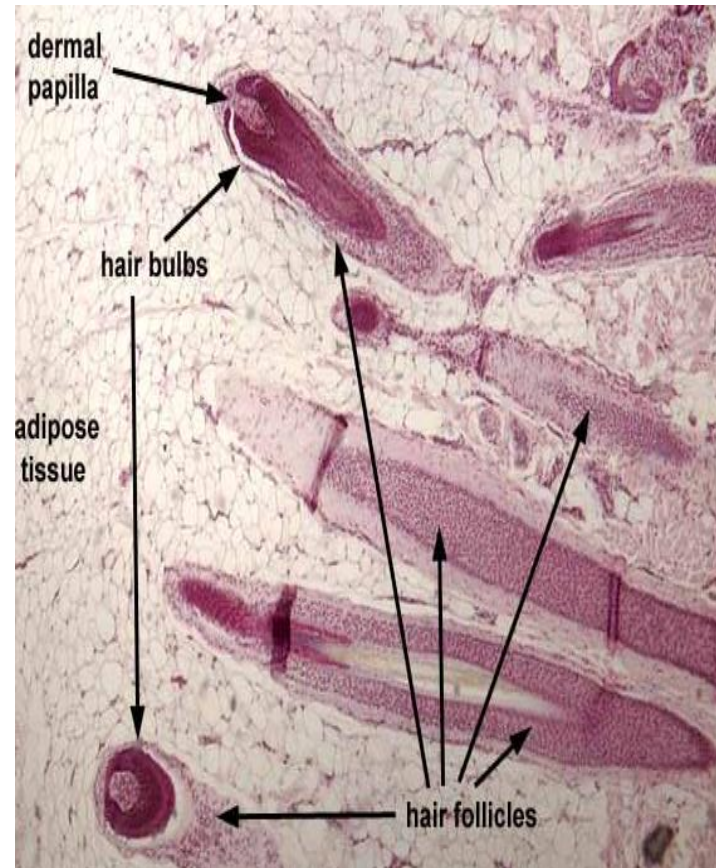


The Integumentary System

The dermis contains epidermal derivatives which are:

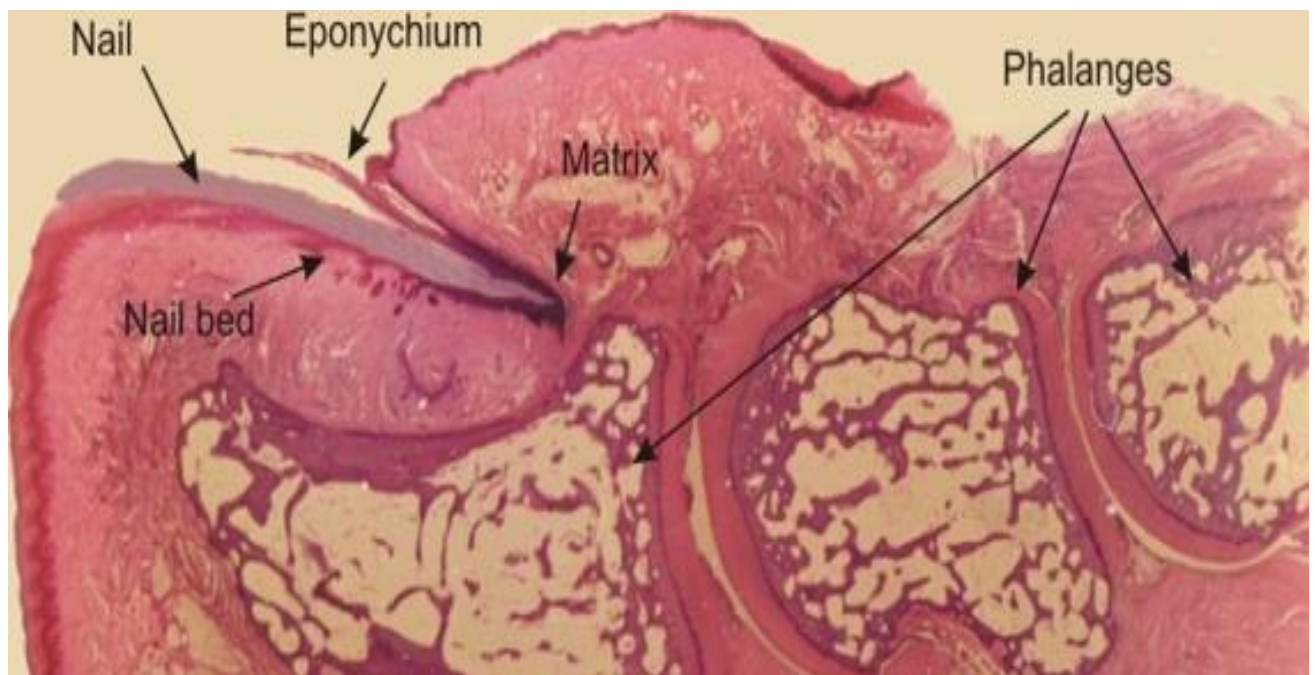
(1) Hairs:

Are elongated keratinized structures; each hair arises from an epidermal invagination called the hair follicle which has a terminal dilatation called a hair bulb. At the base of the hair bulb there is the dermal papilla. The papilla contains capillaries and is covered by cells that form the hair root and develop into the hair shaft. Loss of blood flow or loss of the vitality of the dermal papilla will result in death of the follicle.



