

Introduction

Béla Halász

Neuroendocrine Research Laboratory, Hungarian Academy of Sciences and Semmelweis University, Department of Human Morphology and Developmental Biology, Tüzoltó u. 58, H-1094 Budapest, Hungary

The review articles in this special issue of *Endocrine*, entitled "Recent Developments in Neuroendocrinology and its Clinical Implications," are focused on three topics.

The first topic to be dealt with is estrogen, androgen, and corticosteroid receptors. Both preclinical and clinical observations suggest that activation of estrogen receptors have an important role in neuroprotective and neurodegenerative processes in the mammalian central nervous system. Furthermore, the fairly recently discovered estrogen receptor β appears to be a major mediator of estrogenic effects in depression and anxiety. The first article summarizes our knowledge on estrogen action in mood and degenerative disorders. There is an article dealing with diseases linked to mutated androgen receptors and another one summarizing data on corticosteroid receptor genetic polymorphism and stress responsivity.

The second part reviews the involvement of excitatory amino acids in the control of the anterior pituitary. Today, it is generally accepted that glutamate is the major neurotransmitter in the brain including the hypothalamus. Glutamate is presumably a central regulator of numerous physiological processes including neuroendocrine functions and appears to also be involved in several pathophysiological syndromes and diseases. The articles in this issue provide an overview of the regulatory role of excitatory amino acids in reproduction, in puberty, as well as in the control of

hypophyseal prolactin, adrenocorticotropin, and growth hormone secretion.

In the third section the functional significance of the innervation of the gonads and the adrenal cortex is discussed. It became evident that the nerves to the endocrine glands regulate not only vasomotor tone, but also influence the secretory activity of the glands. The transmitters (both classical transmitters of the autonomic nervous system and neuropeptides) released from the nerve terminals in the glands can act on receptors located on specific, hormone-secreting cells. Therefore, secretion of tissue-specific hormones is under the regulatory control of neural impulses, even if this control mechanism is minor compared to the main endocrine or metabolic signals. The key to understanding the neural control of the target endocrine glands includes the knowledge of spinal cord and brain nuclei that are neurally linked to these organs. The recently introduced viral trans-synaptic tracing technique has made possible the identification of spinal and supraspinal cell groups, neurally connected with endocrine glands. One article in this issue summarizes our present knowledge about the functional significance of the innervation of the gonads. Another article deals with the role of stress and sympathetic innervation in the development of polycystic ovary, and a third article discusses neural circuitry in the regulation of adrenal corticosterone rhythmicity.