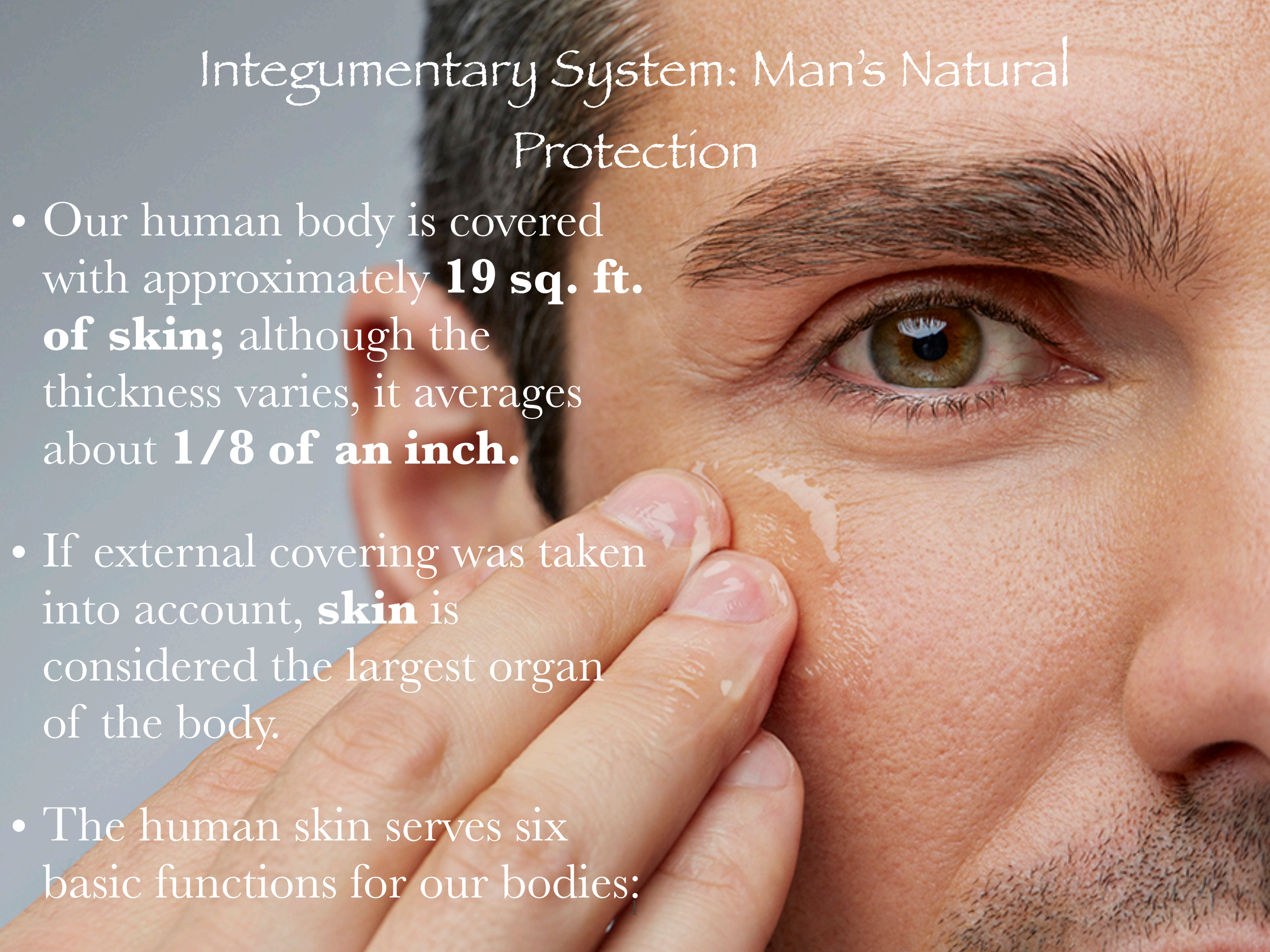


# Integumentary System: Man's Natural Protection

- Our human body is covered with approximately **19 sq. ft. of skin**; although the thickness varies, it averages about **1/8 of an inch**.
- If external covering was taken into account, **skin** is considered the largest organ of the body.
- The human skin serves six basic functions for our bodies:





# Integumentary System: Man's Natural Protection

- **1. Protection-** Skin is an effective barrier against bacteria, viruses, and common chemicals that you constantly touch. It also prevents air and water from going in/out of body.
- **2. Sensation-** Nerve receptors for touch, pressure, temperature, and pain are distributed unevenly throughout the skin.



