

**“For three days
after death, hair
and fingernails
continue to grow,
but phone calls
taper off.”**

*—Johnny Carson, comedian
and television host*



Introduction

Human hair is one of the most frequently found pieces of evidence at the scene of a violent crime. It can provide a link between the criminal and the crime.

From hair, one can determine:

- If the source is human or animal

- Race (sometimes)

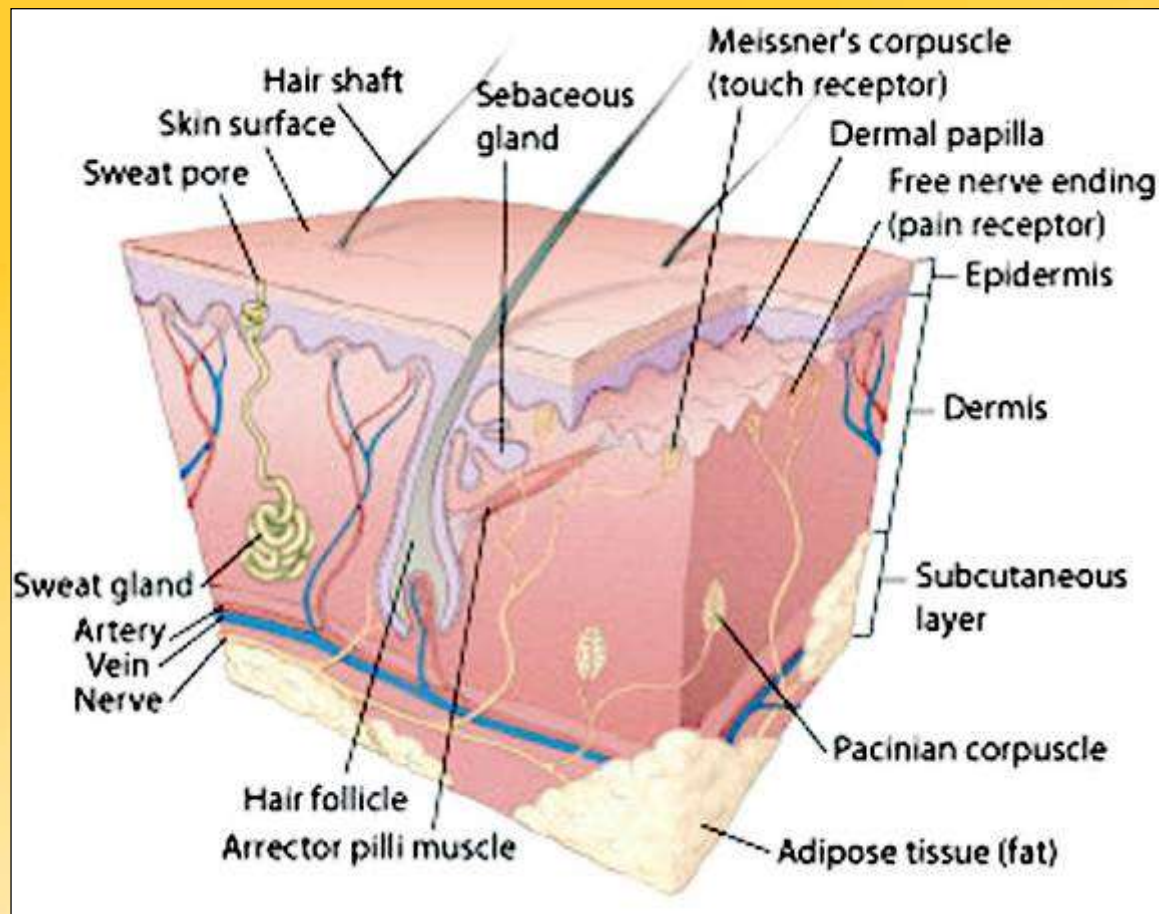
- Origin of the location on the source's body

