

Leukocytes Test Tissues

➤ HOW the white blood cells of a donor stimulate the growth and rate of division of white blood cells of a patient when the cells are mixed together in a test tube is helping to predict the success of human tissue grafts.

Dr. Fritz Bach of the department of medical genetics at the University of Wisconsin reported at the Third International Congress of Human Genetics, Chicago, that the study of white blood cells, or leukocytes, has been receiving much attention in the last two years in relation to tissue grafting.

He noted that when leukocytes from identical twins, or from any two persons with properly similar genetic make-ups, are mixed in a test tube, no reaction is observed. This indicates that grafts between these individuals may have a good chance of being successful.

However, if leukocytes from two persons with sufficient genetic differences are mixed, they tend to stimulate each other's growth and rate of division. This stimulation provides a warning that tissue graft between these two individuals often may not be successful.

Until recently, it was not possible to determine what proportion of the observed stimulation was produced by the donor's white blood cells and what amount was produced by the patient's white blood cells.

A one-way mixed-leukocyte test was needed to determine the patient's compatibility to tissue from a possible donor.

Dr. Bach worked out a procedure for such a one-way reaction by chemically inhibiting the donor's leukocytes from being stimulated when in contact with the patient's leukocytes but not

preventing the donor's leukocytes from stimulating those of the patient.

Dr. Bach theorized that the degree to which the donor's leukocytes affected those of the patient was inversely related to the success of the graft on the patient.

To test his theory, Dr. Bach has performed small skin transplants on humans in collaboration with Dr. William Kiskan of the department of surgery at UW.

Dr. Bach's work is supported by a grant from the Damon Runyon Memorial Fund for Cancer Research.

MEDICINE

Tobacco Fungus Causes Emphysema in Animals

➤ ALL CIGARETTE tobaccos have been found to contain a highly poisonous fungal growth that causes emphysema in mice, but research is already under way to eliminate the problem.

The discovery of fungal effects on animals was reported in a preliminary article in *Science*, 152:1634, 1966, and has been confirmed in later work. Dr. Joseph Forgacs of the Good Samaritan Hospital, Suffern, N.Y., and Clemson University pathologist, Dr. W. T. Carll of Pontiac, S.C., have been examining two predominating fungal isolates in tobaccos for several years.

They examined random samples of 252 tobaccos from various brands of cigarettes and 50 each from cigars and pipe mixtures. The two isolates are a species of *Alternaria* and an *Aspergillus niger*, which they subjected to preliminary toxicity tests in mice, using stomach tubes for each of five mice and smoke-filled chambers for others.

In the first experiment timothy hay was inoculated with fungus and incubated for four weeks before being tested for smoke toxicity. Noninoculated timothy hay, sterilized and similarly treated, served as a control.

"It appears significant," the researchers said, "that pulmonary emphysema was detected grossly in four of four mice exposed repeatedly to *Alternaria* haysmoke aerosol, and in four of six mice exposed to *A. niger* smoke. Two mice in the *Alternaria* group developed alveolar cell cancers, but this incidence

may have been fortuitous in that such neoplasms can occur spontaneously." Since the report was published, they have used tobacco smoke to produce emphysema.

The Surgeon General's Smoking and Health Report discussed various constituents of cigarette smoke as possible causes of lung disorders, but mycotoxins have not previously been studied in this connection, the researchers stated.

"We have studied the two fungi as saprophytes, not as parasites," Dr. Forgacs told *SCIENCE SERVICE*, "so the work being done by the U.S. Department of Agriculture on perfecting tobacco plants is somewhat different. I feel that people are going to smoke and should have the cleanest possible tobacco."

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