

Prostaglandin Synthesized

The synthesis of hormone-like prostaglandin will make a larger supply of the material available to researchers

► THE FIRST TOTAL synthesis of a prostaglandin—one of a group of substances that may be involved in high blood pressure and other body processes—was reported in a Nobel Symposium at the Karolinska Institute, Stockholm.

Three chemists of the Upjohn Company, Kalamazoo, Mich., reported the successful synthesis of the highly potent hormone-like substance, which will increase the supply for research purposes, eventually for human trials.

The prostaglandins, discovered more than 30 years ago, are produced by mammals, including man, at many sites in the body, but were first found in human semen and in the vesicular gland of sheep.

It was not until 1957 that two of the pure compounds were isolated from crude natural sources by scientists at the Karolinska Institute. About that time, the Karolinska and Upjohn groups began exchanging information.

The structures of a dozen or so

natural prostaglandins were determined at Karolinska and soon afterward, biosynthetic methods were developed in the United States and abroad to make these rare compounds.

Some prostaglandins, although not hormones in the classic sense, block many of the effects of epinephrine, the hormone that makes a person's heart pound and his muscles grow tense as he faces a threatening situation.

The synthetic compound made in the Upjohn Research Center is called dihydro-PGE 1, and is identical to a naturally occurring metabolite of a parent prostaglandin called PGE 1. In animal tests it has made smooth muscles contract and blood pressure fall.

Only limited studies have been made so far of the possible role of prostaglandins in medicine, but Dr. David I. Weisblat, director, biochemical research at Upjohn, said they are some of the most "exciting" compounds in biochemical studies.

One prostaglandin is so potent that

less than one-billionth of a gram causes a smooth muscle such as the intestinal tract to contract. Some of the substances raise blood pressure and others lower it. Some are released when the brain and other parts of the nervous system are stimulated. Some affect the reproductive functions, increase heart output and alter fat mobilization.

A kidney substance called medullin, which at St. Vincent Hospital, Worcester, Mass., was first tried on a patient with high blood pressure and reduced it to a normal level, was found to be a member of the prostaglandin family.

The Kalamazoo chemists reporting successful synthesis are Drs. Philip F. Beal and John C. Babcock, with Frank H. Lincoln.

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SURGERY

Ulcer Operation Value Questioned

► THE VALUE of performing ulcer operations without treating underlying psychological conflicts was questioned in a Seattle study of 30 ulcer patients.

The 30 patients were divided into two groups—15 who had had gastrectomy operations and 15 who had not.

Although operations virtually eliminated ulcer symptoms in the 15, the study found that a new set of physical complaints soon appeared whose effect on the patient was as serious as or perhaps worse than the original ulcer.

New symptoms included chest and back pain, fatigue, abdominal cramping and increased nervousness.

Also increased were complaints of a psychological nature—general unhappiness, feelings of isolation, depression, worrying and suspiciousness, reported Drs. Neal E. Ely and Merlin H. Johnson of the University of Washington School of Medicine, Seattle, Wash.

"What appears to happen," the psychiatrists said, "is an increase in the essentially neurotic kinds of complaints in the patients who have had surgical treatment of their symptoms."

With the exception of three patients, the nonsurgical group did not develop new symptoms. They did, however, have an 80% ulcer recurrence.

Of those who had not had operations, two became unemployed, while the rest worked steadily and apparently at the same level as before their ulcer problems.

The surgical group, on the other hand, reported three unemployed, two marginally employed and three more with decreased working status. One patient felt less effective at work.

Personal reports from the patients were paralleled by test results from the Cornell Medical Index and the Minnesota Multiphasic Personality Inventory, the doctors reported in the *American Journal of Psychiatry*, 122: 1362, 1966.

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Upjohn

HAPPY CHEMISTS—Chemists at the Upjohn Company achieved the first total synthesis of a prostaglandin, one of a group of substances that may be involved in high blood pressure, smooth muscle action and other processes. Dr. John C. Babcock, Dr. Philip F. Beal and Frank H. Lincoln (left to right) did the research.