3rd Lab - Sensory Cells

Definition of The Sensory Cells

Types of Sensory Cells

The skin & Skin Cells

Layers of the Skin

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Definition of The Sensory cells

Sensory cells are specialized cells in the nervous system responsible for receiving stimuli from the external environment or from within the body, and converting them into nerve signals that are transmitted to the brain or spinal cord to be interpreted.

Types of The Sensory cells

Types of sensory cells according to the type of sensation they receive

Types of The Sensory cells

1- Photoreceptors: found in the retina, such as rods and cones, and respond to light.

2-Mechanoreceptors: respond to touch, pressure, vibration, or stretch. Such as the cells in the skin and inner ear (for balance and hearing).

3- Chemoreceptors: respond to chemicals, such as the cells in the nose (smell) and tongue (taste).

4- Thermoreceptors : Respond to changes in temperature.

5- Pain receptors or Nociceptors : Respond to harmful stimuli and cause the sensation of pain.

The Skin & Skin Cell

The skin is the largest organ in the body, accounting for about 15% of the total adult body weight and it performs many important functions, including:-

1-Regulating body temperature.

2-Maintaining the balance of water and electrolytes.

3-The sensation of painful and pleasant stimuli.

4- It is also involved in the production of vitamin D.

The Skin & Skin Cell

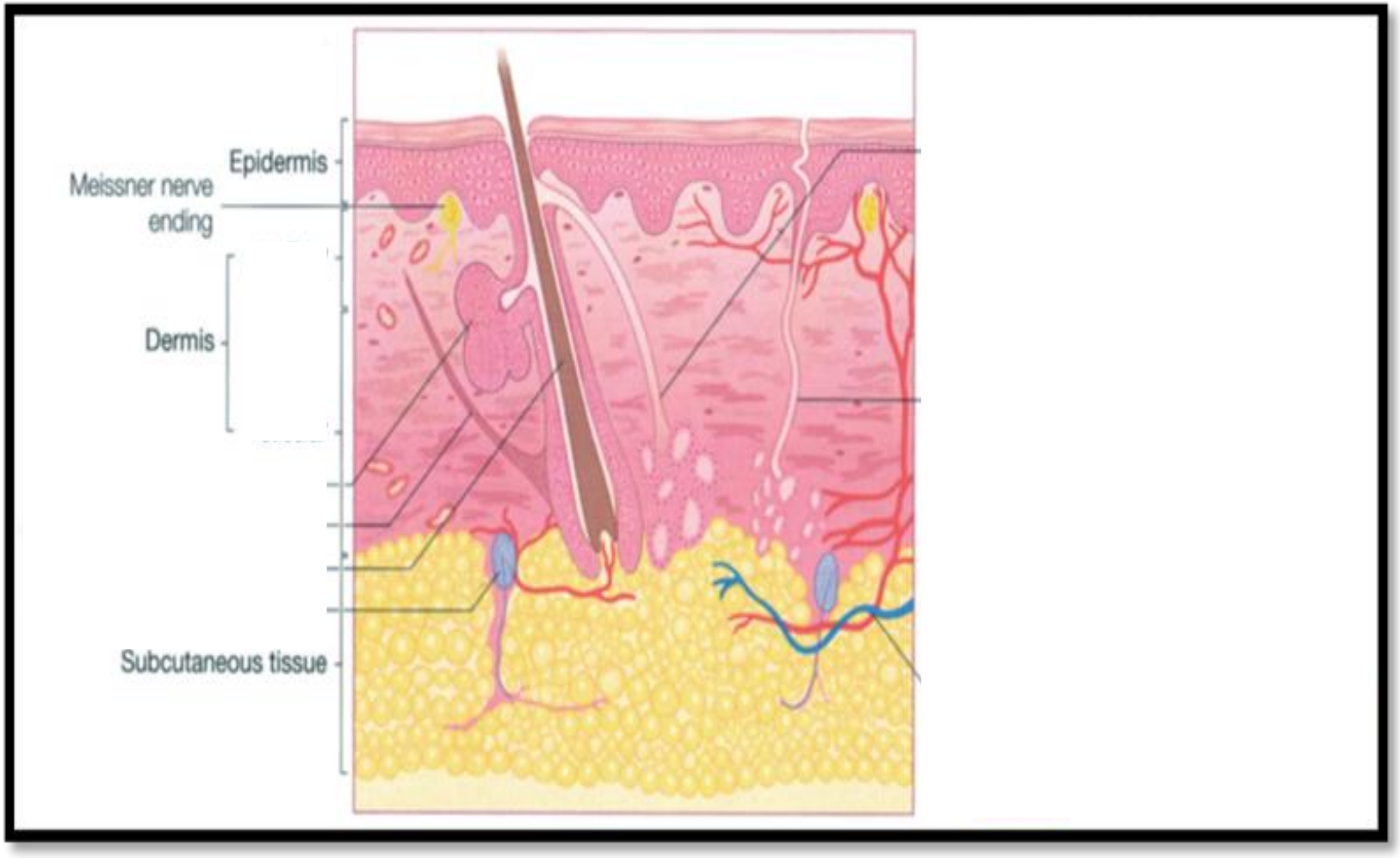
- The skin is consists of 3 layers which performs specific tasks.

