

Integument (skin)

VIBS 443/602

Functions of skin

PROTECTS AGAINST INJURY AND DESICCATION

MAINTENANCE OF WATER BALANCE

EXCRETES (secretes) SUBSTANCES

THERMOREGULATION

RECEIVES STIMULI

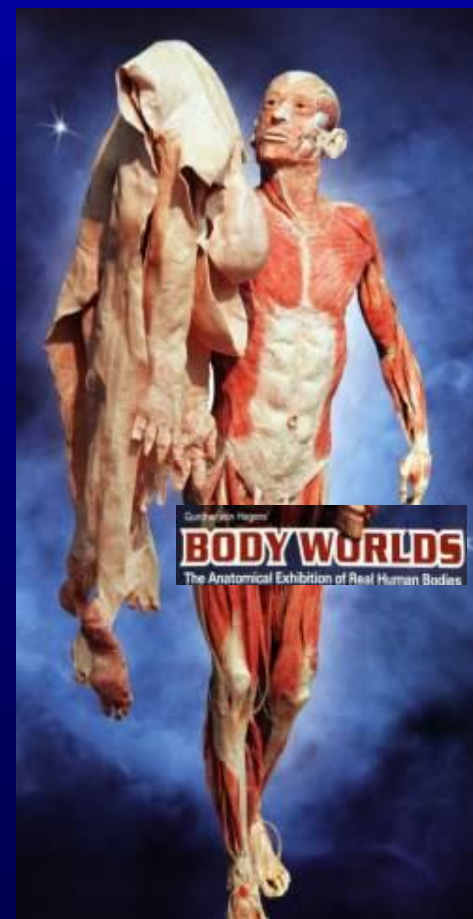
- TEMPERATURE
- PAIN
- PRESSURE

BASIS OF RECOGNITION AND YIELDS

CLUES TO ONE'S WELL BEING

FAT METABOLISM IN THE

SUBCUTANEOUS LAYER



Three Key Steps of Combating Infections

Break the cycle of transmission

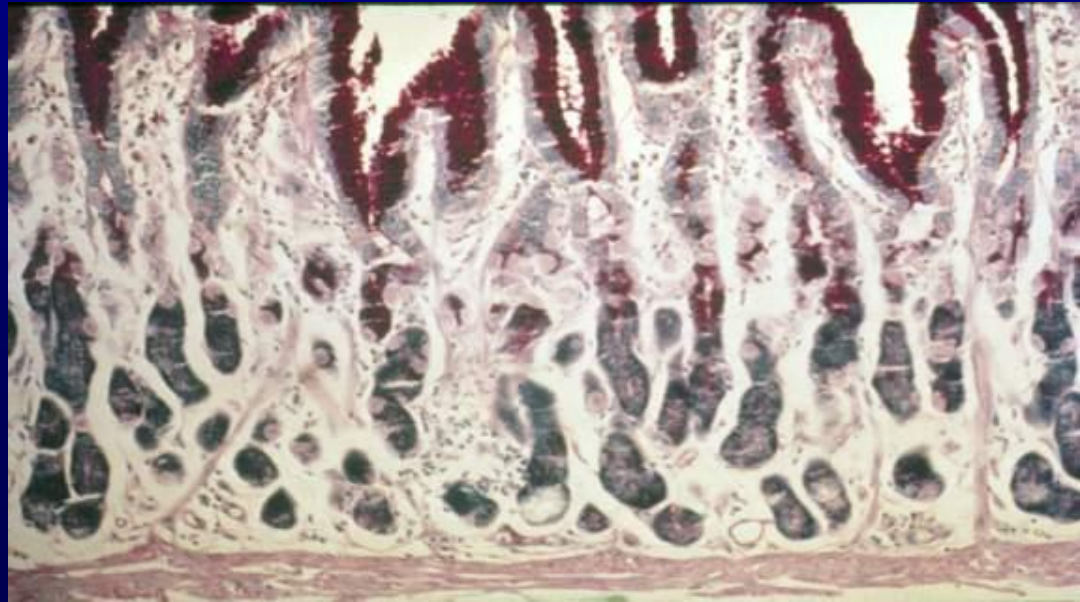
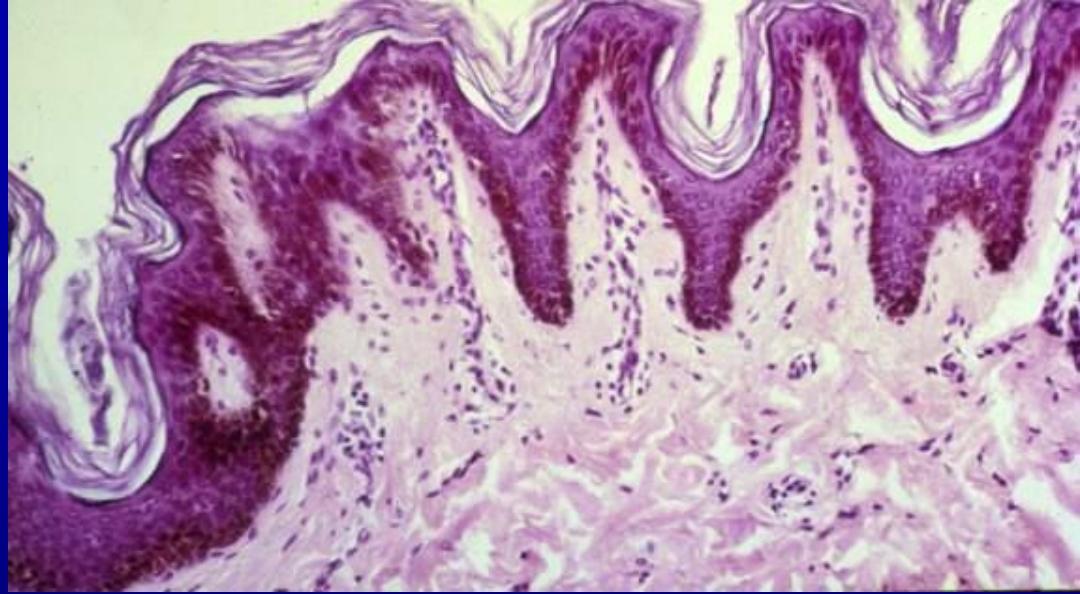
Kill the infectious agent

