TABLE III. Effect of IUdR Against IUdR-Resistant Herpes Simplex in Gradient Plates.

Herpes simplex passaged strain*	Viral dose (PFU/0.5 ml)	Plaque inhibitory conc (μg/ml)
5C-R1	250	32
5C-R4A	700	>44
5C-R4A	70	>44
5C (parent strain)	800	4.4

* Virus originally isolated in IUdR plaque inhibition zone.

dine, and -hydroxybenzylbenzimidazole, all of which produced striking antiviral effects. Reversal of 5-iodo-2′-deoxyuridine (IUdR) activity by thymidine was readily quantified by using this method. The technique was applicable to the bioassay of IUdR and guanidine and to the ready detection and isolation of IUdR-resistant strains of herpes simplex virus.

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Effect of Testosterone on the Involution of Male Rats' Mammary Glands.* (31105)

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In previous studies, it was shown that the mammary glands of male rats could be stimulated to the growth of the duct system by 1 or 2 μg of estradiol benzoate (EB) for 20 days and the lobule-alveolar system by 2 μg EB and 6 mg progesterone (P) for 20 days. It was suggested that the male rat mammary gland was equipotential to the female gland in response to these ovarian hormones(1,2).

When the young are removed from lactating rats, it has been observed that the lobule-alveolar system quickly involutes back to a duct system with DNA values comparable to those of virgin ovariectomized rats(3). In studies on the prevention of the involutionary process by the ovarian hormones(4) and by oxytocin, lactogenic and hydrocortisone acetate(5) it was shown that EB + P was most effective.

The present study was designed to extend our observations upon the growth of the lobule-alveolar system with the ovarian hormones in male rats, then to determine whether testosterone would have the capacity to prevent involution of the glands so grown.

Materials and methods. Adult male rats of the Sprague-Dawley-Rolfsmeyer strain were castrated and maintained on Purina Lab Chow with tap water *ad libitum* in a constant environmental temperature of 78 ± 1°F. After a convalescent period of 15 days, the castrated rats were divided into 3 groups.

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TABLE I. Effect of Testosterone on Mammary Gland Growth of Adult Male Rats.

Group No.	Treatment	No. of animals in each group	Mean body wt (g) Initial	Final	DFFT mean (mg)	DNA/mg DFFT mean ± S.E. (mg)	Total DNA mean ± S.E. (mg)	DNA/100 g body wt mean ± S.E. (mg)
1	Intact male rats with 0.2 ml sesame oil daily for 20 days.	11	235.90	281.20	580.23	14.67 ± .85	7.95 ± .78	2.87 ± .18
2	Gonadectomized male rats with 0.2 ml sesame oil daily for 20 days.	15	225.50	274.60	549.06	17.91 ± .54	9.80 ± .70	3.59 ± .27
3	Gonadectomized male rats with 2 μg EB + 6 mg P in 0.2 ml sesame oil daily for 20 days.	15	226.50	264.90	809.47	20.66 ± .77	16.35 ± .81	6.09 ± .33
4	Gonadectomized male rats with 2 μg EB + 6 mg P daily for 20 days. Then 3 mg testosterone daily for next 20 days.	14	217.60	258.60 304.60	591.25	18.59 ± .41	10.87 ± .37	3.59 ± .004

S.E. = Standard error.
DNA = Deoxyribonucleic acid.
EB = Estradiol benzoate.
P = Progesterone.
DFFT = Dry fat-free tissue.

One group served as control and each animal received 0.2 ml of sesame oil daily for 20 days. Each animal of the other 2 groups was given a combination of 2 μg EB + 6 mg P daily in 0.2 ml of sesame oil for 20 days to stimulate mammary gland growth(9). At the end of 20 days, the control mammary glands were collected on ice. The remaining group was further treated with 3 mg of crystalline testosterone in sesame oil daily for 20 days, the glands were collected, and DNA estimation of all the glands was made by the method previously described(6).