# Integumentary System: Man's Natural Protection

- **3. Heat control-** The amount of blood being carried to the surface of skin is regulated to control the amount of heat lost in the atmosphere.
- **4. Excretion-** Body wastes can be eliminated through sweat.
- **5. Manufacture of vitamin/hormone-** The skin is able to produce small amounts of vitamin D and testosterone.



# Integumentary System: Man's Natural Protection

- **6. Absorption-** The skin is able to absorb certain chemicals, drugs, and amounts of oxygen.
- The human skin is composed of three basic layers:
- **1. Epidermis-** The epidermis is the outermost layer of the skin.



# Integumentary System: Man's Natural Protection

- In the epidermis, a layer known as the **stratum basale** serves the purpose of producing new skin cells.
- Older skin cells eventually are pushed up to the surface, are filled with *keratin*, and die.



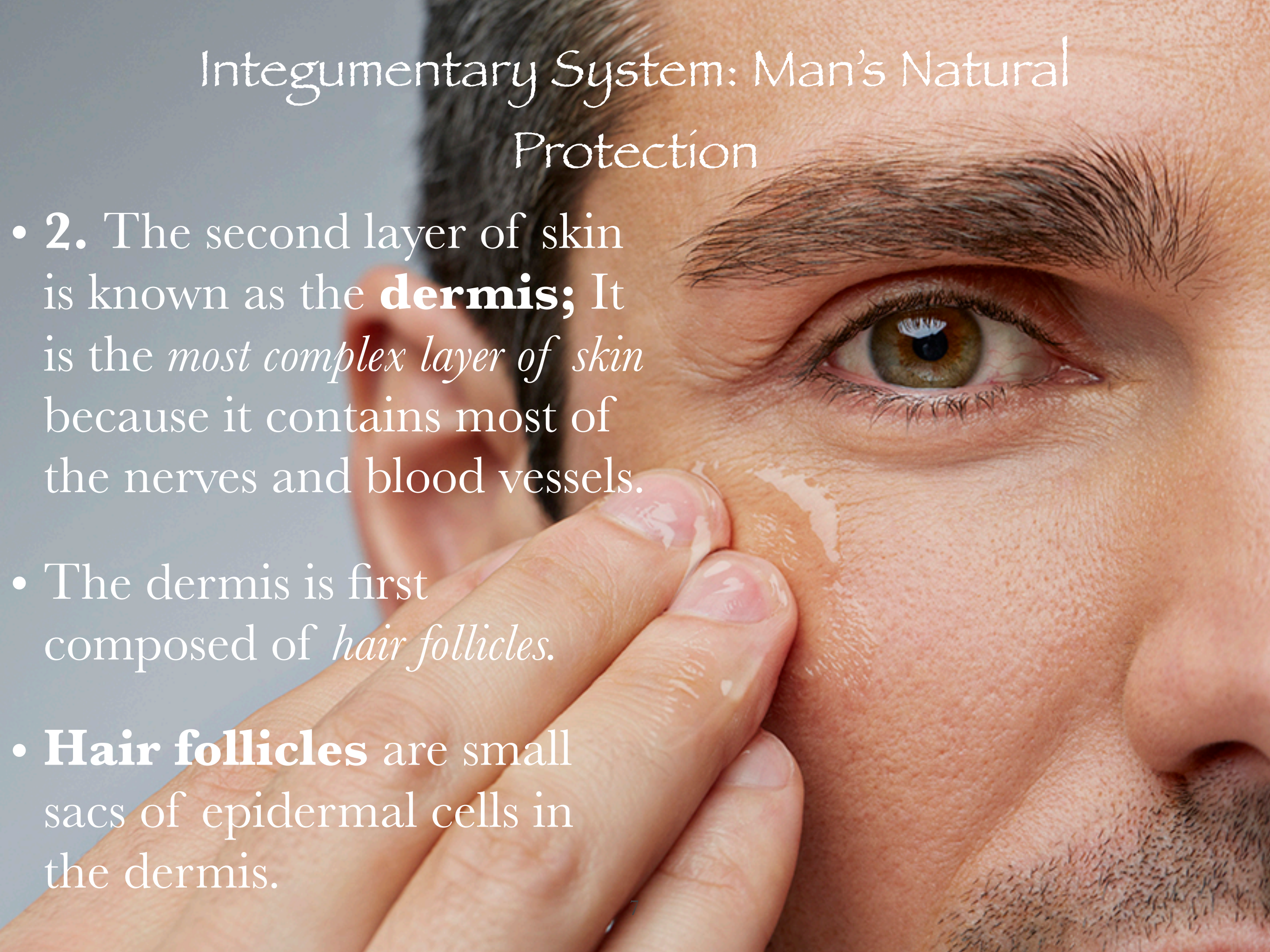
# Integumentary System: Man's Natural Protection

