

Paracrine/autocrine control of female reproduction.

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Neuropeptides, growth factors and cytokines are expressed in reproductive organs and tissues, where they interact with afferent endocrine messages to modulate cell proliferation and differentiation, local hormone secretion and vascular function. These events regulate complex processes such as gonadotropin pulsatility, ovulation, implantation and parturition. During reproductive life, a number of neuropeptides produced within the hypothalamus play a modulatory role in the control of gonadotropin-releasing hormone (GnRH) release, hence characterizing a hypothalamic paracrine system. The pituitary gland is a source and target of inhibin-related proteins, and these typical 'gonadal' products, once secreted by the pituitary cells, acquire the function of paracrine modulators of follicle-stimulating hormone (FSH) secretion. In the ovary, the effect of gonadotropins is locally modulated by growth factors acting in an autocrine/paracrine manner, although their precise role in folliculogenesis remains uncertain. Numerous local factors are involved in the control of endometrial growth, differentiation, receptivity and menstruation. Alterations in the paracrine endometrial system may underlie pathological processes such as infertility or endometrial neoplasia. The human placenta and its related membranes produce cytokines, hormones and growth factors that participate in the control of gestational development as well as in the maternal-fetal adaptation to gestational diseases. There is increasing evidence that paracrine signaling plays a fundamental role in all spheres of female reproductive function, and future research will concentrate on clarifying which of these local mechanisms play a decisive role in both physiology and disease, thus giving rise to new therapeutic strategies.

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