Hormones are involved in the process of cell-to-cell signaling. Hormones interact with their target cells via specific hormone-receptor interactions. The receptor may be in the plasma membrane or inside the cell (cytoplasmic or nuclear). The hormone-receptor interaction may generate second messengers or regulate gene expression. The effect of the hormone on the cell may be the result of altered metabolic pathways (e.g., changes in enzyme activity or concentrations of enzymes) or changes in cell structure and growth. The lower panel illustrates the different modes of cell-to-cell communication.

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Neurohypophysis (Posterior Pituitary); Adenohypophysis (Anterior Pituitary); Neuroendocrine cells in the hypothalamus send axons into the posterior pituitary and to the region of the median eminence. Hormones are released from these axons into the systemic blood (posterior pituitary) or into the hypothalamic-hypophyseal portal system in the region of the median eminence.
Hypothalamic neuroendocrine cells release hormones into the hypothalamic-hypophyseal portal system that stimulate or inhibit the secretory cells of the anterior pituitary. Under the control of these hypothalamic releasing and inhibiting hormones, the cells of the anterior pituitary release tropic hormones, which then act on endocrine glands; the hormones secreted by the endocrine glands feedback on both the cells of the anterior pituitary and the hypothalamus to regulate the secretion of tropic hormones and releasing hormones.
Oxytocin is released from the posterior pituitary in response to vaginal stimulation and suckling. In response to vaginal stimulation, as occurs during sexual intercourse, Oxytocin is released and causes uterine contraction. This may facilitate sperm transport through the uterus and uterine tubes. Oxytocin also facilitates childbirth by increasing uterine contractions during labor. During nursing, stimulation of the nipple by the suckling infant causes Oxytocin release, which then acts on the myoepithelial cells surrounding the mammary gland alveoli and ducts causing expression of milk. Neural pathways activated during suckling also stimulate the secretion of Prolactin.
Antidiuretic hormone (ADH) or vasopressin is involved in the regulation of water balance. Changes in body fluid osmolality and blood volume and pressure are the primary physiologic regulators of ADH secretion. When ADH levels are elevated, a small volume of concentrated urine is excreted. When ADH levels are low, a large volume of dilute urine is excreted.