Hormones	Secreted from ductless glands Acts as an intercellular chemical messenger Non-nutrient and present in trace amounts
Hypothalamus	Diencephalon, master of the master gland Regulates secretion from anterior pituitary through hypophyseal portal system Neurohypophysis is under the direct control
Gonadotrophin releasing hormone (GnRH)	Secreted from- hypothalamus Function- stimulates the synthesis of gonadotrophins from the anterior pituitary

Somatostatin	Secreted from- hypothalamus Function- inhibits the secretion of growth hormone (GH) from the anterior pituitary
Pars distalis	A part of adenohypophysis (anterior pituitary) Secretes- GH, ACTH, TSH, LH, FSH, PRL
Pars intermedia	A part of adenohypophysis Secretes- MSH (melanocyte-stimulating hormone) Function- MSH regulates pigmentation of the skin

Pars nervosa	Neurohypophysis or posterior pituitary Secretes- oxytocin and vasopressin (ADH) These hormones are synthesised in the hypothalamus and transported by axon and released by nerve endings
Growth hormone (GH)	Secreted by- anterior pituitary Function- Regulates growth **Gigantism**- due to over production **Dwarfism**- due to under production **Acromegaly**- due to overproduction in adults
Prolactin (PRL)	Secreted by- anterior pituitary Function- stimulates the growth of mammary gland and milk production

Thyroid-stimulating hormone (TSH)	Secreted by- anterior pituitary Function- stimulates the thyroid gland to secrete thyroid hormones
Adrenocorticotrophic hormone (ACTH)	Secreted by- anterior pituitary Function- stimulates the adrenal cortex to secrete glucocorticoids (cortisol)
Luteinizing hormone (LH)	Gonadotrophins Secreted by- anterior pituitary Function in males- stimulates the synthesis of androgens Function in females- induces ovulation and maintenance of corpus luteum

Follicle-stimulating hormone (FSH)	Gonadotrophins Secreted by- anterior pituitary Function in males- regulates spermatogenesis with androgens Function in females- growth and development of ovarian follicles
Oxytocin	Secreted by- posterior pituitary Function- stimulates contraction of smooth muscles, stimulates contraction of uterus during childbirth Oxytocin injection is given to induce labour pain
Vasopressin or Anti-diuretic hormone (ADH)	Secreted by- posterior pituitary Function- stimulates reabsorption of water from distal tubules in the kidneys and prevents **diuresis** **Diabetes Insipidus-** decreased synthesis of ADH leading to excessive loss of water from the kidneys

Pineal gland	Location- dorsal side of forebrain Secretion- melatonin Function- regulates sleep-wake cycle, temperature. Also regulates metabolism, pigmentation, immune system and menstrual cycle
Thyroid gland	Location- present on both sides of trachea joined by isthmus Secretion- T_4 (thyroxine) and T_3 from follicular cells, calcitonin from 'C' cells Function- regulation of carbohydrate, fat and protein metabolism, BMR and water and electrolyte balance, regulation of blood calcium level by calcitonin
Hypothyroidism	**Goitre**- enlargement of thyroid gland due to iodine deficiency **Cretinism**- due to congenital thyroid deficiency causing growth retardation, learning difficulties Irregular menstrual cycle in adult females

Hyperthyroidism	**Thyroid cancer-** nodule formation leading to excess production of thyroid hormones **Exophthalmic goitre or Grave's disease-** enlargement of thyroid gland, increased BMR, weight loss and eyeballs protrude out
Parathyroid gland	Location- a pair in each lobe of the thyroid gland Secretion- parathyroid hormone (PTH) Function- play role in calcium balance with calcitonin. It increases blood calcium level by dissolution from bones, reabsorption from kidneys and absorption from food
Thymus	Location- between lungs behind sternum Secretion- thymosins Function- play role in immune system development. Differentiation of T-lymphocytes and production of antibodies

Adrenal gland	Location- above each kidney Secretion- glucocorticoids and mineralocorticoids (corticoids) from the adrenal cortex Epinephrine and norepinephrine (catecholamines) from the adrenal medulla
Adrenal cortex	Outer- zona glomerulosa Middle- zona fasciculata Inner- zona reticularis Secretes many hormones called corticoids or steroid hormones Function- involved in carbohydrate metabolism and water and electrolyte balance
Glucocorticoids	Secreted by- adrenal cortex E.g. Cortisol Function- stimulates gluconeogenesis, proteolysis, lipolysis, RBC production, anti-inflammatory reactions, inhibits cellular uptake and utilisation of amino acids and also helps in maintaining cardiac and kidney functions

Mineralocorticoids	Secreted by- adrenal cortex E.g. Aldosterone Function- maintenance of electrolytes, water and blood pressure, stimulates reabsorption of water and Na^+ ions and excretion of K^+ and phosphate ions
Adrenal androgens	Secreted by- zona reticularis of the adrenal cortex E.g. Androstenedione (A_4), Dehydroepiandrosterone (DHEA) Function- weak androgenic activity, play role in the growth of axial, pubic and facial hair during puberty
Catecholamines	Epinephrine or Adrenaline and Norepinephrine or Noradrenaline Secreted by- adrenal medulla during the stress response Function- induce flight or fight responses, alertness, sweating, increased heartbeat, respiratory rate, breakdown of glycogen, lipids and proteins

Pancreas	Both exocrine as well as endocrine Islets of Langerhans secrete two peptide hormones α-cells- glucagon β-cells- insulin
Insulin	Secreted by- β-cells of pancreas Function- increases glucose uptake and utilisation by hepatocytes and adipocytes causing hypoglycemia and also stimulates glycogenesis, i.e. conversion of glucose to glycogen
Glucagon	Secreted by- α-cells of pancreas Function- acts on hepatocytes and induce glycogenolysis, i.e. breakdown of glycogen to glucose and gluconeogenesis leading to hyperglycemia

Testes	Location- scrotal sac in males Secretion- androgens from the Leydig or interstitial cells E.g. Testosterone Function- development and maturation of male sex organs, spermatogenesis, secondary sexual characteristics, libido, anabolic effect on carbohydrate and protein metabolism
Ovaries	Location- abdomen of females Secretion- estrogen from follicles and progesterone from corpus luteum Function- development and maturation of female sex organs, secondary sexual characteristics, progesterone supports pregnancy and milk secretion and alveoli formation
Anti natriuretic factor (ANF)	A peptide hormone Secreted by- atrial wall Function- vasodilator, decreases blood pressure

Erythropoietin	A peptide hormone Secreted by- juxtaglomerular (JG) cells of kidneys Function- stimulates the formation of RBC, i.e. erythropoiesis
Gastrin	A peptide hormone Secreted by- G-cells of stomach Function- stimulates the secretion of HCl and pepsinogen
Secretin	A peptide hormone Secreted by- S-cells of the duodenum Function- stimulates the secretion of pancreatic bicarbonate

Cholecystokinin (CCK)	A peptide hormone Secreted by- I-cells of the duodenum Function- stimulates the secretion of bile juice by the gallbladder and pancreatic enzymes
Gastric inhibitory peptide (GIP)	A peptide hormone Secreted by- K-cells of the small intestine Function- inhibits gastric secretion, stimulates insulin secretion
Growth factors	Secreted by- non-endocrine tissues E.g. epidermal growth factor, fibroblast growth factor, etc. Function- normal cellular growth, repair and regeneration