ment. It is interesting to note that in numerous studies, egg yolk, which contains appreciable amounts of highly unsaturated fatty acids, and also an appreciable amount of cholesterol, has been found to cause an elevation of plasma cholesterol. One may speculate whether this effect may be related to the effect observed in this experiment, that is, whether absorption of cholesterol is facilitated by the content of highly unsaturated fatty acids.

Summary. Thirty male miniature swine were fed a beef tallow basal ration supplemented with crude soybean phosphatides and menhaden oil with and without 0.5% cholesterol for a period of 48 weeks. The animals that received no cholesterol supplement all maintained normal plasma cholesterol values (75-85 mg %). The swine fed soybean phosphatides plus cholesterol showed no change in plasma cholesterol values. The swine fed beef tallow showed on cholesterol supplementation a rise in plasma cholesterol, but returned to normal in 12 weeks. The swine fed menhaden oil showed a 100% increase in plasma cholesterol when supplemented with 0.5% cholesterol and, although this level decreased, it remained substantially above the remaining groups throughout the experiment. Fecal analyses of cholesterol showed much less cholesterol in the feces of fish oil-fed pigs supplemented with cholesterol, indicating that the fish oil (or the highly unsaturated fatty acids in fish oil) may have facilitated the absorption of the dietary cholesterol. The heart and liver analyses showed much lower levels of cholesterol than the other groups, suggesting that the polyunsaturated fatty acids of the fish oil may have aided in transport of the cholesterol to prevent an accumulation in these tissue sites.

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Use of the Y Chromosome in the Wistar/Furth Rat as a Cellular Marker.* (30184)

WILLIAM D. ZIEVERINK† AND WILLIAM C. MOLONEY

Research Laboratory, Holy Ghost Hospital, Cambridge, Mass. and Department of Medicine, Tufts University Medical School, Boston, Mass.

In connection with a long-term program of research on leukemogenesis in the rat and, in particular, in regard to studies presently underway concerning the viral induction of this disease it became essential to determine the normal chromosome constitution in the specific strain of rat under study, namely the Wistar/Furth inbred albino laboratory rat.

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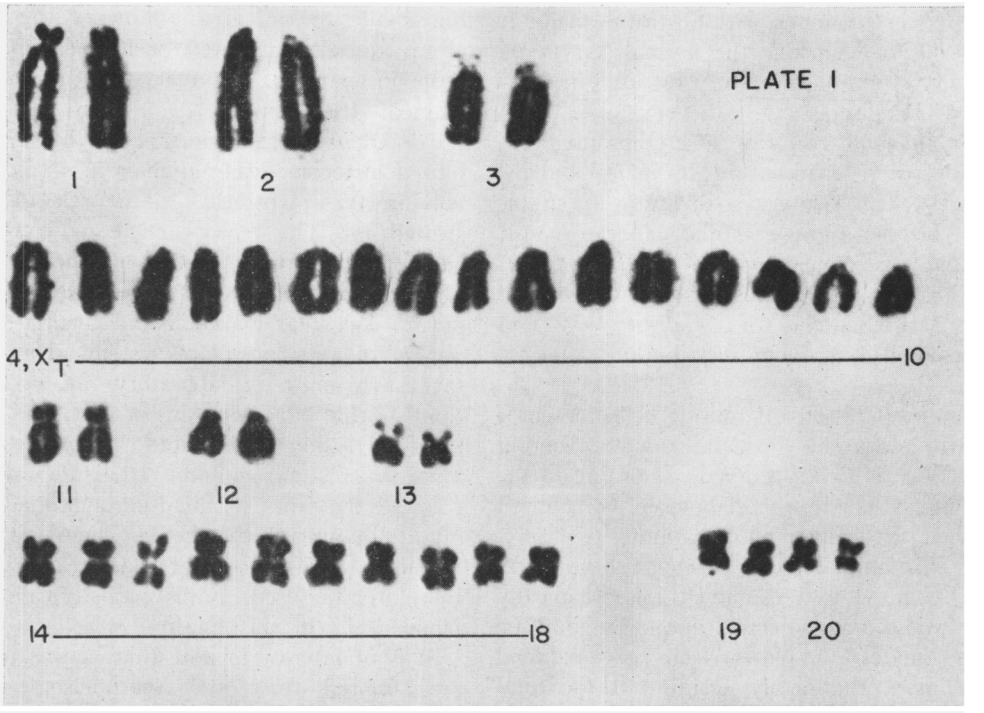
The first detailed descriptions of the normal rat karyotype were reported by Tjio and Levan(1). Fitzgerald(2), using newer techniques, corroborated these earlier findings. These descriptions suggested a uniformity of chromosome constitution in the rat. However, with the recent publication of Hungerford and Nowell(3) concerning sex chromosome polymorphism in 3 strains of laboratory rat it became apparent that differences in chromosome constitution existed between different strains. Their description of variations of Y chromosomes among strains



