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Immunoreactive nerve fibers in the nasal mucosa

An experimental study on neuropeptides Y, calcitonin gene-related peptide and galanin

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Summary. The presence of immunoreactive nervous fibers in the respiratory nasal mucosa of rats and guinea pigs was studied by means of a modified peroxidase antiperoxidase technique for whole mounting, The fibers with neuropeptide Y (NPY) always appeared in the walls of blood vessels, while the fibers immunoreactive to calcitonin gene-related peptide (CGRP) were found in nerve tracts near the vessels and the acini of seromucous glands as thick networks located in the subepithelial layers. Immunoreactivity (IR) for galanin was found in the mucosa studied. The findings after surgical and chemical denervation of the trigeminal and superior cervical ganglia may support the theory that the fibers with NPY are of a sympathetic nature with the superior cervical ganglion their site of origin, while the CGRP-IR fibers may have a sensory nature.

Key words: Calcitonin gene-related peptide – Neuropeptide Y – Galanin – Nasal respiratory mucosa – Nasal autonomic innervation

may therefore be of interest to determine their origin and to elucidate their possible functions on the nasal mucosa.

Materials and methods

Nine adult Wistar rats and nine adult Dunkin-Harley guinea pigs (weighing 200–300 g) were used to study the normal morphology of fibers IR to CGRP, NPY and galanin in the nasal respiratory mucosa. Animals were sacrified by an ether overdose and the bloodless mucosa was removed after dissection of the nasal cavities. Specimens of respiratory mucosa were fixed in formol with phosphate buffered saline (PBS)-tampon for 3 h. Mounting was performed after staining following the peroxidase antiperoxidase (PAP) technique following Sternberger. Antibodies against CGRP, NPY and galanin were produced previously in rabbits. Their dilutions were 1:400, 1:400 and 1:800 respectively.

After chemical and surgical denervation, paraffin-embedded specimens of the trigeminal and cervical superior ganglia from the rats were studied with the PAP technique (antibody dilutions: CGRP 1:600, NPY 1:1200 and galanin 1:3000). Chemical treatment involved the administration of 6-hidroxydopamine (6-OHDA, available from Sigma) to six adult rats and the administration