1-Epidermis

2-Dermis

3-The fatty layer (also called the subcutaneous layer)

Layers of the Skin



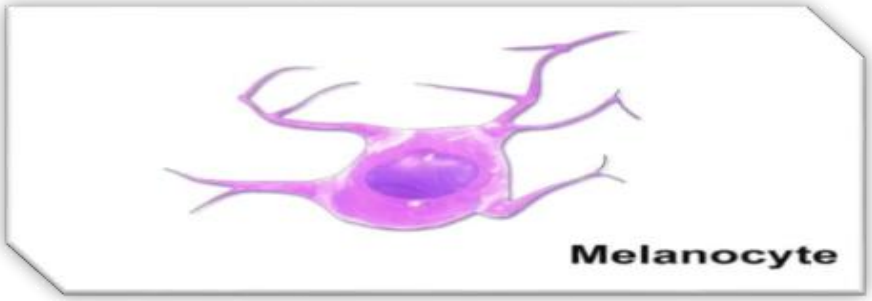
Layers of the skin

1- The Epidermis :- is the layer of skin that can be described as relatively thin, taut. The outer part of the epidermis is known as the stratum corneum, and it is relatively watertight. When intact, it prevents most bacteria, viruses, and other foreign substances from entering the body.

- Most of the cells in the epidermis are keratinocytes which function to synthesize keratin, and they arise from cells in the deepest layer of the epidermis, which is called the basal layer.