Results. In both control and hormone-treated rats, the mean final body weight was used in determination of total DNA/100 g BW. The intact male rats receiving only 0.2 ml of sesame oil for 20 days had a mean DNA content of 2.87 ± 0.18 mg per 100 g BW. The castrated controls showed a higher DNA value of the mammary gland of 3.59 ± 0.27 mg/100 g BW. Injection of 2 μg of EB + 6 mg of P daily for 20 days stimulated the mammary gland growth significantly, showing a DNA value of 6.09 ± 0.33 mg per 100 g BW comparable to that seen in ovariectomized adult female rats with the same treatment as previously reported(8). DNA content after 20 days of testosterone treatment in rats stimulated with EB + P was 3.59 ± 0.004 mg/100 g BW. In all groups body weight increased during treatment.

Discussion. In the present study it was confirmed that EB + P in the gonadectomized male rat was able to stimulate the lobule-alveolar system as measured by DNA equal to that stimulated by these hormones in the ovariectomized female rat(8). Whereas, in the previous study the mean DNA of 14 rats was increased to 5.65 mg; in the present group of 15 rats the mean DNA was increased to 6.09 mg/100 g BW, which is equal to the DNA of ovariectomized females (6.06 mg).

While it has been suggested that testosterone might have some effect upon mammary gland growth in the female(7), its value in the male rat has not been tested. Since EB + P prevents involution of the female lobule-alveolar system, it was suggested that if testosterone in the male had any effect on the mammary glands, it might prevent the involution of the glands stimulated by EB

+ P. As can be seen, the mean DNA of the mammary glands was reduced from 6.09 mg/100 g BW after EB + P administration to 3.59 mg after 20 days of testosterone (3 mg/day), which is the mean DNA of the gonadectomized rats (3.59 mg) prior to ovarian hormone treatment. It is clear that testosterone at the level of 3 mg/day is without value in preventing the involution of the lobule-alveolar system of male rats.

Summary. Adult male rats were gonadectomized for 20 days. The mean DNA of their mammary glands was 3.59 ± 0.27 mg/100 g BW. Similar rats were injected for 20 days with 2 mg EB + 6 mg P/day. The mean DNA of their glands was 6.09 ± 0.33 mg/100 g BW, a significant increase over the control group and equal to the level of DNA induced by the same ovarian hormones in overiectomized female rats. A similar group of gonadectomized rats treated with EB + P for 20 days was then injected with 3 mg testosterone/day for 20 days. Testosterone was ineffective in preventing involution of the lobule-alveolar system of these animals as indicated by the mean DNA of 3.59 ± 0.004 mg/100 g BW, which is the same as the group prior to EB + P treatment.

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Comparative Development of Pheasant and Chick Embryo Sera.* (31106)

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Although the serum of the chick embryo has been intensively studied(1,2,3,4), there are no reports concerning serum analysis of other avian embryonic sera, as far as can be ascertained.

Methods. Identical procedures were used to bleed 132 ring-neck pheasant embryos (*Phasianus colchicus*) and 325 chick embryos: the egg was opened at the air sac end with the inner shell layer carefully removed from the underlying chorioallantoic membrane. A large chorioallantoic artery was placed over a plastic trough secured over the shell opening. Adhering membranes were stripped away from the blood vessel. Blood was collected in chilled tubes, allowed to clot and centrifuged at 2000 × *g* for 30 minutes; the serum was stored at —20°C.

Zone paper electrophoresis was performed in a horizontal apparatus utilizing Veronal-acetate buffer, $\mu = 0.1$, pH 8.6. Fifty μl of sera were applied to the paper strips followed by a current of 1.6 mA/cm strip width for 19 hours at 20°C(4). Densitometric tracings of the electropherograms, stained with aqueous bromphenol blue, were made with an Analytrol®.

Results. Fig. 1 illustrates the electropherograms of pheasant and chick embryo sera, respectively; while Table I shows the relative per cent concentration of serum protein components from the 10th to 21st days of incubation. Conventional electrophoretic terminology was used to name the respective serum fractions. A special component, S or sorbed continuum, was included in the computation of the relative per cent concentration. The

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