

# 組織學實驗：皮膚

## Histology laboratory : Skin

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Please study these slides before coming to the class!

## **Sources of the Pictures & Text**

Wheater's Functional Histology (4<sup>th</sup> ed)

B. Young & J. W. Heath

Color Atlas of Histology (4<sup>th</sup> ed)

L. P. Gartner & J. L. Hiatt

## **Photomicrograph Taken by**

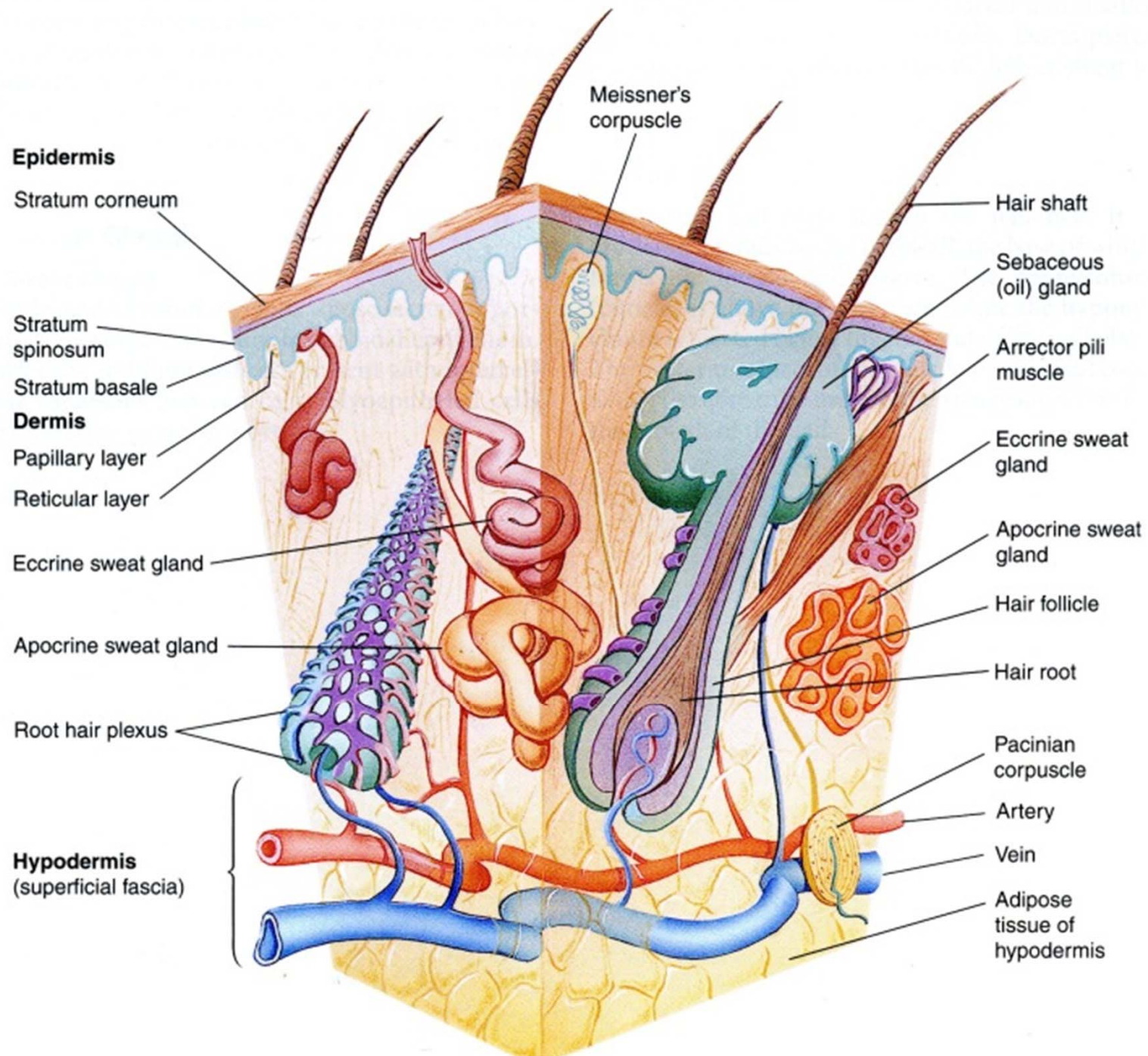
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Kaohsiung Medical University

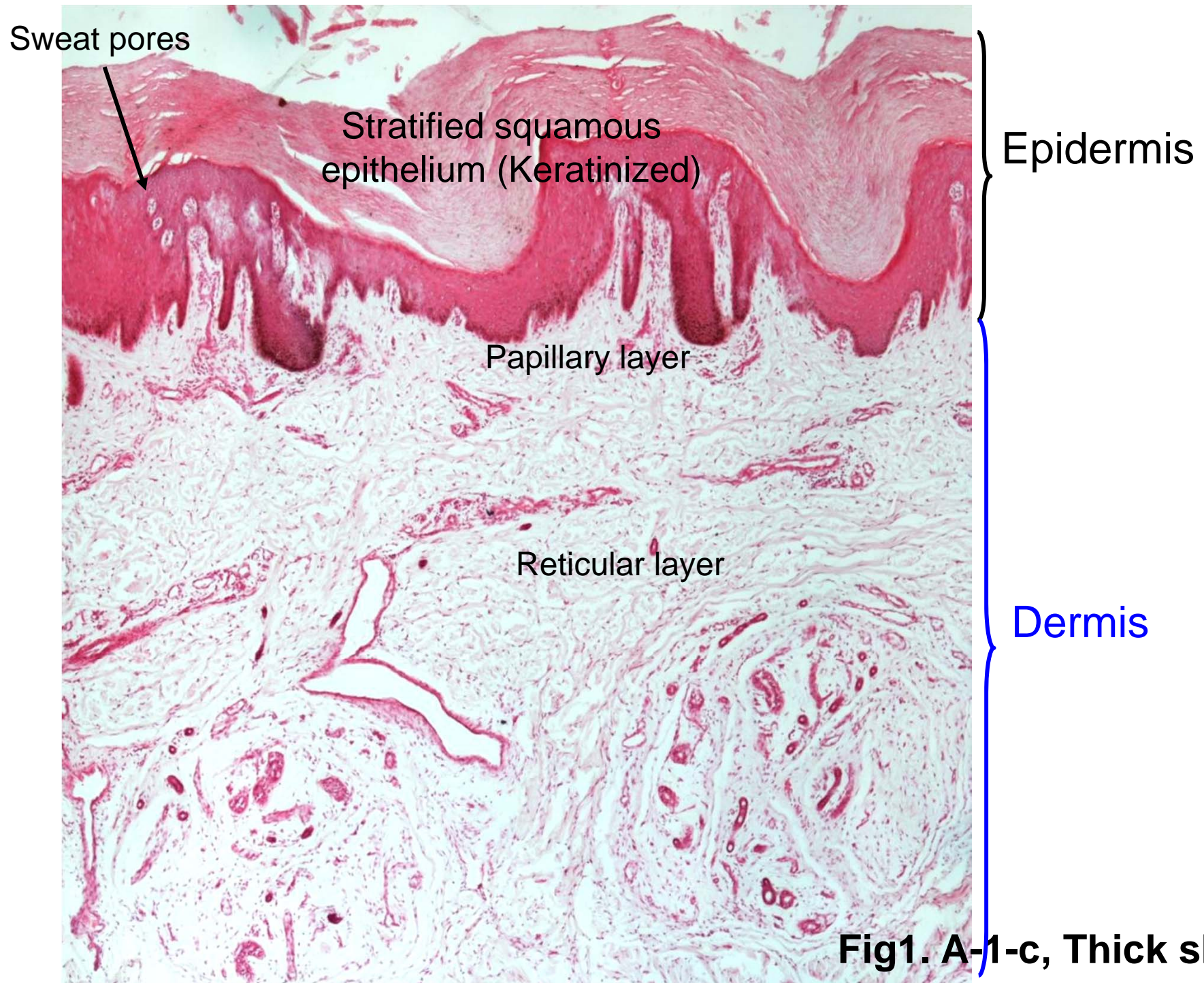
# Learning Objective

Observe the slides below to understand the microscopic structure of skin

- 1) A-1-c, Thick skin, HE;
- 2) A-5-a, Thick skin,  $\text{OsO}_4$ ;
- 3) NF-1-c, Thick skin, Pacinian corpuscle, HE;
- 4) NA-1-i, Caucasian and Negro, Thin skin, HE;
- 5) 93W7034, Axillary skin, HE, human
- 6) M-1-o, Scalp, HE;
- 7) NC-2-a, Finger nail, human, Is.



