

Extended Activity

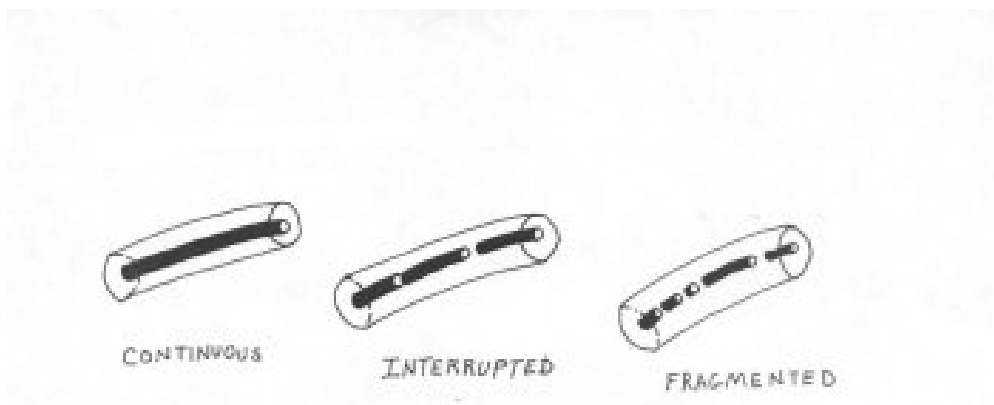
Hair Anatomy and Growth

Hair is present on many different regions of the body. Each region, such as the head, chest, and limbs, has hairs with microscopic characteristics from that region. Although it is possible to identify a hair as coming from a particular body area, the hairs from the head are mainly used in forensic comparison and Crime Scene Investigation (CSI).

Hairs undergo a repeated growth, transition, and resting phase. CSI lab investigators can use visible microscopic characteristics to determine the phase of growth of the hair.

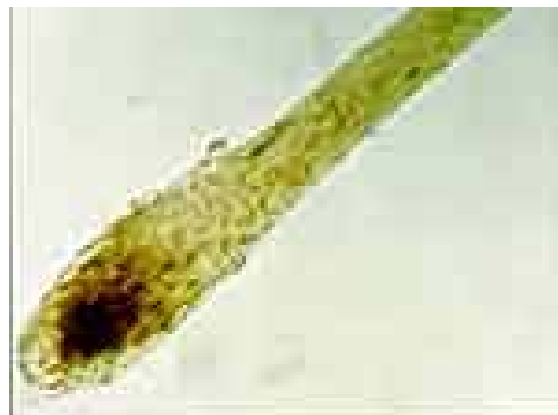
When the hair is actively growing, materials are deposited in the hair shaft by cells found in the follicle. Active and dividing cells form the major parts of the hair—the medulla, cortex, cuticle, and the root sheath.

The medulla is made of cells that run through the center like a canal but it may not be a continuous canal - it can be interrupted, fragmented, or absent.



The hair follicle can also be dormant or resting. There is a transition period between the growth and resting phases.

Hairs are routinely lost during the resting phase and often become a main source of evidence for CSI lab investigators. An example of this natural shedding process is when a person brushes or combs their hair. Shed hairs from combing or brushing can be transferred to another individual or to an object, like a comb or brush, during physical contact.

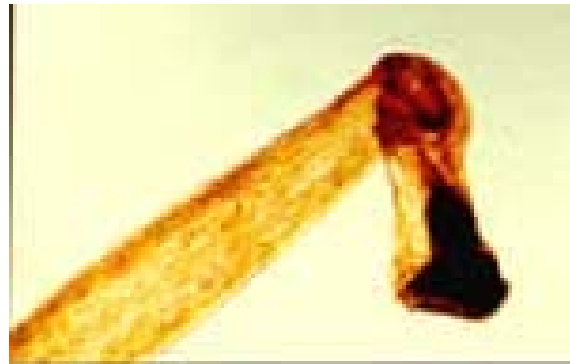


Naturally shed hairs, such as a head hair dislodged through combing, display undamaged, club-shaped roots.

Hairs can also become removed from the body while they are in an actively growing state, such as by

pulling or by striking with an object. A CSI lab investigator can look at the root area of the hair with a microscope to determine the growth phase or how the hair was shed.

On a healthy head, 80 to 90 percent of the hair follicles are in the actively growing phase, 2 percent are in the transition phase, and 10 to 18 percent are in the resting phase. Once the hair reaches the resting phase, the follicles have reached a mature, stable stage. During the resting phase, the hair is anchored in the follicle only by the root, which is club-shaped. The germ cells below the club-shaped root will help the next generation of a growing hair. The replacement of human head hair occurs in a scattered way with no pattern. The average period of growth for scalp hair is about 1,000 days; the resting phase lasts about 100 days. Approximately 10 percent of the hairs on a human head (100 out of every 1000) are in the quiescent resting phase, and a small amount of force—such as brushing and combing—can remove the hairs.



A hair forcibly removed from the scalp will exhibit stretching and damage to the root area.



Forcibly removed hairs may have tissue attached.

The way that hairs are made up is the same for each person, but the individual microscopic differences of the hair allow a skilled hair examiner to tell the difference between hairs from different people. An analogy, or example, would be the ability to recognize the face of a friend or relative in a crowd even though each person in the crowd has ears, eyes, a nose, and a mouth. Only identical twins will have the same hair characteristics and DNA.

Stages of Hair Growth

