

LABORATORY NO. 5

THE INTEGUMENT

Scope of Laboratory Activity

This laboratory exercise consists of four (4) worksheets:

Worksheet no. 1 Macroscopic and microscopic structures of the skin

Worksheet no. 2 Accessory structures of the skin

Worksheet no. 3 Functions of the skin

Worksheet no. 4 Skin glands

Overview

The skin is the largest organ in human body. We have learned that it is made up of tissues to perform functions that protect our body and maintain homeostasis. In this laboratory activity, you will be able to appreciate the importance of the different components of skin and how its physiologic response works.

Objectives

After completing this exercise, you should be able to:

1. Identify the different components and layers of the skin.
2. Describe the functions of the skin.
3. Describe the characteristics and functions of glands located in the skin.

Materials:

Black felt-tipped marker

Bond paper (1 cm x 1cm)

Red felt-tipped marker

Scissors

Iodine Solution

tape

Worksheet no. 1 **Macroscopic and microscopic structures of the skin**

A. Label the skin and accessory structures indicated in the diagrams below.

Write your answers on the space provided using the choices given on the left side.

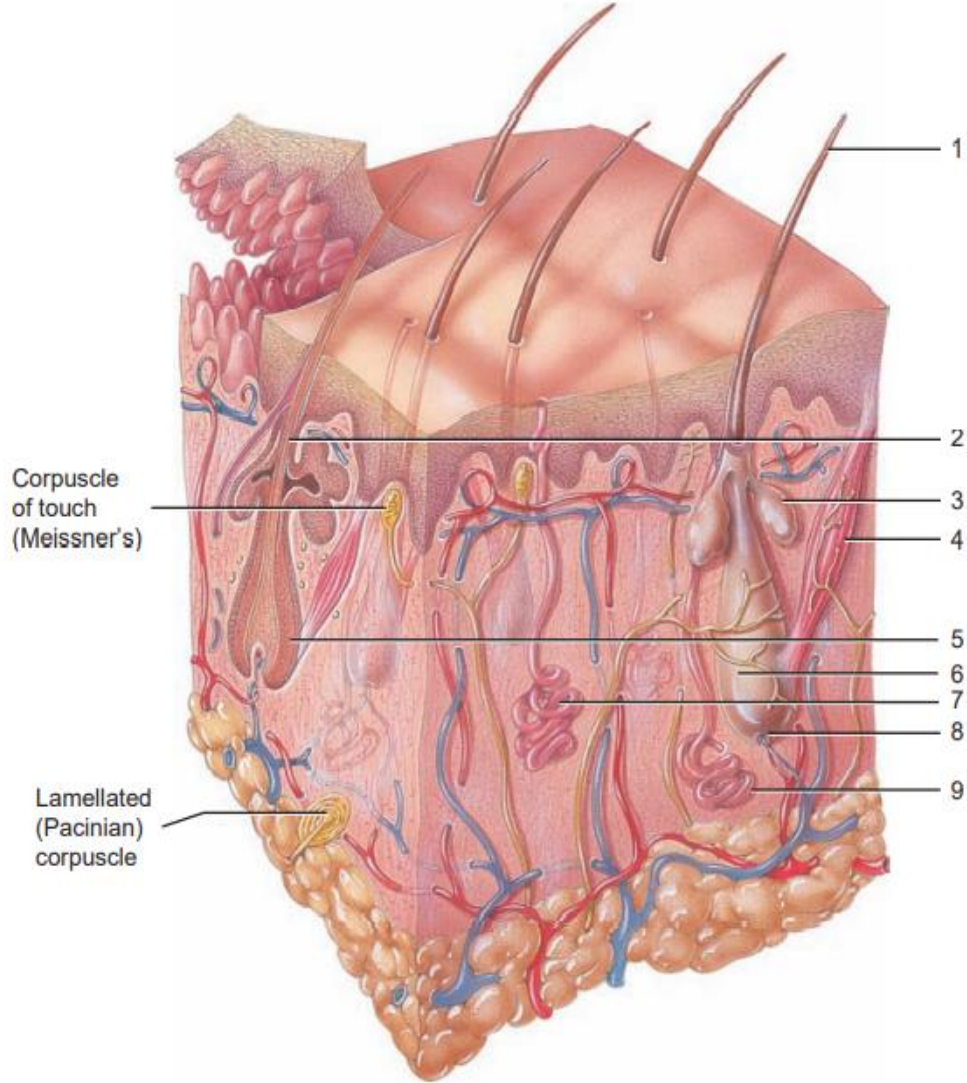


Figure 5. 1a Diagram of the skin and accessory structures

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

- Apocrine sweat gland
- Arrector pili muscle
- Eccrine sweat gland
- Hair bulb
- Hair follicle
- Hair root
- Hair shaft
- Papilla of hair
- Sebaceous gland

