

# Chapter 18 – Study Guide

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in general you should know: appearance of each gland & where in the body it is found

(that includes being able to identify in a picture those structures listed as ***bold, italicized and underlined***)

which glands secrete or release which hormones

which hormones have which functions

(know functions as a “package” - I won't ask about individual functions in isolation from the other functions)

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hormone

exocrine gland

endocrine gland

down regulation

up regulation

circulating hormones

local hormones

paracrine cell

autocrine cell

transport protein

lipid soluble hormones

bind to receptors in the cytosol or nucleus

alter gene expression

alter protein synthesis

water soluble hormones

bind to receptors on the plasma membrane

activate one or several enzymes to catalyze reactions that produce physiologic responses

permissive effect

synergistic effect

antagonistic effect

## ***ANTERIOR PITUITARY GLAND***

hGH – human growth hormone (somatotropin)

stimulates several tissues to secrete insulin like growth factors

that stimulate general body growth

and regulate aspects of metabolism

TSH – thyroid stimulating hormone (thyrotropin)

controls secretions and activities of the thyroid gland

FSH – follicle stimulating hormone

& LH – luteinizing hormone

stimulate secretion of estrogens & progesterone

stimulate maturation of oocytes

stimulate secretion of testosterone

stimulate sperm production

PRL – prolactin

initiates milk production in mammary glands

ACTH – adrenocorticotropic hormone (corticotrophin)

stimulates secretion of glucocorticoids

## ***POSTERIOR PITUITARY GLAND***

OT – oxytocin

enhances contraction of smooth muscle cells in wall of uterus

stimulates milk ejection in response to suckling infant

enhances affection and trust between mother & child, and between partners

ADH – antidiuretic hormone (vasopressin)

causes kidneys to return more water to the blood rather than going to urine output

decreases water loss through perspiration

raises blood pressure by constricting arterioles

## **THYROID**

- T<sub>4</sub> = thyroxine
- T<sub>3</sub> = triiodothyronine
- thyroid hormones (T<sub>4</sub> and T<sub>3</sub>)
  - stimulate use of cellular oxygen to produce ATP
  - stimulate synthesis of Na<sup>+</sup> / K<sup>+</sup> pumps
  - increase heat generated
  - increase protein synthesis, lipolysis, cholesterol excretion
  - increase use of glucose & fatty acids for ATP production
  - enhance some actions of norepinephrine & epinephrine
  - accelerate body growth – particularly of nervous tissue
- calcitonin
  - inhibits osteoclasts

## **PARATHYROID GLANDS**

- PTH – parathyroid hormone – parathormone
  - regulates blood levels of Ca<sup>2+</sup>, Mg<sup>2+</sup>, HPO<sub>4</sub><sup>2-</sup>
  - increases number and activity of osteoclasts
  - decreases Ca<sup>2+</sup> and Mg<sup>2+</sup> loss in urine
  - increases HPO<sub>4</sub><sup>2-</sup> loss in urine
  - promotes formation of calcitriol by kidneys
    - which increases GI absorption of Ca<sup>2+</sup>, Mg<sup>2+</sup>, HPO<sub>4</sub><sup>2-</sup>

## **ADRENAL CORTEX of ADRENAL GLAND**

### MINERALOCORTICIDS

- aldosterone
  - regulates blood levels of Na<sup>+</sup>, K<sup>+</sup>
  - helps adjust blood pressure & volume

### GLUCOCORTICIDS

- cortisol (hydrocortisone), corticosterone, cortisone
  - results in increased protein breakdown, glucose formation, lipolysis
  - resistance to stress
  - anti-inflammatory effects
  - depression of immune response

### ANDROGENS

- DHEA dehydroepiandrosterone, testosterone
  - promote libido
  - stimulates development & maintenance of male secondary sex characteristics
  - get converted to estrogens by other body tissues

## **ADRENAL MEDULLA of ADRENAL GLAND**

- epinephrine (adrenalin) and norepinephrine (noradrenalin)
  - produce effects that enhance those of the sympathetic division of the ANS during stress

## **PANCREAS – PANCREATIC ISLETS – ISLETS OF LANGERHANS**

### glucagon

- stimulates liver cells to accelerate the breakdown of glycogen into glucose
- stimulates the formation of glucose from other nutrients (lactic acid, amino acids)
- raises blood glucose

### insulin

- accelerates transport of glucose into cells
- stimulates conversion of glucose into glycogen
- decreases formation of glucose from other molecules (decreases glycogenolysis & gluconeogenesis)
- increases protein & lipid synthesis
- lowers blood glucose

### somatostatin

- inhibits secretion of insulin & glucagon

### pancreatic polypeptide

- inhibits somatostatin secretion

**TESTES (or TESTICLES)**

testosterone

promotes libido

stimulates development & maintenance of male secondary sex characteristics  
(beard growth, deepening of voice, etc.)

**OVARIES**

estrogen (estradiol & estrone)

progesterone

regulate menstrual cycle

maintain pregnancy

prepare mammary gland for lactation

help stimulate development & maintenance of female secondary sex characteristics  
(big breasts, wide hips, etc.)

**PINEAL GLAND**

melatonin

thought to contribute to setting the body's biological clock

**THYMUS**

thymosin, THF thymic humoral factor, TF thymic factor, thymopoietin

promote maturation of T cells of immune system