

# ANATOMY OF HAIR

The hair can be divided into two parts, the **root** and **shaft**. The root part of hair is in the skin (epidermis) of scalp. A pouch like structure called follicle surrounds the hair root. The base of hair root is in the shape of a bulb. Capillaries and nerve fibers indent this bulb. The cells in the center of bulb divide. The newly divided hair cells push the previous cells up. The cells, which move upwards, die slowly forming hard hair shaft.

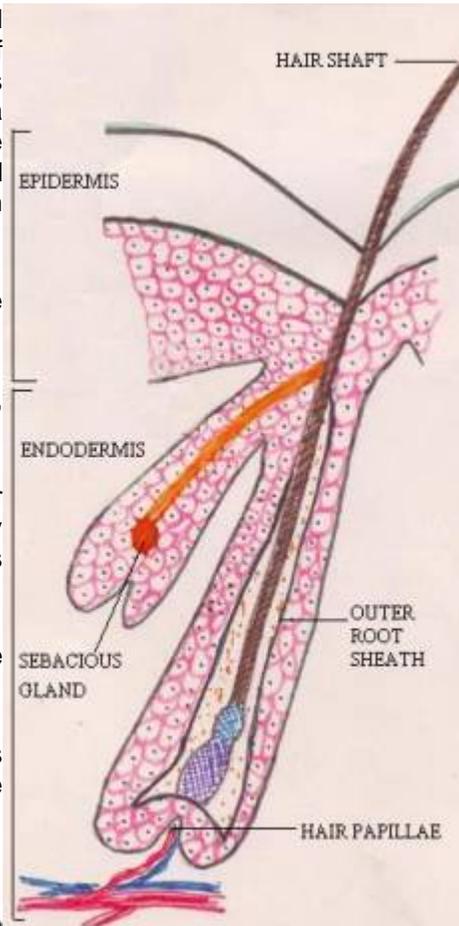
Hair is composed primarily of proteins (88%). These proteins are of a hard fibrous type known as keratin.

The **hair shaft** has **three layers** the **cuticle**, **medulla** and **cortex**.

**Cuticle** is the outer layers and protects the inner layers. It is transparent. Healthy cuticle gives a shiny appearance for hair and unhealthy cuticle gives lifeless look

**Medulla** is the innermost layer composed of large cells.

**Cortex** is the layer between cuticle and medulla. This contains pigment and keratin. Cortex determines the bulk and strength of hair.



The hair follicle contains oil-secreting glands, which make the hair shiny. Stress and illness and lack of proper nutrients diminish secretion of oil and pigments causing graying of hair.

The hair is considered as a tissue which uses the same nutrients of bone, nails and which is formed as bi-product of bone tissue.

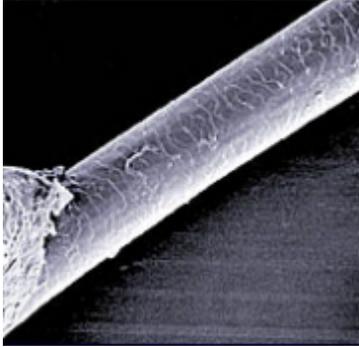
## Normal hair growth cycle:

Each hair grows approximately at the rate of 1 centimeter per month. This growth continues for 2-6 years. When the hair attains full growth it resets for 2-3 months and is later shed.

A new hair starts growing in its place. Thus at any given point of time 10 percent of the total hair on our scalp is in a resting phase and 90 percent of the hair is in growth phase.

As a part of this hair growth cycle it is normal for every warm blooded animal to experience a little hair fall every day. Any condition in which the hair fall is more than normal is termed as hair loss. Hair loss can affect anybody irrespective of age and gender.

### Hair and different textures



Fine hair is close to the resolution of the human eye, about as fine as we can see. Hair thickness varies from person to person, animal to animal, day to day, year to year.

It's anywhere between 1/1500 to 1/450 inches (17 to 181 microns). Hair color is the biggest factor. **Flaxen hair** is the **finest** (1/1500 to 1/500 inches, 17 to 51 microns) and **black hair** the **coarsest** (1/450 to 1/140 inches, 56 to 181 microns).

Warming weather can thicken hair

**Hair shape** (round or oval cross-section) and texture (curly or straight) is influenced heavily by genes. However, nutritional status and intentional alteration (heat curling, "perms") can affect the physical appearance of hair.

### Hair Pigment

**Hair color** is mostly the result of pigments -- chemical compounds that reflect certain wavelengths of visible light. There is two main pigments found in human hair: **Eumelanin** has an oval or elliptical shape, which **gives color to brown or black hair** and is dark pigment. The higher the concentration of Eumelanin the darker the hair.

**Pheomelanin** is what produces the **color in blonde or red hair**. The **higher** the **concentration** of **phaeomelanin, the lighter the hair**. Unlike eumelanin, phaeomelanin is smaller, partly oval and has a rod shape. **White hair contains no melanin at all** and **gray hair contains only a few melanin granules**.

Although some scientists believe that the derivation of pigment is probably derived from coloring substances in the blood. The color of the hair, light or dark, depends upon the color and amount of the grains of pigment it contains.

Natural hair color may also be influenced by the optical effects of light rays by melanin, either as they are absorbed or reflected and bouncing off the surfaces of the different hair layers. The size, amount and distribution of melanin determine the ultimate hair color. Great number of large melanin Molecules distributed throughout the cortex to create different colors. The various combinations in the size, amount and distribution of melanin create all natural hair color. Which contributes to the many different types of texture in hair and coats.

### What is the difference between fur and hair?

The term "fur" refers to the body hair of non-human mammals also known as the pelage (like the term, plumage in birds). The main difference between hair and fur is where it grows, not what it's made of. Human's, have long hair on their heads and short hair on their arms, while a deer has short hair all over. Also, unlike hair, fur includes a layer of finer, shorter denser hairs, the under fur, through which longer, coarser, more thinly distributed guard hairs extend.

So fur is hair, but it is used to describe the dense uniform hair covering on animals