

We noted that curare (1%), erythrine (1%), acetylcholine (2%), and nicotine (0.5%) applied locally or injected into the lymph sac produced an immediate stoppage of the contractions of the lymph hearts. Adrenaline (1%), though not constantly, had the same effect. Strychnine (1%) and veratrine (1%) also stopped the heart beats but only after the general symptoms of intoxication had appeared. Eserine (0.5%), veratrine (1%) and ouabain (1%) applied locally caused slight diminution in the amplitude of the beats. Pilocarpine (1%), atropine (1%), pitressin and pitocin did not affect the activity of the posterior lymph hearts.

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Ovulatory Response of *Rana pipiens* to Mammalian Gonadotropic Factors and Sex Hormones.

WILLIAM B. LANGAN. (Introduced by L. G. Barth.)

From the Biological Laboratories of Columbia and Fordham Universities, New York.

The complete refractoriness of the common frog, *Rana pipiens*, to mammalian gonadotropic factors has attracted considerable attention, especially from point of view of comparative endocrinology and when considering such concepts as species gonadotropic specificity.¹ On the other hand, stimulation of the reproductive tracts of immature mice has been brought about by large doses of fresh anterior pituitary from *Rana pipiens*.² For further investigation of this problem the following preliminary experiment was undertaken.

Twenty-nine adult female *Rana pipiens* received abdominal injections, in varying concentrations, of (1) gonadotropic factors of mammalian anterior pituitary, (2) gonadotropic factors of pregnant mare's serum (gonadogen), (3) α -estradiol dipropionate (di-ovocylin), (4) progesterone (lutocylin), and (5) testosterone propionate (oreton). Injections of distilled water, sesame oil, and homoplastic pituitaries served as controls.

Approximately 72 hours after treatment an attempt to strip eggs was performed, immediately followed by laparotomy. Portions

¹ Creaser and Gorbman, *Quart. Rev. Biol.*, 1939, **14**, 311.

² Adams, E. A., and Granger, B., *Proc. Soc. Exp. Biol. and Med.*, 1938, **38**, 585.

of oviducts and ovaries were preserved for histological study while the pituitaries were prepared for cytological study. The ovulatory response was recorded as the relative number of eggs in the oviducts. In cases of negative response to stripping, a pituitary from a normal female frog was injected, which in all cases resulted in complete ovulatory response thus demonstrating that these specimens were capable of responding.

TABLE I.
Ovulatory Response of *Rana pipiens* to Mammalian Gonadotropic Factors and Sex Hormones. Temperature 15°C.

No. of Frogs	Substance injected	cc	Dosage	Ovulatory response %
2	*Gonadotropic factors of mammalian anterior pituitary	1	300 units (Collip)/cc	—
2	Gonadotropic factors of mammalian anterior pituitary	2	" " " "	—
3	†Gonadotropic factors of pregnant mares serum	1	10 " (Cartland-Nelson)/cc	—
2	Gonadotropic factors of pregnant mares serum	2	10 units (Cartland-Nelson)/cc	—
3	‡α-estradiol dipropionate	2	0.2 mg/cc	—
2	" "	2	" "	—
1	§Progesterone	2	1 "	+ 5
2	" "	1	1 "	+ 50
1	" "	.4	1 "	+ 10
1	" "	.4	1 "	+ 5
1	Testosterone propionate	.5	25 "	+ 100
1	" "	.5	25 "	+ 25
1	" "	.4	25 "	+ 25
1	" "	.4	25 "	—
1	" "	.3	25 "	+ 10
1	" "	.3	25 "	+ 10
1	" "	.2	25 "	+ 100
1	" "	.2	25 "	+ 10
1	" "	.1	25 "	+ 25
1	" "	.1	25 "	—
2	Sesame oil	.5		—
2	Distilled water	1		—
2	<i>Rana pipiens</i> pituitary	1	pituitary ♀	+ 100

*Courtesy of Armour Laboratories.

†"Gonadogen," courtesy of Upjohn Co.

‡"Di-ovocylin," courtesy of Ciba Pharmaceutical Products.

§"Lutoeylin," courtesy of Ciba Pharmaceutical Products.

||"Oreton," courtesy of Schering Corporation.

The substances injected, dosage and ovulatory response are recorded in Table I. This shows that 4 frogs treated with varying doses of mammalian anterior pituitary gonadotropic factors, were completely refractory. Also 5 frogs receiving varying doses of gonadotropic factors of pregnant mares serum, were completely refractory. Likewise, 5 frogs treated with varying doses of

α -estradiol dipropionate, gave no response. However, all 5 frogs injected with varying doses of progesterone gave positive ovulatory responses, ranging from 5 to 50%. Of 10 frogs treated with varying doses of testosterone propionate, 8 gave positive responses ranging from 5 to 100%, while 2 failed to respond. The controls of distilled water and sesame oil were completely negative, while the pituitary controls were completely positive.

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Sex Hormones and Lymphomatosis in Fowls.*

DAVID MARINE AND S. H. ROSEN.

From the Laboratory Division, Montefiore Hospital, New York City.

We have previously reported¹ upon the occurrence of lymphomatosis in 26 of 52 white leghorn capons and its absence in 66 slips of the same group of 118 birds. However, only 19 of these slips were older, when sacrificed, than the youngest bird (256 days) that developed the disease. There were 10 cases of diffuse hepato-renal lymphomatosis (big livered series), 7 of lymphosarcoma, 8 of lymphoma of bursa of Fabricius and 1 leukemia. The significant finding is that we have not seen lymphomatosis develop under our conditions in a bird with spontaneous comb growth. These observations suggested that the presence of a functionally active fragment of testis may have inhibited the development of the disease—possibly because of the production of sex hormones.

The relation of sex to the incidence of lymphomatosis has not been studied and for obvious reasons. Oakley² is the only author to refer to it but gives no data—merely stating that he has the impression it is more common in females and in the breeds kept for egg laying. Data on the sex incidence of leukosis in mice also are lacking.

The present experiment includes 41 white leghorn male castrates of the same age, divided into 3 groups as follows: (1) 12 birds, each receiving 1 mg estradiol dipropionate weekly, (2) 12, each receiving testosterone dipropionate in variable amounts twice weekly,

* We are indebted to the Ciba Pharmaceutical Products, Inc., for generous supplies of Di-ovocylin and testosterone dipropionate.

¹ Marine, D., and Rosen, S. H., *Am. J. Cancer*, 1940, **39**, 315.

² Oakley, C. L., *Proc. Roy. Soc. Med.*, 1935, **28**, 999.