

equimolar concentrations, no inhibition of the coagulation was detected.

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Hypophysis-Thyroid-Gonad Relationship.*

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Thyroidectomy in male and female rats will increase the effectiveness of crude hypophyseal gonad stimulating extracts but the removal of this gland will not increase the effectiveness of pregnancy urine or pregnancy mare serum extracts (Smith,¹ Schockaert,² Fluhmann,³ Leonard and Hansen⁴). Since Fluhmann³ showed that thyroid feeding in rats decreased the effectiveness of both types of gonad stimulating hormones (hypophyseal and pregnancy urine), he suggested that the thyrotropic principle, present in the crude hypophyseal extracts, induced a hyperthyroid condition in the normal rats, which made the gonad stimulating hormone less effective. Pregnancy urine, not possessing a thyrotropic factor, was equally effective in normal and operated animals. This report will show that follicle stimulating hormone from hypophyseal or urinary sources and free of the thyrotropic hormone is more effective in the absence of the thyroid.

Immature female rats 24 to 26 days of age were thyroidectomized and injected with extracts of the urine of castrate women and of a man with a testis tumor, for 8 to 9 days. A similar number of control rats received only injections of the hormone. Another group of operated and control rats were treated with hypophyseal follicle stimulating hormone, prepared by Drs. Fevold and Hisaw,[†] for 5 to 6 days. None of the extracts were found to contain a thyrotropic factor when tested on young guinea pigs or hypophysectomized rats in the doses given. The ovaries and uteri were weighed at autopsy. More than 50 rats were used in these

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¹ Smith, *Sex and Internal Secretions*, 1932, Ed. by Allen.

² Schockaert, *Compt. Rend. Soc. Biol.*, 1931, **108**, 431.

³ Fluhmann, *Am. J. Physiol.*, 1934, **108**, 498.

⁴ Leonard and Hansen, *Anat. Rec.*, 1936, **64**, 203.

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experiments and only representative experiments are given in Table I.

TABLE I.
Effect of Thyroidectomy on the Action of Follicle Stimulating Hormone.

No. of Rats	No. of Days	Amt. of Hormone	Av. Ovarian Wt., mg.		Av. Uterine Wt., mg.		% difference	
			Exp.	Cont.	Exp.	Cont.	Ovary	Uterus
13	6	F.S.H. .33 cc.	42.0	30.4	141.5	90.8	38.1	55.8
5	9	Testis tumor equiv. of 100 cc. urine	49.0	18.8	153.6	65.5	160.6	134.5
5	8	Spayed woman equiv. of 100 cc. urine	39.0	25.6	121.0	42.4	52.3	185.3

From the results in Table I it is seen that the follicle stimulating hormone prepared from the hypophysis and urine and free from the thyrotropic hormone is more effective in the absence of the thyroid. The ovaries are from 38.1% to 160.6% heavier and contain only follicles. The larger ovaries in the thyroidectomized rats produce greater amounts of female sex hormone as the uteri of the thyroidectomized animals are from 55.8% to 185.3% heavier than those of the control.

Since pregnancy urine was previously shown to be equally effective in normal and thyroidectomized rats, it is concluded that the presence of the thyroid gland inhibits or prevents, to a certain degree, the action of the follicle stimulating hormone but does not prevent the action of pregnancy urine hormone (a luteinizer). Thus, the thyroid gland has a differential effect in inhibiting two types of sex stimulating hormones, a follicle stimulator from the hypophysis and urine and a luteinizer from urine.

It has been previously shown that the addition of thyrotropic hormone to pregnancy urine will not inhibit the effect of pregnancy urine (Leonard, Hisaw and Fevold⁵). It would seem from this fact that the increased effectiveness of a crude hypophyseal extract, containing both thyrotropic and follicle stimulating hormone, in the thyroid-less rat, is due, at least in part, to the enhanced effectiveness of the follicle stimulating hormone present.

⁵ Leonard, Hisaw and Fevold, *PROC. SOC. EXP. BIOL. AND MED.*, 1935, **33**, 319.