- **Keratin** is a waxy material making up hair, nails, feathers, horns, claws, hooves, calluses, and of course the outer layer of skin.
- With the dying of old skin cells, a completely new epidermis covers the body about every **25 days**.



# Integumentary System: Man's Natural Protection

- **2.** The second layer of skin is known as the **dermis**; It is the *most complex layer of skin* because it contains most of the nerves and blood vessels.
- The dermis is first composed of *hair follicles*.
- **Hair follicles** are small sacs of epidermal cells in the dermis.





# Integumentary System: Man's Natural Protection

- As new hair cells are produced, old hair cells die and are pushed out of the follicle.
- **Your visible hair is made up of dead cells.**
- Hairs are located on all of the body except the *palms of the hand* and the *soles of the feet*.
- Scalp hair grows about **1/2 inch** per month.



# Integumentary System: Man's Natural Protection

- Hair growth is affected by **diet, hormones, general health,** and **age.**
- **Baldness,** however, is an *inherited trait.*
- Most hair follicles are attached to an **erector muscle**, which contracts causing the hair to stand on end. (goosebumps)
- **Temperature and high emotions** usually can trigger contractions of the *erector muscles.*



# Integumentary System: Man's Natural Protection

- The **nails of the fingers and toes** are similar to hair since they develop from the skin and the visible portion is dead cells filled with protein.
- Fingernails are replaced every **6 months** and toenails require about **one year**.
- The dermis is secondly composed of *sebaceous glands*.



# Integumentary System: Man's Natural Protection

- The sebaceous glands produce **sebum**, an oily secretion which moisturizes the skin and helps it stay soft and flexible.
- The amount of oil produced by sebaceous glands is also an *inherited trait*.



# Integumentary System: Man's Natural Protection

- The dermis is thirdly composed of *sweat glands*.
- There are approximately **80 sweat glands to every square inch of skin.**
- These tube-shaped glands produce *perspiration*.
- **Perspiration** is a substance that is about **99% water, 0.5% salt, and 0.5% sugars, amino acids, and wastes.**



# Integumentary System: Man's Natural Protection

- Normally, the entire body is constantly sweating and excretes about **1/2 pint of water daily**.
- This occurs even if a person remains in a comfortable room and does no strenuous activity.
- Because this amount evaporates quickly, this perspiration goes unnoticed.



# Integumentary System: Man's Natural Protection

- On a hot day, with strenuous activity a person can lose almost **2 gallons of water**.
- Sweat itself *does not have an odor*, but odors are released when sweat combines with substances on the skin or with wastes from bacteria growing on dead skin cells.



# Integumentary System: Man's Natural Protection

- **Washing with warm water** and **wearing clean clothing** minimizes the body odor resulting from perspiration.
- **Antiperspirants** contain chemicals that stop sweat glands from producing sweat; while *deodorants* are usually perfumes to cover body odor, with little antibacterial substance.