

# The Integumentary and Skeletal Systems

## EXPERIMENT 3.1: A CLOSER LOOK AT THE SKIN

### Supplies:

- Microscope
- Prepared slide: human skin (not the one with follicles or hairs)

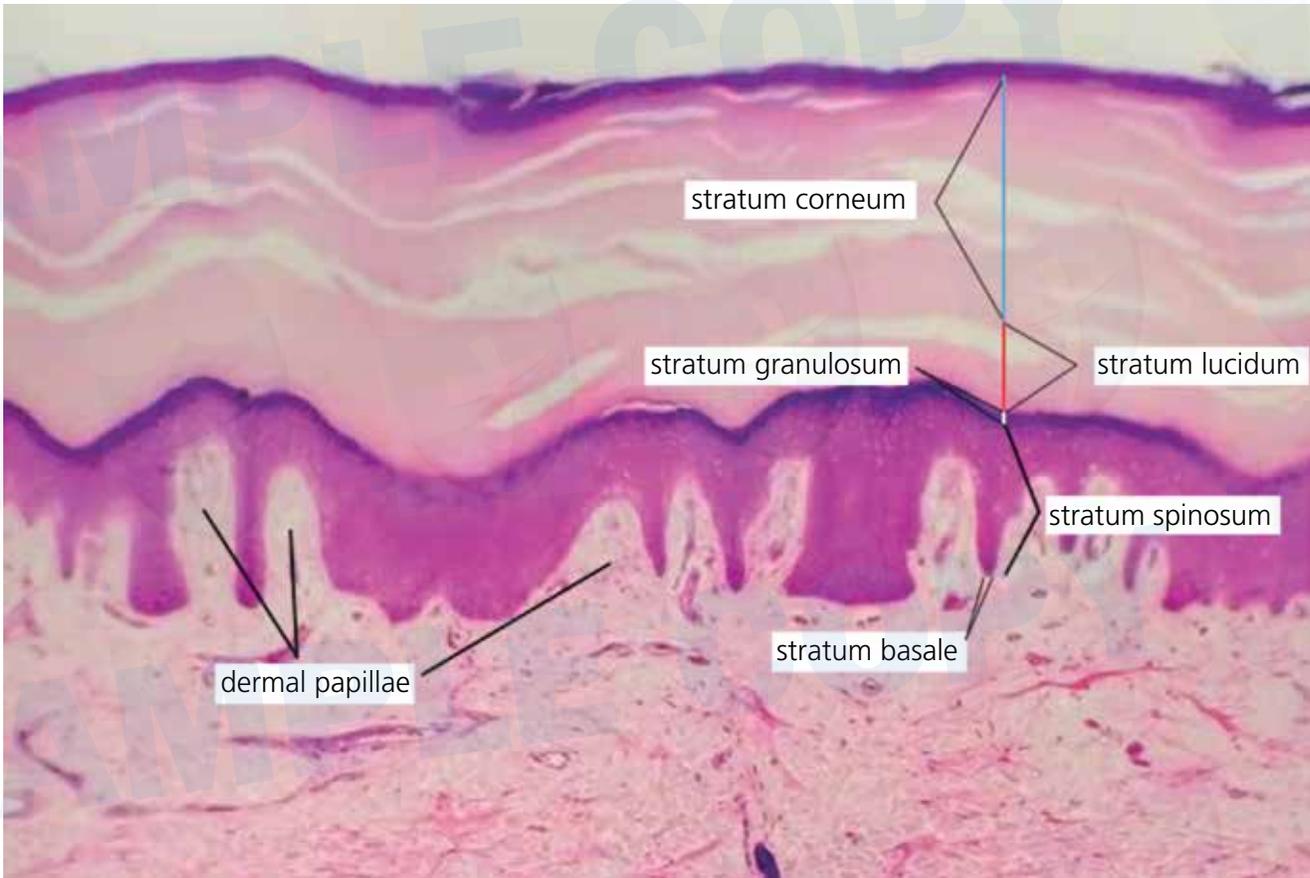
DATE

### Purpose:

To examine the dermis and epidermis in more detail

### Procedure:

1. Place the prepared slide under the microscope at 40x magnification. Look for a wavy pattern of dark tissue near the top of the sample. That is the epidermis. Center on the epidermis and increase magnification to 100x.
2. Focus, center the epidermis, and increase magnification to 400x.
3. Focus again, and, using Figure 3.4 below as a guide, try to identify each layer of the epidermis. Please realize that the tissue sample on your slide might not be from thick skin, so you may not have the stratum lucidum. Also, the layers might not be the same thickness. Center the tissue and increase magnification to 100x. Center it again and focus.



4. Notice the change in cell size and shape in the different regions.
5. Notice also the dermal papillae and how their size varies.
6. Now begin to scan the slide. Note how the thickness of the layers changes across this tissue sample. You may wish to use a lower power to do this.
7. **Draw at least two fields of the scope where the thickness varies greatly. Label what you can.**
8. Put everything away!

Human Skin



Magnification \_\_\_\_\_

Human Skin



Magnification \_\_\_\_\_

Human Skin



Magnification \_\_\_\_\_

Human Skin



Magnification \_\_\_\_\_

**Conclusions:** Write a summary of your experiment making connections to the text and coloring book and relating form and function.

## EXPERIMENT 3.2: A CLOSER LOOK AT FOLLICLES

DATE

### Supplies:

- Microscope
- Prepared slide: human skin with follicles or hairs

### Purpose:

To examine the details of the hair follicle

### Procedure:

1. Place the prepared slide under the microscope at 40x magnification. Once again look for the wavy, dark tissue that marks the epidermis. You should see several hair follicles.
2. Scan the slide to find a follicle with a well-defined bulb. A well-defined bulb has a reasonably circular shape and at least some white in the middle. If you can see a hair sticking out the follicle, that would be ideal.