Increase host resistance

e.g., increase immunity of host



Skin functions as part of the First of Defense against infections

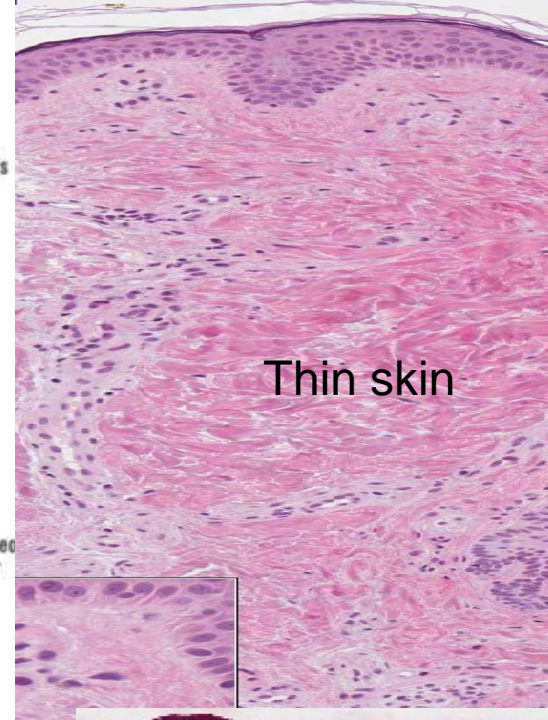
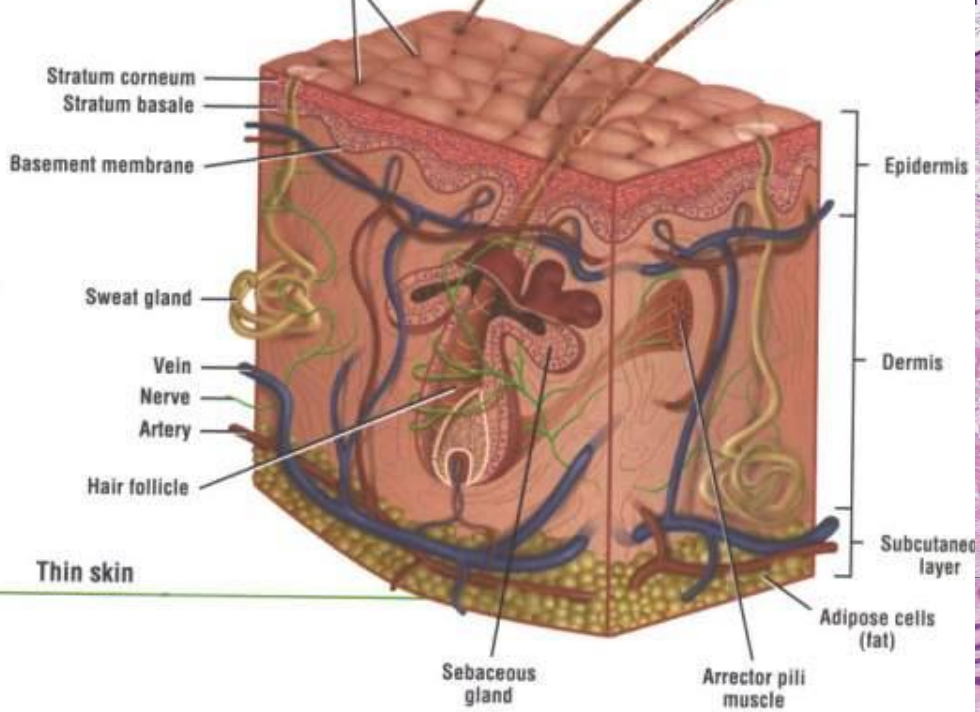