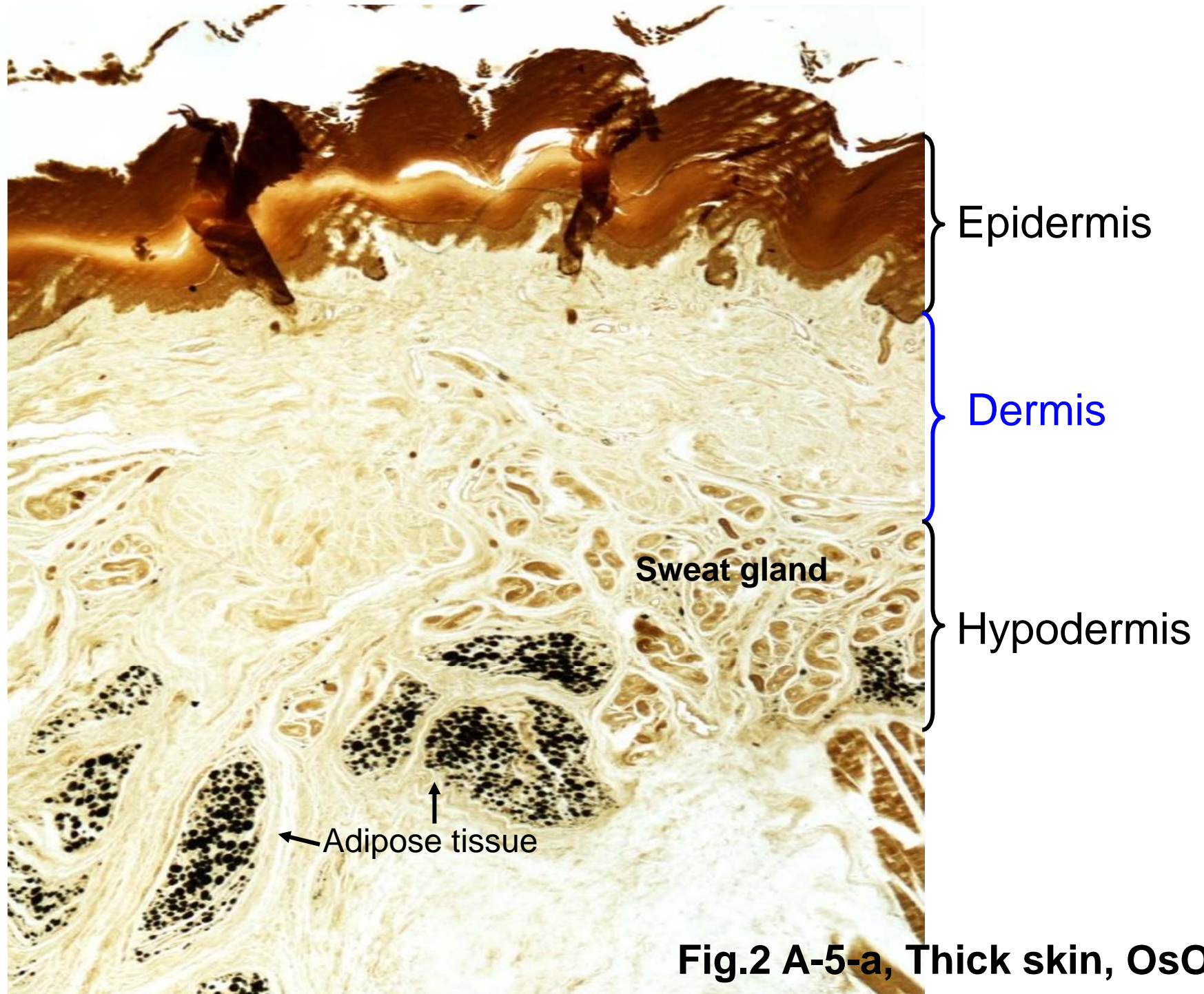




**Fig1. A-1-c, Thick skin**

**Fig.1 Micrograph of skin.** The skin has three main layers: epidermis, dermis and hypodermis. Epidermis have an outer keratinising stratified squamous epithelium. Dermis have tough supporting and nourishing layer of fibroelastic tissue. Hypodermis (not shown in this graph) is a variable deep layer, mainly adipose tissue (please see Fig.2).