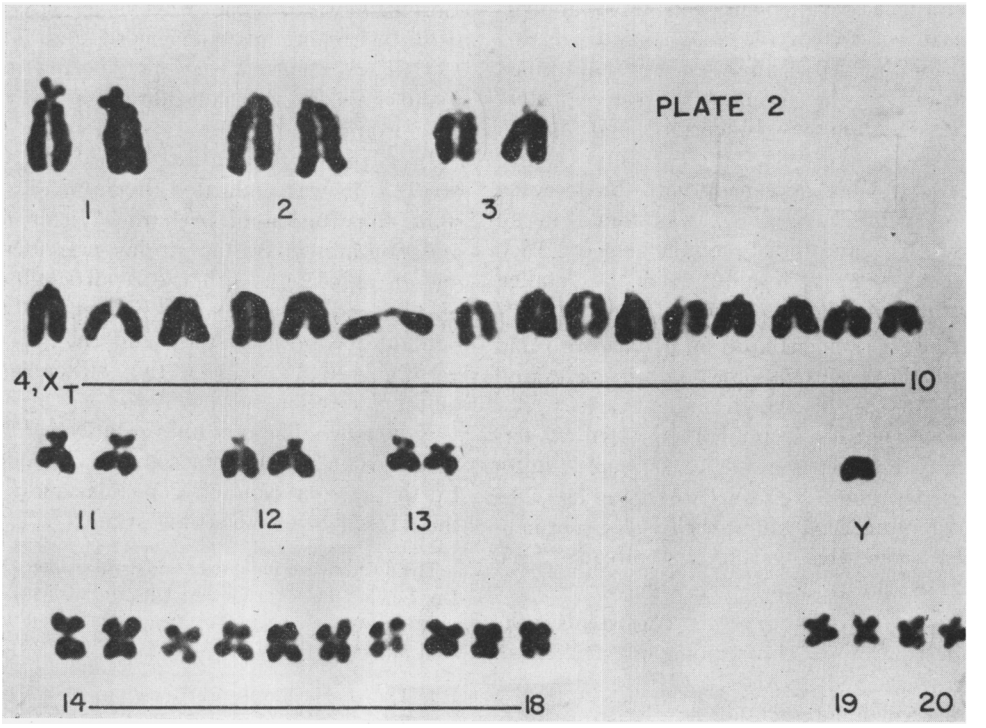


FIG. 1. Karyotype analysis of normal female W/Fu rat. Direct preparation from bone marrow. Note presence of 2 extra terminal chromosomes in group 4-10, X_TX_T.

FIG. 2. Karyotype analysis of normal male W/Fu rat. Direct preparation from bone marrow. Note small terminal chromosome, Y.

and X chromosomes within strains made it essential to determine the normal karyotype of every strain of laboratory rat used in cytogenetic studies.

Methods and materials. Chromosome preparations were made from 10 males and 10 females. The Wistar/Furth strain is an inbred histocompatible albino laboratory rat originally developed by Dr. Jacob Furth(4). The animals used in this study were obtained from A. R. Schmidt Co., Madison, Wis., and represented a random distribution from 20 litters.

The preparations of mitotic cells for chromosome analysis were made from the femoral marrow of etherized animals according to the techniques previously elaborated by Nowell *et al*(5) with minor modifications.

In each animal at least 20 metaphase plates were counted and examined microscopically for sex chromosome constitution. In addition, approximately 5 plates from each animal were more thoroughly scrutinized for total chromosome complement and in 5 animals of each sex karyotypic analysis was carried out. All the above analyses were performed according to the recently suggested system of classification of Hungerford and Nowell (3).

Results. Good agreement with the accepted diploid value ($2N = 42$) was found in all cases. The autosomal complement of each plate was identical in all cases to the detailed description of Hungerford and Nowell(3).

Using the nomenclature of Hungerford and Nowell the X chromosomes both in males and females were of the terminal variety X_T. Thus, all females examined exhibited 16 terminal chromosomes in the 4-10 group (7 autosomal pairs and X_TX_T) (See Plate 1). The difficulty of separating the 2 X_T chromosomes from this group has already been described(3).