• FIRST LINE - PHYSICAL BARRIER

- SKIN - STRATUM CORIUM
- HCL IN STOMACH
- MUCUS IN INTESTINES

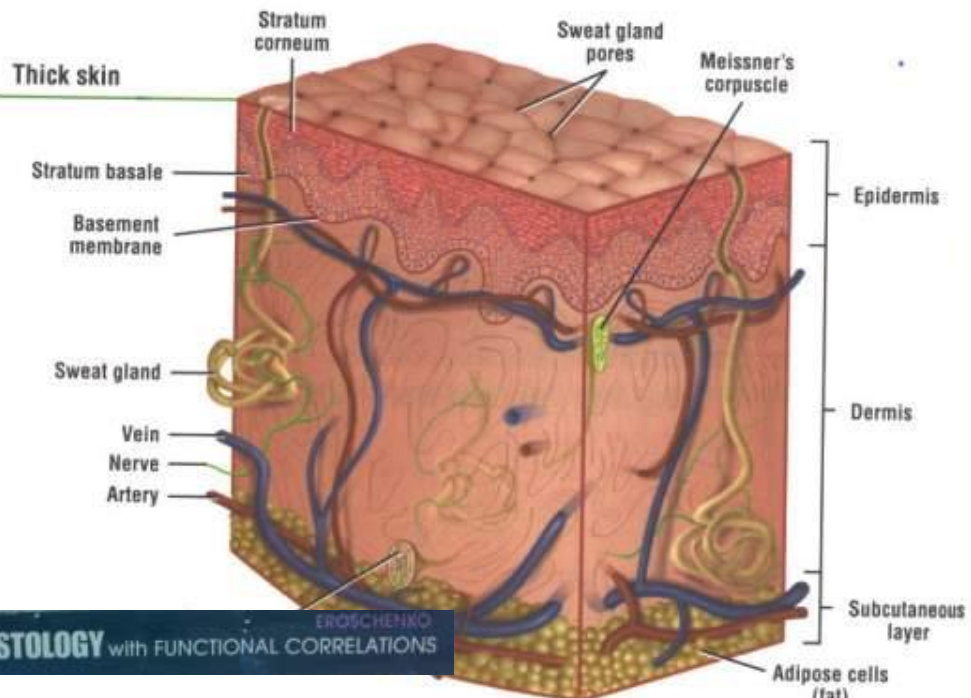
Break the cycle of transmission

Thin skin



Thin skin

Thick skin



Thick skin

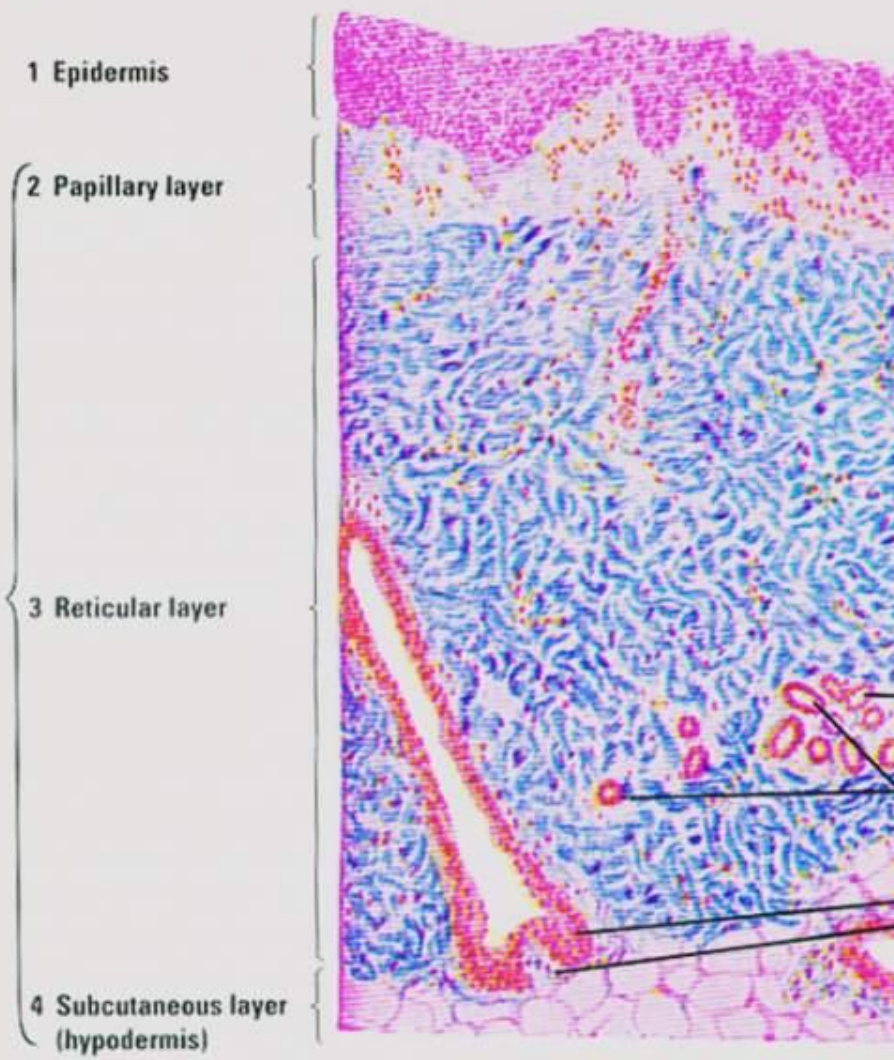
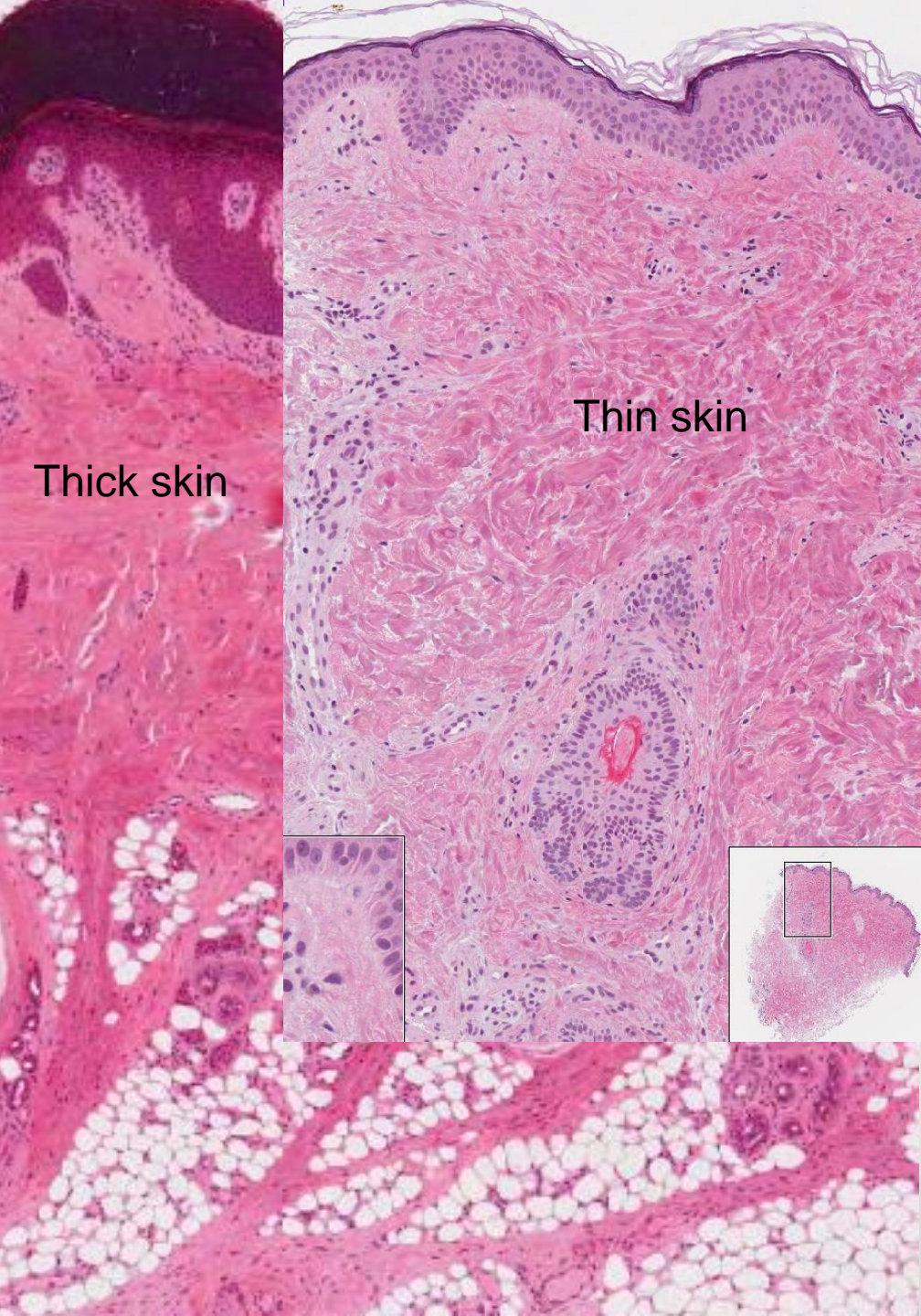


Fig. 9-1 Thin Skin. Stain: Cajal's trichrome. Cytoplasm: magnification.