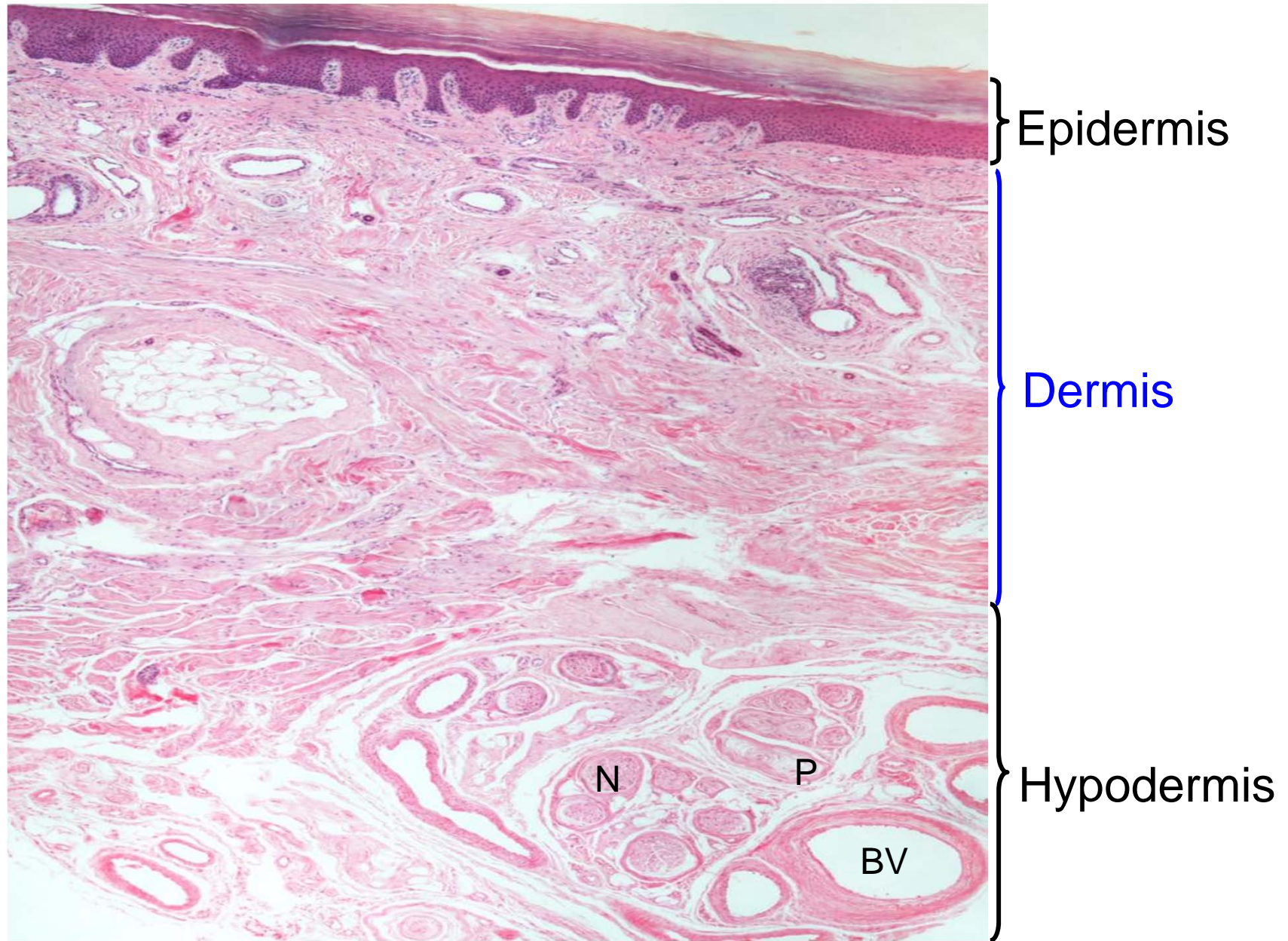




**Fig.2 A-5-a, Thick skin, OsO4**

**Fig.2 Micrograph of skin stained with osmium tetroxide (OsO<sub>4</sub>).** Osmium tetroxide is used as a stain for lipids in optical microscopy. Thus, adipose tissue can be found with higher contrasts in the hypodermis.



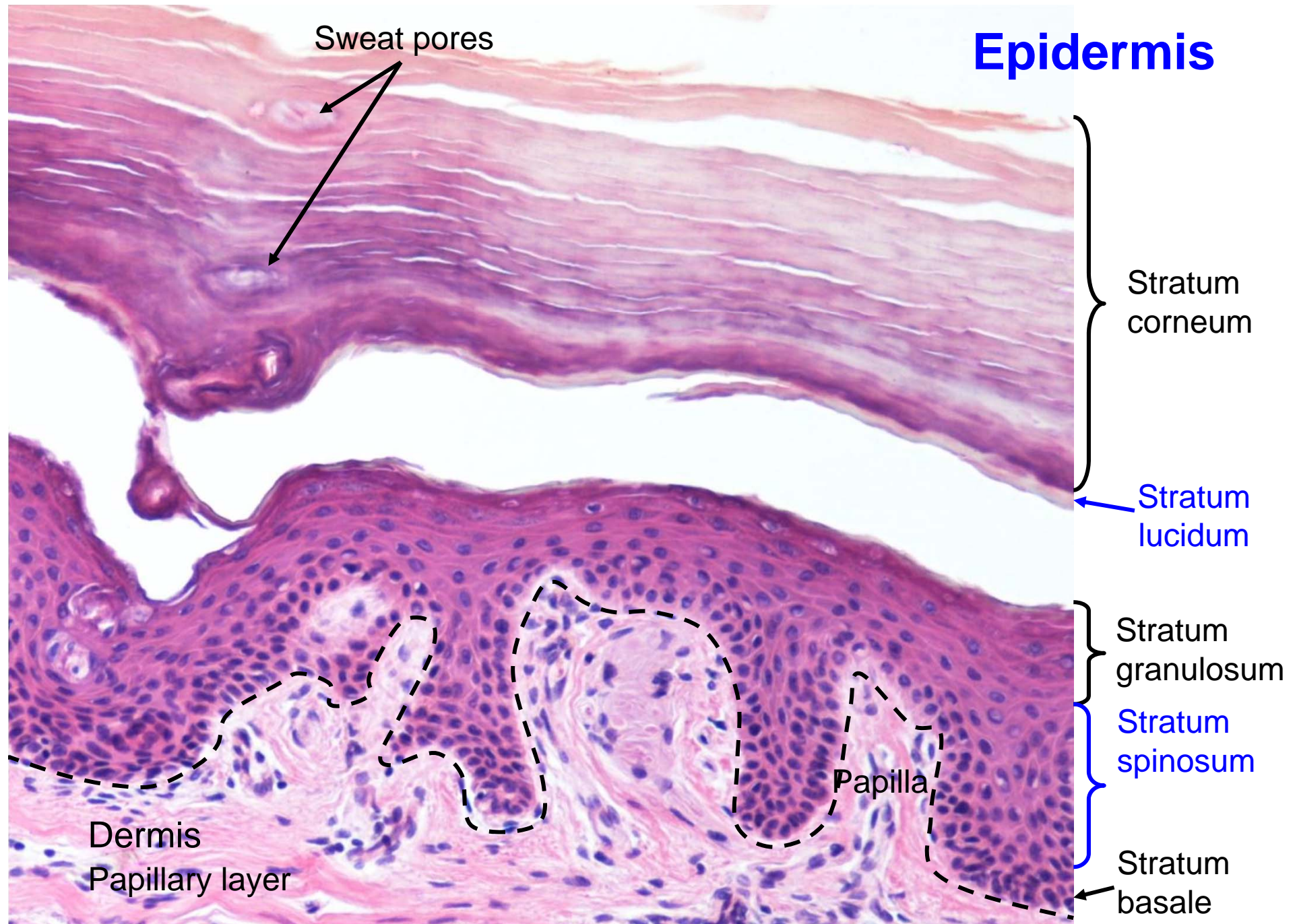


Pacinian corpuscle (P); Nerve fiber (N); Blood vessel (BV)

