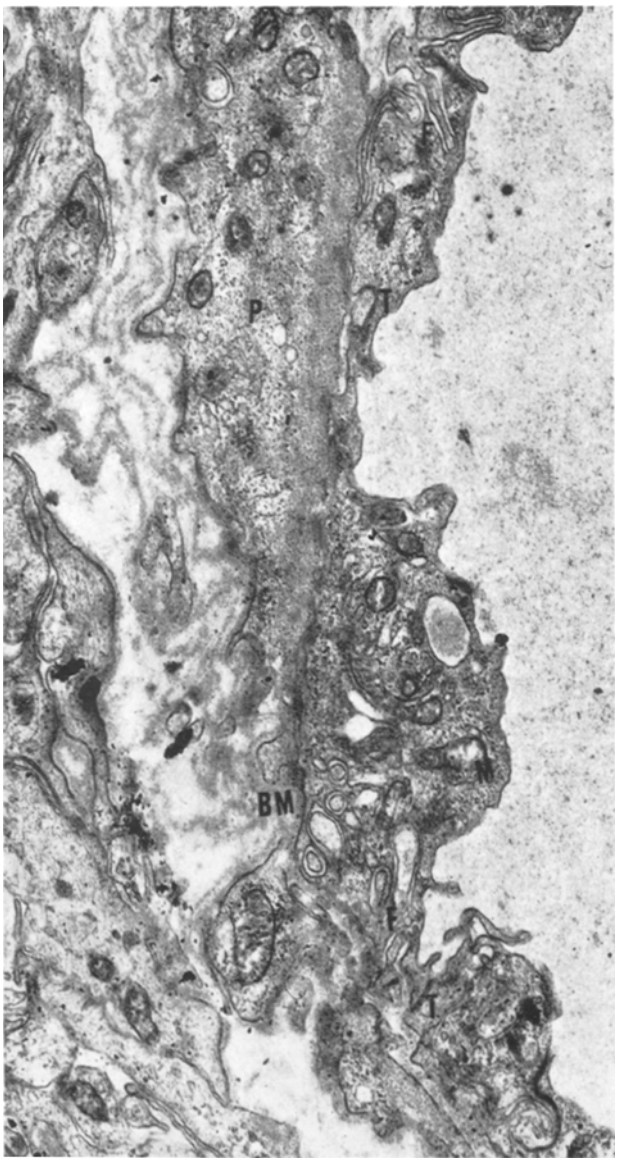
Ultrastructure of Retinal Vessel in Retinoblastoma

Although several descriptions of the fine structure of normal human retinal vessels have been published[1,2] the pathologic conditions of retinal vessels have not been extensively studied[3]. The present paper is a report on the ultrastructure of retinal vessels in retinoblastoma.



An electron micrograph of human retinal vessels in retinoblastoma showing membranous infoldings (F) in the endothelial cells. BM, basement membrane; M, mitochondrion; P, pericytes; T, terminal bar. × 10,000.

The tumor tissue of retinoblastoma was taken from a 21-month-old boy. Immediately after enucleation, the eyes were opened and disclosed the white tumor masses nearly filling the vitreous body. Pieces of tumor tissues each about 1 mm³ in size were fixed in 1% osmium tetroxide buffered with White's saline. After dehydration, the tissues were embedded in Epon 812 and sectioned. Sections were stained with lead citrate and then examined in our RCA-3G electron microscope.

Blood vessels in the tumor mass were of various sizes: some were remarkably large and others were quite small. In general, the diameters of the lumen ranged from 16 to 34 μ. The lumina of the vessels were lined with a single layer of endothelial cells. Adjacent to the endothelial cells were the basement membrane and intramural pericytes. The endothelium was quite thin, except for the part of the cell that contained the nucleus. Golgi complex, endoplasmic reticulum, and mitochondria could be identified in the endothelial cytoplasm. Pinocytotic vesicles were numerous. Terminal bars were found near the endothelial junction. A few villi projected from the endothelium surface toward the vessel lumen. The basement membrane external to the pericytes often was quite thick, whereas the basement membrane of the endothelium was thinner. The striking feature of the endothelial cells was the presence of membranous infolding (Figure). These infoldings, which displayed a complex system, were connected with plasma membrane. Such infolding increases the area of the plasma membrane of the cell, and it may facilitate the transport of material into or out of the cells. Vacuoles or electron-empty areas were also seen in between the infolding membranes.

Résumé. Les vaisseaux de la rétine humaine dans la rétinoblastoma contiennent les cellules endothéliales, les péricytes, et les membranes de la base. Quelques villosités poussent à la surface endothéliale vers le vaisseau du lumen. Les barres terminales se trouvent près de la jonction endothéliale. Au niveau des cellules endothéliales on observe un grand nombre des replis membraneux.

