

biological sciences

Restoring immunity: Thymus transplant

Vaccines are one way to turn on the body's defenses against foreign invaders. Injections of immune cells is another promising approach (SN: 5/27/72, p. 341). At the recent meeting of the Society for Pediatric Research in Washington, pediatrician Russell W. Steele of the Georgetown University School of Medicine reported that he and his colleagues have transplanted a thymus into an infant that lacked one and showed impaired immune function. The thymus, a small gland-like organ at the base of the neck, makes immune cells, or lymphocytes, and is one of the body's major immunological defenses.

This work, Steele said, represents "the first transplant of a thymus encased in a Lucite diffusion chamber. The chamber, which acts like a porous membrane, protected the infant from attack by the thymus cells and enabled us to reconstitute immune competence while running little danger to the host."

Immune reactions were noted as early as six hours after transplantation.

Brain functions at cellular level

Medical scientists agree that the brain is the least understood organ of the body. Few proteins, for example, have been isolated from specific areas of the brain; they have been taken in large quantities from other organs. Now biochemist Frank L. Margolis of the Roche Institute of Molecular Biology in Nutley, N.J., reports in the May PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES that he has extracted a protein from the olfactory bulb of mice. The bulb is an area of the brain involved in modulating behavior related to smell—mating, aggression, territorial claims and maternal behavior.

"We don't know what the protein does," Margolis admits, "but we are now using the protein as a probe of brain function within the olfactory bulb, both in vivo and in vitro."

What changes ATP to energy?

One of the most crucial of all life properties is the breakdown of the energy molecule, ATP, to ADP and phosphorus. The reaction releases energy essential to the life processes of cells, and hence of an organism.

But what really happens when ATP changes to ADP is still mostly conjecture. An enzyme called ATPase is believed to catalyze the reaction. Free ions from various elements are thought to intervene in the process, perhaps serving as energy transfers. ATPase has not been purified well. Now biochemists Joseph Avruch of Harvard Medical School and Grant Fairbanks of the Worcester Foundation for Experimental Biology report in the May PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES that they have fractionated out a molecular intermediate of ATPase that works on the cell membrane and is crucial for extruding sodium from the cell and for bringing potassium into the cell.

"This achievement," Fairbanks told SCIENCE NEWS, "now gives scientists a more specific tool for studying the molecular intermediates in ion transport as well as in other phosphorylation and dephosphorylation processes. In the past it was possible to only indirectly measure phosphorylation and to characterize intermediates."

behavioral sciences

Sexual identity in Barbados

According to the status-envy hypothesis, sex-role identity is learned because a child envies the person who controls resources he wants (food, shelter, love, etc.). This envy becomes a motive for wishing to occupy the status of the person controlling these resources. Exclusive control of resources by the mother during infancy leads to primary feminine identification. If men control the important resources during later childhood, a secondary masculine identity develops.

Roger V. Burton of the National Institutes of Health tested this hypothesis on the island of Barbados where father absence is both common and acceptable. The children tested, 37 boys and 45 girls, were given the Draw-a-Person test as a measure of sex-role identity. As expected, there was a greater likelihood among the father-present boys to draw a male figure first. Among the girls, 82 percent drew a woman first. To retest the hypothesis each child was then asked to draw a second person opposite in sex from the first figure. In every instance the girls drew the female larger than the male. The father-present boys drew the male larger, but the father-absent boys drew the male smaller or the same size. Burton concludes that the father-present boys compose the only group with consistent masculine identity.

Klinefelter's syndrome and schizophrenia

Klinefelter's syndrome is a genetically transmitted endocrinological disorder characterized by the presence of at least one extra X chromosome in a sex grouping. Abnormally small testicles, enlarged mammary glands and sterility are the usual physical results. The disease is often accompanied by neuropsychiatric disorders. Michael A. Sperber, Lucy Salomon, Mary Collins and Morris Stambler of Harvard Medical School found four cases of Klinefelter's syndrome in a population of 350 hospitalized males who had displayed signs of schizophrenia since childhood. This finding, the researchers feel, is statistically significant because Klinefelter's syndrome normally occurs in only one of 500 males. The researchers report in the May AMERICAN JOURNAL OF PSYCHIATRY that these cases are the first in which the association has been made between Klinefelter's syndrome and childhood schizophrenia.

The researchers believe the risk of childhood schizophrenia is higher among those with Klinefelter's syndrome. They also feel "the syndrome is of considerable theoretical interest since it exemplifies a genetically transmitted endocrinological disorder with behavioral concomitants."

War and peace

Maybe war isn't all bad. In Northern Ireland, a marked decrease in suicides and depressions has accompanied the increase in civil warfare. H. A. Lyons of Purdysburn Hospital in Belfast compared hospital records from 1963 to 1968 with those from 1969 to 1970. There was a 50 percent fall in suicides and a sharp drop in depressive illnesses during the second period, especially among the men in the lower socioeconomic classes nearest the fighting. Among the upper classes in Belfast and in the most tranquil areas of Northern Ireland, however, there was an increase in depressive illnesses among men.