**Fig.3-1 NF-1-c, Thick skin, Pacinian corpuscle**

**Fig.3-1 Micrograph of skin.** A full view with three layers. Pacinian corpuscle can be found in the hypodermis.

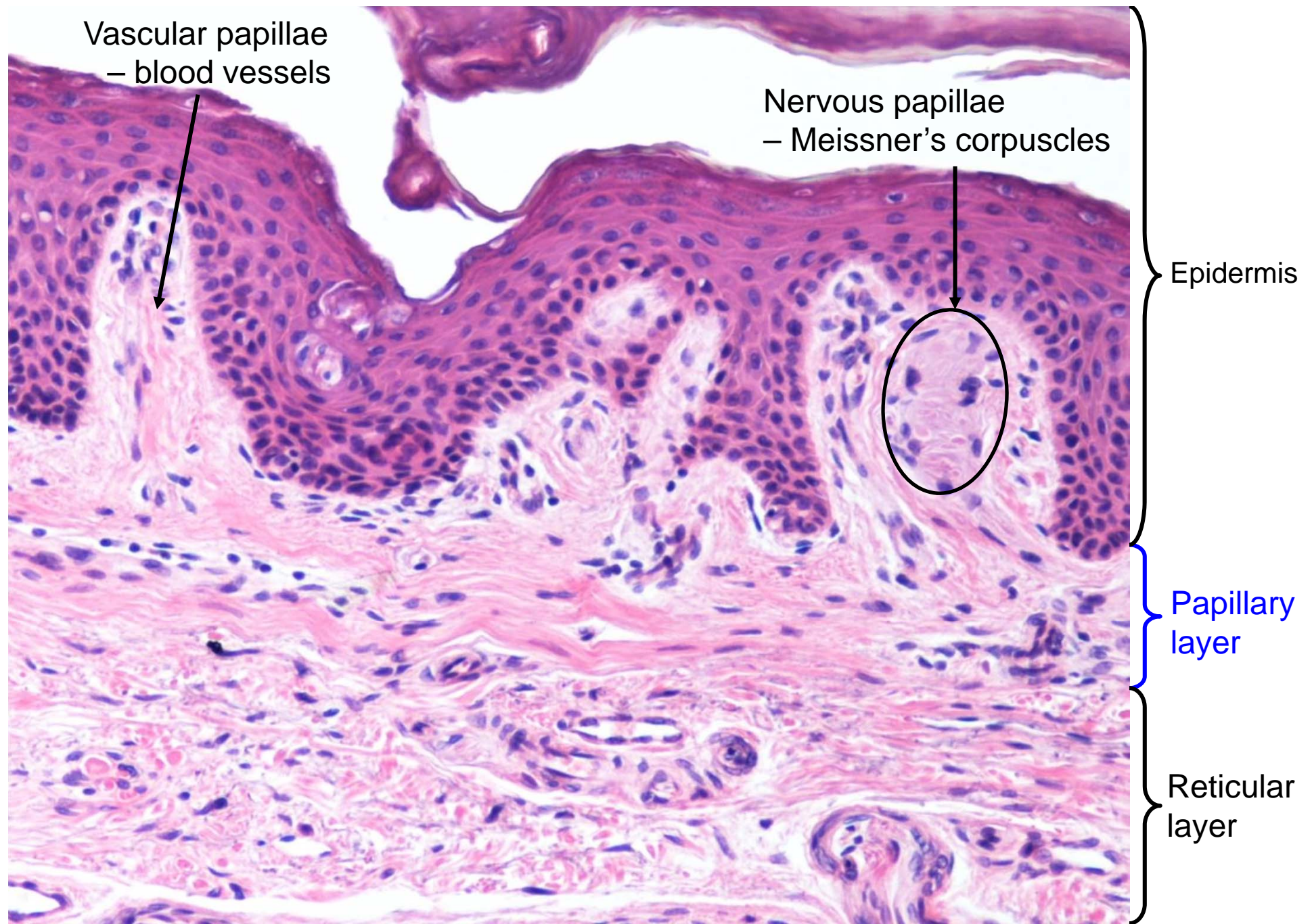




**Fig.3-2 NF-1-c, Thick skin, Pacinian corpuscle**



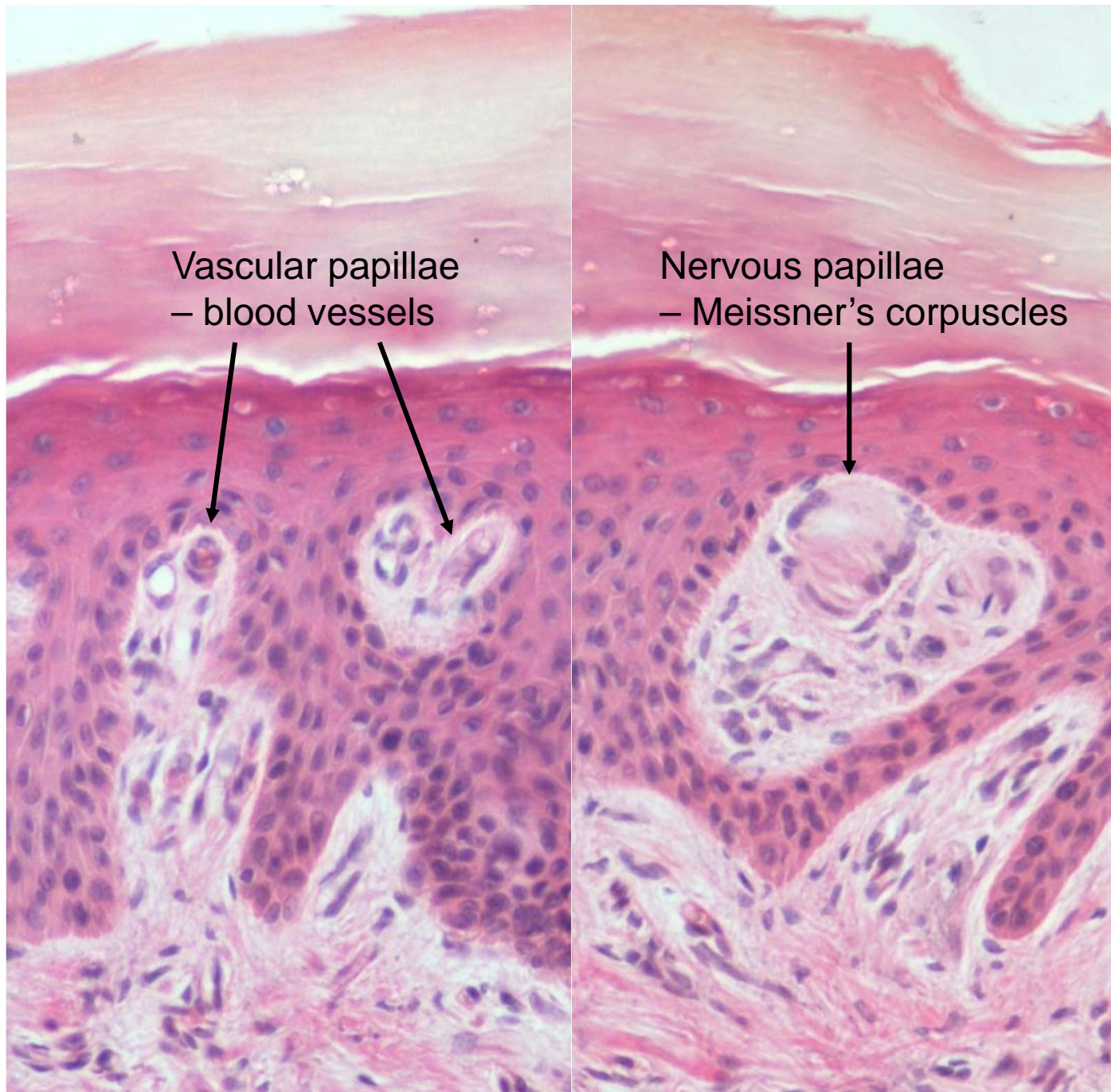
**Fig. 3-2 Epidermis of thick skin.** Note the extreme thick stratum corneum and, under this, a thin pale layer, the stratum lucidum. The deepest layer of cells, adjacent to the dermis, is the stratum basale. Adjacent to this is a layer several cells thick, designed as the stratum spinosum. The most superficial layer of nucleated cells is the stratum granulosum.



**Fig.3-3 NF-1-c, Thick skin, Pacinian corpuscle**

**Fig. 3-3 Higher magnification of the epidermis and dermis.** The junction between the dermis and epidermis as seen with LM presents an extremely uneven boundary. The papillary layer consists of loose connective tissue immediately beneath the epidermis. The reticular layer varies in thickness in different parts of the body but it is considerably thicker and less cellular than the papillary layer.

