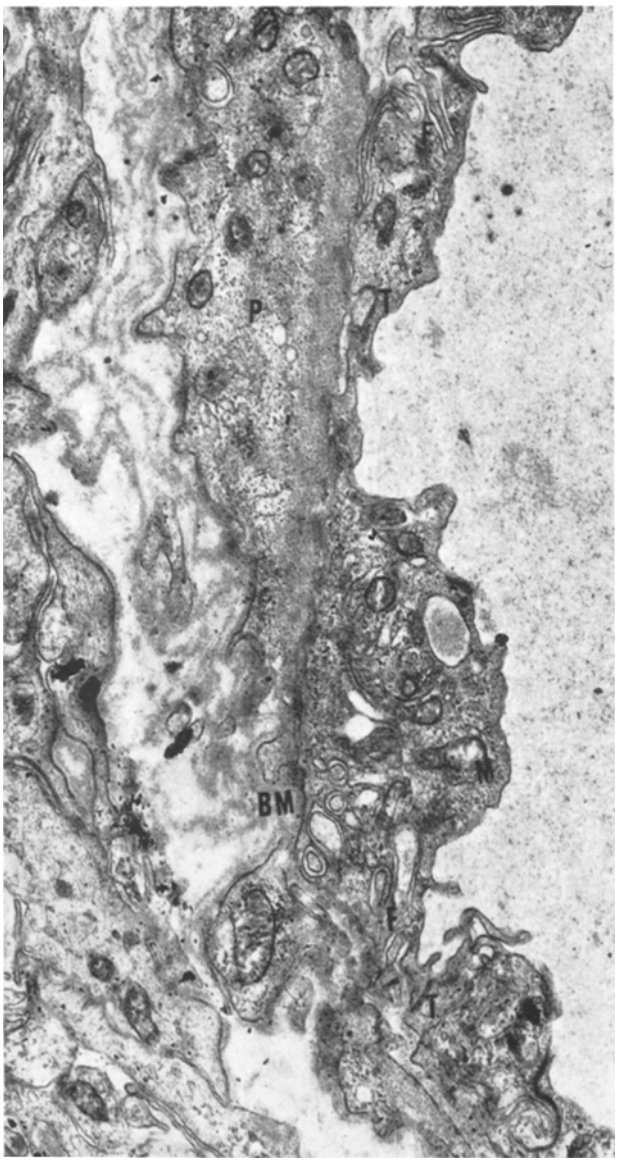
Ultrastructure of Retinal Vessel in Retinoblastoma

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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[1] J. MAEDA, Acta Soc. ophthal. jap. *62*, 90 (1958).
[2] T. ISHIKAWA, Investig. Ophthal. *2*, 1 (1963).
[3] J. M. B. BLOODWORTH, Diabetes *11*, 1 (1962).
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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