

BIOCHEMISTRY

Virus Clue to Cancer

A virus that resists the body's natural defenses during long dormant periods and then erupts into action is providing clues for scientists probing the causes of cancer.

➤ **FEVER BLISTERS**, also called cold sores, are believed to hold clues to the mystery of how viruses could cause cancer. So far, however, there is no absolute proof that any form of cancer is caused by a virus.

As in the case of herpes simplex virus (HSV), which causes cold sores, a cancer virus might lie dormant for a long time and never be found in the blood or in the tumor itself. It could also resist or escape antibodies, natural defenses which might have formed to destroy it.

The cancer could be triggered into a malignant and destructive rampage, however, by some internal or external cause.

Dr. Bernard Roizman of Johns Hopkins University School of Medicine, Baltimore, in research supported by the American Cancer Society of New York, has uncovered some clues to dormancy after years of research on HSV. These clues show how a cancer virus in humans could escape detection and annihilation by drugs or antibodies.

Dr. Roizman and his associates found that the sleeping HSV can be roused in many ways. In some patients, strong ultraviolet light activates it. In others a general run-down condition, fever, the severing of certain nerves, shock, physical injury or even an emotional upheaval can bring about manifestations of the disease.

Only about one percent of HSV victims show symptoms when they are first infected.

Usually they have fever blisters on the lips, cold sores in the mouth, and occasionally a severe encephalitis, or blinding inflammation of the eye cornea. Fever blisters especially plague children younger than five.

In the other 99% of the infected persons symptoms are either non-existent or so mild that they are unnoticed. The infected persons, however, do have the virus itself hidden somewhere in the system, presumably inside some kind of cell and in an immature or disassembled state.

HSV victims nearly always are attacked in the same place. Mary has a fever blister on her lip, while John may be affected in the cornea of his eye. Some persons have learned to expect that a "vesicle" will form on their upper lip about a day after a severe emotional episode.

In test-tube experiments Dr. Roizman found that the virus can spread either by being released from the infected cell into the fluid around it, or by being passed from the infected cell directly into a normal cell adhering to it. In the latter case, antibodies cannot reach the virus.

How the human system counteracts a virus outbreak is still a mystery, but here are some clues:

Apparently white blood cells, called leukocytes, and antibodies act against the cells that multiply the virus. Interferon, and a number of other natural anti-viral chemi-

cals, may be involved. A very severe drop in body temperature or a rise in the acidity of the vesicle, or blister, could also cause spread of the infection contained by it.

The drug IU DR, short for 5-iodo-2'-deoxyuridine, which was developed by other scientists to destroy leukemia, or blood cancer cells, proved too toxic for this purpose, but it did arrest herpes of the eye, and was one of the first drugs effective against a virus.

IU DR interrupts the cell's manufacture of essential virus nucleic acid, which is DNA, and stops corneal infection.

Dr. Roizman believes that some cells of the body produce a chemical capable of blocking the multiplication of herpes simplex virus. Eventually it should be possible, he says, to identify and characterize this chemical and to produce others that destroy the virus while it is in a dormant state.

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Westinghouse

STEERING SYSTEM—Arc plasma jet of helium gas operating in a vacuum chamber is observed by research engineer H. C. Ludwig, who developed it at Westinghouse Research Laboratories. Stable, easy to turn on and off, and operating on low voltage, the jet is promising as an attitude control method for satellites.

ENGINEERING

Plasma Jets Proposed To 'Steer' Satellites

➤ **PLASMA JETS**, the white-hot streams of gas used for such tasks as cutting and welding, may soon have yet another use, "steering" satellites through space.

A plasma jet system, using helium as fuel, would be able to keep an orbiting satellite pointing in the right direction for long periods and would out-perform chemically fueled jets in fuel economy, ease of starting and stability, researchers say.

The new satellite "steering system" was proposed by engineers at the Westinghouse Research Laboratories in Pittsburgh, Pa.

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Better Drugs Foreseen

➤ **A MORE EFFECTIVE DRUG** for protection against strokes and heart attacks looks possible, a U.S. scientist told the 10th congress of the International Society of Hematology in Stockholm, Sweden.

Dr. Robert J. Speer, Wadley Research Institute and Blood Bank, Dallas, Texas, said he has isolated for the first time a blood clotting factor that could be implicated in heart and artery disease. This factor is one of 13 known to be involved in the complex clotting mechanism.

Further study may reveal that current anticoagulant drugs taken by stroke and heart attack victims "are working against the wrong factors," said Dr. Speer. If this is the case, new and more effective drugs could be developed, he said.

The newly-isolated agent, called the Hageman factor, starts a blood clot by triggering a chain reaction of the other 12 agents involved in clotting.

Dr. Speer said he believes strokes and heart attacks are caused by either too much of the Hageman factor in the

blood or by atherosclerosis. Atherosclerosis, he believes, activates the Hageman agent because the deposits that build up inside arteries offer the necessary conditions for clot formation.

If heart attack and stroke victims are found to have activated Hageman factor in their blood, or an over-abundance of the agent, it would mean an important lead to understanding heart and artery disease, Dr. Speer said. This means it would then be possible to develop an anticoagulant to work against the Hageman factor.

Dr. Speer said an anticoagulant against the Hageman factor, if effective, would probably not cause uncontrolled bleeding or the other side effects produced by anticoagulants used against other factors.

To aid his research, Dr. Speer hopes to conduct a mass survey in Dallas, Texas, to see if the Hageman factor is in greater abundance or acts differently in the blood of people with histories of strokes or heart attacks.

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