LABORATORY NO. 10

ENDOCRINE SYSTEM

Scope of Laboratory Activity:

This laboratory exercise consists of four (4) worksheets:

Worksheet no. 1 Major endocrine glands and its gross anatomy
Worksheet no. 2 Major Endocrine organs and their Hormones
Worksheet no. 3 Hormone Functions
Worksheet no. 4 Control mechanism of endocrine secretion

Overview

In this laboratory activity, you will be able to further enhance your understanding about the various endocrine organs, their hormones and their mechanism of secretion.

Objectives

After completing this exercise, you should be able to:

1. Recognize the gross structure of the major endocrine glands
2. Name the major endocrine organs and its secreted hormones
3. Identify the functions of each hormone in each endocrine gland
4. Explain the negative feedback mechanism of hormonal secretion

Materials None

Worksheet no. 1 **Major endocrine glands and its gross anatomy**

A. Identify the 10 major endocrine glands on a human torso using the choices below.

adrenal glands • hypothalamus • ovaries • pancreas • parathyroid glands • pineal gland • pituitary gland or hypophysis • testes • thymus • thyroid gland

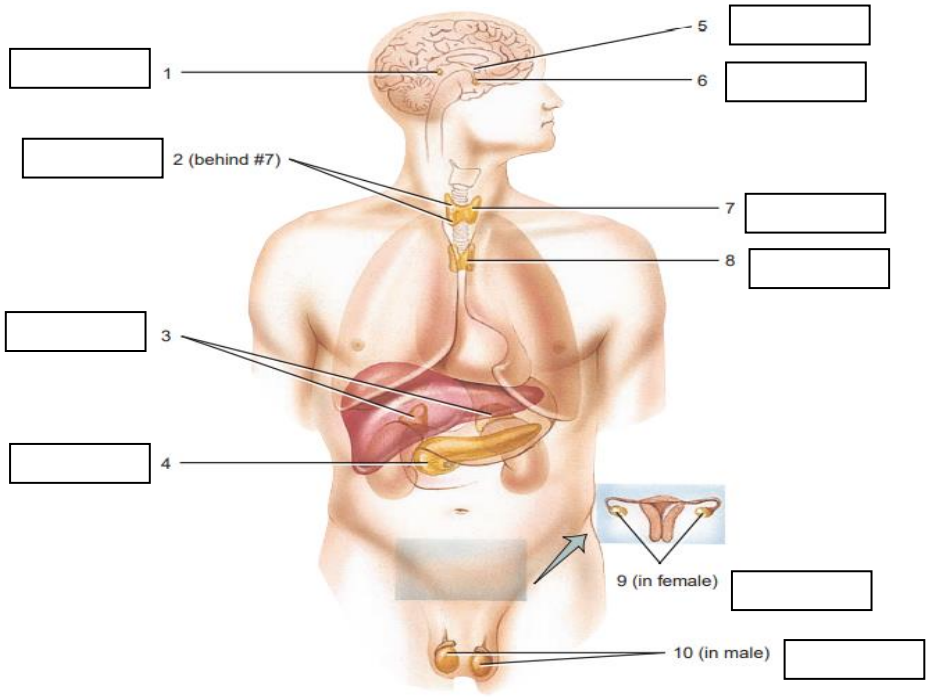


Figure 10. 1 Anterior view of the Major Endocrine Glands

B. Answer the following with not more than 4 sentences.

1. Briefly explain the difference between the endocrine and nervous systems which are considered the major regulating systems of the body.

_____

_____

_____

2.What is a hormone?

_____

_____

3. Compare and contrast endocrine and exocrine glands.

_____

_____

C. Label the diagrams below using the choices from the box. Write your answer beside each corresponding number.

Anterior pituitary	Right lobe of thyroid gland
Hypothalamus	Trachea
Infundibulum	Left parathyroid glands
Posterior pituitary	Right parathyroid glands
Isthmus of thyroid gland	Thyroid gland
Left lobe of thyroid gland	trachea

