

Life Sciences Notes

PROTEIN ANALYSIS

Cell's engine seen

Within body cells, tiny powerhouses called mitochondria supply energy for all cellular activity. By means of X-ray diffraction, scientists for the first time have seen what a mitochondrion's energy source looks like. According to Dr. Richard E. Dickerson of the California Institute of Technology, the source—a protein called cytochrome-c—is shaped like an egg one ten-millionth of an inch across. The cytochrome-c engine is only one small part of a mitochondrion's complex energy-producing factory.

Scientists previously learned that cytochrome-c is made up of 104 amino acid molecules hooked together in a highly specific sequence. Dr. Dickerson's X-ray analysis of the protein engine provides a blueprint of how these 104 components fit together into a three-dimensional machine.

ENTOMOLOGY

Mold added to pesticide arsenal

Aflatoxin, a mold that grows on stale peanut meal and other kinds of foods—and suspected of being a carcinogen—produces a chemical that kills insect pests. In experiments on house and fruit flies, University of Wisconsin scientists found that most flies die if they eat aflatoxin with their food. According to Drs. Fumio Matsumura and S. G. Knight, any flies that do survive suffer loss of fertility. These flies produce fewer eggs and of those, fewer than normal hatch.

Mosquitoes apparently are immune to the lethal effect but, as with the flies, the mold limits fertility and could be used to reduce drastically the number of young mosquitoes.

ENTOMOLOGY

Nerves influence pesticide resistance

Insect resistance to pesticides such as dieldrin and DDT may, in some cases, be due to a nerve defense mechanism. Scientists previously have attributed insect resistance to some biochemical reaction that breaks down pesticides into harmless components, but Dr. Fumio Matsumura of the University of Wisconsin finds that resistance may depend on the degree of interaction between the insect's nervous system and the pesticide.

Dr. Matsumura discovered that a protein substance in the insect's nerve tissue is an important factor in the resistance mechanism. Fatty compounds and other nerve tissue substances may also play a part.

Insect resistance to pesticides is transmitted from generation to generation, though the mechanism may vary in different populations of the same species and from one species to another. It is also possible that nerve tissue response is only a part of the defense mechanism.

ANALGESIC

FDA's approval criticized

The Food and Drug Administration has been severely criticized by a board of independent drug investigators for approving a new pain killer that has been called a super aspirin. In a warning to 33,000 physicians, the *MEDICAL LETTER* said it could not understand why FDA approved a drug that "may be excessively hazardous if taken for more than seven days and meets no urgent need." The drug, available by prescription only, is Ponstel, a product of Parke, Davis and Co.

Ponstel, by all clinical evidence, does relieve pain, the *MEDICAL LETTER* says, but leads to side effects including severe diarrhea, headache, drowsiness, nausea and nervousness.

Before approval for sale in the U.S., Ponstel was tested and used in Britain and other foreign countries for 10 years. Almost 190 million capsules have been sold, a Parke, Davis spokesman says.

FDA officials say "We always take notice of *MEDICAL LETTER*'s comments and we'll watch this drug closely."

BIOCHEMISTRY

Proteins clue to graft rejection

The level of a particular group of proteins in the blood may be a clue that a patient is about to reject a grafted organ.

In experiments on guinea pigs, Drs. Edward D. Coppola and Gregorio R. Villegas of the Hahnemann Medical College, Philadelphia, show that the quantity of a certain protein called C' goes down while the body is in the process of rejecting a graft. Guinea pigs that received skin grafts from other guineas had a steady drop of C' protein levels in blood during the 10 to 15 days it took for complete rejection of the foreign skin. Afterwards, levels returned to normal.

The researchers report their findings in the September *PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE*. Dr. Villegas says that similar reductions of protein levels have been reported in humans during graft rejections but the number of cases is too small to produce definite conclusions.

BIOCHEMISTRY

Test for rheumatoid arthritis

The presence of two specific molecular forms of an enzyme called acid phosphatase in knee fluid may be a useful test for diagnosing rheumatoid arthritis.

From studies of 36 patients, scientists at the Universities of Hawaii and Uppsala, Sweden, find that those with rheumatoid arthritis had high levels of acid phosphatase forms A and B in knee fluid. Patients with other types of arthritis did not show this enzyme pattern, according to a report in the Oct. 21 *NATURE*.