LAYERS OF THE EPIDERMIS: PALMS AND SOLES OF FEET

STRATUM CORNEUM

- KERATINIZED
FLATTENED,
DENUCLEATED, DEAD
CELLS

STRATUM GRANULOSUM

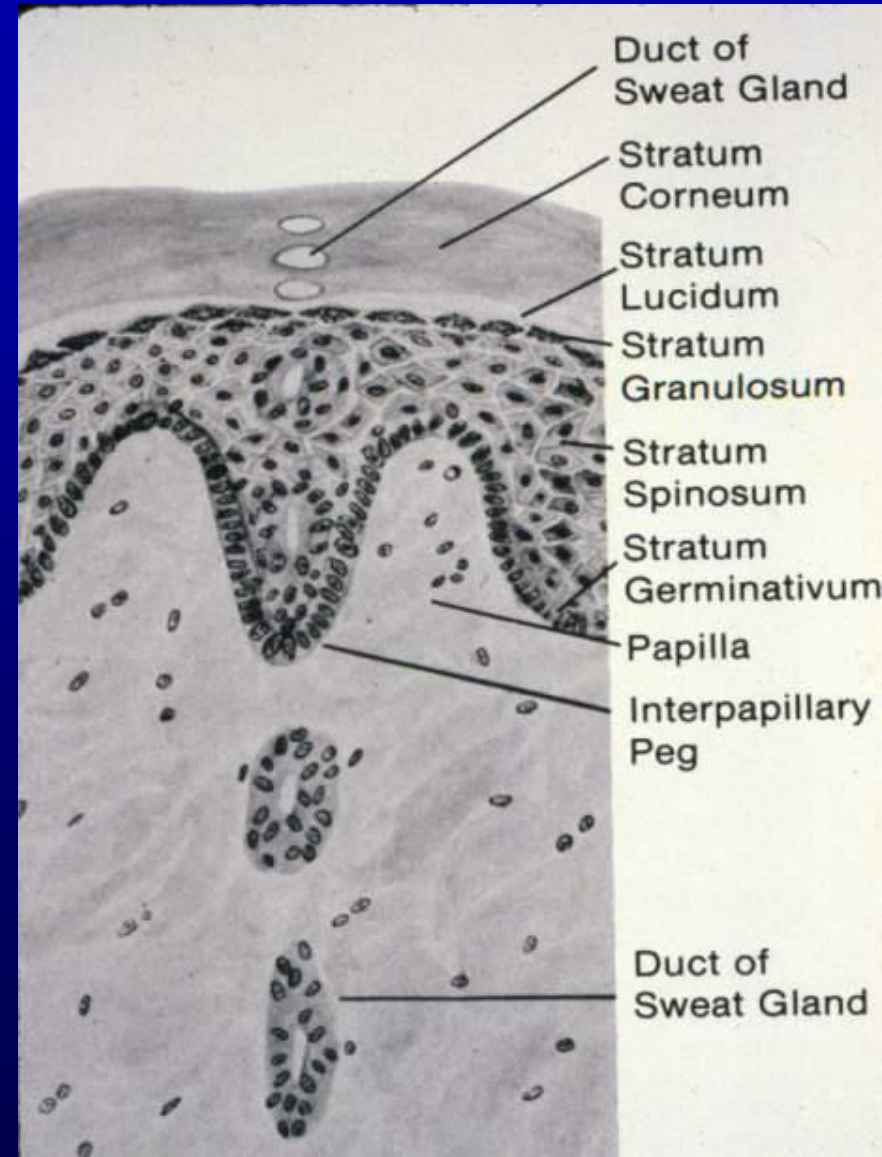
- KERATOHYALIN
GRANULES

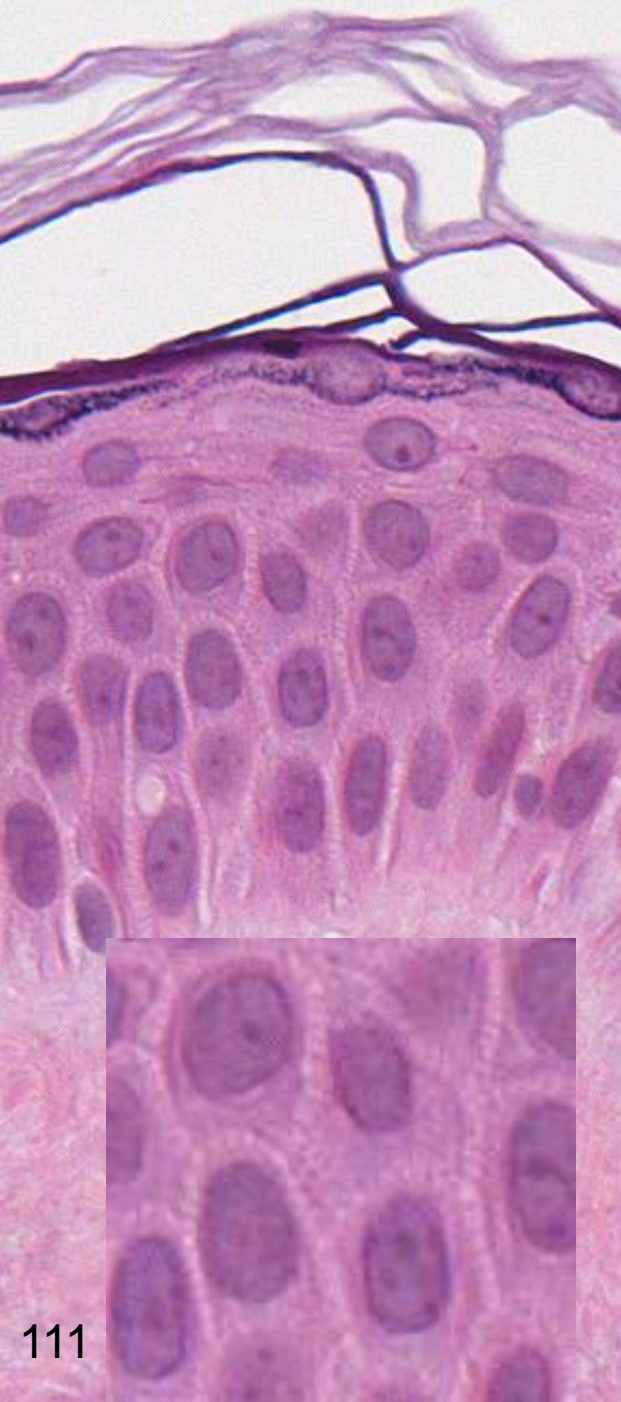
STRATUM SPINOSUM

- TONOFIBRILS -
DESMOSOMES

STRATUM BASALE

- CONTINUAL RENEWAL