- Whether the hair was forcibly removed

- If the hair has been treated with chemicals

- If drugs have been ingested

Skin Structure



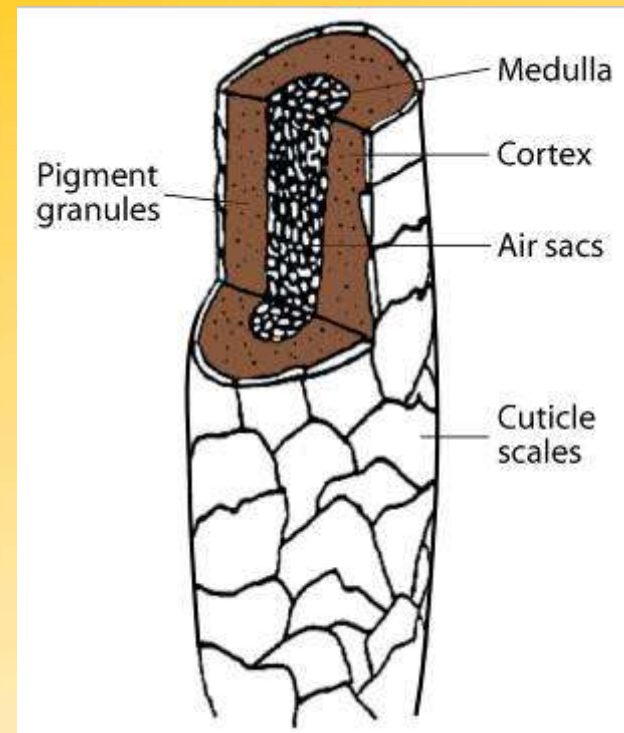
Hair Shaft

Composed of:

Cuticle—outside covering, made of overlapping scales

Cortex—inner layer made of keratin and embedded with pigment; also contains air sacs called cortical fusi

Medulla—inside layer running down the center of the cortex



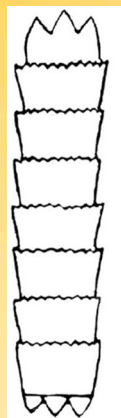
The Cuticle

The cuticle is the outermost layer of hair which is covered with scales. The scales point toward the tip of the hair. Scales differ among species of animals and are named based on their appearance. ***The three basic patterns are:***

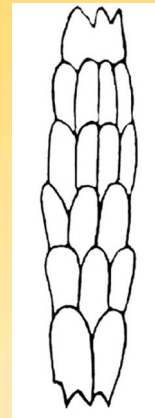
Coronal

Spinous

Imbricate



Coronal

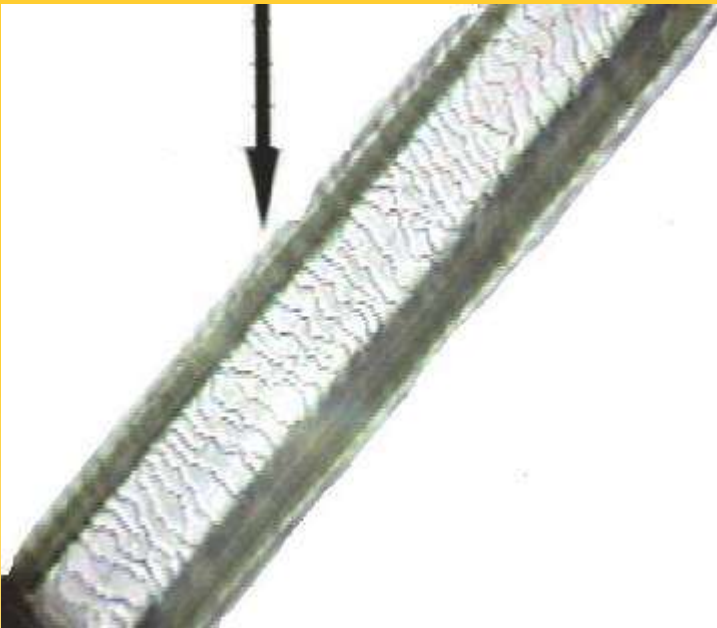


Spinous



Imbricate

Human Scales



In order to visualize the scales:

Paint clear fingernail polish on a glass slide.

