Aspects of the Ultrastructure of the Brush Border of the Kidney of Normal Mouse. By Mario M. Sampaio,* Adolfo Brunner, Jr., and Benedicto Oliveira Filho. (From the Laboratório de Virus e Virustерапии, Instituto Butantan, São Paulo, Brasil)†

In spite of the intensive research which has been carried out on the kidney, little is actually known about the ultrastructure of the brush border.

This preliminary note refers to a structural detail of the brush border found in the proximal convolution of the nephrons in normal mouse kidney, as studied under the electron microscope.

Normal mice were decapitated and immediately afterwards the kidney was exposed, stripped from its capsule, and a thin slice of its cortex was fixed for electron microscopy (Palade, 1952). The rest of the technique was routine. The material was examined at a Siemens electron microscope UM 100b model. Micrographs were taken at original enlargements of 1,200, 7,200, and 15,000.

The appearance of the brush border of all cells is basically the same as described by different authors (Sjöstrand and Rhodin, 1953; Rhodin, 1954; Pease, 1955; Policard, 1957; and others), with the exception that in a few digitations (microvilli) of some brush borders, infoldings of the membrane (Fig. 1, A) and vesicles (Fig. 1, B) with an apparently dense content can be visualized. These vesicles, which measure about 200 Å, are disposed along the middle of the units of the brush border (Figs. 1, C and 1, D). Fig. 3, at A, shows the same aspect in a somewhat less marked form. Fig. 2 is an enlarged aspect of Fig. 1. These vesicles have been observed in both longitudinal and cross-sections of the brush border. It is to be noted further that the digitations of the brush border which exhibit the vesicles are somewhat wider than others seen in these images. This may be a differentiation of functional significance.

Although the aspect described above is not yet understood, it is tempting to suggest that it represents morphological evidence of micropinocytosis.

We are undertaking further work, aimed at studying the brush border in different functional states.

BIBLIOGRAPHY


Rhodin, J., Correlation of ultrastructural organization and function in normal and experimentally changed proximal convoluted tubule cells of the mouse kidney, Karolinska Institutet, Stockholm, Aktiebolaget Godvol, 1954, 1.

FIG. 1. Electron micrograph of section of proximal convolution of normal mouse kidney. The digitations of the brush border are cut lengthwise, and some are bent. An infolding of the membrane is apparent at A, and at B the "formation" of vesicles is evident. Note also the vesicles along the middle of the digitations at C and D. X 39,500.
(Sampaio et al.: Ultrastructure of brush border)
FIG. 2. Enlarged aspect of a section similar to Fig. 1. X 64,000.

FIG. 3. Longitudinal section of the digitations of the brush border. A points to the infolding of the membrane and to the vesicles. X 62,000.
(Sampaio et al.: Ultrastructure of brush border)