

Some aspects of the secretory activity of the human olfactory glands

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SUMMARY

Two kinds of secretions, both merocrine and apocrine, have been detected in the serous adenomeres of the human olfactory glands. While the low-density vesicles secrete their products into the glandular lumen by a merocrine way (exocytosis), the electron-dense granules are produced by an apocrine mechanism.

The olfactory glands, located within the tunica propria of the olfactory mucosa, are usually described as branched, tubulo-acinous (Zaccheo et al., 1973; Weiss and Greep, 1977; Gray, 1978).

Their adenomeres are characterized by two kinds of cells, which are respectively light and dark (Seifert, 1971; Breiphof, 1972; Katz and Merzel, 1977; Pasqualino and Nesci, 1980; Cattaneo, 1981).

As no major reports concerning this topic can be found in the literature, the aim of the present paper is to describe the mechanism of apocrine secretion we have referred to in previous papers (Lucheroni et al., 1979a, b).

MATERIALS AND METHODS

Specimens of human olfactory mucosa, collected from the upper portion of the upper turbinate, were fixed in glutaraldehyde 2.5%, buffered with cacodylate 0.1 M, pH 7.3 and sucrose 2.75%. Specimens were then postfixed in OsO₄ 1% in the same buffer. After dehydration through a graded series of alcohols, specimens were finally embedded in Epon-Araldite. Sections, counterstained with uranyl-acetate and lead-citrate, were then observed by means of a Philips EM 300 Electron Microscope.

RESULTS AND DISCUSSION

The adenomeres of human olfactory glands are made up by serous (Figure 1) and mucous (Figures 2, 3) cells, the former being considerably more represented than the latter.

Within the serous cells cytoplasm low-density vesicles, containing an electron-dense nucleus (Figure 4) and granules, can be detected. Such granules are sur-

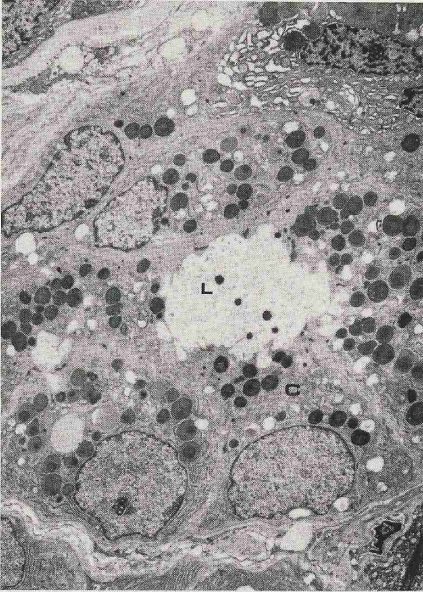


Figure 1. Human olfactory mucosa gland. Serous adenomere. Cells (C) secrete into the glandular lumen (L). 2.200 \times .

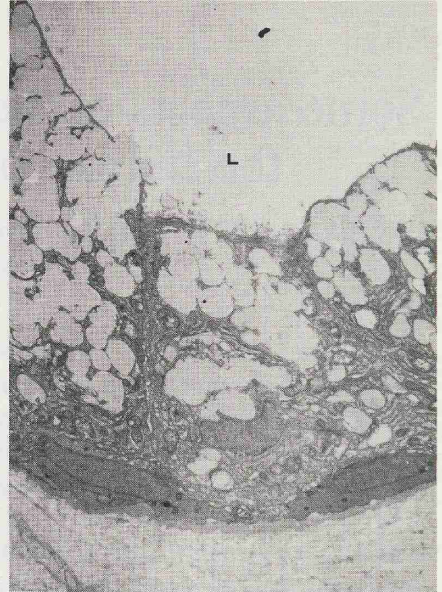


Figure 2. Human olfactory mucosa gland. Mucous adenomere. Cells (C) secrete into the glandular lumen (L). 2.700 \times .



Figure 3. Human olfactory mucosa gland. A secreting mucous cell. 2.400 \times .

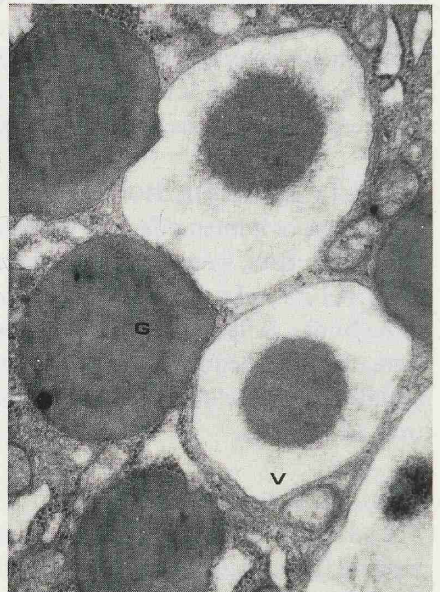


Figure 4. Human olfactory mucosa gland. A serous cell with dark granules (G) and light vesicles (V). 24.000 \times .