OF EPIDERMIS





- 1 Stratum corneum
- 2 Stratum lucidum
- 3 Stratum granulosum
- 4 Stratum spinosum
- 5 Stratum basale
- 6 Dermal papilla
- 7 Cell with keratohyalin granules
- 8 Cells of the stratum spinosum
- 9 "Intercellular bridges" (desmosomes)

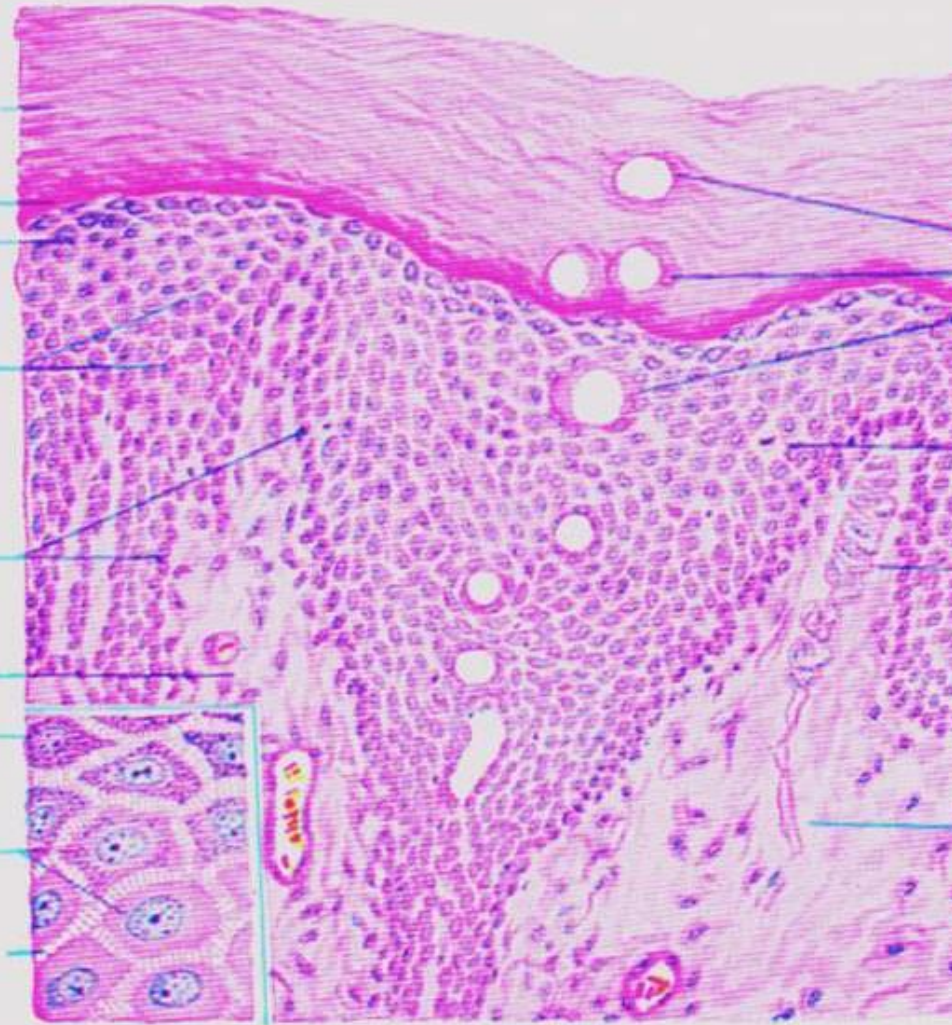
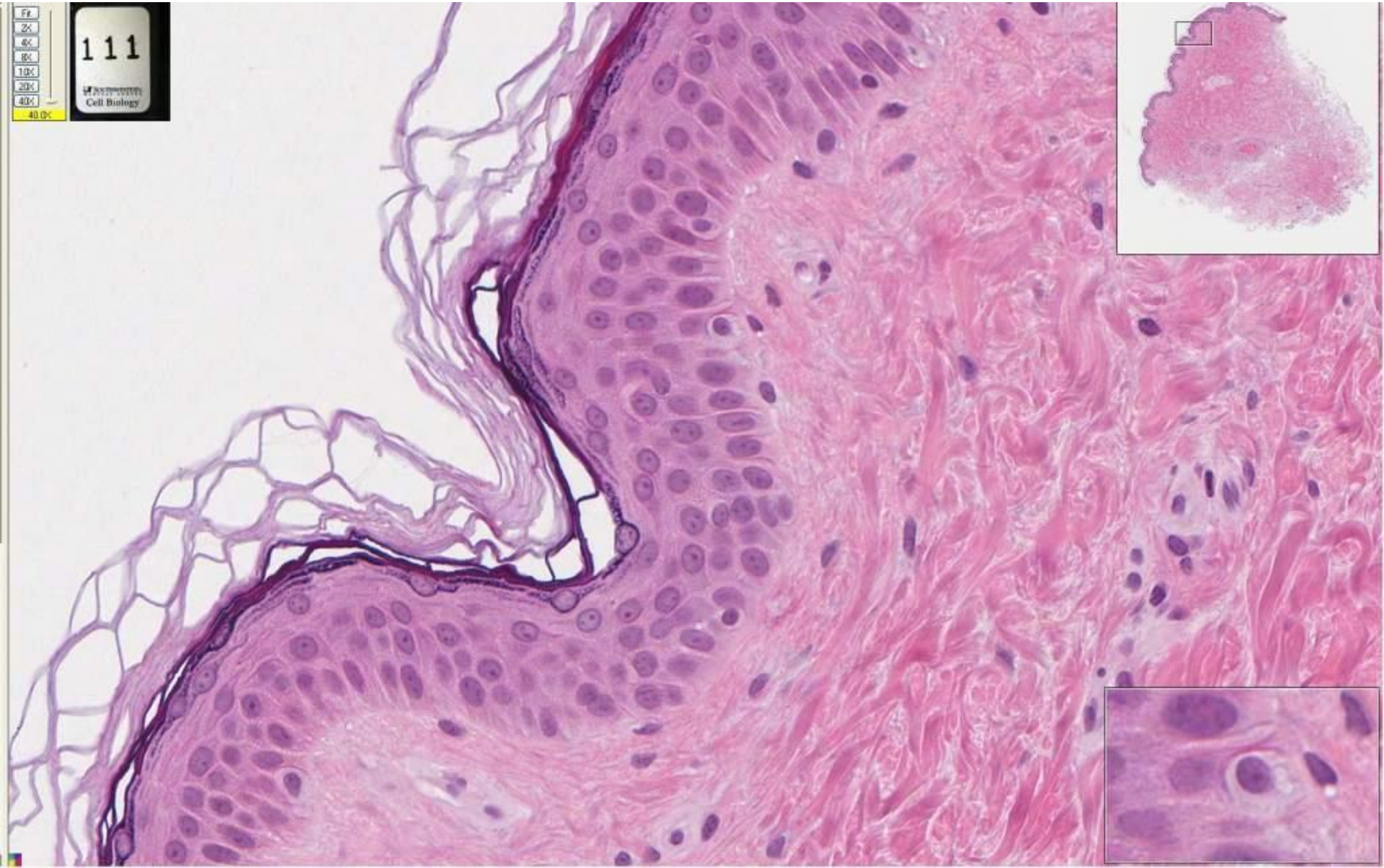


