The so-called fingerprint-like granules have been found mainly in human lung tissues and their structures have been described by some investigators. In the present study occurrence of the fingerprint-like granules in prostatic cancer tissue is reported. Thus far no report of this point has appeared in the literature.

**Material and Method**

The patient was a 71-year-old male with well differentiated adenocarcinoma of the prostate which had been confirmed by light microscopy previous to the electron-microscopical study. Materials were obtained by open perineal biopsy and the tissues were cut into small pieces which were then fixed by 1% veronal acetate buffered osmium tetroxide at 0–4°C for 1½ hours. Following the fixation, the tissues were rapidly dehydrated by a series of graduated ethanol solutions, then washed twice with propylene oxide and finally embedded in Epon 812. Thin sections cut on an LKB Ultrotome were stained with uranyl acetate and examined under an AKASHI Tronscope 50F type electron microscope.

**Observations**

Fig. 1 shows an electronmicrograph of the cancer tissue in lower magnification. The cells which contain granules are found mostly among cancer cells and loose connective tissue. The granules of these cells are clustered in the cytoplasm, and give a specific type in their structure in spite of variation in shape and size. The diameter of the granules ranges approximately from 0.25μ to 0.7μ. Under higher magnification (Fig. 2) the granules appear to have an almost round shape and have no limiting membrane. They are composed of amorphous regions and membranous structures showing mainly a whirlpool shape or striated form. Electron dense bands and lucent ones are arranged alternately at regular distance apart forming a lamellar structure which resembles the pattern of fingerprint. The striated form of the granule consists of 4—6 layers of osmiophilic material. The most frequent form seen in these granules is the whirlpool shape which has several whorls of electron dense bands surrounding concentrically a central amorphous region (Fig. 3). Each electron dense band of the membranous structure is composed of small dense round granules approximately 30—50 Å in diameter.
Fig. 1. A cell which contains large dense granules is found among cancer cells and loose connective tissue. \( \times 9,600 \)

Fig. 2. The granules are composed of amorphous matrix and electron dense lamellae. \( \times 72,000 \)
Fingerprint-like Granules in the Prostatic Cancer

Discussion

Fingerprint-like granules were first described by SCHULZ (1960) who reported them in the interstitial cell of human lung. He believed it to be a virus from the point of morphological similarity. BARLAND et al. (1964) described such a granule in rheumatoid synovial membrane electron-histochemically. They demonstrated it to contain a high level of acid phosphatase activity, and also suggested it to represent breakdown products of phagocytized materials and to be called "residual body". Cytosegresome which has membranous structure and myelin-figure-like material was demonstrated by ERICSSON et al. (1964, 65) in cells of the proximal tubule of rat kidney. They demonstrated acid phosphatase activity in these inclusion bodies. In view of the fact that acid phosphatase activity has been proven in the cytoplasmic inclusion body with fingerprint-like structure, the present granules with the same morphological feature would be accounted to be lysosomal bodies, though the presence of acid phosphatase activity was not determined in the present investigation.

Meanwhile, peculiar particles similar to the fingerprint-like granules were observed in the cytoplasm of the macrophage cells of the interstitium of diseased human lung by SUN (1965). ATHANASIADES et al. (1965) reported cytoplasmic inclusions within macrophages of human tissue, especially in the alveolar septae, and described the morphological structure of the granules. They suggested that these granules arise from the granules of mast cell. The fingerprint-like granules in the present study are extremely similar in structure and size to those inclusion bodies described by SUN and ATHANASIADES.

Thus it seems most likely that our fingerprint-like granules correspond to the lysosomal bodies in macrophages contained in the prostatic cancer tissue.

Summary

The fingerprint-like granules in the prostatic cancer tissue were observed electronmicroscopically. The granules containing membranous structure were round in shape and measured 0.25–0.7 µ in diameter. The granules are supposed to correspond to the lysosomal bodies of macrophage.
前立腺癌組織内にみられた指紋状顆粒の微細構造について（内容自抄）

いわゆる指紋状顆粒については，すでに少数の研究者によって発表されている。我々はこの顆粒を前立腺癌組織内に見出した。

顆粒は 0.25—0.7 μ の大きさで，前立腺癌細胞と膠原線維にかこまれた細胞の中にある。顆粒の内部には電子密度の高い層状構造がみられている。この層状構造は線状，うずまき状があり，各層は 30—50 Å 大の電子密度の高い小顆粒より成り立っている。

この指紋状顆粒はリソソームに相当するものと考えられ，前立腺癌組織中のマクロファージュ内に存在するものと思われる。

References