When the polish begins to dry, place a hair on the polish.

When it is almost dry, lift off the hair and observe the scale imprints.

What pattern is seen in this slide?

The Cortex

The cortex gives the hair its shape.

It has two major characteristics:

Melanin—pigment granules that give hair its color

Cortical fusi—air spaces, usually found near the root but may be found throughout the hair shaft

The Medulla

The medulla is the hair core that is not always visible. The medulla comes in different types and patterns.

Types:

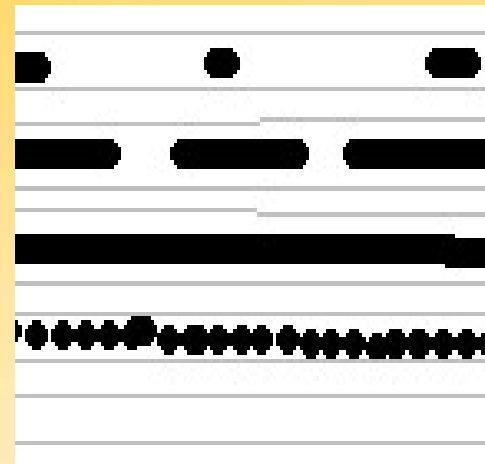
Intermittent or interrupted

Fragmented

Continuous

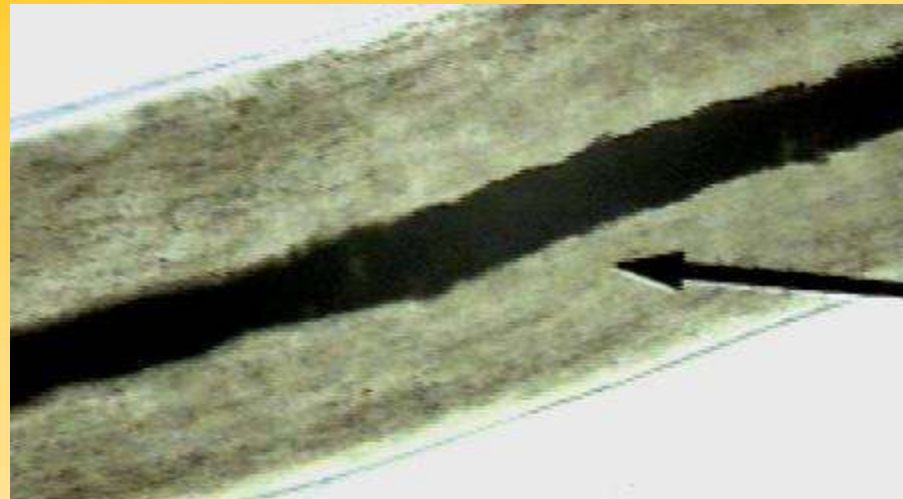
Stacked

Absent—not present



Human Medulla

Human medulla may be continuous, fragmented, or absent.



Medullary Index

Determined by measuring the diameter of the medulla and dividing it by the diameter of the hair.

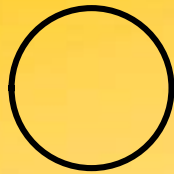
Medullary index for human hair is generally less than $1/3$.

For animal hair, it is usually greater than $1/2$.



Hair Shape

Can be straight, curly, or kinky, depending on the cross-section, which may be round, oval, or crescent-shaped.



Round
(Straight)



Oval
(Curly)



Crescent moon
(Kinky)

Hair Growth

Terminology

Anagen—hair is actively growing; lasts up to 5 years

Catagen—hair is not growing; a resting phase

Telogen—follicle is getting ready to push the hair out; lasts two to six months

Grows about 0.4 mm per day, or 1 cm per month; approximately one-half inch per month

The Root

Human roots look different based on whether they have been forcibly removed or they are telogen hairs and have fallen out. Animal roots vary, but in general have a spear shape.

