material production and the tube apex as site of wall formation.


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THE SUBMICROSCOPIC LOCALIZATION OF D-AMINO ACID OXIDASE IN TELEOST KIDNEY PEROXISOMES, BY MEANS OF CERIUM IONS

Reports on the cytochemical localization of peroxisomal marker enzymes such as D-amino acid oxidase or L-α-hydroxy acid oxidase are scarce. In our opinion this is mainly a consequence of the inadequacy of available procedures to demonstrate these enzymes.

The method recently developed for the localization of extracellular NADH-oxidase (1) was successfully adapted for the demonstration of intracellular D-amino acid oxidase activity in the renal tubule cells of the teleost Gasterosteus aculeatus. The procedure is based on chemical trapping, by cerous ions, of enzymatically produced H₂O₂. This leads to the formation of an electron dense precipitate, presumably cerium perhydroxide. After incubation of glutaraldehyde fixed tissue, with D-alanine as a substrate, the reaction product was almost exclusively found in the microbodies. Substrate-free pre-incubation with cerium ions proved to be essential for a proper localization.

The microbodies also contain catalase, as was demonstrated with the diaminobenzidine procedure modified after the recommendations of Roels et al. (2). The combined presence of these enzymes characterizes the microbodies as peroxisomes.

The presence of urate oxidase or glycolate oxidizing L-α-hydroxy acid oxidase could not be demonstrated in the renal tubule cells, biochemically or cytochemically. In rat liver peroxisomes, however, both enzymes could be localized with the cerium method. This suggests that this technique is of significance for the demonstration of hydrogen peroxide producing oxidases in general. Inhomogeneous staining of microbodies as well as random and non-specific staining deposits, characteristic of the copper ferrocyanide method, were not observed with the cerium technique.


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ELECTRON MICROSCOPIC STUDIES ON THE LAMINA PROPRIA OF SMALL INTESTINAL BIOPSIES OF CHILDREN

There is done a lot of histological, ultrastructural, biochemical and quantitative studies of the enterocytes (the epithelial layer of the villus), intraepithelial lymphocytes and goblet cells (review articles: Toner 1968 and Lojda et al. 1970) (1,2).

Contrary ultrastructural and quantitative studies of the cell population of the lamina propria of the villus are in spite of the very important role of some of these cells, as for example plasma cells with their immunological role, and the macrophages with their phagocytic role, not frequently done.

This has stimulated us to study the fine structure and quantitate cells of the lamina propria in intestinal biopsies obtained by means of peroral suction biopsies of controls and in some diseases (Vio, 1975) (3).

Electron micrographs of ultrathin sections of small intestinal suction biopsy specimens of control children were pasted up to form a complete 'composite picture' showing the exact topography of the villus. Quantitative studies done in these composite pictures indicate that macrophages, fibroblasts, endothelial cells and pericytes are distributed more or less evenly in the lamina propria. Plasma cells and eosinophilic granulocytes show a preference for the base of the villi, lymphocytes for the tip. Neutrophilic granulocytes and mast cells occur in a highly variable frequency and may be even absent in some villi. There is considerable variation both from one villus to another and between children.