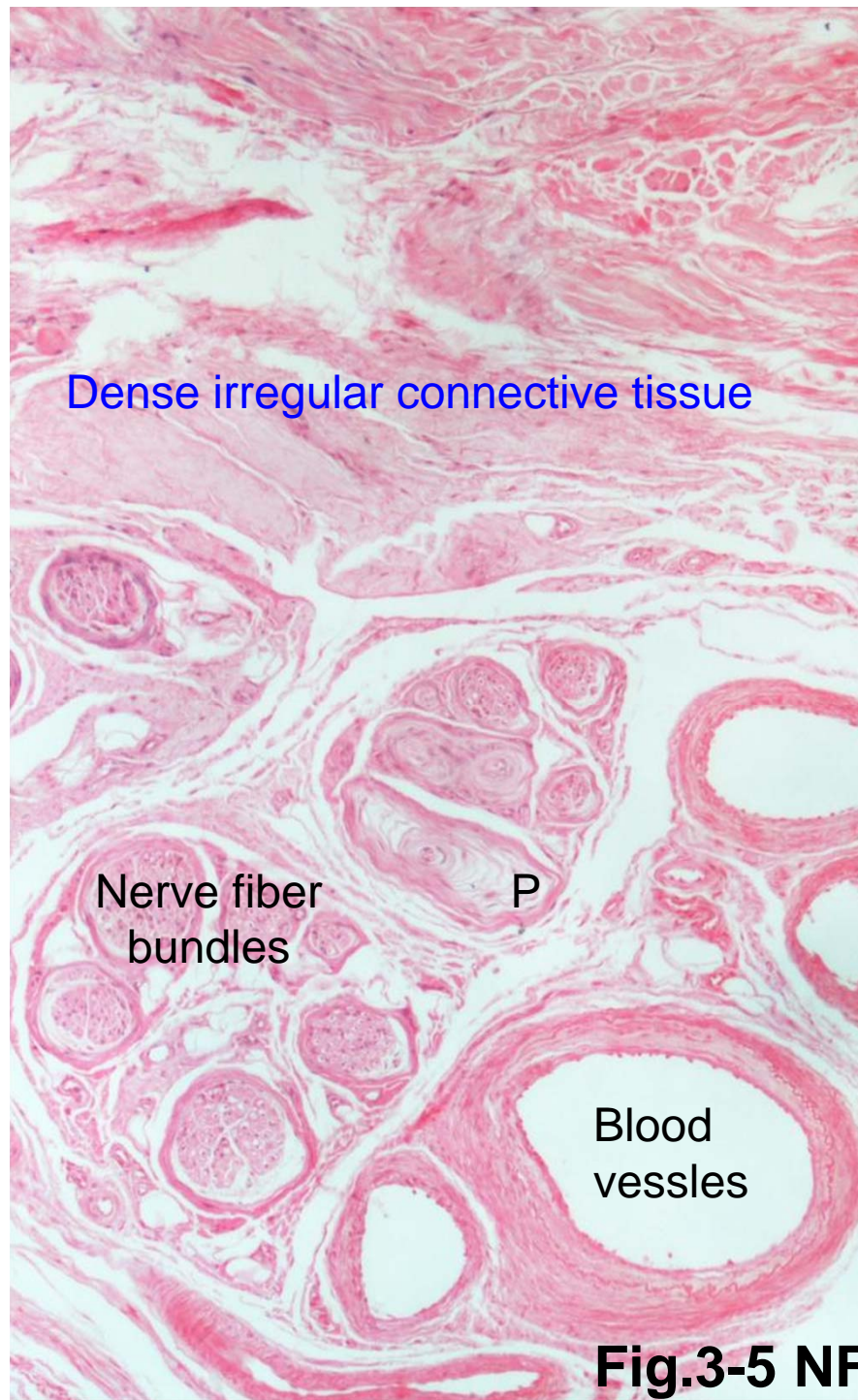




**Fig.3-4 NF-1-c, Thick skin, Pacinian corpuscle**

**Fig. 3-4 Higher magnification of the Meissner's corpuscle.** Meissner's corpuscles are small, encapsulated, sensory receptors found in the dermis of skin. They are oval in shape, usually located in the dermal papillae and involved in the reception of light discriminatory touch.