Fig. 9-2 Thick Skin, Palm: Superficial Layers. Stain: hematoxylin-eosin

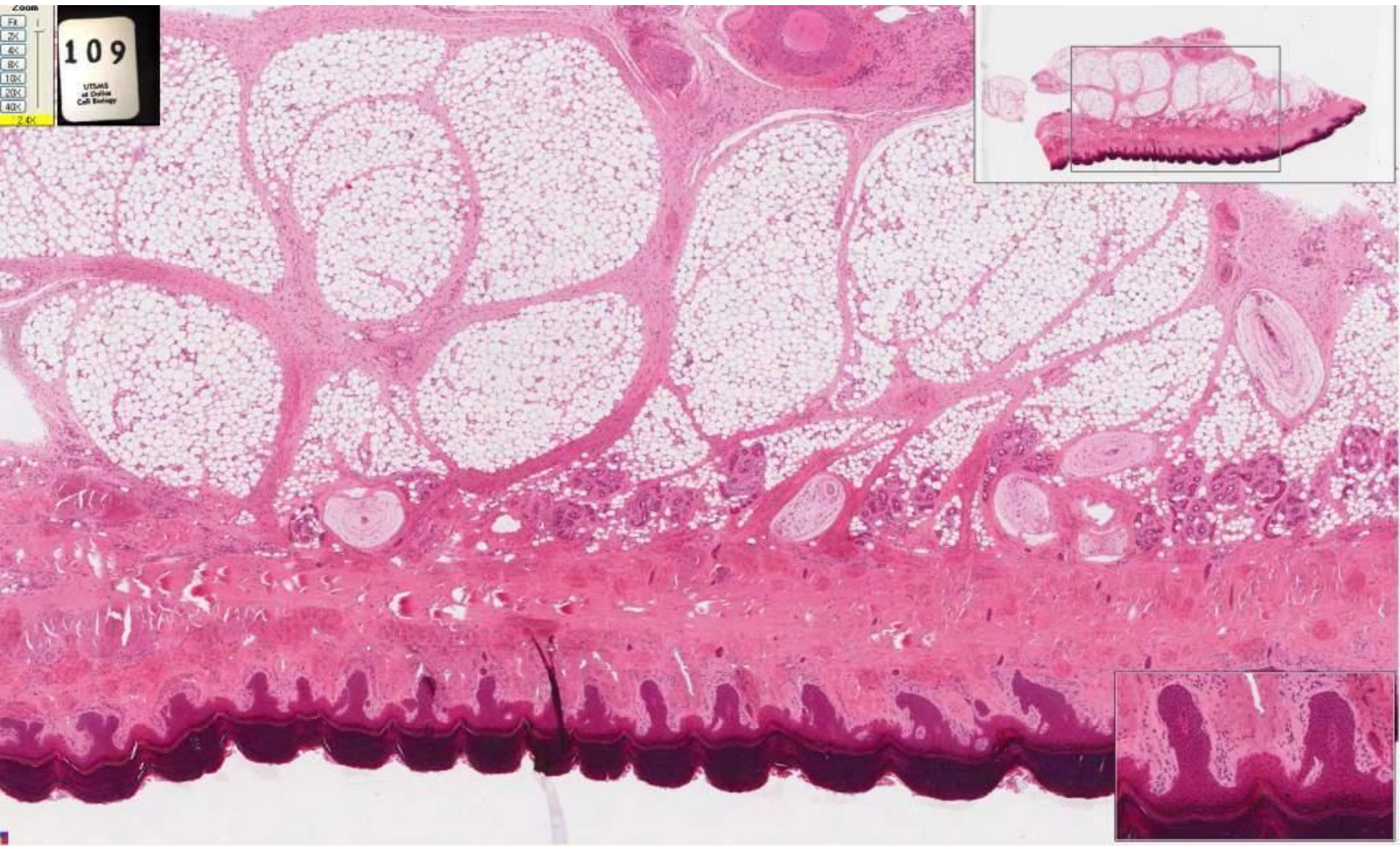
111

Skin

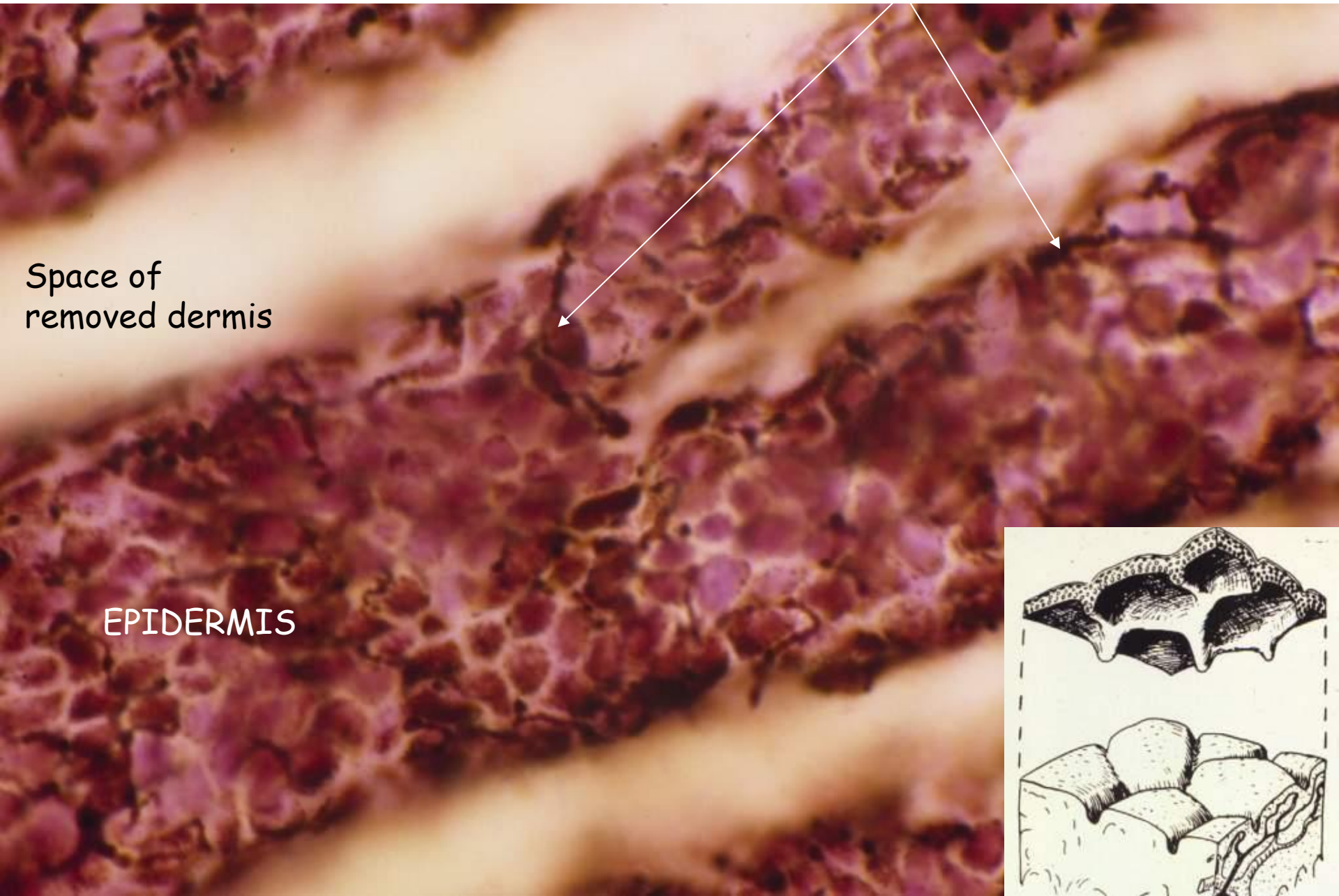


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Skin hand monkey