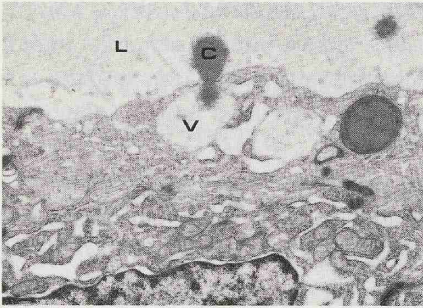


Figure 5. Human olfactory mucosa gland. Merocrine secretion (esocytosis). A vesicle (V) secretes its content (C) into the glandular lumen (L). 8.700 \times .

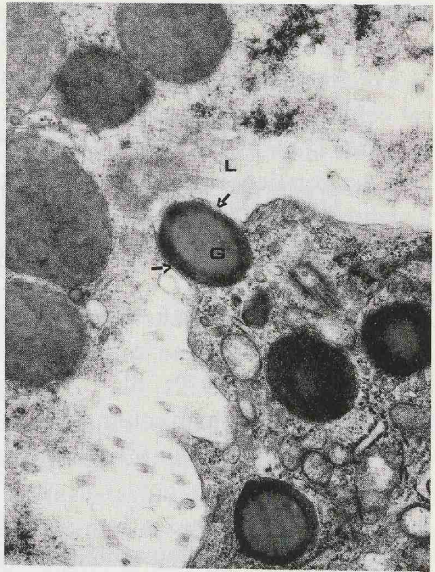


Figure 6. Human olfactory mucosa gland. Apocrine secretion. An electron-dense granule (G) projects into the glandular lumen (L) surrounded by cytoplasm (arrows) 16.000 \times .

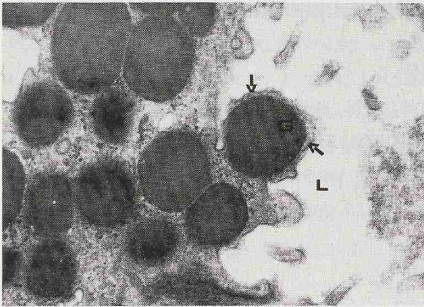


Figure 7. Human olfactory mucosa gland. Apocrine secretion. An electron-dense granule (G) surrounded by cytoplasm (arrows) projects into the glandular lumen L. 20.000 \times .

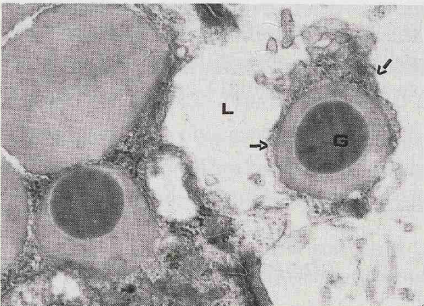


Figure 8. Human olfactory mucosa gland. Apocrine secretion. An electron-dense granule (G) surrounded by cytoplasm (arrows) is free in the glandular lumen. 17.000 \times .

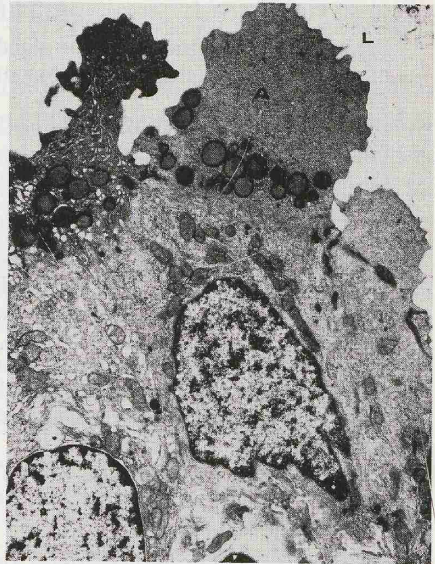


Figure 9. Human olfactory mucosa gland. High columnar glandular cells. Their apical portion (A), granule-free, projects into the adenomere lumen (L). 4.500 \times .

rounded by a membrane and a nucleus, with an lightly variable density, is present in its centre (Figures 6, 8). Low-density vesicles secrete into the glandular lumen by a merocrine way (esocytosis). The vesicle membrane at first fuses with the apical cellular membrane; then the vesicle content is secreted into the glandular lumen (Figure 5).

The electron-dense granules are secreted by an apocrine way as they fall into the glandular lumen surrounded by the cellular membrane and a thin lining of cytoplasm, which remains between the granular and the cellular membranes (Figures 6, 7, 8).

It can be stated that in human olfactory mucosa glands, two kinds of secretions (merocrine and apocrine) can be detected, as previously observed in other glands (Lucheroni et al., 1979a, b).

In some cases very high columnar cells can be seen of which the granule-free apical portion projects into the adenomere lumen (Figure 9).

RÉSUMÉ

Deux types des sécrétions, merocrine et apocrine, ont été observés dans les adénomères séreuses des glandes olfactives humaines. Les vésicules avec une densité réduite sont produites par les glandes avec une sécrétion merocrine (éxocytose) tandis que celles électron dense avec un mécanism apocrine.

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