(2) Nails:

Represent keratinized epithelial cells arranged in plates of hard keratin; located on the distal phalanx of each finger and toe, are composed of plates of heavily compacted, highly keratinized epithelial cells that form the nail plate, lying on the epidermis, known as the nail bed.



(3) Glands:

A-Sebaceous Glands: are acinar glands embedded in the dermis over most of the body surface. but the frequency increases in the face, forehead, and scalp. They usually have several acini opening into a short duct which usually ends in the upper portion of a hair follicle; in certain regions, such as the lips, it opens directly onto the epidermal surface.

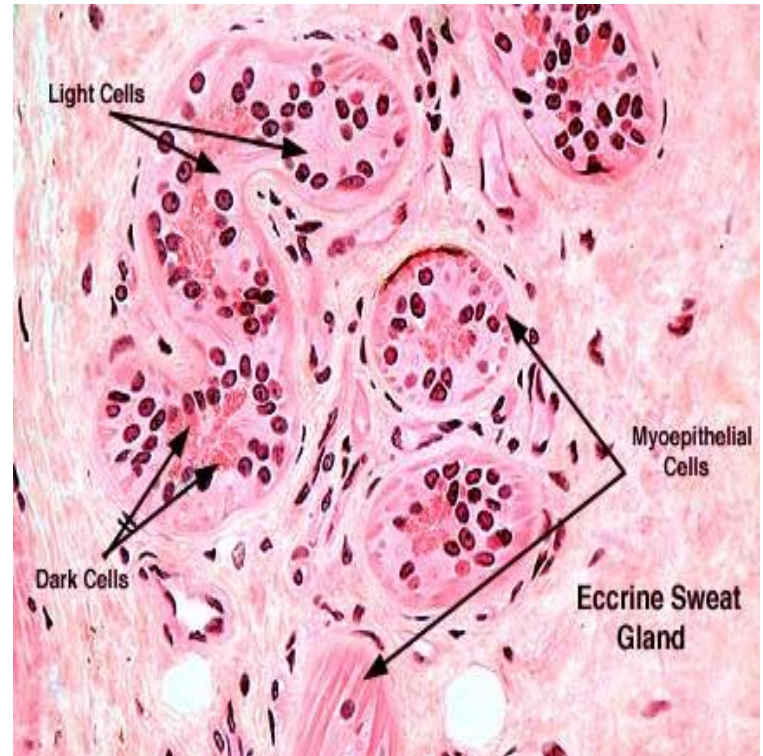
The acini consist of a basal layer of undifferentiated flattened epithelial cells that rest on the basal lamina. These cells proliferate and differentiate, filling the acini with rounded cells containing increasing amounts of fat droplets in their cytoplasm. Their nuclei gradually shrink, and the cells simultaneously become filled with fat droplets and burst. The product of this process is sebum, the oily secretion of the sebaceous gland, which is gradually moved to the surface of the skin.

Sebaceous glands are holocrine gland begin to function at puberty. The primary controlling factor of sebaceous gland secretion in men is testosterone; in women it is a combination of ovarian and adrenal androgens.



B-Sweat Glands:

1: Merocrine glands. They are simple, coiled tubular glands whose ducts open at the skin surface. Their ducts do not divide, and their diameter is thinner than that of the secretory portion. The secretory part of the gland is embedded in the dermis is surrounded by myoepithelial cells. Contraction of these cells helps to discharge the secretion. Two types of cells have been described in the secretory portion of sweat glands:



(A) **Dark cells (mucoïd cells)** are pyramidal cells that line most of the luminal surface of this portion of the gland. Their basal surface does not touch the basal lamina. Secretory granules containing glycoproteins are abundant in their apical cytoplasm, and the secretion released by dark cells is mucous in nature.

(B) **Clear cells** do not possess secretory granules; they are involved in transepithelial salt and fluid transport. Clear cells have limited access to the lumen of the gland because of the dark cells; therefore, their watery secretion enters intercellular canaliculi interposed between adjacent clear cells, where it mixes with the mucous secretion of the dark cells. The ducts of these glands are lined by stratified cuboidal epithelium.

2: Apocrine sweat glands: is present in the axillary, areolar, and anal regions. Apocrine glands are much larger than merocrine sweat glands. They are embedded in the dermis and hypodermis, and their ducts open into hair follicles. Apocrine glands are innervated by adrenergic nerve endings, whereas merocrine glands receive cholinergic fibers.



1- Subcutaneous Tissue (hypodermis)

Is a tissue layer consists of loose connective tissue that binds the skin loosely to the subjacent organs, making it possible for the skin to slide over them. The hypodermis often contains fat cells that vary in number according to the area of the body and vary in size according to nutritional state. This layer is also referred to as the superficial fascia of gross anatomy and.

The connective tissue of the skin contains a rich network of blood and lymphatic vessels. The arterial vessels that nourish the skin from 2 plexuses. One is located between the papillary and reticular layers; the other, between the dermis and the subcutaneous tissue. Veins are disposed in 3 plexuses, 2 in the position described for arterial vessels and the third in the middle of the dermis, participating in the regulation of body temperature. Lymphatic vessels begin as closed sacs in the papillae of the dermis and converge to form 2 plexuses, as described for the arterial vessels.

The skin is the most extensive sensory receptor. In addition to numerous free nerve endings in the epidermis, hair follicles, and cutaneous glands, encapsulated and expanded receptors are present in the dermis and subcutaneous tissue; they are more frequently found in the dermal papillae.

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