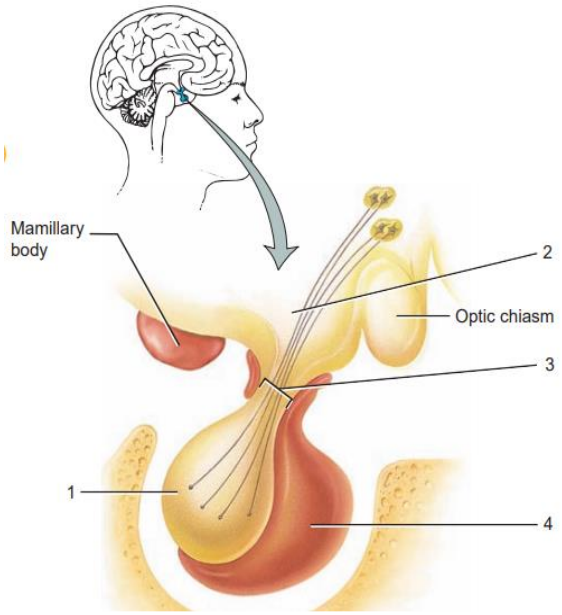


Figure 10. 2 Hypothalamus and Pituitary Glands

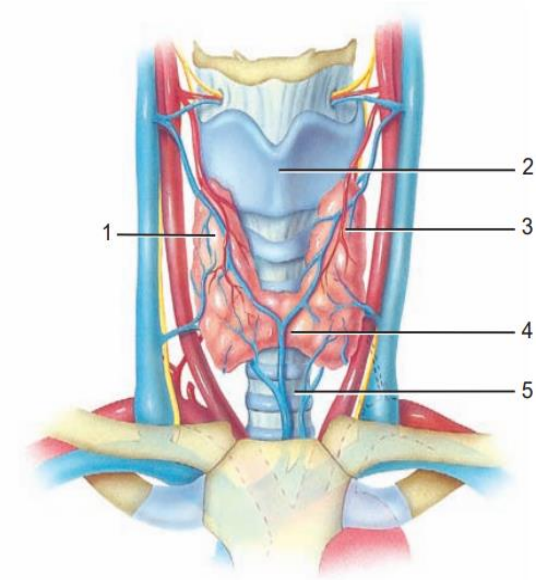


Figure 10.3 Anterior view of the thyroid Gland

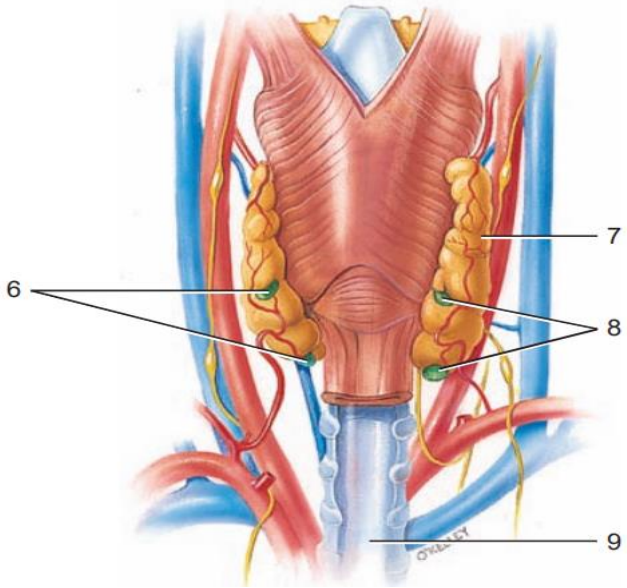


Figure 10. 4 Parathyroid Gland

Worksheet no. 2 **Major Endocrine organs and their Hormones**

A. Watch the video on effects of hyperinsulinism on the goldfish and answer the following questions. Click the link below https://youtu.be/rHgsiWeYqqI.
   1. About how long did it take for the fish to become comatose?
   2. What activities did you observe before it became comatose?
   3. Briefly explain what happened to the fish when immersed in insulin solution.
   4. What happened to the fish when it was transferred to beaker B?
   5. In humans, what endocrine gland is responsible for these events?

B. Write the name of the endocrine gland that secretes the following hormones.

Anterior Pituitary gland
Posterior Pituitary gland
Thyroid gland
Parathyroid glands
Pancreas
Gonads
Adrenal glands
Pineal gland
Thymus

Hormone	Endocrine Gland
ACTH	
ADH	
Aldosterone	
Androgens	
Calcitonin	
Cortisone; cortisol	
Epinephrine	
Estrogen	
FSH	
MSH	
Thymosin	
Glucagon	
Melatonin	
PTH	

Worksheet no. 3 **Hormone Functions**

Match each hormone to its respective function. Write the correct answer in the space provided. Use the choices below.