B. Identify what is being described below. Write your answers on the space provided.

_____ 1. This is the layer of epidermis where there is the most rapid cell division.

_____ 2. This layer of the skin includes scale like dead cells, full of keratin, that constantly slough off.

_____ 3. This is the layer where melanocytes and tactile (Merkel) cells are located

_____ 4. It is a areolar connective tissue layer found in thick skin but absent in thin skin.

_____ 5. This is a dermal layer responsible for fingerprints

_____ 6. It is the layer where web-like pre-keratin filaments appears.

_____ 7. It is the major skin area as a whole that produces derivatives (nails and hair)

Worksheet no. 2 Accessory structures of the skin

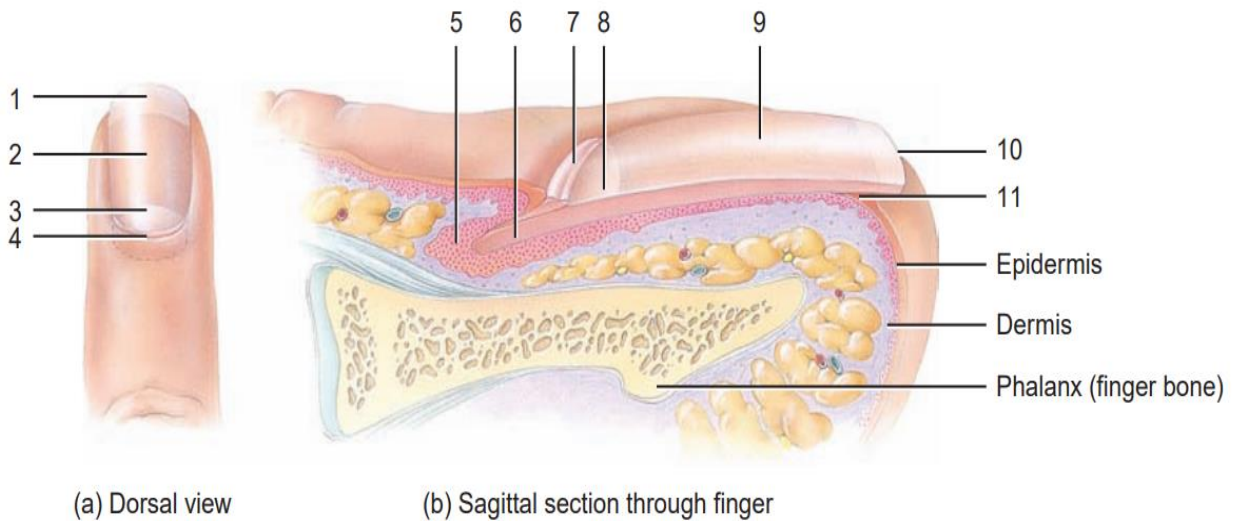


Figure 5.1b Diagram of nail Structure

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

(a) Dorsal view

- eponychium (eh-poh-NICK-ee-um)
- free edge
- lunula
- nail body

(b) Sagittal section through finger

- eponychium
- free edge
- hyponychium (hypo-NICK-ee-um)
- lunula (loon-you-luh)
- nail root
- nail body

Worksheet no. 3 Functions of the skin

1. Name four protective functions of the skin

- | | |
|-----------------|-----------------|
| a. _____ | c. _____ |
| b. _____ | d. _____ |

2. How does the skin help to regulate body temperature? (Describe two different mechanisms.)

3. Testing Tactile Localization

In the succeeding activities, you should be able to get a partner (anyone from household) to get the activities done. One person will be the subject and the other as the experimenter.

- a. The subject's eyes should be closed during the testing. The experimenter touched the palm of the subject's hand with a pointed black felt-tipped marker. The subject should then try to touch the exact point with his or her own marker, which should be different color (preferably red). Measure the error or localization millimeters.

- b. Repeat no. 1 in the same spot twice, recording the error of localization for each test. Compute for the avers of the results of the three determination and record.
- c. Repeat above procedure but in different part of the body. A) fingertip, B) forearm, C) back of hand and D) back of neck
- d. Record the results in a table and answer the questions below

Questions:

1. Does the ability to localize the stimulus improve the second time or third time? Explain

2. Which are has the smallest error of localization (most sensitive to touch)?

Worksheet no. 4 **Skin glands**

Plotting the distribution of Sweat Glands

1. Cut two squares of bond paper (each 1cm x 1cm). Also prepare adhesive tape, and Betadine (povidone-iodine) swab and a cotton-tipped swab.
2. Using iodine solution, paint an area of the medial aspect of your left palm (avoiding the crease lines) and a region of your forearm. Allow the solution to dry thoroughly. The painted area in each case should be slightly larger the paper squares to be used.
3. Label one paper with “H” for hand and “A” for arm. Ask you partner tape the bond papers over the iodine-painted area. Leave the squared in place for 10 minutes. Warm environment is advisable for this activity.
4. After 10 minutes, remove the paper squares and count the number of blue-black dots on each square. Appearance of blue-black dots on paper indicates an active sweat gland.

5. Answer the questions below after doing the activity

1. Which area of the skin has the most sweat glands?

2. What substance in the bond paper does the painted iodine on the skin react?

3. Which skin area has more sweat glands? Forearm or palm of hand?_____

4. Which organ system controls the activity of the eccrine sweat glands?_____

REVIEWING YOUR KNOWLEDGE (POSTTEST)

References

Allen, C. & Harper, V. (2009). *Laboratory Manual for Anatomy and Physiology*. 3rd ed. Hoboken, NJ: John Wiley & Sons, Inc, c2009

Marieb, E. (2012). *Essentials of Human Anatomy and Physiology: Laboratory Manual*. 5th ed. Sansome St., San Francisco, CA: Benjamin Cummings. C2012

J. Gordon Betts, Young, K. A., Wise, J. A., Johnson, E., Poe, B., Kruse, D. H., Korol, Oksana , Johnson, J. E., Womble, Mark , & DeSaix, P. (2013, April 25). *Anatomy and Physiology*. Houston, Texas: OpenStax, c2020 CC License 4.0 license

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