

BIOCHEMISTRY

Nucleic Acids Cancer Clue

➤ A MAJOR KEY to solving the cancer problem is seen in studies of the relationship between human cells and infective nucleic acids taken from viruses by Dr. Joseph Huppert, head of research at the Pasteur Institute, Paris.

Dr. Huppert, who is presently collaborating on studies on cancer viruses and their nucleic acids at Sloan-Kettering Institute, New York, was the first to report causing tumors in mice using nucleic acid taken from a virus found in human cancers.

A normal cell has a complicated protective system and a specific amount of genetic information (its nucleic acids) to enable it to reproduce itself correctly at any given moment.

Wrong information may enter a cell by the introduction of a virus, but this does not mean, Dr. Huppert believes, that the virus will cause cancer. The important issue is whether or not the cell uses the information.

Only under the following circumstances can a cell use the wrong information, Dr. Huppert said:

1. When the cell divides. However, only a small percentage of cells in the body divide frequently.

2. In the presence of "trigger mechanism."

The trigger mechanism can be introduced into a cell by many factors, including perhaps tumor viruses.

3. When a second virus of the non-cancerous variety such as influenza or vaccinia, the material of vaccine, is added to the cell.

This may result in the development of a new virus that may be injurious to the cell or may cause the cell to lose its normal controls.

Dr. Huppert emphasized, however, that in some cases, once a non-cancer-producing virus enters the cell, a substance is produced which prevents the viruses from growing in the cell. This substance has been isolated.

Certain viruses, said Dr. Huppert, will infect cells but will not produce more intact virus. They may, however, produce infective nucleic acid.

Recent studies of a small bacterial virus have demonstrated that the infective ability of its nucleic acid can be inhibited up to 90% by the addition of any other nucleic acid, including nucleic acid from mammalian cells, and can be stimulated by the addition of breakdown products of nucleic acid.

• Science News Letter, 79:293 May 13, 1961

Uncovered Arms in Space

➤ ASTRONAUTS who stick their hands and arms outside pressure suits in space can expect to have blisters, engorgement of veins, drying of skin and other disagreeable effects.

Capt. Charles L. Wilson, U. S. Air Force Aerospace Medical Center, Brooks AFB, Texas, reported to the Aerospace Medical Association in Chicago that tissue changes arose during exposure of unprotected parts to near-space-equivalent vacuum by 20 human volunteers.

Gas pockets appeared under the skin, but always disappeared when the low pressure chamber was repressurized.

Blood vessels contracted, causing a condition known as ischemia, and small spots were formed by effusion of blood. Edema of the hands and feet, in which abnormal fluids formed, also occurred.

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Eskimo Clothing Ideas

➤ LIGHTWEIGHT synthetic materials fashioned on Eskimo concepts of clothing have been developed in Canada for Arctic wear.

Military activity in Arctic winters has been seriously hampered by the weight and bulk of protective clothing, Squadron Leader S. E. Alexander of the Royal Canadian Air Force's Institute of Aviation Medicine, Toronto, reported at the Aerospace Medical Association meeting in Chicago.

New lightweight mukluks, similar to sealskin boots worn by Eskimos, have been designed, offering better protection at one-third the weight. Waterproof nylon fabric, treated with polyurethane, has been produced that cannot be penetrated by air but offers sufficient vapor diffusion to dissipate body moisture.

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AEROMEDICINE

Oneness With Universe

➤ WHEN AN ASTRONAUT gets out into space he should have a feeling of "oneness with the universe" just as Admiral Richard Byrd did when he spent four and a half months in the icy wastes of Antarctica.

In a report read to the Aerospace Medical Association meeting in Chicago, Capt. George W. Barnard, a psychiatrist at Wright-Patterson Air Force Base, Dayton, Ohio, said oneness with the universe was gained by identifying oneself with its order and not in a sense of being supported in a child-like way.

To defend themselves, the astronauts as well as others who have been thrown inward with their thoughts, must maintain an intellectual rather than emotional attitude toward what is going on around them.

Each person on a lonely mission in the past had a positive faith or hope that he could successfully complete the mission and return home to his loved ones, Capt. Barnard said.

Each was an independent, self-reliant person, flexible and able to adapt to a stressful situation. Even during times of crisis they did not panic and thereby put themselves into a position of being destroyed by a hostile environment.

Astronauts, like Byrd, may see mirages and unusual light reflections that they may interpret unrealistically. In space there will be no day-night cycle, and the spacemen will be in total darkness or total light. Fantasy must be avoided for fear of losing respect for harsh reality.

If astronauts cannot accept themselves under these strange conditions they may become anxious and overwhelmed so that they may make irrational and impulsive moves that would terminate their missions.

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TOOTH TO TELL CAUSE—Cross section of a baby tooth being studied by scientists at University of Illinois College of Dentistry, Chicago, Ill., to determine from growth rings and enamel the cause of certain handicaps of crippled children and the time the crippling agent occurred.