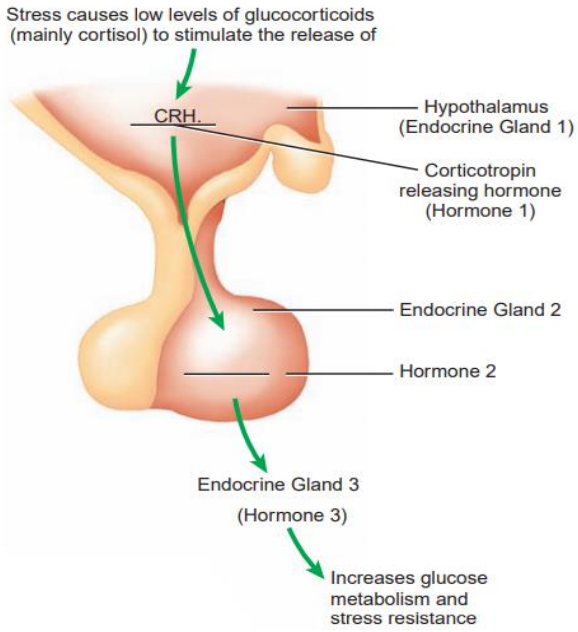
ACTH ADH aldosterone androgens calcitonin cortisol epinephrine estrogen FSH glucagon hGH

insulin LH melatonin MSH NE OT PRL progesterone PTH T3 T4 testosterone thymosin TSH

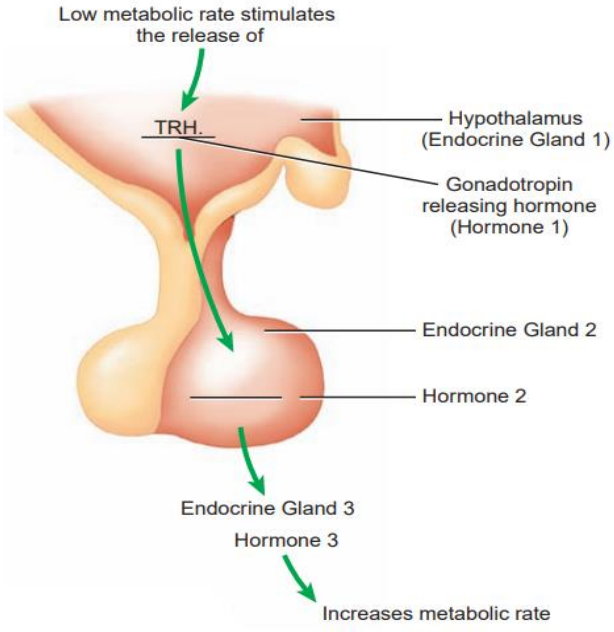
Hormone Function	**Hormone**
Stimulates uterine contractions and milk ejection	
Stimulates secretion of hormones by adrenal cortex	
increasing reabsorption of water in blood and decreasing urine production	
Triggers ovulation and stimulates secretion of estrogen and progesterone	
Increases blood calcium levels	
Promotes fight or flight response	
Stimulates production and secretion of milk	
Increases resistance to stress, increases blood glucose levels and decreases inflammation	
Helps set biological clock	
Helps regulate menstrual cycle	
Stimulates secretion of thyroid hormones	

Worksheet no. 4 **Control mechanism of endocrine secretion**

A. Sometimes more than one tropic hormone is involved in a cascade of events involved in negative feedback regulation. In Figures a and b, a stimulus disrupts homeostasis and initiates release of hormones in a specific order to return to homeostasis. Answer the questions associated with each figure.



(a)



(b)

In figure a,
Identify endocrine glands 2 & 3 _____ &_____
Identify hormones 2 & 3 _____ & _____
What are the 2 tropic hormones?

In figure b,
Identify endocrine glands 2 & 3 _____ &_____
Identify hormones 2 & 3 _____ & _____
What are the 2 tropic hormones?

B. Choose one from the above figures (a &b) and explain the negative feedback regulation that is happening to maintain homeostasis.

Reference:

Allen, C. & Harper, V. (2009). *Laboratory Manual for Anatomy and Physiology*. 3rd ed. Hoboken, NJ: John Wiley