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Original Article

Distribution of Peptidyl-Glycine α-Amidating Mono-oxygenase (PAM) Enzymes in Normal Human Lung and in Lung Epithelial Tumors[1]

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C-terminal α-amidation is a post-translational modification necessary for the biological activity of many regulatory peptides produced in the respiratory tract. This modification is a two-step process catalyzed by two separate enzyme activities, both derived from the peptidyl–glycine α-amidating mono-oxygenase (PAM) precursor. The distribution of these two enzymes, peptidyl–glycine α-hydroxylating mono-oxygenase (PHM) and peptidyl–α-hydroxyglycine α-amidating lyase (PAL), was studied in the normal lung and in lung tumors using immunocytochemical methods and in situ hybridization. In normal lung the enzymes were located in some cells of the airway epithelium and glands, the endothelium of blood vessels, some chondrocytes of the bronchial cartilage, the alveolar macrophages, smooth muscle cells, neurons of the intrinsic ganglia, and in myelinated nerves. A total of 24 lung tumors of seven different histological types were studied. All cases contained PAM-immunoreactive cells with various patterns of distribution. All immunoreactive cells were positive for the PHM antiserum but only some of them for the PAL antiserum. The distribution of PAM co-localizes with some other previously described amidated peptides, suggesting that amidation is an important physiological process taking place in the normal and malignant human lung tissue. (*J Histochem Cytochem 44:3–12, 1996*)

KEY WORDS: Human lung; Lung tumors; Amidation; PAM; PHM; PAL.