The Y chromosome was consistently the smallest terminal chromosome present in all males examined and could with relative ease be discerned microscopically. In size it was similar to the small Y chromosome described in the Lewis and non-inbred Wistar strains examined by Hungerford and Nowell(3). It was small enough to be distinguished from the smallest terminal autosome of the 4-10 group and demonstrated positive heteropycnosis in many of the metaphase plates examined. (See Plate 2.)

Discussion. The importance of using fully inbred histocompatible animals in studies involving transplants has been well demonstrated(4). The recent article of Woodruff on the immunological aspects of cancer re-emphasizes this point(6). As Fitzgerald points out(2) a cellular marker is an essential component of any transplant system. The Wistar/Furth strain of laboratory rat, in addition to being inbred and histocompatible, contains a readily identifiable Y chromosome. Since this Y chromosome is distinguishable from all the other terminal chromosomes and often exhibits positive heteropycnosis it represents a built-in cellular marker and may, therefore, be used to distinguish male and female cells in this strain.

It is of interest to note that in this recognized inbred strain no sex chromosome polymorphism was found. This is in agreement with the report of Hungerford and Nowell (3) that sex chromosome polymorphism was found only in the non-inbred strain which they examined.

In a recent publication from this laboratory(7) it was indicated that the chromosome constitution of both the Wistar/Furth and non-inbred Wistar strains was identical and in agreement with the reported findings of Tjio and Levan(1) and Fitzgerald(2). In light of the present study and that of Hungerford and Nowell(3) this statement requires correction.

Summary. These studies establish that the heteropycnotic Y chromosome in the Wistar/Furth rat is a distinctive cellular marker in this inbred histocompatible strain.

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Regulation of Prostate Secretion in the Rat.* (30185)

WELLS E. FARNSWORTH AND MINNIE H. LAWRENCE
(Introduced by Joseph T. Roberts)
General Medical Research Laboratories, Veterans Administration Hospital and Department of Biochemistry, School of Medicine, State University of New York, Buffalo

Over 30 years ago, Moore and Gallagher (1) undertook the bioassay of androgenic substances by measuring the volume of ejaculate released on electrical stimulation of control and treated guinea pigs. Farrell(2) modified the procedure of Eckhard(3) for cannulating the prostatic urethra of dogs and replaced the electrical stimulus by administration of the parasympathomimetic drug, pilocarpine. Thereupon, his group undertook an extensive pharmacological study of this reaction. Farrell concluded that "pharmacologically, the secretory innervation of the prostate is chiefly parasympathetic in nature, although its secretion is also affected to some extent by the sympathetic drugs, epinephrine and ergotamine. However, considering the physiologic fact that the pelvic nerve, or the sacral parasympathetic, does not augment secretion when stimulated as the sympathetics do, we must consider the prostate as being most analogous to the sweat glands."

Although pilocarpine is widely used in assaying anti-androgenic activity and as a means of collecting prostatic fluid for bio- and immuno-chemical studies, little more has been done to elucidate the neurological basis of the secretory process. The mechanism of ejaculation has been studied by Potts(4). No work has been done on the rat except the histo-chemical demonstration by Risley and Skrepetos(5) of cholinesterase-positive receptor, or possibly effector, cells in the prostatic urethra of this species.

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The present report presents our efforts to define the pathways of normal and pilocarpine-stimulated release of prostatic secretion.

Materials and methods. Rats weighing 300-400 g were anesthetized with intraperitoneal sodium pentobarbital, (50 mg/kg, initially, then 5-10 mg/kg as needed). In lieu of an airway, each animal was tracheotomized.

Using an inverted Y abdominal incision, the genitourinary system was exposed. The ductus deferens, coagulating gland, and seminal vesicle on each side were ligated at their junctions with the urethra. The pubic bones were separated to expose the urethra. After the body of the bladder was opened and laid back against a saline-soaked sponge to collect urine, a 6-9-in. piece of PE-90 or PE-100 polyethylene tubing was inserted through the neck of the opened bladder to a point in the urethra proximal to the openings of the prostatic ducts. A second piece of tubing was inserted through a perforation in the urethra to a point distal to the prostatic ducts. Both tubes were secured in place by ligatures tied around the tube-containing parts of the urethra. The character, rate and volume of flow of secretion in these tubes could be observed readily. To determine rate of flow, the leading edge of the column of fluid was marked at known times by tying colored threads around the tubing. Then, following each experiment, flow rates were determined by plotting the measured advances of fluid against time. Knowing the internal diameter of the tubing to be 0.86 mm it was possible to convert the linear advances of the fluid into volumes, since 1 cm of tubing contains 5.7 mm^3. Slow advances of retrograde secre-