Study Sheet for the Endocrine System

1. Chemically hormones are either lipid or water soluble. The lipid soluble hormones include hormones produced by the \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ glands as well as the sex organs. Water soluble hormones are composed of small \_\_\_\_\_\_\_\_\_\_\_\_\_ molecules or larger \_\_\_\_\_\_\_\_\_\_ molecules.

2. Because of their chemical structure, lipid soluble hormones travel in the blood in this form

\_\_\_\_\_\_\_\_\_\_\_\_\_. The receptor is located where? - within the cell membrane OR within the nucleus?

The hormone then causes –

3. Neurons in the hypothalamus produce 2 hormones that are released from the posterior pituitary (so the PP is NOT an endocrine gland but simply a release site). One of the hormones is \_\_\_\_\_\_\_\_\_\_\_\_. It acts on the collecting duct of the kidney and causes increased reabsorption of \_\_\_\_\_\_\_\_\_\_\_\_ resulting in a more \_\_\_\_\_\_\_\_\_\_\_\_\_ urine.

4. The second hormone released into the posterior pituitary is \_\_\_\_\_\_\_\_\_\_\_\_\_. Its effects are best seen in females. One action is to cause \_\_\_\_\_\_\_\_\_\_\_\_ of milk from the mammary gland. The second effect is to cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. The Hypothalamus secretes hormones called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that activate endocrine cells in the anterior pituitary to produce 7 different hormones. TSH acts on the follicle cells of the thyroid gland causing it to produce the hormone \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Name 4 actions produced by this hormone –

a. c.

b. d.

6. The parafollicular (C cells) of the thyroid produce the hormone \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that acts

on the \_\_\_\_\_\_\_\_cytes found in bone and a/an \_\_\_\_\_\_\_\_\_\_\_ in blood calcium level. Review

the action of Parathyroid Hormone (PTH) on blood calcium levels from exam 1.

7. GHRH is produced by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and acts on the \_\_\_\_\_\_\_\_\_\_\_\_cells of the

Anterior Pituitary. In turn the AP produces the hormone \_\_\_\_\_\_\_\_\_\_\_\_ that acts on various body cells to accelerate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

8. The hormone FSH, released by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acts on the testis of the male to cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_ while the hormone LH causes the testes to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

9. The pancreas is both an exocrine and endocrine gland. The exocrine portion produces digestive enzymes that are found in pancreatic juice. The endocrine portion is called the Islets of Langerhans. The alpha islets produce the hormone \_\_\_\_\_\_\_\_\_\_\_\_\_\_. This \_\_\_\_\_\_\_\_\_\_ the blood sugar level by causing a breakdown of glycogen in the liver. The Beta cells/islets produce the hormone \_\_\_\_\_\_\_\_\_\_\_ which \_\_\_\_\_\_\_\_\_\_\_ blood sugar levels by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

10. Diabetes is a disease characterized by \_\_\_\_\_\_\_\_\_\_ levels of blood sugar. Type 1 (Juvenile) Diabetes results because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ while Type 2 (Adult Onset) Diabetes results because \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If a hormone is present in excess (like insulin) the number of receptors \_\_\_\_\_\_\_\_\_\_\_\_, an effect called Down-Regulation. This makes the target\_\_\_\_\_\_\_ sensitive to the hormone. In contract, a deficiency of a hormone causes the number of receptors to \_\_\_\_\_\_\_\_\_\_\_\_\_\_, making the target cells \_\_\_\_\_\_\_ sensitive to the hormone. This effect is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. The Adrenal Cortex is composed of three layers of cells. The Zona Glomerulosa produces hormone called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The middle zone – called the Zona Fasiculata – secretes primarily \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hormones while the third layer – the Zona Reticularis – secretes \_\_\_\_\_\_\_\_\_\_\_\_. In females adrenal androgens are important in sex drive and are converted into female estrogens.

12. Glucocorticoids include the hormones \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These regulate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and increase resistance to \_\_\_\_\_\_\_\_\_\_\_\_. The Hypothalamus releases CRH (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) which is carried through the blood to the \_\_\_\_\_\_\_cells of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. They releases the hormone ACTH -\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

which travels through the blood to the Adrenal Cortex.

13. List the 6 effects of Glucocorticoids -(be sure you know what effect means)

a. d.

b. e.

c. f.

14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_is the primary mineralocorticoid. It helps adjust blood pressure and blood

volume by controlling levels of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ ions in the body.

15. Complete the following question by looking at Figure 18.16 on page 667.

Name the 3 conditions that produce a decrease in blood volume and thus blood pressure –

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 2. \_\_\_\_\_\_\_\_\_\_\_\_ and 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This stimulates special

cells in the \_\_\_\_\_\_\_\_\_\_\_\_ to secrete an enzyme called \_\_\_\_\_\_\_. This hormone converts an

inactive plasma protein called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into the active form \_\_\_\_\_\_\_\_\_\_\_\_\_.

As Angiotensin I circulates through the body it is converted by ACE (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which then acts on the Adrenal Cortex and causes release of the

mineralocorticoid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This acts on the collecting duct of the kidney, causing

increased reabsorption of \_\_\_\_\_\_\_\_ ions which tne sets up a concentration gradient causing

increased reabsorption of water, increasing blood volume and hence blood pressure.

Angiotension II also causes vasoconstriction of smooth muscle in the walls of some blood

vessels also increasing blood pressure.(**You will get to see this again in A&P2!!!!!!!)**

18. Most of the hormones discussed above were “circulating” hormones – moving through the

blood from one region on the body to another. There are also “local hormones”. Cells that

produce local hormones that act on neighboring cells are called Paracrines. For example a

type of white blood cells called a “helper T produces a hormone called Interleukin 2 during

an immune response that activates nearby immune cells.

19. Eicosanoids are local hormones that are produced in response to chemical or mechanical

Stimuli. They include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that may promote inflammation and fever,

Intensifying pain. Drugs like aspirin and ibuprofen inhibt synthesis of prostaglandins,

bringing pain relief.

The second type of eicosanoids are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They are also important in the

inflammation response by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ white blood cells (You will learn more about

this in the early part of A&P II when you talk about body defenses).

20. Likewise many of the above hormones are produced by the Hypothalamus and/or the

Anterior Pituitary. (The exceptions were insulin and glucagon and parathyroid hormone –

they monitor levels of glucose or calcium in the blood and respond to changes. Alpha and

beta cells are “antagonists” – producing opposite effects (so also are the hormones Calcitonin

and PTH).

21. A number of other body organs produce hormones and you will hear more about them in

A&PII. For example, Atrial Natriuretic Peptide (ANP) is produced by the \_\_\_\_\_\_\_\_\_\_ and

acts to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

22. Many digestive organs produce hormones which regulate release or production of digestive

juices. For example the hormone CCK causes release of \_\_\_\_\_\_\_\_ by the gall bladder while

the hormone \_\_\_\_\_\_\_\_\_\_\_ causes release of gastric juice in the stomach.

23. Complete the table below for 2 additional hormones

Hormone Gland that produces it Effect/Function

a. melatonin

b. thymus