Rous Sarcoma in Baboons: Development of Tumour in an Uninoculated Animal treated with Cortisone

INVESTIGATIONS are now in progress in this laboratory to elucidate the mechanism of tumour formation induced by the Schmidt–Ruppin strain of RSV (supplied by Dr Robert Holdenried, National Cancer Institute, National Institutes of Health, Bethesda, Maryland) in baboons (*Papio* sp.)[1]. To enhance the oncogenic potential of the virus a number of animals were placed on a regimen of celestone (B-methazone-21-phosphate) throughout the experiment at a dose of 3 mg/kg/day (supplied by the Schering Corporation, Bloomfield, New Jersey). For control purposes, animals of similar age were placed on this cortisone regimen but were not inoculated with RSV. This report is concerned with development of a tumour and subsequent death of an immature baboon treated with cortisone but not inoculated with RSV. This animal was maintained, however, in the same rooms with the other baboons which developed tumours as a result of inoculation with RSV.

About 170 days after the first inoculation of RSV into baboons and 140 days after the appearance of the first tumour in the test animals, a nodule was noted on the right leg of a cortisone control animal (No. 6076), approximately 7 months old. This nodule was observed for several weeks and was finally biopsied. Histopathological examination of this tissue revealed a fibrosarcoma similar in morphology to tumours induced by RSV. The tumour showed no change in growth for 40 days, thereafter enlarging only slightly until the animal died 225 days after the start of the experiment.

Table 1. SOME FINDINGS IN BABOONS WITH TUMOURS

Date of sampling	CF antibodies to RSV tumour antigen	Viral isolation in BKC: Oral swabs	Viral isolation in BKC: Rectal swabs	Remarks
Feb. 20, 1967	< 1 : 10	– *	–	
March 10, 1967	< 1 : 10	–	–	
March 28, 1967	< 1 : 10	–	–	
April 12, 1967	< 1 : 10	–	–	
April 28, 1967	< 1 : 10	–	–	
May 16, 1967	< 1 : 10	–	+ †	
June 1, 1967	< 1 : 10	–	+ †	
June 23, 1967	1 : 20	–	–	Small nodule noted on the right thigh
Aug. 7, 1967	1 : 20	–	+ †	Biopsied on Aug. 15, 1967
Aug. 31, 1967	< 1 : 10	–	–	
Sept. 20, 1967	< 1 : 10	–	–	
Oct. 3, 1967	< 1 : 10	–	–	Animal died

* No virus recovered.
† Tentatively identified as adenovirus.

On autopsy, multiple firm tumorous nodules (1–2 cm in diameter) were found in the following tissues: bone (occipital, right femur and ulna, rib cage and right intraocular), heart (base), adrenal gland (medulla) and meninges. The liver showed a most extensive fatty metamorphosis and both kidneys showed evidence of nephritis. No evidence of tumour development was observed in the lungs. On the basis of the types of cells involved, the tumours were at first classified as histiogenic sarcomas. Large numbers of mature and immature virus particles resembling RSV particles were seen in the cytoplasm following electron microscopy of the intraorbital tumour. Mature virus, about 50–100 mμ in size, was also observed in the cytoplasm surrounding the nucleus.

Attempts to isolate virus from specimens which had been autopsied, by inoculating baboon kidney cells and 7 day old White Leghorn chicks, were negative. Sera collected at various intervals were routinely examined for the presence of CF antibodies to RSV tumour antigen. Homogenized, sonicated tumour supernatant fluid obtained from White Leghorn chicks previously inoculated with RSV–SR served as antigen in the CF test. CF antibodies to this antigen appeared at a titre of 1 : 20 for two consecutive bleedings concomitantly with development of the tumour on the right thigh. Part of this tumour was later biopsied, at which time the titre disappeared. Berman *et al.*[2] reported a similar parallelism between COFAL and neutralizing antibodies and tumour growth in their studies in rhesus monkeys.

The overall low incidence of malignant tumours in non-human primates has been pointed out repeatedly[3,4]. One of the few infectious agents able to produce neoplasms in Old and New World monkeys, including baboons, is RSV (refs. 5–7). Burmester and Fredrickson[8] have shown that RSV is transmitted in chicks by direct contact. Uninoculated chicks have been found to develop fibrosarcomas, and some, after a long latent period, show a lymphoid leucosis believed to be caused by Rous associated virus.

This finding is reported because malignant tumours in non-human primates are rare, and also because the very important possibility exists that this sarcoma developed as a result of contact with baboons inoculated with RSV. Furthermore, development of this fatal sarcoma was preceded by the occurrence of a tumour indistinguishable from that produced by RSV. Although cell transformation *in vitro* has been well established, little is known concerning this phenomenon *in vivo*. The possibility that the morphological changes seen here may have been thus induced is a consideration that needs further study.

We thank Dr M. W. Bayliss (Baptist Memorial Hospital, San Antonio, Texas) who made an independent study of tumour sections. This work was supported in part by grants from the US Public Health Service and the World Health Organization.

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Received April 1; revised April 8, 1968.

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Bitter-sensitive Protein from Porcine Taste Buds

WE have already reported the isolation and assay of a sweet-sensitive protein from bovine taste buds which forms complexes with sugars and saccharine[1]. The strengths of the complexes paralleled quite closely the degree of sweetness of the compounds, and the purification and characterization of this protein has been reported elsewhere[2]. This communication reports the investigations into another taste receptor—the bitter-receptor protein.

Porcine tongues were obtained from a slaughterhouse, and epithelial tissue from the back of the tongue, an area believed to be particularly sensitive to bitter tastes, was dissected free from underlying fat and muscle. Material from a minimum of fifteen tongues was disintegrated in a Waring blender. This material was further homogenized in four volumes of 0·1 M phosphate buffer (*p*H 7·0) with a motor-driven glass mortar and pestle of medium tolerance. All operations were carried out at