

BACTERIOLOGY

Staph Becomes Deadly

A possible explanation of how staphylococcal infection begins is seen in the discovery of the role coagulase plays in turning harmless "staph" into virulent ones.

THE ENZYME coagulase can turn harmless "staph" into deadly virulent bacteria.

For the first time it has been shown that when coagulase is mixed with strains of bacteria that do not usually produce disease, these bacteria then become virulent and produce infection, Dr. Richard Ekstedt of Northwestern University Medical School has reported.

It has never been understood just how a staphylococcal infection gets started in the body, Dr. Ekstedt told scientists at the Society of American Bacteriologists meeting in St. Louis, Mo. The type of staphylococci which produce disease also produce coagulase. The enzyme by itself is harmless to animal tissues. Now laboratory studies indicate that when a mixture of coagulase and harmless staphylococci is injected into mice, the animals quickly die of a fatal staph infection. The same bacteria injected alone had no effect.

The bacteria that cause staph infections—ranging from minor skin irritations to pneumonia—are generally present in the atmosphere. Many of them have become resistant to penicillin and other antibiotics, however, and have become a major problem in hospitals today.

This study may bring scientists one step closer to solving the problem of preventing and controlling these staphylococcal infections. Dr. William Yotis, also of Northwestern, is co-worker with Dr. Ekstedt.

In another report to the bacteriologists' meeting a practical test was described that makes it possible to identify the staphylococci that cause food poisoning.

The test may also be useful for the direct detection of the staph-produced poison enterotoxin in food, Dr. E. P. Casman of the Food and Drug Administration's microbiology division said.

There are at least two types of enterotoxin, he reported. However, only one type is associated with food poisoning.

Studies showed when enterotoxin was injected into rabbits an antitoxin was formed which reacts with and neutralizes the poison. A specific serological test for enterotoxin, the cause of the most common type of food poisoning known, is the result.

Undulant Fever Bacteria

THE MOST infectious form of the bacteria that cause undulant fever is the one that does the least damage to the body's white blood cells.

This finding seems to go against current theories of how these blood cells fight infection. It seems that the white blood cells may be "joining instead of fighting" the invading bacteria, Prof. Bob A. Freeman of the University of Chicago said. Damon

J. Kross and Richard Circo also worked on the study.

Various forms of the bacteria *Brucella* were grown in test tube cultures of white blood cells. *Brucella* cultures of low virulence—least infectious—caused almost complete destruction of the blood cells. However, Prof. Freeman reported, cultures of higher virulence showed very little destruction. This indicates that a fundamental character of virulent organisms is their capacity to infect and grow inside animal cells without causing the destruction of those cells, the microbiologist said.

It may be that the more virulent bacteria protect themselves against the body's defenses, such as the white blood cells, by their ability to live and grow within the host cells.

Drs. W. Stinebring and R. Kessel of the Institute of Microbiology at Rutgers University reported on similar studies. They grew *Brucella* bacteria in tissue cultures of guinea pig monocytes without finding signs of a reduced number of organisms. No changes were observed in the organisms recovered from the guinea pig tissue cultivation, the scientists said.

Trench Mouth Bacteria

MORE EVIDENCE has been reported that tiny spiral-shaped bacteria called spirochetes are the cause of trench mouth.

Ulcer-like lesions were produced in rabbits and guinea pigs by injecting them with cultured strains of the spirochetes. This is the first positive evidence that reproducible lesions can be started with pure cultures of these bacteria, two dental researchers from the National Institutes of Health, Bethesda, Md., reported.

Abscesses formed, Dr. Edward G. Hampp told scientists at the Bacteriologists meeting. He and his co-worker, Dr. Stephan E. Mergenhagen, were able to take spirochetes from the abscesses and use them to produce lesions in other animals.

Trench mouth, first recognized in soldiers, is an acute and ulcerative infection. It usually affects the gums but may extend to the lining of the cheek and larynx. Gums frequently bleed and brushing teeth is extremely painful. When the infection reaches the tonsil area, it is called Vincent's angina.

Previously numerous attempts had been made to produce experimental infections in animals with these oral spirochetes.

Dr. Hampp reported that he and his co-workers expect to study other oral bacteria that may play supporting roles with spirochetes in the production of oral diseases.

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PHARMACOLOGY

Tissue Culture Test Aids Anti-Tumor Drugs Search

See Front Cover

A RAPID, relatively low-cost testing procedure for detecting anti-tumor compounds has been developed by Irving Toplin at the John L. Smith Memorial for Cancer Research, Maywood, N.J.

In the photograph on the cover of this week's SCIENCE NEWS LETTER, a technician works on the test procedure. She places a nutrient broth containing human blood serum into a series of transparent plastic cups in which cells from human cancers are growing. Adding the test chemical to the broth enables researchers to measure its effect in inhibiting tumor cell growth.

The cells are incubated and then examined microscopically for signs of anti-tumor activity. Results from these tests have given the same results as those with laboratory animals. The method is relatively inexpensive.

The Smith Memorial is a research division of Chas. Pfizer & Co., Inc.

Science News Letter, May 30, 1959

PHARMACOLOGY

New Anti-Vomiting Drug Eliminates Side Effects

A DRUG that can prevent and control nausea and vomiting safely without causing sleepiness and other undesirable side effects has been developed.

The drug, called Tigan, has been found to successfully prevent and suppress vomiting and nausea in pregnancy, motion sickness due to land, air or sea travel, radiation therapy in cancer, drug-induced vomiting, upset stomach and other disease states, as well as in post-operative conditions, scientists reported at a clinical symposium in New York.

The compound is unrelated to other antiemetics now on drug shelves. It is not an antihistamine or a derivative of phenothiazine, drugs that achieve their effects by tranquilizing and sedation.

Tigan travels to the portion of the brain through which impulses are carried to the vomiting center. It has proven effective in more than 5,000 adult and child patients without producing the undesirable side effects associated with other antiemetic usage.

The drug has proved particularly valuable in radiation therapy with cancer patients, Dr. David W. Molander of the George S. Pack Medical Group, Cornell University Medical School and Sloan-Kettering Institute, New York, reported.

Tigan, a hydrochloride, is a stable, odorless, somewhat soluble white powder. It is available only on prescription. Dr. M. W. Goldberg and S. Teitel of the Hoffmann-LaRoche Laboratories successfully synthesized the agent.

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