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Suppression of Carcinogen-Induced Rat Mammary Tumor Formation by Actinomycin D

Rat mammary gland and mouse skin cancer can be induced by the polycyclic hydrocarbon, 7,12-dimethylbenz(α)anthracene (DMBA)[1,2]. Actinomycin D applied locally inhibits DMBA-induced skin tumorigenesis, and this inhibition is accompanied by reduced synthesis of DNA[3]. In addition, DMBA inhibits rat mammary gland DNA and RNA synthesis[4], while preliminary experiments in this laboratory have shown an inhibition by actinomycin D of ^{3}H-thymidine incorporation into total mammary gland DNA. With this information at hand we

induced mammary tumors in Sprague Dawley rats, using intravenous DMBA according to the HUGGINS[5] procedure, and in parallel experiments administered 25 µg of actinomycin D i.p. 20 min before, after or simultaneously with the carcinogen.

Rats that received DMBA alone first developed easily palpable mammary tumors 50 days later; animals surviving challenge with both drugs evidenced fewer such tumors during the arbitrary period of observation from 50 to 200 days (Table). These preliminary findings suggest that systemic actinomycin D at least delayed the appearance of palpable tumors, and in most animals may in fact have prevented their development. Rats that received one or both drugs and were sacrificed or died during the period studied almost invariably showed adrenal calcification whether palpable mammary tumors were present or not. Although there is evidence that actinomycin D can damage the adrenal glands[6], histologic examination of these glands from the first 3 groups of rats suggests that the drug did not prevent the eventual regeneration of DMBA-damaged adrenals. In addition we found no reduction in blood pressure measured externally with a sphygmomanometer, when rats treated with one or both drugs were compared to normals. It has been reported that adrenalectomy enhances the growth of 3-methylcholanthrene-induced rat mammary cancer[7], consequently adrenal damage and impaired regeneration might have been expected to further the development of mammary cancer. It has also been shown that adrenalectomy does not significantly affect the incidence of this carcinogen-induced rat mammary tumor[8].

Examination of the estrous cycles in rats from all groups by the Papanicolau technique failed to reveal any abnormality. Administration of DMBA did not alter their frequency[9], and administration of actinomycin D as described does not appear to do so either. This suggests that when rats were challenged with both DMBA and actinomycin D, pituitary-ovarian function was not drastically impaired. This further implies that in all groups FSH, LH and possibly prolactin are present in sufficient amounts to support the estrous cycle. There is evidence that for 5 months after DMBA administration no significant change in pituitary weight or histology occurs[10]; in addition actinomycin D apparently does not easily cross the blood brain barrier[6]. The gain in weight of animals in Groups I–V lagged behind untreated controls, but statistical differences among treated groups were not found. Thus there is reason to believe that several of the primary endocrine organs that influence rat mammary tumor development were not prevented from achieving or maintaining essentially normal function by challenge with either one or both drugs.

Whether the mammary gland is the primary site of interaction with actinomycin D or is secondarily affected due to some more fundamental effect at another site(s) is not certain. For reasons presented, neither the pituitary, adrenals nor ovaries seem to be the site of this hypothetical effect[12].

Zusammenfassung. Sprague-Dawley-Ratten, die eine kombinierte Belastung mit 7,12-Dimethylbenz(α)anthrazen und Aktinomyzin D überleben, weisen eine drastisch erniedrigte tastbare Tumorinzidenz auf. Kontrolltiere erhielten nur das Karzinogen.

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Incidence of palpable mammary tumors in treated rats, observed from 50 to 200 days after treatment

Group	Agent	Total number	Tumors	Tumor incidence (%)
I	DMBA	13	13	100
II	AD	21	6	28
III	DA	20	5	25
IV	S	9	2	22
V	A	9	0	0

Rats were obtained from the Sprague Dawley Company of Madison, Wisconsin, and maintained on Rockland mouse/rat diet and water ad lib. AD, actinomycin D 20 min before DMBA; DA, the reverse order; S, DMBA followed by Actinomycin D within 1 min; A, 25 µg of Actinomycin i.p. The period of observation from 50–200 days was chosen for convenience. Rats treated with both agents exhibited an enhanced mortality during the first 5–30 days after challenge, in accord with reports of increased sensitivity of adrenalectomized rats to Actinomycin D[11].

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Evolution de l'épithélium gastrique isolé de son mésenchyme et cultivé in vitro au contact du foie

Associé au foie d'embryons de Poulet et de Lapin, l'épithélium gastrique de foetus de Lapin se transforme profondément[1-3]. Après 6 jours de culture, il encercle une vésicule vide bordée d'un mince feuillet épithélial monocellulaire et discontinu.

Les techniques de coloration classiques utilisées, ne nous permettent pas d'évaluer la part de responsabilité des 2 types de cellules, gastriques et hépatiques, dans le déroulement des phénomènes observés. Or, LE DOUARIN et BARQ[4] montrent que dans les cas d'associations de