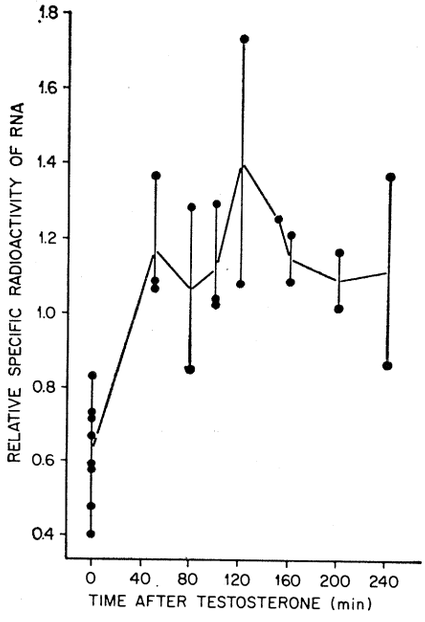

Fig. 1. Effect of testosterone on the rate of RNA synthesis in the seminal vesicle. Each point represents one determination. Relative specific radioactivity of RNA is the ratio: [(count/min per milligram of RNA) to (count/min per micromole of acid-soluble P_i)] times 100.

fraction were adsorbed onto a small charcoal column (*6*), and the nucleotides were eluted with ammoniacal ethanol (*7*). After evaporation, the samples were chromatographed on diethylaminoethyl cellulose paper in the formate form (*8*), and the ultraviolet spots were located. In all cases, the only radioactive regions on the chromatograms coincided with the four ultraviolet-absorbing spots corresponding to the four nucleotides. The nucleotides were eluted with 0.5*M* NH_4HCO_3 and, after evaporation, were analyzed for ultraviolet absorption and for radioactivity.

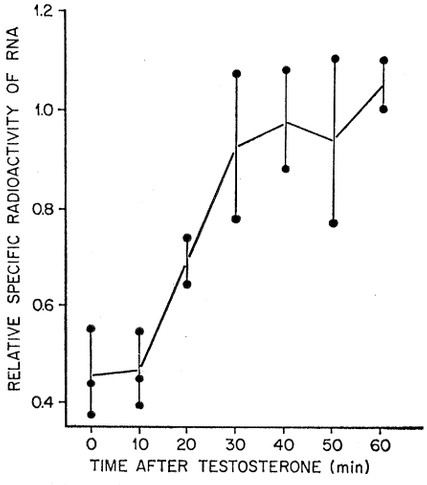

Fig. 2. Early effect of testosterone on the rate of RNA synthesis in seminal vesicle. For other details see Fig. 1.

The results indicate that testosterone is capable of inducing a rapid increase in the rate of RNA synthesis (Fig. 1). The specific activity of RNA at 50 minutes was nearly twice that of the untreated (zero time) controls. No further significant increase in specific activity was detected for as long as 4 hours after the hormone was given. Observations at earlier intervals revealed a 50 percent increase in the specific activity of RNA 20 minutes after injection of testosterone (Fig. 2), whereas no effect was observed at 10 minutes. In view of the time required for the hormone to reach the seminal vesicle and to interact with some cellular component, it appears that the synthesis of RNA is closely linked to the primary site of action of the hormone.

It is of some interest that the specific activity of the acid-soluble phosphate pool is also increased markedly by testosterone. This effect, however, does not occur until some 50 minutes after injection, 30 minutes after the first effect on RNA synthesis. The same effect was noted with the phosphate fraction adsorbed on charcoal and eluted with HCl at 100°C.

The distribution of P^{32} in the nucleotides of the newly synthesized RNA is unlike the base composition of either total seminal vesicle RNA (determined concomitantly with P^{32} composition) or the DNA of the rat (*9*) (Table 1). The observed composition suggests a mixture of ribosomal and DNA-like RNA's, similar to observations of Perry (*10*) and Georgiev *et al.* (*11*) on pulse-labeled RNA in other mammalian tissues and cells. Several intervals after hormone administration other than those listed in the table were also examined and no effect of testosterone on the P^{32} base composition was detected.

Attempts to fractionate this tissue into nuclear and cytoplasmic components have not been completely successful. In these experiments it does appear that an increase in the labeling of RNA occurs in both fractions 50 minutes after treatment with the hormone, but because of contamination of each fraction with the other, it is not known in which fraction the increase is initiated. In the other aspects examined, however, the early effect of androgen on the seminal vesicle is nearly identical to the effect of hydrocortisone on the liver (*5*). Thus these steroids cause an early and marked stimulation of RNA synthesis but do not alter the composition of the RNA formed. In each case this composition is indicative of a mixture of several kinds of RNA. These considerations suggest that the stimulation of RNA synthesis by these hormones is not limited to the synthesis of a single type of RNA.

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Taste Sensitivity to Phenylthiourea in Glaucoma

Abstract. *In a series of Caucasian patients over the age of 40 years, the number of individuals unable to recognize the bitter taste of phenylthiourea (8.1 mg/100 ml) was found to be 28 percent in a "normal" eye clinic population (446 individuals), 17 percent in a series of 155 patients with angle-closure glaucoma, and 53 percent in 211 patients with primary open-angle glaucoma.*

The primary glaucomas are divided into two categories based upon the anatomic appearance of the angle of the anterior chamber, namely primary angle-closure glaucoma and primary open-angle glaucoma. The hereditary nature of each variety of primary glau-

Table 1. Phenylthiourea taste in glaucoma.

