

BIOLOGY

Tumor protein via recombinant DNA

A Harvard research team has engineered bacteria to produce a protein of much interest in cancer studies. The protein, which is called t ("little t") antigen, appears in the surface membranes of mammalian cells infected with the SV40 virus, which causes tumors in some animals.

The production of SV40 t antigen is the second instance in which scientists have coaxed bacteria to produce a mammalian protein that is not fused to any bacterial product. That strategy avoids the need to find a way to separate components before they can be used commercially or in laboratory investigations. To produce SV40 antigen, Tom Roberts and collaborators degraded a portion of the DNA in front of the t antigen gene and inserted a DNA fragment containing the site to which bacterial ribosomes bind to begin protein synthesis. "Our techniques can also be universally adapted to the manufacture of products that are pharmaceutically useful," Roberts says. Human growth hormone is the other purely mammalian protein that has been synthesized by bacteria (SN: 9/16/78, p. 195).

Fish speed-eating captured on film

High speed cinematography has revealed extraordinary dining habits of shallow-water anglerfish. The animals capture prey with four times the speed previously described for any fish. That speed may be essential for the success of the anglerfish's unusual eating strategy. Anglerfish mimic an immobile, algae-encrusted rock while wiggling a highly conspicuous piece of tissue that looks like a smaller fish. (SN: 8/5/78, p.86). The trick is to ingest any prey attracted before the prey bites off the anglerfish's lure. To do so, the anglerfish creates strong suction pressure by expanding the volume of its mouth cavity by a factor of 12. David B. Grobecker and Theodore W. Pietsch of the University of Washington report that the speed, as well as the volume, of mouth expansion is impressive. For three anglerfish species, the average time for expansion and subsequent prey engulfment is 6 milliseconds. "These extremely rapid feeding sequences are unparalleled in other fishes so far examined," Grobecker and Pietsch say in the Sept. 14 SCIENCE.

Radar focus on insect flight

Echoes from moths, locusts and even tiny gnats interfere with radar studies of weather features. However, Russell Schnell of the National Oceanic and Atmospheric Administration suggests that radar tracking may reveal important aspects of insect flight. Entomologists' knowledge of the winged stage of an insect's life cycle has been limited by difficulties in observing and tracking flight. That period is very important for pest management and control, however, because during the winged stage insects distribute their eggs. Doppler frequency-modulated, continuous wave (FM-CW) radar is the tool entomologists are now considering. It was developed originally for observing the structure of the clear atmosphere — measuring winds and detecting temperature inversions. Russell Chadwick and Earl Gossard of NOAA believe that radar system can resolve individual insects. They already report concentrations of insects above or below temperature inversions, depending on circulation, and dramatic redistributions of insects during convection conditions. Chadwick and Gossard have observed changes in insect behavior that correspond to atmospheric temperature changes. The radar also can distinguish strong-flying insects from drifters and it can make observations at night. Although insects have confounded operators of military and weather radars since the 1940s, those radar systems were too large, too expensive and too insensitive to be useful for deliberate insect studies.

OCTOBER 13, 1979

BIOMEDICINE

Vitamin C not effective

The latest but not last round in the vitamin C controversy ended in a setback for the vitamin's champions, when Mayo Clinic researchers announced that high doses of vitamin C had no beneficial effects on a group of sixty cancer patients. These results differ from previous reports that vitamin C enhanced survival and reduced the symptoms of advanced cancer.

The randomized double-blind study, conducted by Edward T. Creagan and colleagues at the Rochester, Minn. clinic and reported in the Sept. 27 NEW ENGLAND JOURNAL OF MEDICINE, evaluated the effect of a daily 10-gram dose of vitamin C on the symptoms and survival time of patients with preterminal cancer. An additional 63 patients, matched for tumor site and other characteristics, received a placebo.

Creagan reports that the patients who took vitamin C did not survive any longer or feel significantly better than those who took the placebo. However, since most of the study subjects had had previous cancer treatment, Creagan points out, these results cannot be generalized to apply to otherwise untreated patients.

Nonsurgical prostate treatment

Benign prostatic hypertrophy, commonly known as enlarged prostate, affects a large number of middle-aged and elderly men, and has been successfully treated only with surgery. Marco Caine of the Hadassah University Hospital in Jerusalem reports considerable success in alleviating the problem using phenoxybenzamine, an alpha-adrenergic blocking agent, to treat enlarged prostate. Although the drug does not reduce the size of the prostate, it does relieve the symptoms of urinary obstruction that accompany the condition.

Phenoxybenzamine works, Caine says, by blocking the activity of the alpha-receptors in the prostate, which results in the relaxation of the smooth muscle fibers. This, in turn, results in the decrease of urinary obstruction symptoms.

Phenoxybenzamine is currently used in the United States to treat renal and vascular disorders, but is not yet approved by the FDA for treating prostatic enlargement. Caine's findings are reported in the September COMPREHENSIVE THERAPY.

NCI pits nutrition against cancer

Recently the Senate nutrition subcommittee, headed by Sen. George McGovern (D-S.D.), has been prodding the National Cancer Institute to give the public some practical advice regarding nutrition and cancer. Last week, the NCI did just that. It told the subcommittee that the risk of cancer can be considerably reduced in the United States by people eating less; by their eating a balanced, low-fat, high-fiber diet and by their drinking moderate amounts of alcohol.

The NCI's recommendations are based on increasing research findings that diet can be an influence for or against cancer (SN: 6/23/79, p. 414). For instance, cancers of the esophagus and larynx have been linked with alcohol abuse combined with smoking. A high-fat diet has been linked with cancers of the breast, ovaries, prostate, intestine and rectum. A diet rich in unsaturated fats is even more co-carcinogenic, at least in rats, than is a saturated fat diet. In contrast, Seventh Day Adventists, who eat a low-fat diet, have only 70 percent the risk of others of developing various kinds of cancers. Dietary fiber has been linked with low levels of colon cancer. Vegetarian diets have been associated with resistance to breast cancer.

The NCI's recommendations are similar to those that medical researchers propose for avoiding heart disease, except for the addition of recommendations of more fiber, a reduction in unsaturated as well as in saturated fats and moderate alcohol use.

249