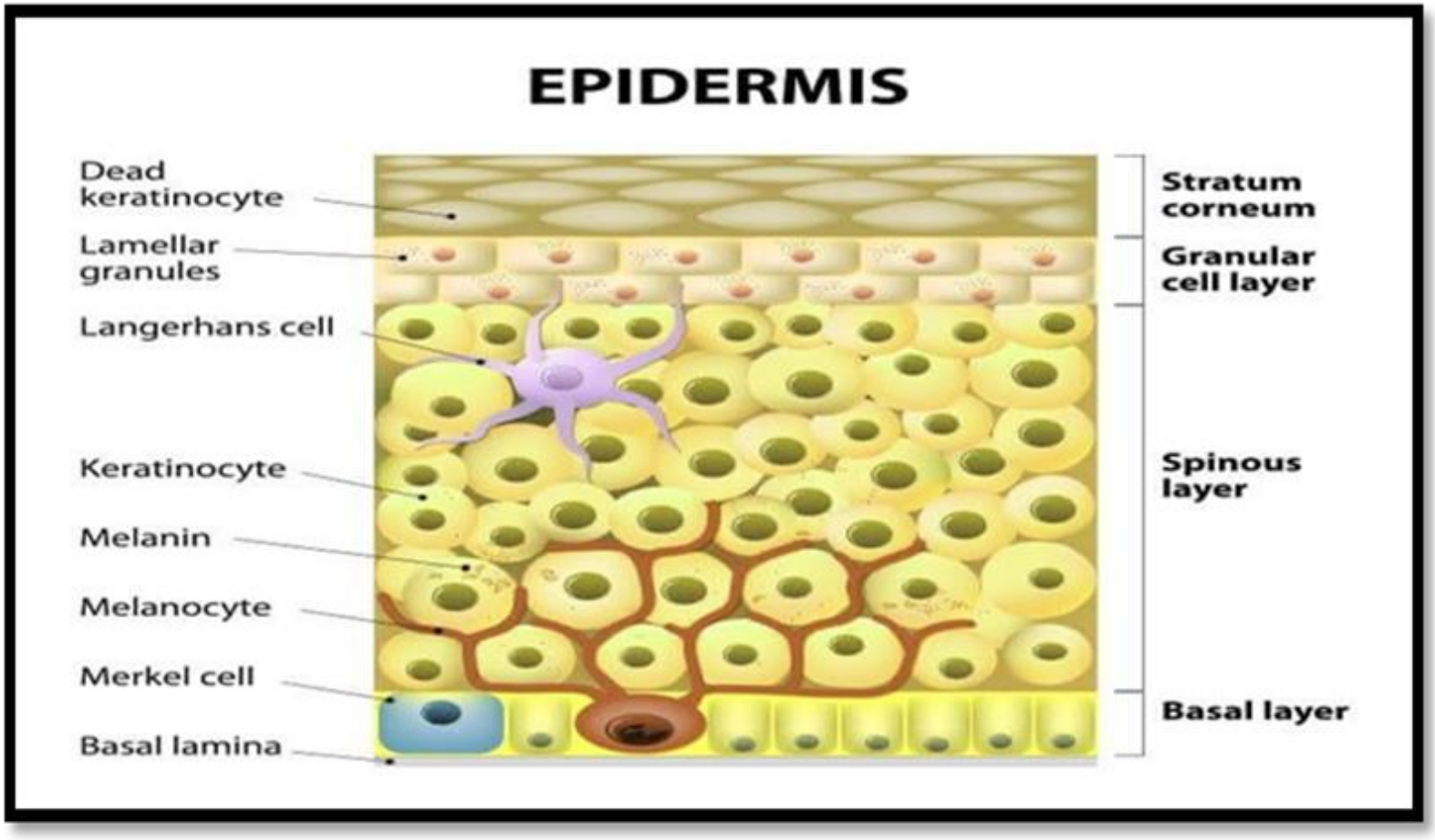
- The basal cells of the epidermis undergo proliferation cycles that provide for the renewal of the outer epidermis, “New keratinocytes move upward slowly toward the surface of the epidermis. When these cells reach the surface of the skin, they gradually begin to shed, and are replaced by new cells that pour out from below

• There are cells scattered throughout the basal layer of the skin called melanocytes which produce the pigment melanin, which mainly contributes to skin color. However, the main function of melanin remains to filter ultraviolet rays emanating from sunlight Which causes damage to genetic DNA, and leads to a number of harmful effects, including skin cancer.



- The Epidermis also contains Langerhans cells, which are part of the skin's immune system. These cells help detect foreign substances, defend the body against infection, and play a role in the occurrence of skin allergies.

- The other cells found in the Epidermis are Merkel cells which are found in the digits, lips, regions of the oral cavity, and outer root sheath of the hair follicle and are sometimes assembled into specialized structures known as tactile discs or touch domes.


EPIDERMIS
Dead keratinocyte
Lamellar granules
Langerhans cell
Keratinocyte
Melanin
Melanocyte
Merkel cell
Basal lamina
Stratum corneum
Granular cell layer
Spinous layer
Basal layer