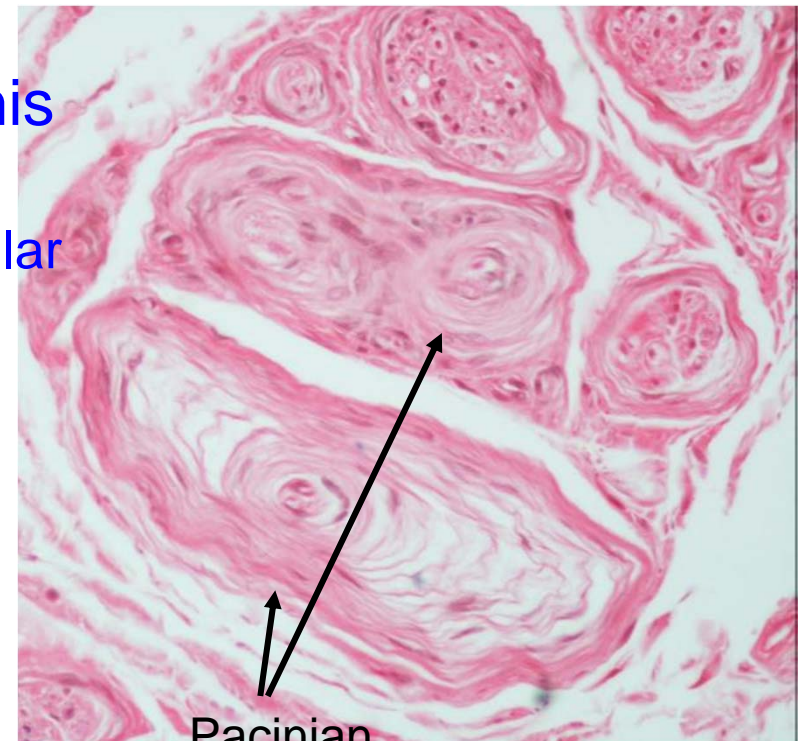




Dermis

Reticular Layer

Hypoderm



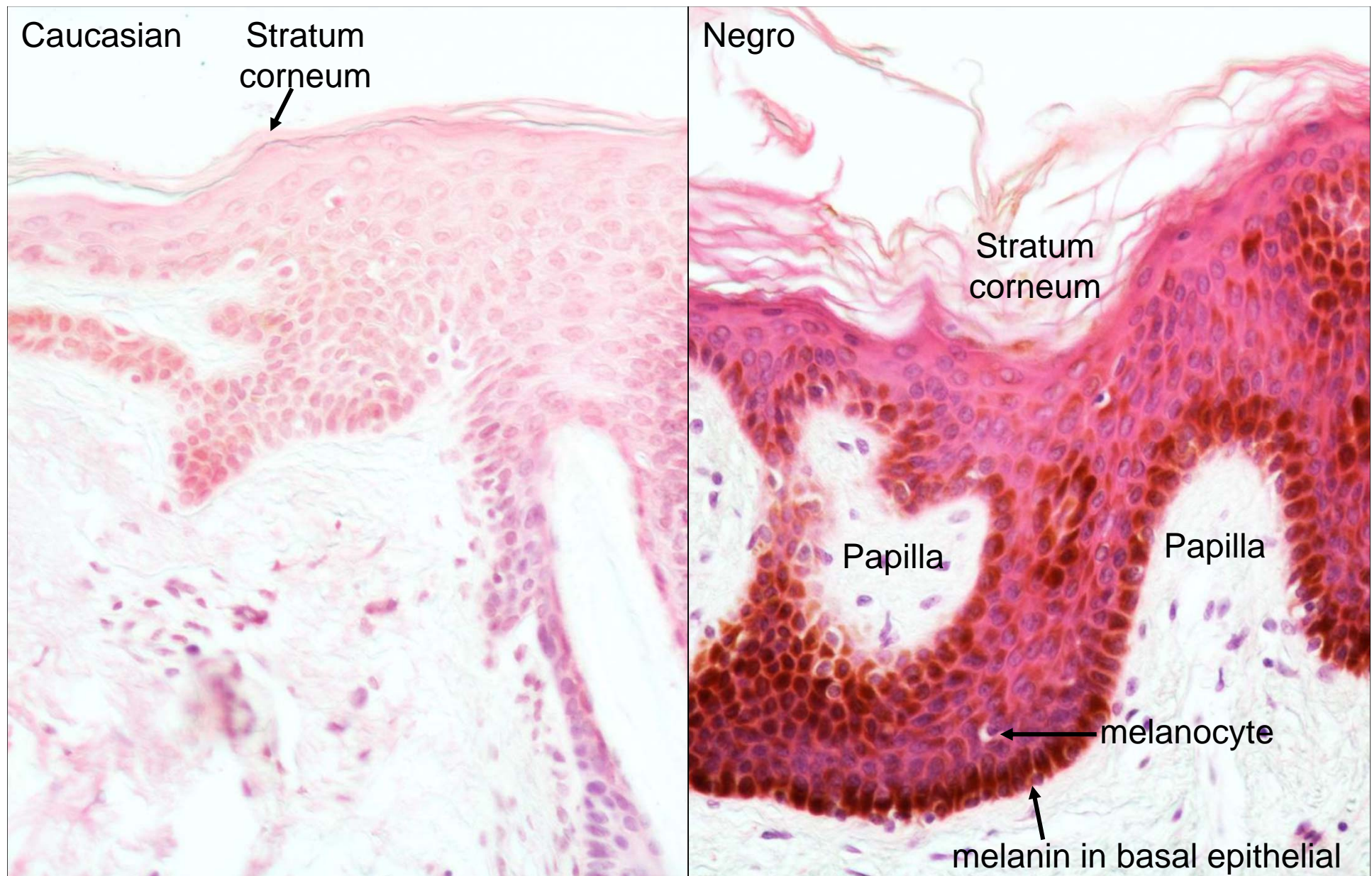
Pacinian corpuscle



**Fig.3-5 NF-1-c, Thick skin, Pacinian corpuscle**



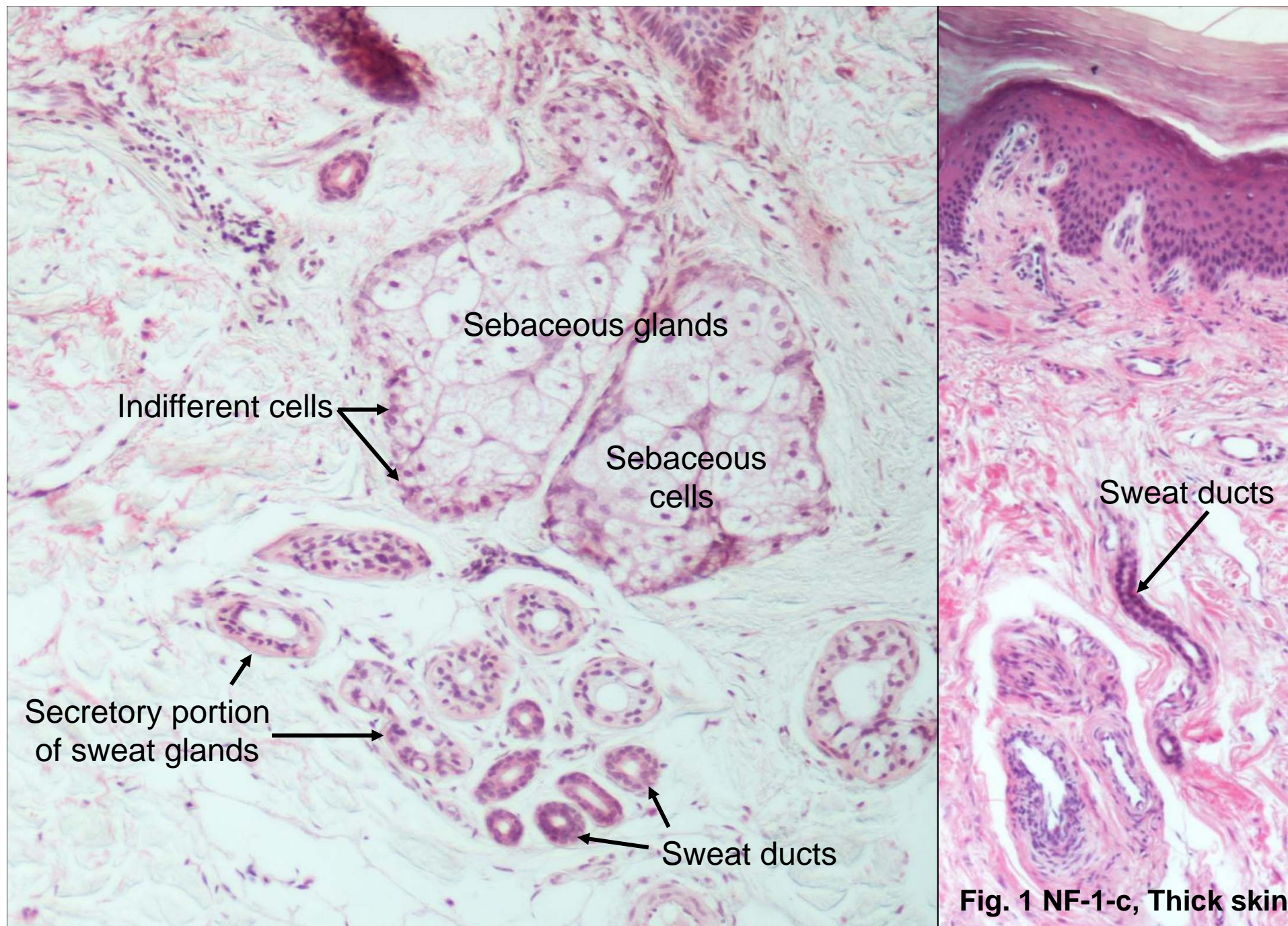
**Fig. 3-5 Higher magnification of the Pacinian corpuscle.** Pacinian corpuscle are deep pressure receptors for mechanical and vibratory pressure. They are found in deep dermis and hypodermis as well as in connective tissue in joints and internal organs. Distortion of the Pacinian corpuscle produces an amplified mechanical stimulus in the core which is transduced into an action potential in the sensory neuron.



**Fig.4-1 NA-1-i, Caucasian and Negro, Thin skin**

**Fig. 4-1 Comparison of skin of Caucasian and Negro.** Observe the structure in both sections and see the melanin, which is produced by the melanocytes and transferred to the keratinocytes, appears in the basal cells of the stratum basale. More pigment is present in dark skin than in light skin. The difference is due to more rapid digestion of the pigment by lysosomes of keratinocytes in light skin.



