CHEMISTRY

Make Body Hormone

Beginning with a coal tar product, chemists have been able to synthesize a few crystals of aldosterone, a hormone important in maintaining the body's salt balance.

➤ THE VITAL HORMONE that controls the salt balance of the body has been prepared directly from coal tar products. The accomplishment could make aldosterone more readily available for the treatment of human disease, such as the dreaded Addison's disease.

The chemists who reported their synthesis of the hormone to the American Chemical Society meeting in San Francisco said it still is too early to do more than speculate on what significance their work will hold for physicians.

They pointed out, however, that aldosterone can be extracted from adrenal glands only in very small amounts, and the only practical way to obtain it in quantities large enough for wide medical study is through synthesis.

In comparison with the artificial adrenal hormone desoxycorticosterone acetate, or DOCA, aldosterone is extremely active. Biological, physical and chemical tests have shown it has 30 times as much salt-retention potency as DOCA.

Before the synthetic aldosterone can be made available for routine salt level control in humans, it must first be produced in quantities large enough for testing chemically, and in animal and hospital experiments, Dr. William S. Johnson of the University of Wisconsin said.

Dr. Johnson headed a research team consisting of Drs. Joseph C. Collins, Raphael Pappo and Mordecai B. Rubin, also of the University.

The salt-retaining aldosterone first was totally synthesized in 1955 by Dr. Arthur Wettstein and a team of Ciba Company scientists in Switzerland, Dr. Johnson said.

The synthesis described was the first to be based on a very readily available coal tar chemical, 1,6-dihydroxynaphthalene. That chemical was chosen as a starting point, Dr. Johnson said, because it is very similar in structure to some parts of the aldosterone molecule.

Following the addition of two more compounds plus treatment in some 30 separate chemical reactions, a few crystals of the hormone were obtained.

The yield was only "about equal to the amount of salt from one shake of a saltcellar," Dr. Johnson said, but it was sufficient for positive identification.

For the total synthesis of the important body chemical, as well as for previous work, Dr. Johnson received the American Chemical Society $1,000 award for creative work in synthetic organic chemistry. Earlier, he synthesized the femal hormone estrone and performed the first total synthesis of the male sex hormone testosterone.

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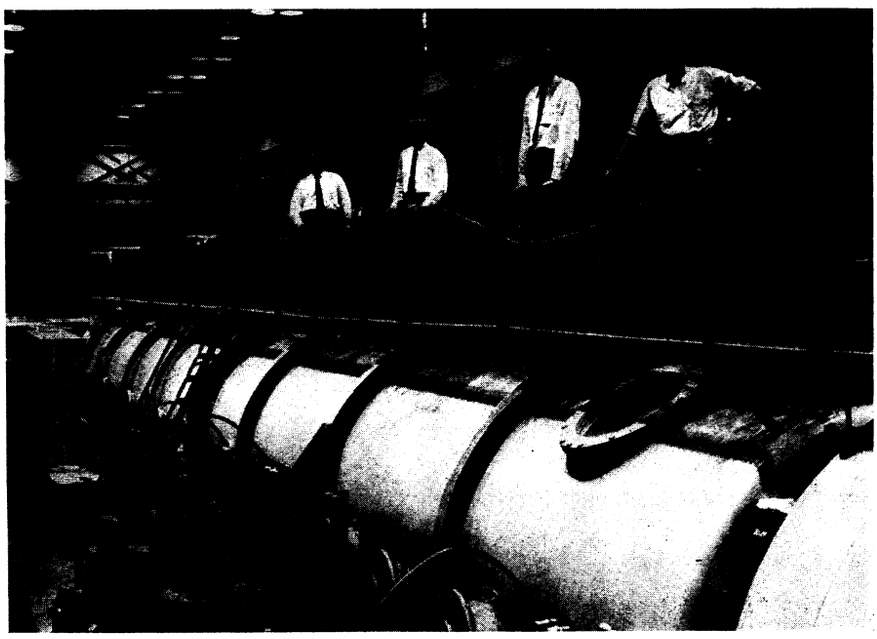

ATOM SMASHER—A giant new heavy ion linear accelerator has gone into operation at Yale University. More than three years of work went into the design and construction of the $1,800,000 accelerator financed by the U. S. Atomic Energy Commission. Standing on the runway are four physicists who worked on the design and development of the accelerator: beginning at the left, Prof. Edward R. Beringer, director of the project, Myron S. Malkin, Carl E. Anderson and Robert L. Gluckstern.

PUBLIC HEALTH

Diet Can Protect Man From Harmful Isotope

➤ MAN CAN protect himself from the dangers of radioactive strontium-90 fallout in his food by chemically treating garden soil and by switching his tastes in vegetables.

Treat garden soil with lime and learn to eat more plants that do not readily pick up strontium from the soil. These are the life-saving proposals reported to the American Chemical Society meeting in San Francisco by Dr. Eric B. Fowler, Los Alamos, N. Mex., Scientific Laboratory of the University of California.

Bone cancer-causing strontium-90 from nuclear test fallout may pose a serious threat to man by entering the foods he eats, Dr. Fowler said.

Based on the Los Alamos research, lettuce and alfalfa could be considered "safe" plants, and various grasses would have to be called unsafe for humans and animals with respect to their ability to take up strontium-90.

Strontium is chemically very similar to calcium, which is normally absorbed from the soil by plants. Plants that pick up needed calcium from the soil also will pick up dangerous strontium-90. To reduce the strontium-90 uptake, Dr. Fowler said, it is necessary to make calcium much more available to the plant.

Experiments performed in New Mexico as part of "Project Green Thumb" show that large quantities of calcium, in the form of lime, added to plant-growing soil considerably reduced the strontium-90 uptake of lettuce, alfalfa and grass.

Dr. Fowler suggested the lime be added to soil in the form of limestone, which is nearly half calcium.

Plants such as lettuce and alfalfa "seemed to prefer calcium to strontium and during their growth acquired less strontium from the soil than would be expected." Other plants, such as grass, preferred strontium and appeared to concentrate strontium as they grew.

The Los Alamos chemists pointed out that other scientists have reported that strontium-90 from radioactive fallout concentrates in the upper two to four inches of soil and that plants with deep roots absorb only a small amount of radioactivity.

They suggested that "food for humans and cattle obtained from deep-feeding plants may be important sources of nutrient low in strontium."

Co-authors of the report, all of the Los Alamos Laboratory, were Richard G. Thomas, George L. Johnson, Mitchell A. Melnick, Elgin H. Rex, Felix A. Vigil and C. W. Christenson.

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