

INCLUSION OF LEUCOCYTES IN THE HEPATIC CELLS*

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Since Rössle (1907)¹⁾ first reported a curious phenomenon of phagocytosis of blood corpuscles in the parenchymal epithelium-cells of glandular organs such as the liver and pancreas from autopsy materials, similar information has been gained by several investigators as follows: phagocytosis of carbon particles, bacteria and erythrocytes in the epithelium-cells of the kidney tubules of toads and rabbits by Sugiyama and Tachibana²⁾ (1933); cytoplasmic inclusion bodies, possibly derived either from ingested leucocytes or from microorganisms, in the hepatic cells of man by Pappenheimer and Hawthorne³⁾ (1936) and by Terbrüggen⁴⁾ (1937); phagocytosis of bacteria (*Malleomyces mallei*) in the liver cells of horses by Watanabe⁵⁾ (1943); and the presence of leucocytes in the liver cells by Bierman⁶⁾ (1944)**.

In the course of our earlier studies on transplantation of bone marrow into the circulating blood of normal rabbits (Osogoe⁷⁾, 1943; Osogoe and Ōmura⁸⁾, 1950), we incidentally met with a few hepatic cells including polymorphonuclear leucocytes with pseudoeosinophilic granules or lymphocytes in their cytoplasm. Such hepatic cells were found in small numbers in two of 6 rabbits killed 72 hours after the intravenous injection of a large amount of bone marrow suspension.

The included leucocytes were present in the cytoplasmic vacuoles closely adjacent to the nucleus (Fig. 1). Usually single hepatic cells included a single leucocyte, but sometimes two small lymphocytes were found in a single hepatic cell (Fig. 2). It is interesting to note that such leucocyte inclusion was observed not only in resting but also in mitotic dividing hepatic cells (Fig. 1).

Neither nucleus nor cytoplasm of the hepatic cells including leucocytes showed any degenerative changes as compared with the other cells without such inclusion bodies. Degeneration or digestion of the leucocytes included in the hepatic cells, on the other hand, seems to occur, since small spherical nuclear debris, presumably derived from the ingested leucocytes, were seen in the cytoplasmic vacuoles of some hepatic cells (Fig. 3). Furthermore, pseudoeosinophilic granules of the polymorphonuclears found in hepatic cells were greatly reduced in number, and the nucleus of these leucocytes showed reduced segmentation, a degenerative change.

Because of the rare occurrence of leucocytes and other cytoplasmic inclusions in the liver cells, the phagocytic property of these cells is questionable. However, in

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** Original paper could not be referred to.

view of the facts that the epithelium-cells of the kidney tubulus in Amphibia are actively phagocytic under physiological conditions (Sugiyama and Tachibana²⁾, 1933; Osogoe and Murata, unpublished observations), and that epithelial cells, which are not normally phagocytic, are known to become so in abnormal environmental condtions, particularly in tissue culture (Ishikawa and Shimomura,⁹⁾ 1926; Carleton,¹⁰⁾ 1931), it is conceivable that the hepatic cell may occasionally exhibit phagocytic power under special circumstances.

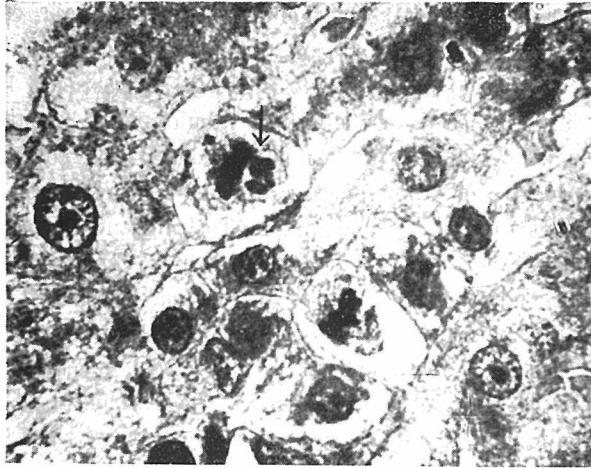


Fig. 1 A hepatic cell in mitosis including a polymorphonuclear leucocyte with pseudoeosinophilic granules (arrow). To the right and below this hepatic cell, another mitotic dividing cell is seen.

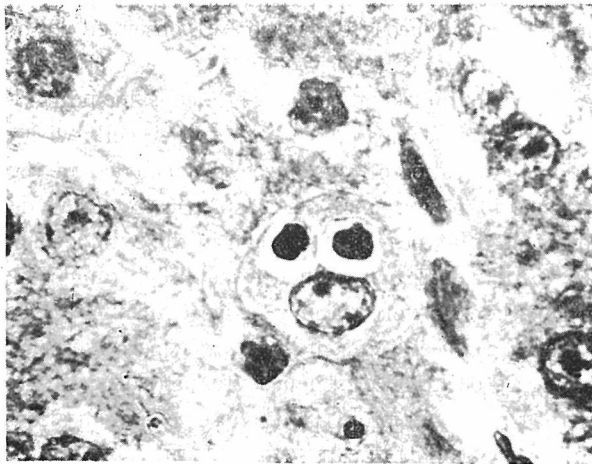


Fig. 2 A hepatic cell including two lymphocytes which are present in the cytoplasmic vacuoles.

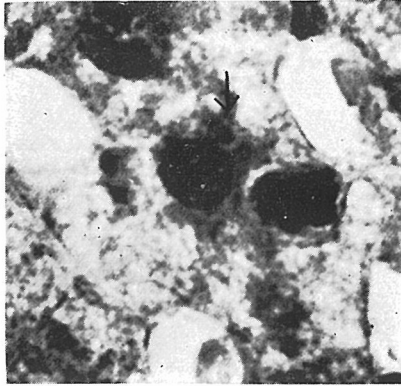


Fig. 3 A small spherical nuclear fragment (arrow) in a hepatic cell. It is present in a cytoplasmic vacuole adjacent to the nucleus.

Further experimental or comparative histological investigation is desired to elucidate the phenomenon of phagocytosis in the parenchymal epithelium-cells of the liver and other glandular organs.

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