MELANIN-producing enzymes in MELANOCYTES

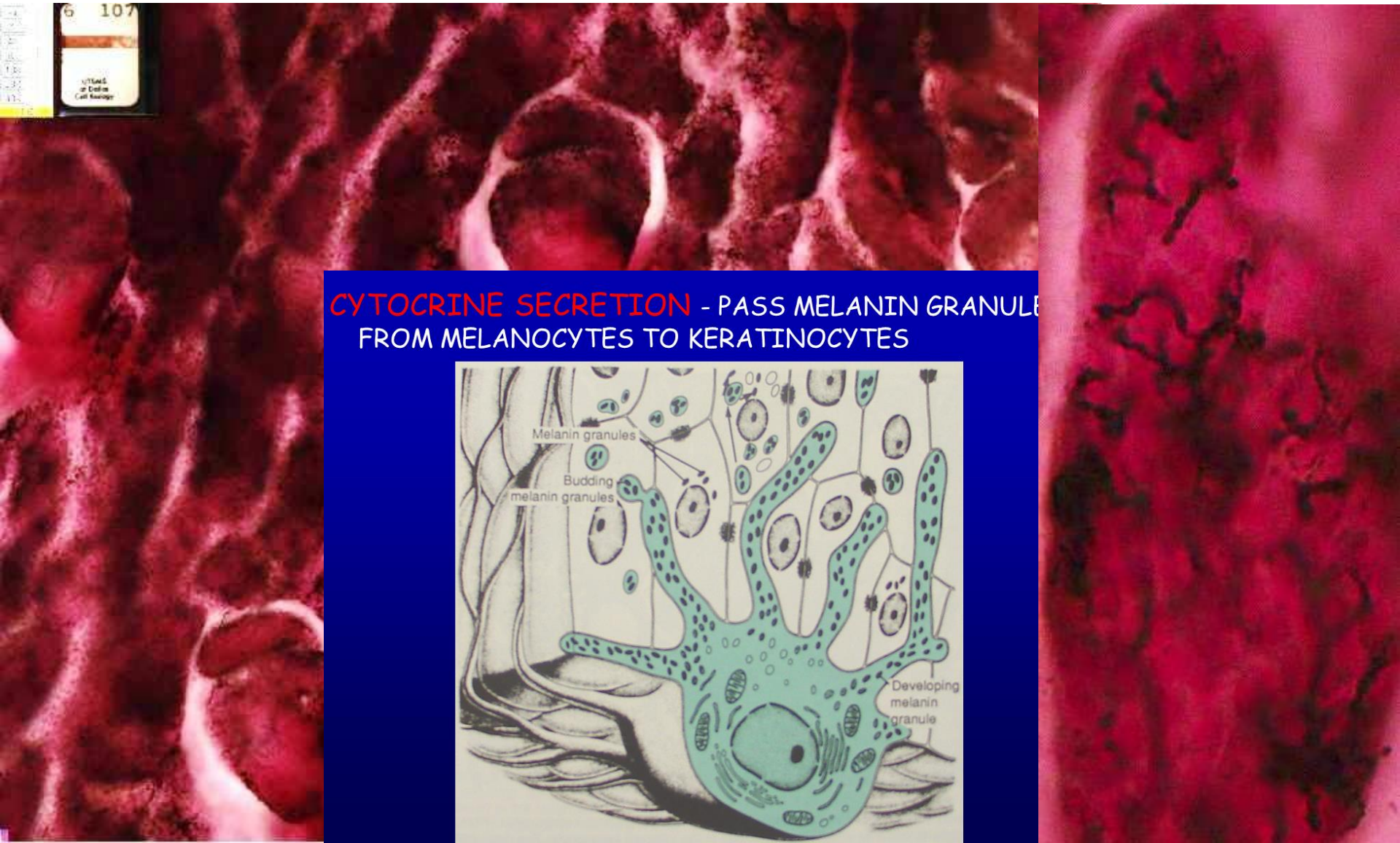


Space of removed dermis

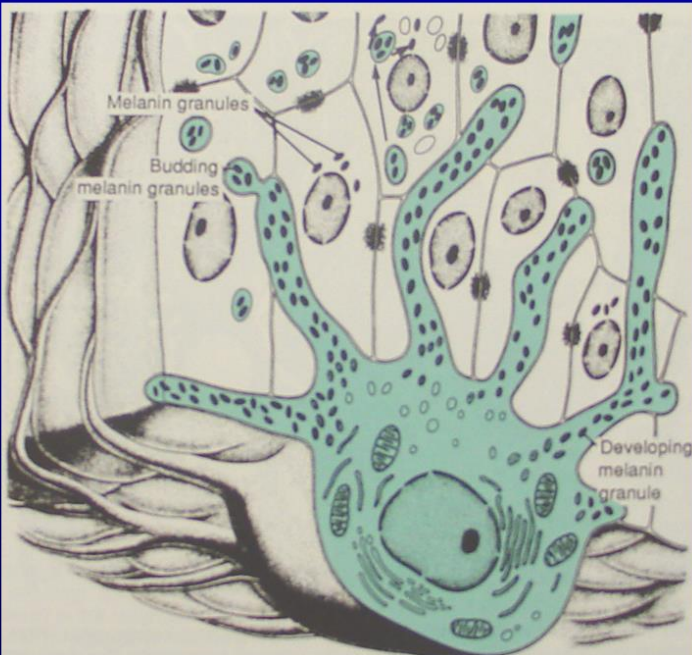
EPIDERMIS



Skin, melanocytes, guinea pig (DOPA reaction)



