

MEDICINE

Clue to Anti-Clot Drug

Chemical structure of heparin, which is used to forestall blood clot formation in heart attack patients, is being probed with an organism found in the earth.

► THE SECRETS of the human body's own anti-blood-clotting drug, heparin, are being pierced by a kind of germ warfare attack at the National Heart Institute, Bethesda, Md.

Heparin is used to forestall formation of blood clots in patients who have had heart attacks such as President Eisenhower's. It is also used to prevent such clots after surgical operations. Its high cost, however, keep it from being as widely used as some of the synthetic anti-clotting chemicals.

Besides its anti-clotting action, heparin also plays a role in "clearing" fatty blood associated with arteriosclerosis, the serious artery hardening that leads to most heart attacks and kills more than 350,000 persons yearly.

Heparin, however, has for 40 years, since its discovery in 1916, defied efforts of scientists to learn its chemical structure and exactly what happens to it in the body.

The germ warfare attack at the National Heart Institute has given scientists what seems to be the first breakthrough on these heparin chemistry problems.

By using an obscure germ, or organism, found in the earth around the Heart Institute in Bethesda, scientists have for the first time degraded heparin chemically and separated some of the large chemical "building blocks" that make up the anti-clot chemical.

These "building blocks" are being analyzed and attempts will be made to break them down still further. Eventually the scientists hope to learn heparin's structure and perhaps to create it synthetically in the laboratory.

Heparin's role in clearing fatty blood is played with an enzyme chemical called lipoprotein lipase which scientists at the National Heart Institute discovered some time ago.

With the new way of learning more about heparin, the scientists hope to find out more about the body's system for fat transport and from that what goes wrong, and why, to cause the fatty artery hardening that kills.

They hope, also, to get the part of the heparin that works with the enzyme to clear fat, and to get it separate from the part that prevents blood clotting.

The germ warfare attack on heparin was made by Drs. A. Nail Payza and Edward D. Korn. The organism they used belongs to a widespread group known as Flavobacterium. One of these tiny-rod-shaped bacteria actually utilizes heparin for nourishment, the scientists found. In the course of this, it breaks heparin down, something

as our bodies break down meat and other food into their basic chemical parts.

These newly important soil organisms are now being grown at the Heart Institute in pure form. With their aid, the scientists hope to get for study all the components of the complex chemical.

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BIOLOGY

Heat Plus Chemical Checks Cancer in Eggs

► HEAT plus a chemical has checked experimental cancers growing in the yolk sacs of embryonated eggs, Drs. Alfred Taylor and Roger J. Williams of the University of Texas and the Clayton Foundation for Research, Austin, Texas, announce in the *Proceedings of the National Academy of Sciences* (Feb.).

Cancer control in humans might be achieved, the Texas scientists believe, by a similar simultaneous use of chemical and physical agents.

The chemical they used in their experiments was TEM, short for triethylenemelamine, already known as capable of checking some experimental cancers. The heat used was enough to raise the temperature of the egg embryos about six degrees Fahrenheit. This also has previously been shown unfavorable to cancer growth.

In the experiments with TEM, the cancer-bearing eggs got one injection of the chemical at the 10th day of incubation and the temperature was raised for 48 hours. Of 140 eggs treated this way, 86 survived to the 16th day of incubation at which time only traces of atypically appearing tumor were present in most of them.

Of 57 control eggs in the same experiment, all but one were killed by the growing tumors. One survived to the 16th day and contained a large tumor.

The scientists declare they do not want to over-emphasize the implications of their experiments for cancer treatment. But they think the approach, that is, use of chemical and physical agents simultaneously, "could lead to further progress and the establishment of some general principles which apply to cancer control."

Science News Letter, March 3, 1956



MODEL REACTOR ON TOUR—French scientists visiting Chalk River see an NRX reactor model that will be shown in Paris during March and then will go on a three-year tour of the Far East. Built by Atomic Energy of Canada Limited, the model will be shown in UNESCO's science exhibit entitled "Energy and Its Transformations." Shown examining it are, from left to right, Dr. D. A. Keys, scientific adviser to the company's president, and Drs. Pierre Mouret and Robert Sartorius, chemists of the French Atomic Energy Commission project at Chatillon, France.