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Ultrastructural Differences Between the Preterminal Nerve Fibres and their Endings in the Mechanoreceptors, with Special Reference to their Degeneration and Mode of Uptake of Horseradish Peroxidase

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Publisher Summary

This chapter describes the ultrastructural differences between the preterminals and their terminal swellings, or the so-called "nerve endings," in different capsulated and non-capsulated mechanoreceptors. The nerve ending axoplasm possesses a great accumulation of centrally located mitochondria, much more glycogen granules, lysosomes, and multivesicular bodies than the preterminals. Besides that, the nerve endings possess specific signs, such as denuded axoplasma-axolemma complexes, clear vesicles, dense core vesicles, and coated vesicles. The denuded complexes, especially the

finger-like processes, represent the extensive direct contact of the sensory axoplasm with the surrounding intercellular substance. These processes show a different growth in the capsulated and non-capsulated receptors. In connection with the vesicular material, the indirect arguments are presented against the suggestion that acetylcholine (Ach) and catecholamine (CA) fulfill a transmitter role in the mechanoreceptors. The use of the denervated Pacinian corpuscle suggests that the nerve endings, especially the finger-like processes are the most sensitive parts of the receptors because they first react with disintegration and destruction; in other words, they are probably the most responsible sites involved in the process of sensory transduction. The ultrastructural localization of exogenous peroxidase in the pinocytotic vesicles, coated vesicles, multivesicular bodies, and lysosomes of the non-nervous receptor structures, as well as in the vesicular material and lysosomes of the nerve endings are also described.



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