

life sciences notes

ANTIBODIES

Antibody aggravates respiratory disease

A National Institutes of Health researcher reports identification of an antibody response to a respiratory tract virus which apparently aggravates rather than inhibits the action of the virus.

Dr. Robert M. Chanock, chief of the respiratory virus section of the National Institute of Allergy and Infectious Diseases, described the antibody response at the Gustav Stern Symposium on Perspectives in Virology in New York. He says the effect has blocked efforts so far to develop a vaccine to give infants protection against respiratory virus attacks. Such attacks may lead to pneumonia, and are responsible for many of the 10,000 infantile pneumonia deaths annually, Dr. Chanock believes.

At fault, apparently, is what is known as a complementary reaction. These may occur when an antibody fixed in a tissue reacts with an antigen. The result of the reaction is destruction of surrounding cell walls and death of cells. Respiratory viruses generally are confined to the tissues of the alveoli and bronchi of the lungs, so the antibody-antigen reaction occurs there. Dr. Chanock says the resulting tissue damage is not permanent, but at the time it leaves the infant open to a bacterial infection, besides adding to the damage caused directly by the virus.

HERBICIDES

Mechanism of herbicide selectivity found

A mechanism whereby rice is immune to a herbicide that kills pest grasses has been discovered by a Rutgers University biochemist. In an announcement by the University, Dr. Cecil C. Still reports that he has partially purified and characterized an acylanilide hydrolase associated with the lysosomes of rice plant cells.

The enzyme, originally thought to be contained in the chloroplast, hydrolyses dichloropropionic acid into non-toxic products. The herbicide exerts its effect by inhibiting photosynthesis in susceptible plants. Before Dr. Still's work it was not known where in the cell or by what agent the herbicide was destroyed.

Dr. Still said the enzyme has been found in a variety of useful plants studied; peak levels occur at various stages of the development of the plant. He says work is needed to determine at just what point in the life of each useful species the peak occurs. Herbicide applied at this time will have the maximum selectivity.

An offshoot of the work, Dr. Still says, is the finding that the lysosomes of plant cells, just as those of animal cells, play a role in the destruction of foreign macromolecules. In animals such molecules are termed antigens. Dr. Still says plant and animal cells now appear more closely related than was thought.

VIRUSES

Fatty acids found with viruses

Unusually large amounts of unusual fatty acids have been isolated from tissues known, or believed, to con-

tain viruses. In a report to last week's Biophysical Society meeting in Pittsburgh, Dr. C. L. Burger of the Upstate Medical Center of the State University of New York says similar concentrations of such fatty acids have not been found in undiseased tissues.

Tissues or substances in which the fatty acids have been found include bovine milk from animals with leukemia, human cells growing virus and spleens of leukemic mice; the mouse leukemia was induced by a virus.

Dr. Burger reports that the fatty acids in question are both saturated and unsaturated and have carbon numbers greater than 24.

DIAGNOSIS

Acoustic holography shows tumors

Soft tissue tumors in rats, invisible to X-ray techniques, have been detected with ultrasonic holography, according to a report to the Biophysical Society.

Drs. Leonard Weiss and E. Douglas Holyoke of the Department of Experimental Pathology of Roswell Park Memorial Institute in Buffalo report that discrete tumors down to 2 millimeters in diameter can be detected with the technique.

Two ultrasonic transducers are immersed in water and oriented so that their radiations converge at the water/air interface, forming an interference pattern. A specimen is placed in the path of one of the beams, modifying the interference pattern and thus creating an ultrasonic hologram at the interface. The hologram is then illuminated by a quasi-coherent beam of light, which is reflected from the hologram and serves to reconstruct the latter on a photographic plate.

The researchers so far have successfully used the technique in detecting implanted tumors and inflammatory lesions in skin flaps lifted from rats.

LEARNING

Proteins may have role in memory

Injection into mice of a powerful inhibitor of cerebral protein synthesis has no effect on learning ability or short-term memory but markedly impairs the mice's long-term retentive power.

This is the substance of a report to the Biophysical Society by Dr. Samuel H. Barondes of the Departments of Psychiatry and Molecular Biology of the Albert Einstein College of Medicine in New York City. Dr. Barondes says the results indicate that protein synthesis is required for long term memory. What the exact function of the protein may be is not yet known, though he suggests that it operates on the synapses.

In the experiment the mice were injected with acetoxy-cycloheximide to suppress better than 90 percent of cerebral protein synthesis. Then, to avoid electric shock, the mice learned to choose the lighted arm of a T-maze. It was found that the test mice learned the maze as well as the control mice. Three hours after the test they still did as well as the controls. But six hours afterward they did much worse. If the drug was given immediately after training it had a reduced though still significant effect on memory. Given 30 minutes after, it had no effect. This indicates "memory protein" must be synthesized during and shortly after the event.