

MEDICINE

DNA May Trigger Cancer

DNA, the heredity-carrying chemical of some viruses, may change normal cells to cancer cells. Report indicates possibility of chemically destroying the cancer DNA.

THE LATEST STRATEGY in the war against cancer is to play the deadly game according to the enemy's rules—and beat him at it.

A report released by the Sloan-Kettering Institute for Cancer Research in New York reveals that deoxyribonucleic acid (DNA), the heredity-carrying chemical of some viruses, has been isolated from a cancer-inducing virus and has led to cancers in laboratory animals. Many scientists believe the DNA of the virus, not content to control only its own hereditary factors, either alters or supplements the DNA in body cells.

This change in cellular DNA may trigger the change from normal to cancer. In fact, leukemic blood cells are distinguished from normal white blood cells by characteristic differences in the DNA.

Putting together the newest pieces of information gathered by its own and other research groups, Sloan-Kettering's report indicates that if the cancer DNA can influence normal DNA, it may be possible to turn

the tables and chemically influence or destroy the cancer DNA.

Some of the chemical agents used against cancer appear to do just that—interfere with the cancer cell's manufacture of nucleic acid. Different chemicals may inhibit nucleic acid synthesis at different points in its manufacture.

The Institute also reports that the mechanism by which cancer cells become resistant to chemical treatment by developing new routes of nucleic acid synthesis has now been pinpointed in several instances. But this re-routing problem remains one of the major stumbling blocks in treating the disease with medical agents.

In a slightly different approach, advances in organic chemistry have made it possible to synthesize normal and abnormal components of DNA. It is hoped that the abnormal components will be taken up by cancer cells and will lead to their destruction.

Science News Letter, July 9, 1960

MEDICINE

Shoshin Beriberi in U. S.

SHOSHIN BERIBERI, a variety of beriberi which is generally associated with the Orient, is "probably not an uncommon disease in the United States," two Detroit physicians have reported. However, from the few reports on it in the current American medical literature, it apparently is rarely diagnosed.

In the United States, Shoshin beriberi is primarily associated with alcoholic patients, according to Dr. Paul L. Wolf, resident, department of pathology, Wayne State University Affiliated Hospitals, and Dr. Murray B. Levin, resident, department of internal medicine, City of Detroit Receiving Hospital and Wayne State University College of Medicine.

In two instances of Shoshin beriberi described by the doctors in an article in the New England Journal of Medicine, 262:1302, 1960, both victims had foregone food for liquor for a period of days.

In one case, where the disease was recognized and thiamine therapy applied, "the patient made a dramatic recovery."

Failure to diagnose the other case resulted in death five and a half hours after admission to the hospital.

The reporting doctors consider the disease in its alcoholic manifestations "a medical emergency" to which more attention should be given so that diagnosis and treatment may be applied in time to prevent death.

Beriberi is an ancient disease caused by

inadequate diet and resulting vitamin deficiency, particularly of B-1 (thiamine). It was first described in Oriental literature as long ago as 2697 B.C.; but it was not mentioned in Western accounts until 4,000 years later in 1642 A.D.

Shoshin beriberi is characterized by sudden severe heart attack that may result in death within a few hours. It is characterized by shortness of breath, swelling of the ankles, and other symptoms associated with heart ailments. The symptoms of less acute forms of beriberi are extreme lassitude, anemia, muscular atrophy and paralysis. The accepted therapy today for all beriberi is administration of thiamine either orally or intravenously, depending upon the severity of the disease.

Science News Letter, July 9, 1960

BIOLOGY

Photosynthesis May Have Electronic Start

NEW EVIDENCE strongly suggests that the first step in photosynthesis, the vital reaction whereby all green plants convert carbon dioxide and water into glucose, may be purely electronic in nature.

Prof. William Arnold and Dr. Roderick K. Clayton, both of the biology division of Oak Ridge National Laboratory in Oak Ridge, Tenn., have studied by spectroscopic

methods the initial changes that take place in the purple bacteria groups when illuminated. They found the change to be the same at temperatures from slightly above room temperature down to nearly absolute zero, which is 459.7 degrees below zero on the Fahrenheit scale. At this latter temperature no ordinary chemical changes can take place. Thus the reaction must be electronic, the scientists reason.

Prof. Arnold and Dr. Clayton report their work in Proceedings of the National Academy of Sciences, 46:769, 1960. Prof. Arnold showed in 1957 that dried chloroplasts—particles containing chlorophyll—act as semiconductors.

As a result of their present research, the Oak Ridge scientists conclude that "the first step in photosynthesis appears to be the separation of an electron and a hole in a chlorophyll semiconductor."

A hole is a missing electron and behaves, in an electrical field, like a positive charge.

The mechanism of photosynthesis is of great practical importance. It could lead to a direct and efficient method of harnessing the energy of the sun for the use of man.

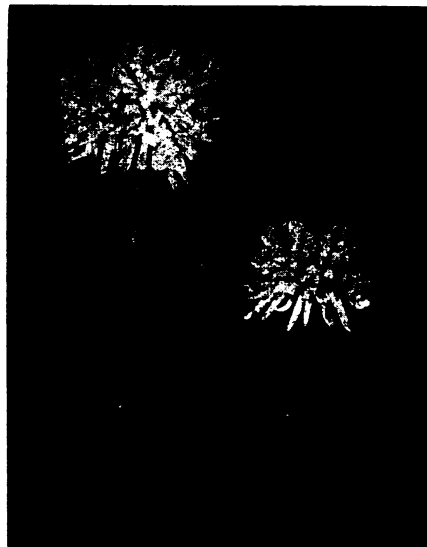
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BOTANY

Chemical Shortens Stems Of Chrysanthemum

PHOSFON, a relatively inexpensive plant-growth regulator for chrysanthemums, shortens the mums' stems so that plants require less room in greenhouses and no staking. Tests by the U. S. Department of Agriculture at Beltsville, Md., show the size of flowers on the treated plants is not notably affected by the chemical. Phosfon went on sale at most seed houses on July 1.

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SHORTER CHRYSANTHEMUMS—A chemical, Phosfon-D, reducing the height of chrysanthemums, has been introduced by the Virginia-Carolina Chemical Corporation, Richmond, Va. The plant at right was treated with Phosfon; the plant at left was not.