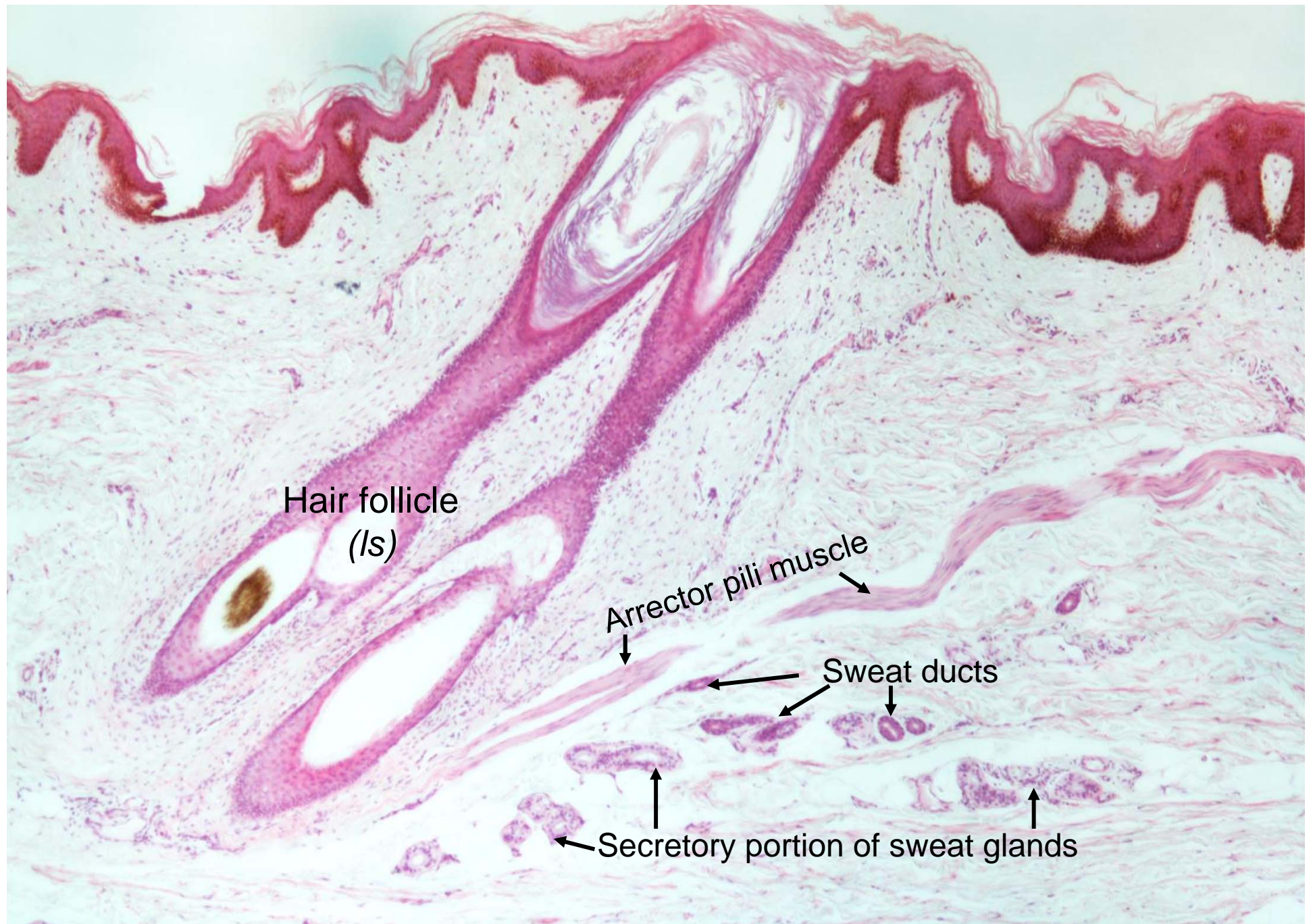


**Fig.4-2 NA-1-i, Caucasian, Thin skin**

**Fig. 1 NF-1-c, Thick skin**

**Fig. 4-2 Sebaceous glands and sweat glands.** Sebaceous glands secrete sebum that coats the hair and skin surface. Sweat gland is arranged as a simple coiled tubular structure composed of a secretory segment located deep in the dermis or in the upper part of the hypodermis and a directly continuous duct segment that leads to the epidermal surface.



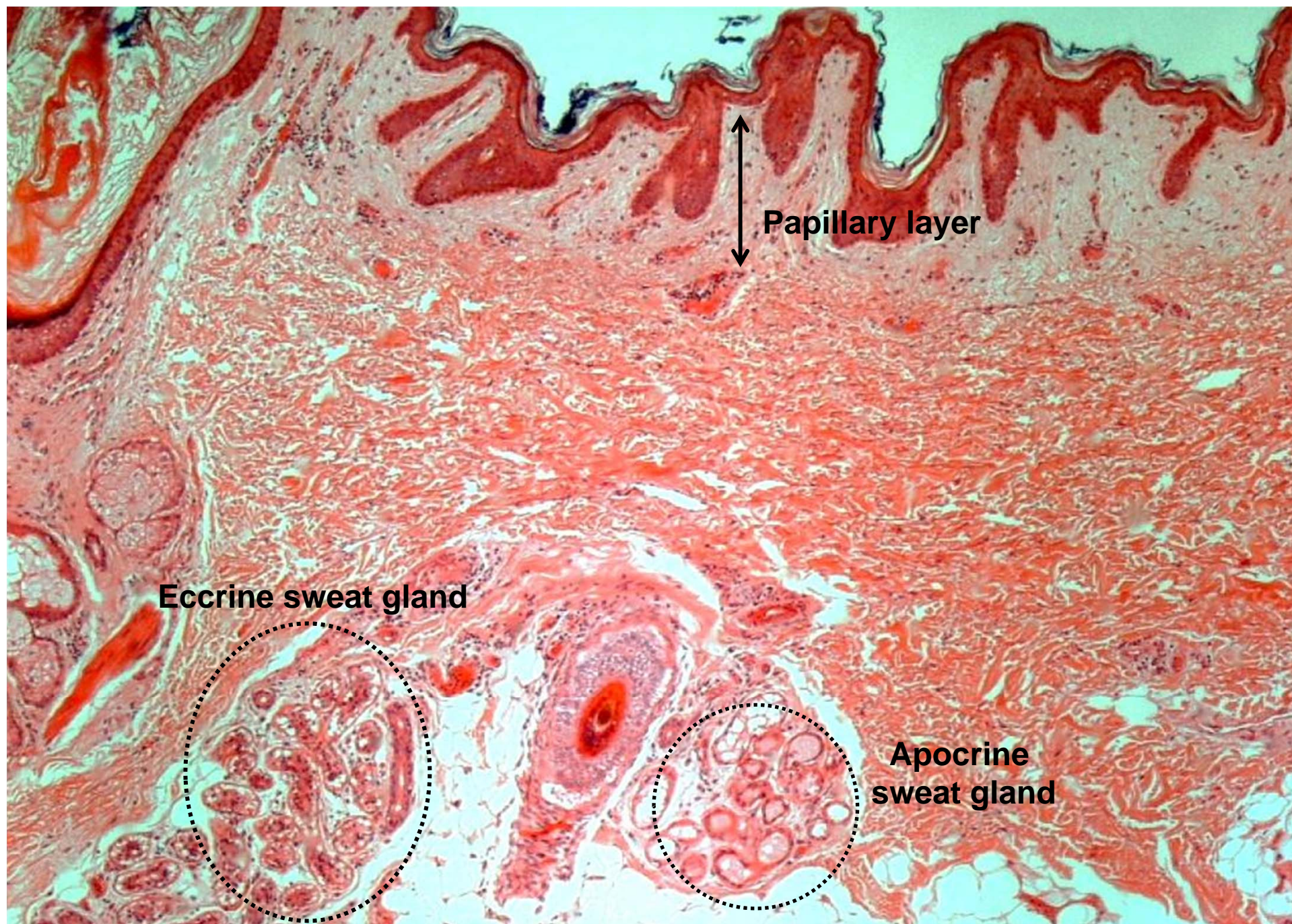


**Fig.4-3 NA-1-i, Negro, Thin skin**



**Fig. 4-3 Hair follicle.** Hair follicle is responsible for the production and growth of a hair. The follicle is surrounded by a connective tissue sheath to which the arrector pili muscle is attached.