Layers of the Skin

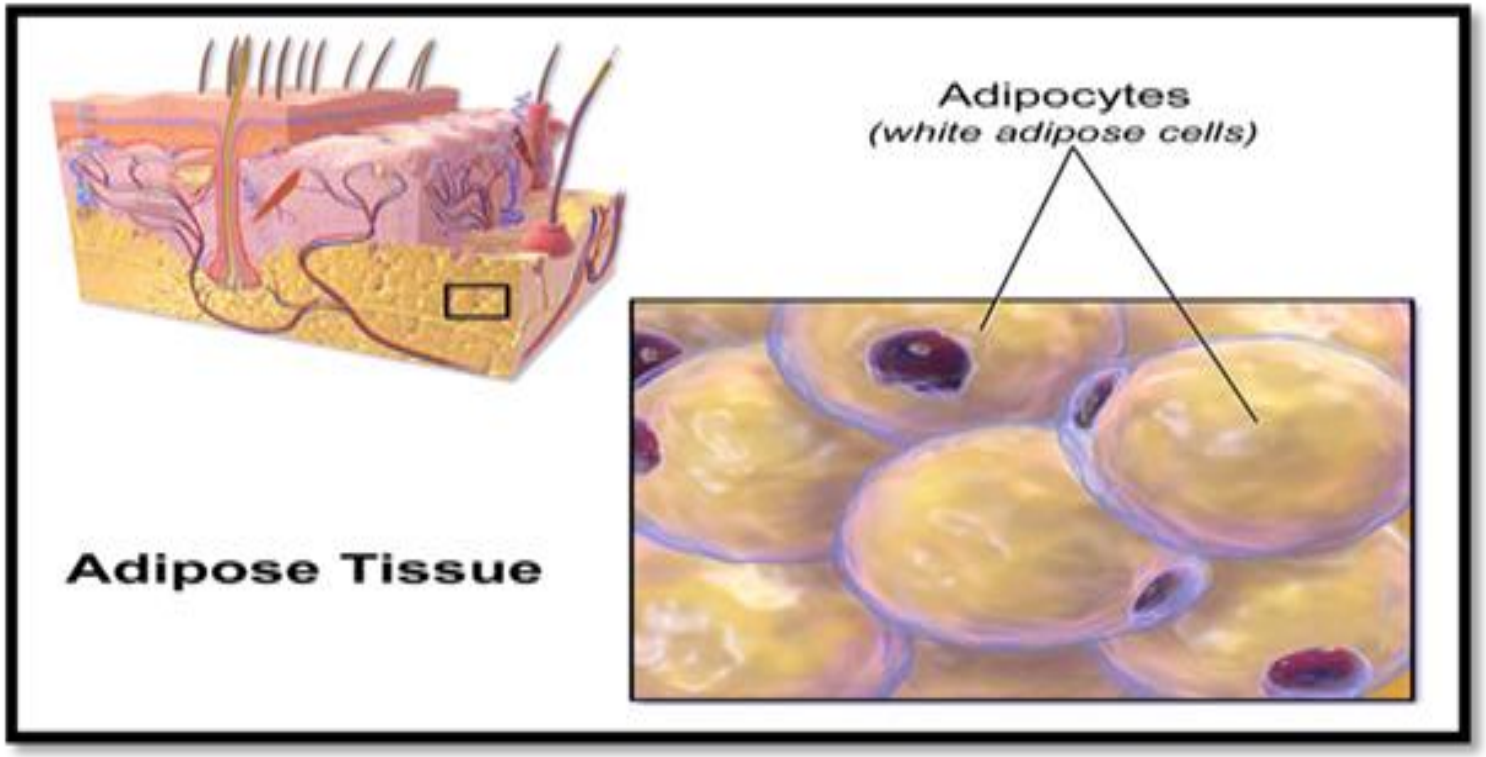
2-The Dermis : is the second layer of the skin. It is a thick layer of fibrous and elastic tissue, and it consists mostly of collagen with a small but important component called Elastin, (which gives the skin its elasticity and strength).

The dermis contains:

- Nerve endings sense pain, touch, pressure, and temperature.
- Sweat glands produce sweat in response to heat and stress.
- The blood vessels of the dermis provide nutrients to the skin and help regulate body temperature.

3-The fat layer : located under the dermis and it helps in insulate the body from heat and cold. It acts like a padding or protective cushion and an area for storing energy.

Fat is found in cells called Adipocytes, where fibrous tissue keeps them connected to each other. The thickness of the fat layer varies from one area to another in the body, it does not exceed a fraction of an inch on the eyelids, and reaches several inches on the abdomen and buttocks in some people.


Adipocytes
(white adipose cells)
Adipose Tissue


Thanks