 4 NATURE, raises some disturbing questions about the safety of these common devices that emit soft ultraviolet light. A team of biologists exposed cultures of mouse and human tissue to black light and found that in some cultures more than 99 percent of the cells were killed by a 90-minute exposure. A puzzling density effect was also found, however, for damage ceased when the number of cells present in the culture rose above a million.

A member of the team, Richard J. Wang, told SCIENCE NEWS that subsequent research has shown that damage was caused by toxic substances formed when light strikes the cells, rather than by direct DNA destruction as in the case of hard ultraviolet radiation. But this discovery still does not solve the density puzzle, and he emphasizes that much more work still needs to be done before these findings can be applied to everyday life, especially concerning possible long-term effects, such as cancer. However, asked to comment on the current craze among students of staring at psychedelic posters illuminated by black light, Wang says: "If my kids were doing it, I'd discourage them."

Cigarette gases and tars harmful

The going theory of how cigarette smoking causes cancer holds that the particulate matter—"tar"—in the smoke is the main culprit. But a spate of experiments on smoke gases, minus the particulates, have shown that these also seem to cause cancer. Now a team of Swiss cancer specialists has carried out an extensive, carefully controlled series of tests to determine the effect of the gases on tissue cultures taken from mouse lungs. Holding the amount of particulates constant while varying the gas concentration with charcoal filters, the researchers conclude that presence of smoke gases is related to both cell damage and DNA disturbance, usually considered related to cancer. Smokers seem left with a dismal rule of thumb: If you can taste it, it can hurt you.

Lead workers' kids may be spared

Acute or chronic overexposure to lead compounds can cause agonizing illness and death, but little has been known about the possible genetic effects on children of lead workers. Now M. L. O'Riordan and H. J. Evans of Western General Hospital, Edinburgh, report in the Jan. 4 NATURE that shipyard workers exposed about 50 hours a week to airborne lead oxide appear to have no more chromosomal damage than a similar group of men studied as a control. While this is good news for the offspring of these men, society still doesn't get off the hook on generalized lead pollution, since even a "low level of damage in a large population" can wreak havoc for future generations through genetic changes.

177