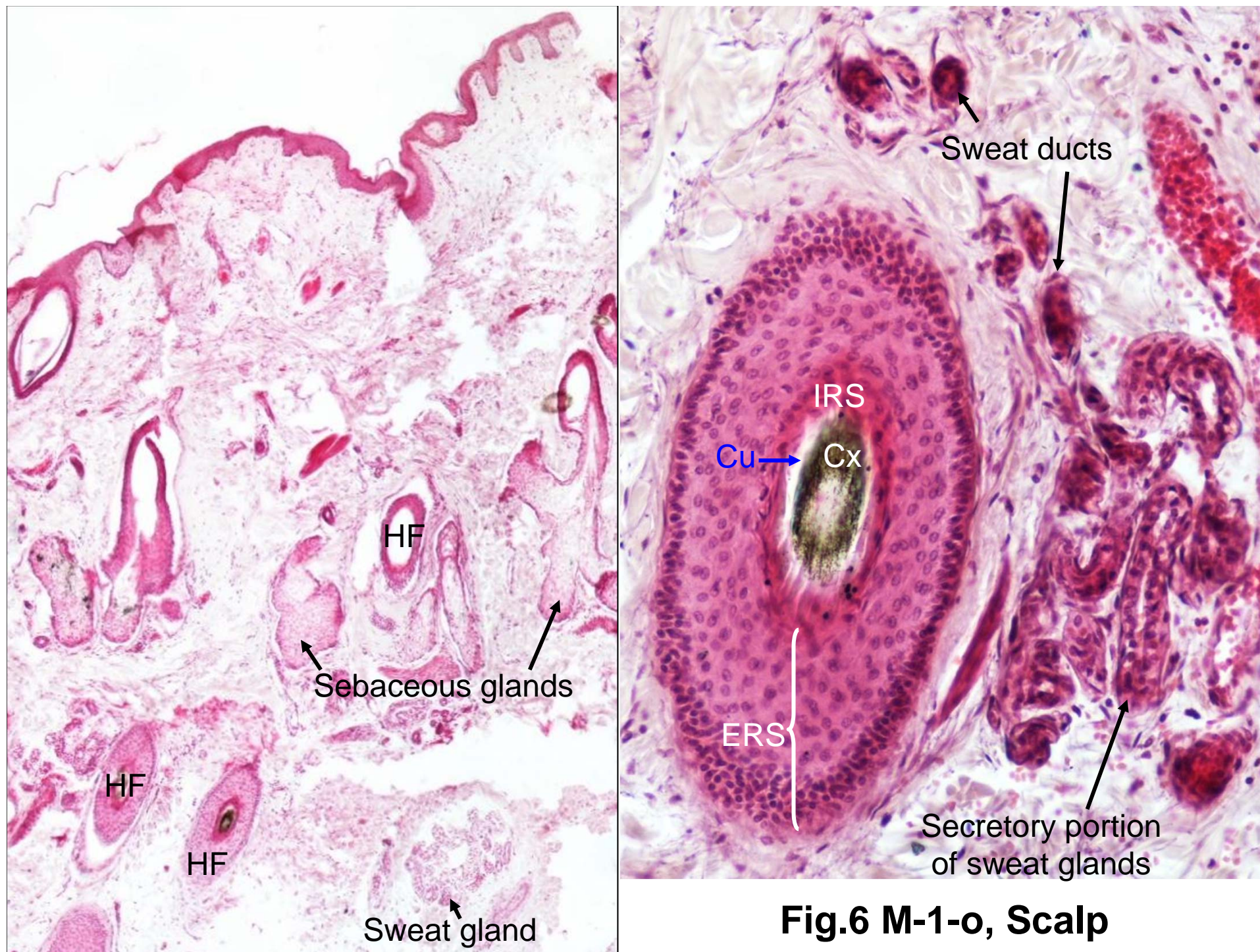
**Fig.5 93W7034, Axillary skin, HE, human.**



**Fig. 5 Eccrine and Apocrine sweat gland.**

The apocrine sweat glands are easily identified by virtue of the large lumen of their secretory portion which is striking contrast to the small lumen displayed of the eccrine sweat gland.

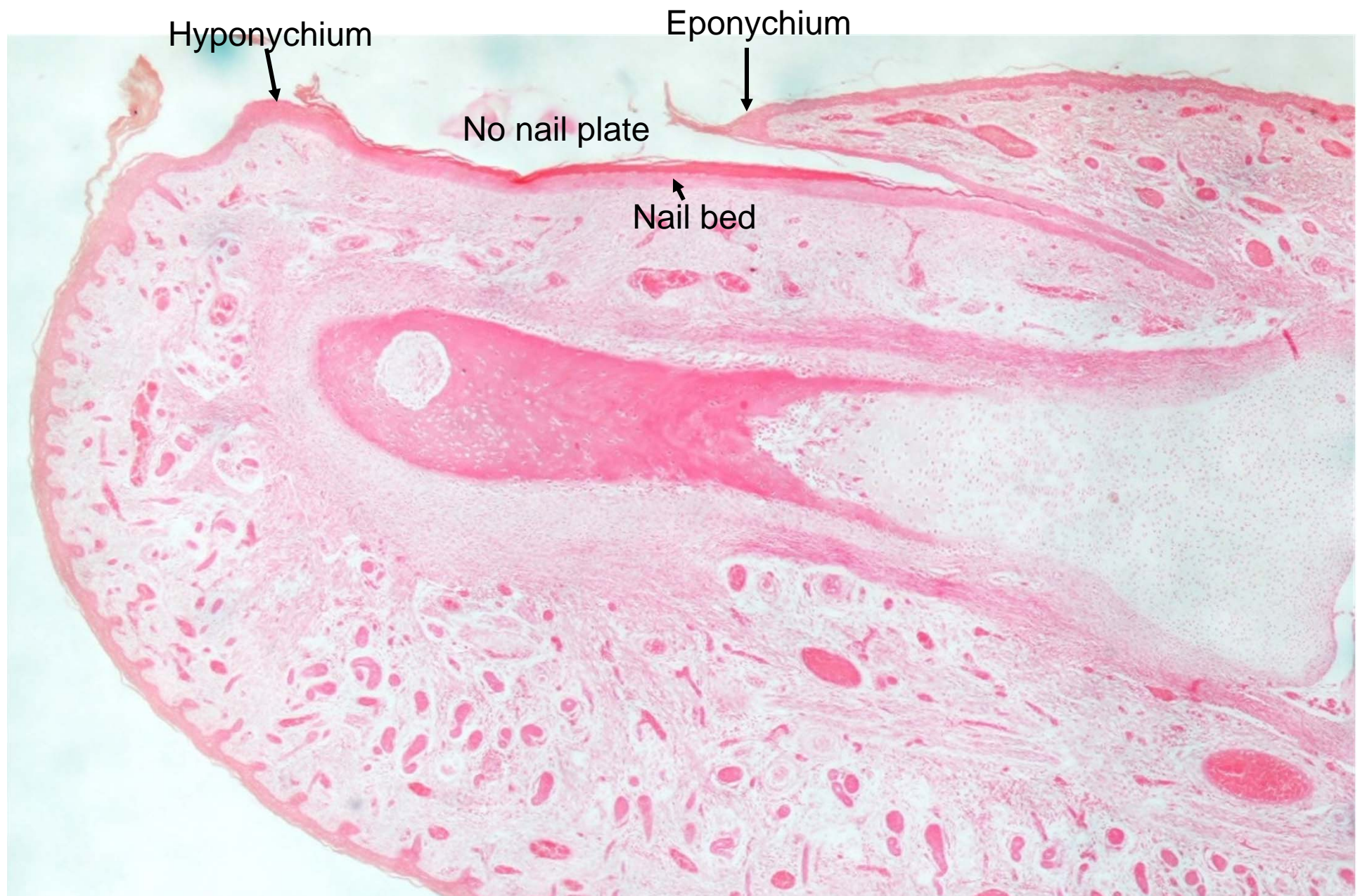




**Fig.6 M-1-o, Scalp**

**Fig. 6 Hair follicle.** The outermost part of the hair follicle is a downgrowth of the epidermis designated the external root sheath (ERS). The internal root sheath (IRS) is a multilayered cellular covering that surrounds the cuticle (Cu) and cortex (Cx) of the hair.





**Fig.7 NC-2-a, Finger nail, human, Is.**



**Fig. 7 Nail.** The slightly arched fingernail or toenail rests on the nail bed. The bed consists of epithelial cells that are continuous with the stratum basale and stratum spinosum of the epidermis. The edge of the skin fold covering the root of the nail is the eponychium. A thickened epidermal layer, the hyponychium, secures the free edge of the nail plate at the fingertip.