

## Forensic Lab Activity: Hair Analysis

### Background Information:

Hair is encountered as physical evidence in a wide variety of crimes. Consequently, forensic scientists are often asked to compare hair found at a crime scene with hair from a particular individual. The examiner compares a variety of factors, including color, coarseness, granule distribution, hair diameter and the presence or absence of a medulla.

Each hair grows out of a tiny pocket in the skin called a follicle. The base of the hair--the part attached to the follicle--is called the root hair. A strand of hair has three layers (refer to Figure 1): cuticle (the outer covering), cortex (contains the pigments granules that gives hair its color) and medulla (hollow tube). The color, shape, and distribution of the granules provide important points of comparison between the hair of different individuals. The medulla is sometimes present, sometimes not. Sometimes the canal is continuous, while in other cases it is fragmented. Different ethnicity yields different granule distribution and medulla structure. Sometimes the hair found at a crime scene is from an animal. This too may be helpful, for it is possible to identify the species. Different species have different scale patterns on the cuticle of the hair. Animal hair has a characteristically thicker medulla and cuticle than in a human, since their hair is their means of warmth.

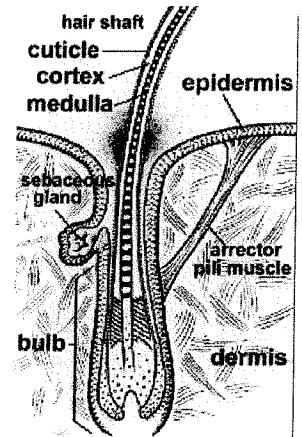


Figure 1. Hair Structure.

### Materials:

Unknown hair samples mounted on slides  
Microscope  
Colored Pencils  
Data/Observation Sheet  
Hair Images for comparison

### Methods:

1. Obtain 5 unknown hair samples, which are labeled as follows: unknown1, unknown 2, unknown 3, unknown 4, and unknown 5.
2. Examine each unknown under a microscope. Look for the medulla, cuticle and scale patterns.
3. Draw and record observations on your data sheet.
4. Compare your drawings and observation to that of the known hair images. Then:
  - a. Determine whether the hair is human or animal.
  - b. If the hair is not human, determine the animal in which the particular unknown sample originated from.

## Data and Observation Sheet

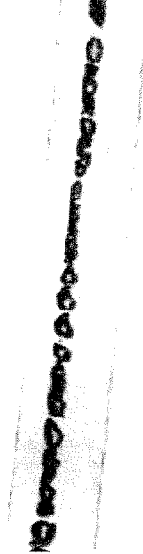
Using your colored pencils, sketch the images you see under the microscope in their respective boxes.  
Write down any additional information on the space provided.

<p style="text-align: center;"><b>Unknown 1</b></p>      <p>Observations: _____ _____ _____</p>	<p style="text-align: center;"><b>Unknown 2</b></p>      <p>Observations: _____ _____ _____</p>	<p style="text-align: center;"><b>Unknown 3</b></p>      <p>Observations: _____ _____ _____</p>
<p style="text-align: center;"><b>Unknown 4</b></p>      <p>Observations: _____ _____ _____</p>	<p style="text-align: center;"><b>Unknown 5</b></p>      <p>Observations: _____ _____ _____</p>	

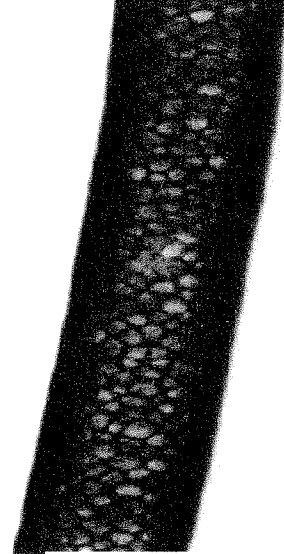
**Below are different kinds of hair images. Compare your sketches to the images below to identify the unknowns.**



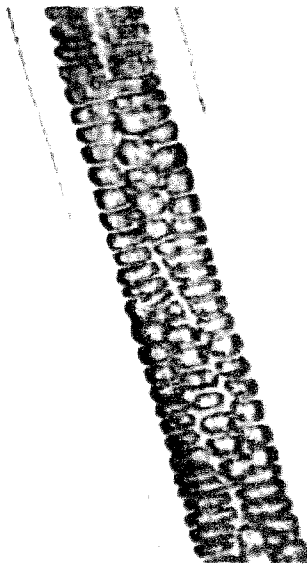
(a) **Human Hair**



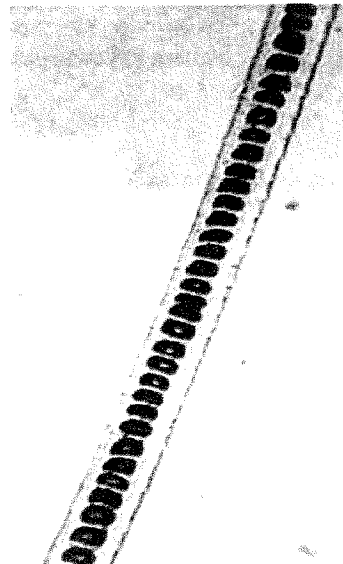
(b) **Dog Hair**



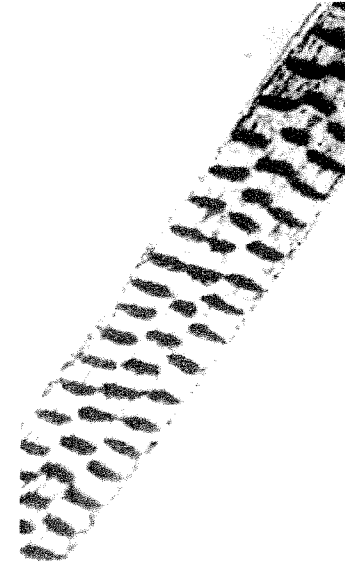
(c) **Deer Hair**



(d) **Rabbit Hair**



(e) **Cat Hair**



(f) **Mouse Hair**