

垂体腺苷酸环化酶激活肽的研究概况

Pituitary Adenylate Cyclase-activating Polypeptide

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中文摘要:

垂体腺苷酸环化酶激活肽(PACAP)及其受体存在于许多动物的下丘脑和垂体中,而且在肾上腺、睾丸、卵巢、肝脏、肾脏、胰腺、松果腺、心脏、脊椎、神经节、呼吸系统和消化系统等组织或系统中也存在,其中肾上腺含量最高.在这些组织或系统中,通过Ca²⁺、Na⁺、腺苷酸环化酶或磷酸肌醇等作用通路,PACAP发挥神经递质/调质、或神经营养因子等生物学功能.

英文摘要:

Pituitary adenylate cyclase-activating polypeptide (PACAP) which belongs to the secretin/glucagon/VIP family has been originally isolated from the sheep hypothalamus on the basis of its ability to stimulate cAMP formation in culture rat anterior pituitary cells. Post-translational processing of the PACAP precursor generates two biologically active molecular forms, PACAP-38 and PACAP-27. The primary structure of PACAP has been remarkably conserved during evolution. The sequence of PACAP-27 exhibits substantial similarities with those of vasoactive intestinal polypeptide (VIP), glucagon and secretin. The gene encoding the PACAP precursor is widely expressed in brain and various peripheral organs, notably in endocrine glands, gastro-intestinal, uro-genital tracts and respiratory system. *In vivo* and *in vitro* studies have shown that PACAP exhibits multiple activities especially a trophic activity during ontogenesis, notably in the adrenal medulla and the central nervous system. The biological effects of PACAP are mediated through three distinct receptor subtypes which exhibit differential affinities for PACAP and VIP. The PAC1 receptor, which shows high selectivity for PACAP, is coupled to several transduction systems. In contrast, VPAC1 and VPAC2, which bind with the same affinity for PACAP and VIP, are mainly coupled to the adenylyl cyclase pathway. In conclusion, PACAP is neuropeptide, and it functions as a hypothalamic hormone, neurohormone, neuromodulator, vasodilator, neurotransmitter or trophic factor in the brain and the various organs.

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