

## BIOCHEMISTRY

# Make Pituitary Hormone

Oxytocin, important in childbirth and lactation, is synthesized, marking the first time that a hormone from the pituitary gland has been made artificially.

► **SYNTHESIS FOR** the first time of a hormone from the pituitary, often called the body's master gland and famous as source of anti-arthritis ACTH, is announced by Dr. Vincent du Vigneaud and associates of Cornell University Medical College at the New York Hospital-Cornell Medical Center in New York.

Synthesis of a second hormone from this same gland has almost been accomplished, Dr. du Vigneaud also reports.

The first hormone is oxytocin, important in childbirth and lactation. The second is vasopressin, the blood pressure raising and antidiuretic hormone of the pituitary.

Associated with Dr. du Vigneaud in synthesis of oxytocin were Drs. Charlotte Ressler, John M. Swan, Carleton W. Roberts, Panayotis G. Katsoyannis and Samuel Gordon.

Working with him on vasopressin were Miss H. Claire Lawler and Dr. Edwin A. Popenoe.

Details of the synthesis of oxytocin and the chemical structure of vasopressin with signs of success in its synthesis are reported by the Cornell researchers in the *Journal of the American Chemical Society*.

Oxytocin gets its name from the Greek word for "rapid birth." Its effect in causing contractions of the uterus make it important in childbirth, while it also influences release of milk in the mammary glands.

The achievement of the synthesis of oxytocin establishes the structure of this hormone and opens the door to many new investigations in biochemistry, pharmacology and physiology, which should lead to a better understanding of the function of this important principle, Dr. du Vigneaud pointed out. Such a synthesis may also provide an unlimited source of the oxytocic hormone for possible expansion of its use in clinical medicine, particularly in obstetrics, and in veterinary medicine, he said.

Tests of synthetic oxytocin, by Dr. R. Gordon Douglas, Dr. Kenneth G. Nickerson and Prof. Roy W. Bonsnes of the department of obstetrics and gynecology, showed it fully effective in stimulating labor in humans. It also possessed milk-releasing activity. About one-millionth of a gram of either the natural or synthetic material injected into a woman's veins induced milk release in 20 to 30 seconds. (A gram is about one-thirtieth of an ounce.)

Oxytocin is a polypeptide and the first polypeptide hormone to be made synthetically. It is made up of eight amino acids: leucine, isoleucine, proline, tyrosine, glutamic acid, aspartic acid, glycine and cystine. It also contains three molecules of ammonia.

Five of the amino acids are in a ring-like structure with three in a chain at the side. The two sulfur atoms of cystine are in the ring.

Vasopressin is believed to have a similar structure. It is made of eight amino acids and three molecules of ammonia. Six of the amino acids are the same as those in oxytocin, but the leucine and isoleucine are replaced by phenylalanine and arginine.

Oxytocin from hog glands appeared to be the same as that from beef glands, but a surprise was encountered with vasopressin. Dr. Popenoe, Miss Lawler, and Dr. du Vigneaud found that hog vasopressin contained lysine in place of arginine. This may be of far-reaching significance and the hormones from other species are being investigated, Dr. du Vigneaud said.

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## SURGERY

## Find Survival Limit For Lung to Be Grafted

► **IF SURGEONS** ever dare to graft a lung from one person to another, as skin, bones, nerves and blood vessels now are grafted, they will have at least a half hour in which the lung can be separated from its original owner before being stitched into the body of its new owner.



In dogs this length of time, 30 minutes, seems to be the upper limit for any appreciable survival of breathing function in a lung completely cut off from a blood supply, Drs. Brian Blades, Howard C. Pierpont, Abdussamed Samadi and Robert P. Hill of George Washington University School of Medicine, Washington, D. C., reported to the American College of Surgeons meeting in Chicago. Whether a human lung could survive longer was not stated.

In the studies reported the lung was not removed from the dog. Instead, the blood supply was shut off for varying periods of time, then turned on again, as it were. At this point the lung was gently reinflated. Test of its ability to function came when the lung on the opposite side was removed.

Science News Letter, October 17, 1953

## SURGERY

## First Half Hour Critical Period in Heart Wound

► **PATIENTS WOUNDED** in the heart who reach the hospital alive at least 30 minutes after the wounding have a good chance of recovery without operation.

Studies of dogs that suggest this were reported by Drs. H. LeRoy Brockman, Denton A. Cooley and Michael E. DeBakey of Baylor University College of Medicine at Houston, Tex., at the surgeons' meeting.

Chances of dying immediately are a little greater if the wound is in the left ventricle of the heart, the chamber that pumps oxygen-rich blood from the lungs to the body, than when the wound is in the right ventricle, the chamber that pumps blood to the lungs to pick up oxygen.

Bleeding is likely to be greater from right ventricle wounds than left.

Science News Letter, October 17, 1953



**STUDY PRECIPITATED PARTICLES**—To examine the precipitates formed by mixing chemical reagents, Drs. Robert B. Fischer and Joseph P. Ellinger of Indiana University have devised a technique using a one-step, shadowed replica for the electron microscope. A direct view of lead chromate particles is on the left, a shadow replica on the right.