Sex	No. tested	Nontasters (%)
*Primary open-angle glaucoma**		
Male	104	53
Female	107	52
Angle-closure glaucoma		
Male	44	16
Female	111	18
"Normal"		
Male	195	29
Female	251	27

* With loss of visual field.

coma has been demonstrated repeatedly (*1*).

In studies of the general population, taste sensitivity for phenylthiourea is distributed in bimodal fashion, about 30 percent of Caucasians falling into the nontaster group (*2*, *3*). The ability to taste this and related compounds is genetically determined and provides a convenient genetic marker (*2*). In the course of genetic studies on glaucoma patients, taste sensitivity to phenylthiourea was determined. This preliminary report presents an association, found in Caucasian patients over the age of 40 years, between taste sensitivity for phenylthiourea and glaucoma.

We studied patients attending the eye clinic of the Washington University Clinics, as well as those hospitalized on the eye service of the Barnes Hospital Group. A serial-dilution technique was used for evaluating the taste threshold of each patient, the test starting with the most dilute solution (No. 11, containing 1.27 mg of phenylthiourea per liter of tap water) and proceeding by twofold increases of concentration as described by Harris and Kalmus (*2*). We performed the taste test without knowing of the patient's glaucoma classification, and we made our clinical glaucoma diagnoses without knowledge of the results of the taste test.

Patients were classified as having primary open-angle glaucoma when elevated intraocular pressures, decreased outflow facilities, and charasteristic cupping of the optic nerve head and loss of visual field could be documented. All patients included in this category had open angles (grade II or more) and no evidence of inflammatory, traumatic, or neoplastic eye disease. Sixty-seven percent of these patients were over the age of 60 years.

The diagnosis of angle-closure glaucoma was made when elevated intraocular pressure was associated with occluded anterior chamber angles. Sixty-six percent of the patients in this category were over the age of 60 years.

Patients were classified as "normal" when they had no family history of glaucoma, intraocular pressure measurements less than 20 mm-Hg, and no evidence of cupping of their optic nerves or visual field loss. Sixty-six percent of these patients were over the age of 60 years.

We also studied patients with various secondary glaucomas, as well as those whose intraocular pressures, provocative tests, and family histories fell into intermediate categories.

The distribution of taste sensitivities in each of the three groups was bimodal, with the antimode between solutions 4 and 5. With "nontasters" defined as all individuals who failed to experience a bitter taste to solutions up to No. 5 (81.25 mg/liter), the percentage of nontasters for each group is shown in Table 1. It was of interest that the "normal" eye clinic population had a 28-percent incidence of nontasters. This differed very little from the 30 percent nontasters found by other observers in Caucasian populations (*3*). Of particular interest was the high percentage (53 percent) of nontasters found in patients with primary open-angle glaucoma, and the remarkably low incidence (17 percent) of nontasters in individuals with angle-closure glaucoma. Each of the glaucoma groups differed significantly from the "normal" (for open-angle glaucoma compared to normal, $p < .001$; for angle-closure glaucoma compared to normal, $p < .01$), and most significantly from each other ($p < .001$).

In each of the three groups no significant differences were noted between individuals 41 to 60 years of age and those over 60 years. As in other glaucoma studies, angle-closure glaucoma was more prevalent among females, but in none of the three categories did the taste testing results differ in males and females. All glaucoma patients were using topical miotic therapy and some also received systemic carbonic anhydrase inhibitors. Conceivably, the long-term use of these agents might alter taste sensitivity, but there were no differences in therapy between the group of glaucoma patients classified as tasters and the nontasters. Furthermore, similar medications were used by the open-angle glaucoma group (53 percent nontasters) and the angle-closure glaucoma patients (17 percent nontasters).

The findings raise questions concerning the nature of the association between phenylthiourea taste sensitivity and glaucoma.

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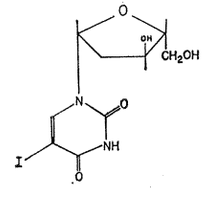
1 April 1964

5-Iodo-2′-Deoxyuridine: Relation of Structure to Its Antiviral Activity

Abstract. *The crystal and molecular structure of 5-iodo-2′-deoxyuridine has been determined by x-ray diffraction methods. The most interesting feature of the structure is an unusually short intermolecular distance between the iodine and oxygen of a carbonyl group; this type of bonding may be the molecular basis for the antiviral activity.*

5-Iodo-2′-deoxyuridine (IDU)



has been used in the treatment and cure of *herpes simplex* keratitis (*1*) and it is the first antiviral agent to have proven clinical chemotherapeutic value. The blocking of the metabolic pathways of viral synthesis by IDU has been attributed either to the selective action of IDU on a virus-specific enzyme system which may take part in the synthesis of viral DNA, or to the incorporation of IDU itself in place of thymidine into an aberrant DNA which presum-