

PRODUCTION OF REGULATORY FACTORS IN THE RESPIRATORY SYSTEM OF VERTEBRATES

by

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ABSTRACT

Among the different cell types present in the respiratory tract of the vertebrates, some (epithelial, endothelial, neural) specialise in the production of regulatory factors. Endocrine cells occur either single, spread throughout the epithelial lining, or in innervated groups, called 'neuroepithelial bodies' (NEBs). In mammals, these endocrine cells may be involved in lung maturation during perinatal life and in chemoreception. A neuroendocrine diffuse system is present in the respiratory organs of all classes of vertebrates. In amphibians and reptiles, single endocrine cells as well as NEBs are located in the apices of the lung septa. The respiratory tract shows nerve fibres immunoreactive to several neuropeptides. Since some neurons and fibres contain NO synthase a broad evolutionary presence of NO-releasing neurons, probably involved in the control of relaxation, is suggested.

KEY WORDS: endocrine cells, neuroepithelial bodies, innervation, lung, peptides, nitric oxide, vertebrates.

Highly active peptides and other factors are released from various cell types in the vertebrate lung, such as endocrine, neural, and non-endocrine epithelial cells. The biological effects of these factors are currently being investigated in mammals (SPRINGALL *et al.*, 1991) and are the object of this short review.

1. Endocrine cells

The existence of endocrine cells (ECs) in the lung is known since 1938 when FEYRTER reported the presence of 'clear cells' in the mammalian lung epithelium. FRÖHLICH (1949) described clusters of cells spread throughout the airways epithelium, later called 'neuroepithelial bodies' (NEBs) (LAUWERYS *et al.*, 1972). ECs and NEBs also occur in the lungs of birds, reptiles and amphibians (figs. 1 and 2) and in the gills of neotenuous amphibians and teleost fishes.

Localisation. In the extrapulmonary airways only isolated ECs are found, whereas in the intrapulmonary airways both ECs and NEBs are present. In mammals, NEBs are frequently located at branching points of the bronchiolar tree (fig. 3). In amphibians and reptiles, NEBs occur

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