PEPTIDE-AMINE-STEROID INTERACTIONS IN BRAIN REGULATION OF GONADAL FUNCTION. A. Negro-Vilar, Reproductive Neuroendocrinology Section, Lab. Reprod. Dev. Tox., NIEHS, NIH, Research Triangle Park, NC 27709, USA.

The primary regulatory action of LHRH on gonadotropin secretion and gonadal function is modulated by a series of complex regulatory mechanisms at brain, pituitary, and gonadal sites. The feedback signals provided by gonadal steroids induce both inhibition and facilitation of LHRH secretion. These effects are mediated by catecholaminergic neurons, which are in close contact with LHRH neurons, and also by peptidergic neurons, including those of the β-Endorphin system. Central opiatergic neuronal systems exert a tonic inhibitory effect upon LHRH neurons and, hence, upon gonadotropin secretion, and they also seem to mediate the inhibitory effects of steroids on LHRH secretion. Moreover, these inhibitory effects of the opiates seem to be modulated by circulating levels of gonadal steroids, according to the physiological state of the animal. Pulsatile secretion of gonadotropins is also modulated by this multiple steroid-peptide-amine regulatory complex. LHRH may act to auto-regulate its own secretion, as evidenced by the fact that LHRH agonists that suppress LH and testosterone secretion, inhibit LHRH secretion *in vitro* and also *in vivo* into the portal-hypophyseal vasculature, an effect independent of the presence of the gonads. Part of this auto-inhibitory effect seems to be mediated by interactions with the endogenous opiate systems. The intracellular events mediating the actions of opiate receptor blockers such as naloxone include activation of α-adrenergic-receptors and increased formation and release of prostaglandin E_2, events leading to an enhanced secretion of LHRH. This neuroendocrine regulatory system therefore represents a valuable model for the analysis of the cellular and subcellular mechanisms underlying the steroidal modulation of peptide-amine interactions in the central nervous system.