Life Sciences Notes

CIRCADIAN RHYTHMS

Amino Acids Have Rhythm

The amounts of protein-building amino acids in human blood and serum show a 24-hour rhythm, scientists report.

In studies on six healthy adult males, aged 20-23 years, investigators at U.S. Army Fort Detrick, Frederick, Md., found amino acid levels are highest between noon and 4 p.m. and lowest at 4 a.m. Each subject had similar periods of highs and lows, although the absolute concentrations of amino acids varied significantly from man to man.

The volunteers all ate the same food and followed the same exercise routine for the five days of the study. Their amino acid levels were measured at four hour intervals, six times a day.

Drs. Ralph D. Feigin, Albert S. Klainer and William R. Beisel report their work in the July 29 issue of NATURE. But they offer no explanation for the variations or rhythmicity.

The influence of dietary factors on concentrations is a subject of much current debate. Some scientists say protein-rich food raises amino acid levels; others say it has no effect.

Recently, however, scientists reported that an enzyme called tyrosine transaminase follows a circadian rhythm, breaking down the amino acid tyrosine more at some times than at others (SN: 7/8). If similar activity applies to all enzymes and their amino acids, it could at least partially explain the variations in amino acid levels.

IMMUNOLOGY

Evidence of Cancer-Immunology Link

Evidence supporting the hypothesis that some forms of cancer develop because the body's immune system breaks down (SN: 4/1) is reported by researchers at Roswell Park Memorial Institute, Buffalo, N.Y.

From studies on about 500 persons—healthy volunteers, cancer victims and patients with other diseases—Dr. Julian L. Ambrus and co-workers conclude that cancer-associated viruses infect a majority of individuals. But only a few of them develop cancer.

Tests measuring the level of antibodies in blood show that the body's immune system is active during most of life, but operates at a very low key during a few childhood years and from age 60 on. These are the two periods leukemia most frequently develops.

Dr. Ambrus's volunteers, persons of all age ranges, were natives of Africa, Alaska and Buffalo.

Blood serum from the volunteers was mixed with cancer cells from patients with Burkitt's lymphoma (a form of cancer prevalent among African children), Hodgkin's disease and leukemia. If antibodies were present in the serum, researchers concluded the volunteers had been exposed previously to the virus, or to some substance in the cancer cells.

Apparently some natural resistance to viruses is transferred from mother to child; more than half of the infants studied at Roswell Park had antibodies to all three types of cancer. However, the antibodies disappeared within three months after birth. Scientists suspect antibodies for Burkitt's lymphoma will not reappear until the child is 11 years old and that antibodies for the other two cancers won't show up again until he reaches 20.

Because the tests showed only that some antibody-antigen reaction took place, and not the exact nature of that reaction, Dr. Ambrus cautions his findings are preliminary, not conclusive.

ANALGESICS

FDA Approves New Pain-Killer

The U.S. Food and Drug Administration has approved for sale a new non-addicting pain-killer reportedly as potent as morphine. This is the first time FDA has allowed such a claim for a pain-killer.

Called Talwin (it's generic name is pentazocine), the analgesic was synthesized nine years ago by Dr. Sydney Archer and co-workers at the Sterling-Winthrop Research Institute, Rennselaer, N.Y.

It has been under development and in clinical testing on some 12,000 patients in the United States since then.

Talwin, a prescription drug, can be used in place of morphine in some cases to relieve pain associated with cancer, childbirth, arthritis, trauma and surgery, its manufacturer, Winthrop Laboratories, claims.

Side effects include nausea, vertigo, light-headedness and vomiting.

In 1963 the National Research Council recommended Talwin not be placed under the narcotic regulations. In 1966, the World Health Organization made the same recommendation to FDA, which has imposed no special legal restrictions on its use.

BIOCHEMISTRY

New Insecticide for Body Lice

Synthetic juvenile hormone, a compound that effectively controls the yellow-fever mosquito, also is effective against Pediculus humanus, a kind of body louse that carries with it the threat of typhus epidemics.

Although typhus is a rarity today, there is always the possibility of its spreading through poverty-ridden or war-torn parts of the world.

Drs. J. W. Vinson and Carroll M. Williams of the Harvard School of Public Health, Cambridge, report that synthetic juvenile hormone is lethal to both adult lice and to unhatched eggs. Eggs were tested on wool and nylon pads treated with the hormone. In every case, less than 25 percent survived.

Controls, tested on the same kind of padding treated with peanut oil, hatched about 85 percent of the time.

Exposure to synthetic juvenile hormone in varying concentrations also kills adult lice and inhibits normal sexual development of nymphs.

Drs. Vinson and Williams, in the July PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, report their findings are of special interest because in many parts of the world, lice have become immune to most insecticides.