3. Center the bulb, increase magnification to 100x, and focus. At this point, you should start being able to see the structure of the hair follicle. You should see individual cells, and the divisions between the hair (medulla, cortex, and cuticle) and the follicle (internal epithelial root sheath, external epithelial root sheath, and dermal root sheath) should be noticeable. Spend a little time observing at this magnification before going on to the next step.
4. Center the bulb, increase magnification to 400x, and focus again. Now you should be able to see some real detail.
5. Begin by looking at the bottom of the bulb. This is the matrix. You can tell it is the matrix by the density of cells in that region. The cells are simply denser than in other parts of the follicle.
6. Look at the follicle just above the bulb, and try to identify the regions of the hair follicle. Notice the tissue of the dermis below the follicle. Do you see a thin line of tissue like it surrounding the outer layer of the follicle? That is the dermal sheath. The internal and external epithelial root sheaths will be essentially the same color, so you might have a hard time distinguishing them. However, the external sheath is wider, and the internal sheath has smaller cells. The hair should be distinct from the follicle. Most likely, the tissue of the hair will be darker. That will be one way to tell where the internal epithelial root sheath is. You can look at the hair, and the layer of tissue right outside of the hair is the internal epithelial root sheath.
7. **Draw the bulb and the portion of the follicle you see in this field of the scope. Label what you can identify.**
8. Now look at a hair shaft. Hopefully, the follicle you were examining will have one. If not, find another follicle with a hair shaft.
9. It will be very difficult to separate the medulla from the cortex. However, you can easily see the cuticle by adjusting the focus. If you focus in on the cells at the center of the hair shaft (the medulla and cortex), and then de-focus one way and then the other (remember, you only use fine focus at the high magnification), you should see a fine, yellow outline around

the hair. Notice the darker lines in that yellow outline. Do you see how they overlap like shingles? That's the cuticle of the hair. **Draw it.**

10. Put everything away

**Human Skin**



Magnification \_\_\_\_\_

**Human Skin**



Magnification \_\_\_\_\_

**Conclusions:** Write a summary of your experiment making connections to the text and coloring book and relating form and function.