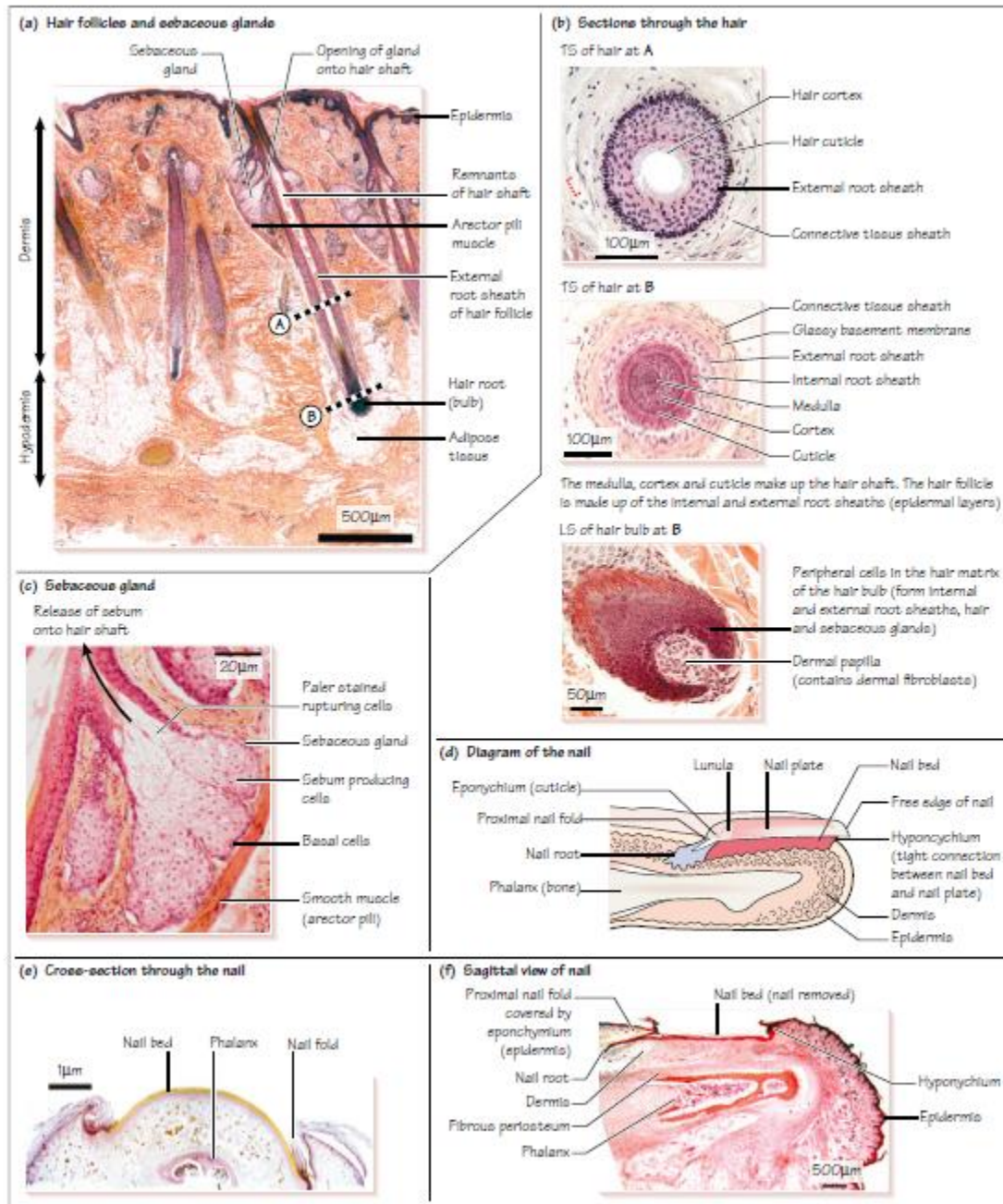


Skin Appendages:

Hair , sweat glands , sebaceous gland and nail



1- Hair:

Hairs are made up of hair follicles and hair shafts. The hair shaft is made up of columns of dead keratinized cells (hard keratin) organized into three layers :

- a central medulla , or core (not seen in fine hairs);
- a keratinized cortex ;
- a thin hard outer cuticle , which is highly keratinized.

Hair follicles are tubular invaginations of the epidermis, which develop as down growths of the epidermis into the dermis. The hair follicle contains the following.

- An external root sheath (ERS) , which is continuous with the epidermis. This layer does not take part in hair formation. A glassy basement membrane separates the ERS from the surrounding connective tissue.
- An internal root sheath (IRS) , which lies inside the ERS. The IRS contains keratinized cells derived from cells in the hair matrix. The type of keratin found here is softer than that found in the hair itself. The IRS degenerates at the point where the sebaceous gland opens onto the hair.

Hair follicle stem cells in the hair matrix , which is found in the hair bulb , are responsible for forming hair . The stem cells proliferate, move upwards, and gradually become keratinized to produce the hair. These stem cells also form the ERS and IRS , and sebaceous glands.

The dermis forms a dermal papilla at the base of the hair follicle/ hair bulb, which provides the blood supply for the hair. It is separated from the hair matrix by a basement membrane.

Contraction of the arrector pili muscle , a small bundle of smooth muscle cells associated with the hair follicle, raises the hair, and forms ' goose bumps ' . This helps to release sebum from the gland into the duct, and to release heat.

2-Sweat glands:

the sweat glands are simple tubular [exocrine](#) glands that are found in the superficial hypodermis bordering on the dermis. There are eccrine and apocrine sweat glands. They differ in embryology, distribution, and function.

1-[merocrine \(eccrine\) glands](#) :They discharge their contents onto the surface of the skin via coiled secretory ducts). The ducts open out onto epidermal ridges at a sweat pore. They can be further classified as [merocrine \(eccrine\) glands](#). They secrete a watery fluid which is hypotonic to plasma its evaporation is important for thermoregulation. Sweat contains water, sodium, potassium, chloride, urea ammonia and lactic acid.

Eccrine sweat glands are simple, coiled, tubular glands present throughout the body, most numerous on the soles of the feet. Thin skin covers most of the body and contains sweat glands. Exceptions are the vermillion border of the lips, external ear canal, nail beds, glans penis, clitoris, and labia minora, which do not contain sweat glands. The thick skin covering the palms of hands and soles of feet lack all skin appendages except sweat glands.

2-**Apocrine sweat glands**:, also referred to as odoriferous sweat glands, are known for producing malodorous perspiration. They are large, branched glands, mostly confined to the axillary and perineal regions, including the perianal region, labia majora in women, and the scrotum and prepuce in men. Apocrine sweat glands are also present in the nipples and areolar tissue surrounding the nipples.

3-Sebaceous glands

These glands are branched, acinar holocrine glands found next to hair follicles .The cells rupture to secrete an oily sebum into the lumen of the hair follicle (holocrine secretion).

The ruptured cells are continuously replaced by stem cells (basal cells), located at the edges of the gland.

4-Nails

Nails (or nail plates) consist of a strong plate of hard keratin, and they protect the distal end of each digit . The nail plate is a specialized layer of stratum corneum . It is formed by the nail bed (nail matrix) underneath the nail plate. Proliferating cells in the basal layer of the nail bed move upwards continuously. As the cells move upwards they are displaced distally and gradually transformed into hard keratin, which lengthens and strengthens the nail plate. The tightly packed, hard, keratinized epidermal cells in the nail plate have lost their nuclei and organelles. Nails grow at a rate of about 0.1 – 0.2 mm per day.