life sciences

TRANSPLANTATION

Enzyme signals rejection

Excesses of an enzyme found in heart tissue warns physicians of imminent rejection within the first month of transplantation. Dr. James J. Nora and transplant surgeon Denton A. Cooley of Baylor University College of Medicine in Houston report from studies of 17 cardiac transplant patients that a particular molecular form of the enzyme lactate dehydrogenase appears to be a good clue to early rejection.

When rejection begins within a few weeks of surgery, levels of LDH-1 rise to abnormal levels, Drs. Nora, Cooley and colleagues report in the May 30 issue of SCIENCE. However, they find, there appears to be no correlation between LDH-1 levels and the rejection phenomenon if it begins much more than a month later. "From previous animal studies electrocardiographic abnormality was the one parameter considered valid enough to carry into the monitoring of human cardiac rejection," they say. However, "the electrocardiogram is least discriminating during the early period after operation, especially during the first two weeks when non-specific changes related to heart surgery may obscure signs of rejection." LDH-1 activity may meet the need for an early indicator.

IMMUNOLOGY

Drug prevents chicken pox

Though exposure to varicella or chicken pox poses no serious threat to normal children, the disease can be deadly to young patients with various immune deficiencies and cancer, and to those receiving steroid drugs. In the May 29 issue of THE NEW ENGLAND JOURNAL OF MEDICINE, four New York researchers announce an effective preventative.

In double-blind studies, Drs. Philip Brunell, Avron Ross, Lawrence Miller and Betty Kuo of the New York University School of Medicine administered one of two drugs to children who had been exposed less than 72 hours before. Those given standard immune serum globulin developed symptoms of chicken pox. Those given Zoster immune globulin (ZIG) were immunized effectively. The ZIG is prepared from pooled plasma of patients recuperating from herpes zoster, an inflammatory disease of cerebral nerves, caused by chicken pox virus. ZIG therapy is recommended primarily for those children to whom chicken pox is potentially fatal.

MICROBIOLOGY

Infection, auto-immunity and cell damage

In spite of scientists' ability to handle a large number of bacterial and viral infections, they are unable to explain how offending organisms damage the body. The classic theory is that toxins are produced, as is true in diptheria and lockjaw, though in many diseases, including malaria and pneumonia, toxins have not been found.

From studies of malaria, three scientists from Michigan State University in East Lansing suggest that auto-immunity may be the mechanism by which cells and tissues are damaged. Drs. Herbert W. Cox, Robert W. Corwin and Colin G. Ludford find that in the later stages of malaria red blood cells or related substances of the blood become antigenic in response to the malaria parasites. The antigens are unique in that they are not part of the invading parasite, but are part of the patient's own blood system. Like any antigen, they trigger antibody production. In this case, because the person's cells, by some unexplained process, are rendered foreign, he produces antibodies against himself, antibodies that destroy blood cells and damage the lining of blood vessels. The researchers reported to the International Workshop on Malaria in Washington, D.C.

INTERFERON

Respiratory viruses vulnerable

Evidence that artificially stimulating the body's production of interferon knocks out virus diseases is mounting. Dr. David A. Hill of the National Institutes of Health in Bethesda, Md., reports that in tissue culture and animal studies, interferon-rich cells resisted infection by four common respiratory viruses.

Interferon production was triggered by a chemical called Poly I:C. This is a synthetic agent that mimics the double-stranded core of viruses that naturally stimulate interferon, though often too late to prevent infection.

Dr. Hill worked with Dr. Samuel Baron, also of NIH, who recently showed that Poly I:C stimulates enough interferon in rabbits to cure an eye infection (SN: 1/18, p. 60) caused by herpes simplex viruses. The researchers treated cultures of human embryonic kidney cells or human connective tissue cells with Poly I:C and, after incubating them overnight, exposed them to one of four human viruses: influenza A2, respiratory syncytial, parainfluenza and rhinovirus 13. The treated cells were highly resistant to infection.

Mice given small doses of Poly I:C through the nose and then given a dose of influenza A2 virus were virtually immune to the flu, they found.

ENDOCRINOLOGY

Cancer clue in hormones

Hormone tests may be used to identify women prone to breast cancer in the same way that mass X-ray screening is used to detect lung disease, says Dr. R. D. Bulbrook of the Imperial Cancer Research Fund in London.

Dr. Bulbrook, chairman of the department of clinical endocrinology, describes a seven-year study of female volunteers in Guernsey.

The survey found that 13 of the 17 women who developed breast cancer during the trial had secreted unusually large amounts of hormone.

If the results are representative of women generally, they indicate that about two-thirds of the breast cancer cases develop in women with a previous abnormal secretion of these agents, including estrogen.

About one-fifth of women have this condition. Among these, therefore, the breast cancer rate might be as high as one in 10 or one in 12, Dr. Bulbrook says. In the other four-fifths of the population it should be very low.

If hormone tests were used to pick out the high-risk women, their hormone balance might be corrected.