VANCOUVER COMMUNITY COLLEGE

Endocrine System I

Anterior Pituitary (adenohypophysis):

ACTH – stimulates release of steroid hormones by adrenal cortex.

 ${\sf TSH}-{\sf stimulates}$ the release of thyroid hormones by the thyroid.

GH – stimulates cell growth and replication by accelerating the rate of protein synthesis. Skeletal muscle and cartilage are particularly sensitive to it

PRL – stimulates mammary gland development in females and milk production during nursing period.

FSH – promotes follicle development in females and (along with LH) stimulates estrogens secretion by the ovaries.

LH – induces ovulation and stimulates secretion of estrogen and progestins by the ovaries in females.

MSH – stimulates the production of melanin by the melanocytes in epidermis (skin).

Thyroid Gland:

Thyroxine (T4), Triodothyronine (T3) – target most cells, increase energy utilization, oxygen consumption, growth and development Calcitonin – when Ca concentration increases, Calcitonin is secreted and drops it. Acts on bones and kidneys.

Thymus:

Thymosins – promote the development and maturation of lymphocytes (defense cells).

Pineal Gland:

Melatonin – inhibits reproductive functions, protects CNS against damage by free radicals, maintenance of circadian rhythms.

Hypothalamus:

ADH – restricts water loss at the kidneys.

Oxytocin – stimulates smooth muscle contractions in the uterus and mammary glands (female); prostate glands (male).

Regulatory hormones – control endocrine cells in the pituitary gland.

Posterior Pituitary (neurohypophysis):

Oxytocin and ADH are produced by the hypothalamus and stored at the neurohypophysis until release.

Release of Oxytocin – Oxytocin stimulates labor contractions and ejection of milk in females. Stimulates contraction of ductus deferens and prostate gland.

Release of ADH - ADH decreases the amount of water lost at the kidneys: cause

amount of water lost at the kidneys; causes vasoconstriction.

Parathyroids:

Parathyroid hormone – increases calcium concentrations in body fluids. It acts on bones and kidneys.



Adrenals:

Mineralocorticoids – increase renal absorption of Na and water, accelerate urinary loss of K. Glucocorticoids – act on most cells. Promote glucose and glycogen formation by the liver, peripheral utilization of lipids, anti-inflammatory effects, release of amino acids from skeletal muscles, and lipids from adipose tissue.

Androgens – small quantities. Stimulate muscle growth, blood cell formation in children and women.

Epinephrine/norepinephrine – increases cardiac activity, blood pressure, glycogen and glucose breakdown, release of lipids by adipose tissue.

Kidneys:

Erythropoietin – stimulates red bone marrow to produce red blood cells.

Calcitrol – stimulates calcium and phosphate absorption, stimulates calcium release from bones.

Ovaries:

Estrogens – support maturation of follicle, development of secondary sex characteristics and associated behaviours.

Progestins – prepare uterus for implantation and mammary glands for lactation.

Inhibin – inhibits secretion of FSH by anterior lobe of pituitary gland.

Heart:

Natriuretic Peptides (ANP and BNP) – increase in water and salt loss by the kidneys. Decrease thirst, suppress secretion of ADH (by hypothalamus) and aldosterone (by adrenals).

Adipose tissue:

Leptin – feedback control of appetite.

Resistin – reduces insulin sensitivity throughout the body.

Digestive tract:

Numerous hormones that coordinate digestive activities.

Pancreas – pancreatic islets

Glucagon – increases blood glucose concentrations by increasing glycogen breakdown and glucose release by the liver.

Insulin – lowers blood glucose concentrations by increasing glucose utilization by body cells and glycogen synthesis by skeletal muscles and liver.

Testes:

Testosterone – support maturation of sperm, development of male secondary characteristics and associated behaviours.

Inhibin – inhibits secretion of FSH by anterior lobe of pituitary gland.

