Presence of Locusta diuretic hormone in endocrine cells of the ampullae of locust Malpighian tubules

L.M. Montuenga[1], E. Zudaire[1], M.A. Prado[1], N. Audsley[2], M.A. Burrell, G.M. Coast[2].

1. Departament of Histology and Pathology, Faculty of Medicine, University of Navarra, E-31080 Pamplona, Spain.
2. Departament of Biology, Birkbeck College, Malet Street, London WC1E 7HX, UK.

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This is an investigation of an endocrine cell type in the midgut of the migratory locust Locusta migratoria. This cell type is found in the posterior region of the midgut and is especially common in the ampullae through which Malpighian tubules drain into the gut at the midgut-hindgut junction. Strong Locusta diuretic hormone-like immunoreactivity in these cells was colocalized with FMRFamide- and substance P-like immunorectivities. At the ultrastuctural level, immunoreactivities for Locusta diuretic hormone was found in spherical granules (mean diameter of 450 nm), the contents of which showed variable electron density. Fractionation of a methanolic extract of the ampullae by reversed-phase high performance liquid chromatography revealed the presence of two peaks of Locusta diuretic hormone-like immunoreactive material, both of which stimulate cyclic AMP production by isolated Malpighian tubules. The more hydrophobic material is most likely Locusta diuretic hormone, which has the same retention time when chromatographed under identical conditions.

Expression of Peptidyl-Glycine α-Amidating Mono-Oxygenase (PAM) Enzymes in Morphological Abnormalities Adjacent to Pulmonary Tumors

Alfredo Martínez, Anthony M. Treston, Laura Saldise, Luis M. Montuenga, and R. Ilona Linnoila

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Carboxyl-terminal amidated peptide hormones are known to be autocrine growth factors for lung tumors and tumor cell lines. Expression of the enzymes necessary for the biosynthesis of active amidated peptide hormones is therefore necessary for autocrine growth stimulation in lung tumors and possibly in the early proliferative stages of lung carcinogenesis. The peptidyl amidating enzymes have previously been identified in cell lines of all histological types of lung cancer and in lung tumors by immunohistochemistry and *in situ* hybridization. In this study we analyzed the expression of the peptidyl amidating enzymes in histological abnormalities found in the proximity of pulmonary tumors from a series of 59 patients. Most of the lesions in both the proximal airways (basal cell hyperplasia, carcinoma *in situ*, and some squamous metaplasia) and the alveoli (type II cell hyperplasia, bronchiolization of the alveoli, atypical alveolar hyperplasia, and isolated atypias) had a high proportion of cells strongly positive for the peptidyl amidating enzymes. The intense expression of peptidyl amidating enzymes in type II cell hyperplasia and atypical alveolar cells, together with the frequency of these abnormalities in the alveoli, which is an area that does not express these enzymes in normal lung, points to the involvement of peptide hormones in the growth biology of pulmonary tumors. These findings suggest that peptide hormone stimulation of mitogenesis is an early event in tumor progression and merits additional investigation as a target for early detection and chemo-intervention of lung carcinogenesis.