

TABLE 40.1 MAJOR ACTION AND SOURCE OF SELECTED HORMONES

SOURCE	HORMONE	MAJOR ACTION
Hypothalamus	Releasing and inhibiting hormones CRH TRH GHRH GnRH Somatostatin Dopamine	Controls the release of pituitary hormones  Inhibits GH and TSH Inhibits prolactin release from the pituitary Inhibits FSH and LH
Anterior pituitary	GH  ACTH  TSH FSH  LH	Stimulates growth of bone and muscle, promotes protein synthesis and fat metabolism, decreases carbohydrate metabolism  Stimulates synthesis and secretion of adrenal cortical hormones Stimulates synthesis and secretion of thyroid hormone Female: stimulates growth of ovarian follicle, ovulation Male: stimulates sperm production Female: stimulates development of corpus luteum, release of oocyte, production of estrogen and progesterone Male: stimulates secretion of testosterone, development of interstitial tissue of testes
Posterior pituitary	Prolactin ADH (arginine vasopressin, AVP) Oxytocin	Prepares female breast for breast-feeding Increases water reabsorption by kidney Stimulates contraction of pregnant uterus, milk ejection from breasts after childbirth
Adrenal cortex	Mineralocorticosteroids, mainly aldosterone Glucocorticoids, mainly cortisol  Adrenal androgens, mainly dehydroepiandrosterone (DHEA) and androstenedione	Increases sodium absorption, potassium loss by kidney Affects metabolism of all nutrients; regulates blood glucose levels, affects growth, has anti-inflammatory action, and decreases effects of stress  Have minimal intrinsic androgenic activity; they are converted to testosterone and dihydrotestosterone (DHT) in the periphery
Adrenal medulla	Epinephrine  Norepinephrine	Serve as neurotransmitters for the sympathetic nervous system
Thyroid (follicular cells)	Thyroid hormones: triiodothyronine (T <sub>3</sub> ), thyroxine (T <sub>4</sub> )	Increase the metabolic rate; increase protein and bone turnover; increase responsiveness to catecholamines; necessary for fetal and infant growth and development
Parathyroid glands	Calcitonin Parathyroid hormone (PTH)	Lowers blood calcium and phosphate levels Regulates serum calcium
Pancreatic islet cells	Insulin  Glucagon	Lowers blood glucose by facilitating glucose transport across cell membranes of muscle, liver, and adipose tissue  Increases blood glucose concentration by stimulation of glycogenolysis and glyconeogenesis
Kidney	Somatostatin 1,25-Dihydroxyvitamin D	Delays intestinal absorption of glucose Stimulates calcium absorption from the intestine
Ovaries	Estrogen  Progesterone	Affects development of female sex organs and secondary sex characteristics Influences menstrual cycle; stimulates growth of uterine wall; maintains pregnancy
Testes	Androgens, mainly testosterone	Affect development of male sex organs and secondary sex characteristics; aid in sperm production

**TABLE 40.2 CLASSES OF HORMONES BASED ON STRUCTURE**

AMINES AND AMINO ACIDS	PEPTIDES, PROTEINS, AND GLYCOPROTEINS	STEROIDS	FATTY ACIDS
Dopamine Epinephrine Norepinephrine Thyroid hormone	CRH GHRH TRH ACTH FSH LH TSH GH ADH Oxytocin Insulin Glucagon Somatostatin Calcitonin PTH Prolactin	Aldosterone Glucocorticoids Estrogens Testosterone Progesterone Androstenedione 1,25-Dihydroxyvitamin D DHT DHEA	Prostaglandins Thromboxanes Leukotrienes Prostacyclins