CYTOCRINE SECRETION - PASS MELANIN GRANULES FROM MELANOCYTES TO KERATINOCYTES

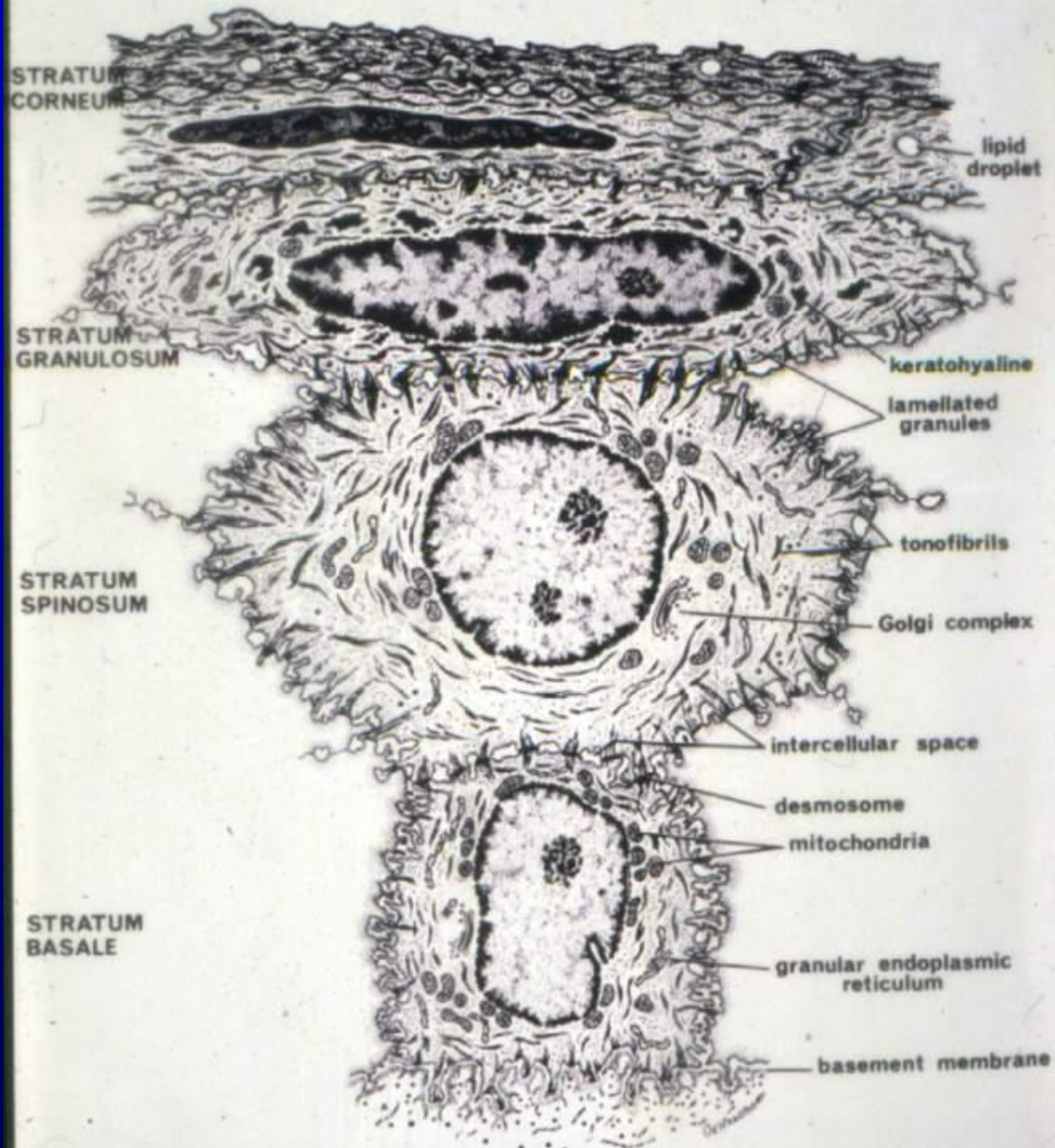


STRATUM
CORNEUM

STRATUM
GRANULOSUM

STRATUM
SPINOSUM

STRATUM
BASALE

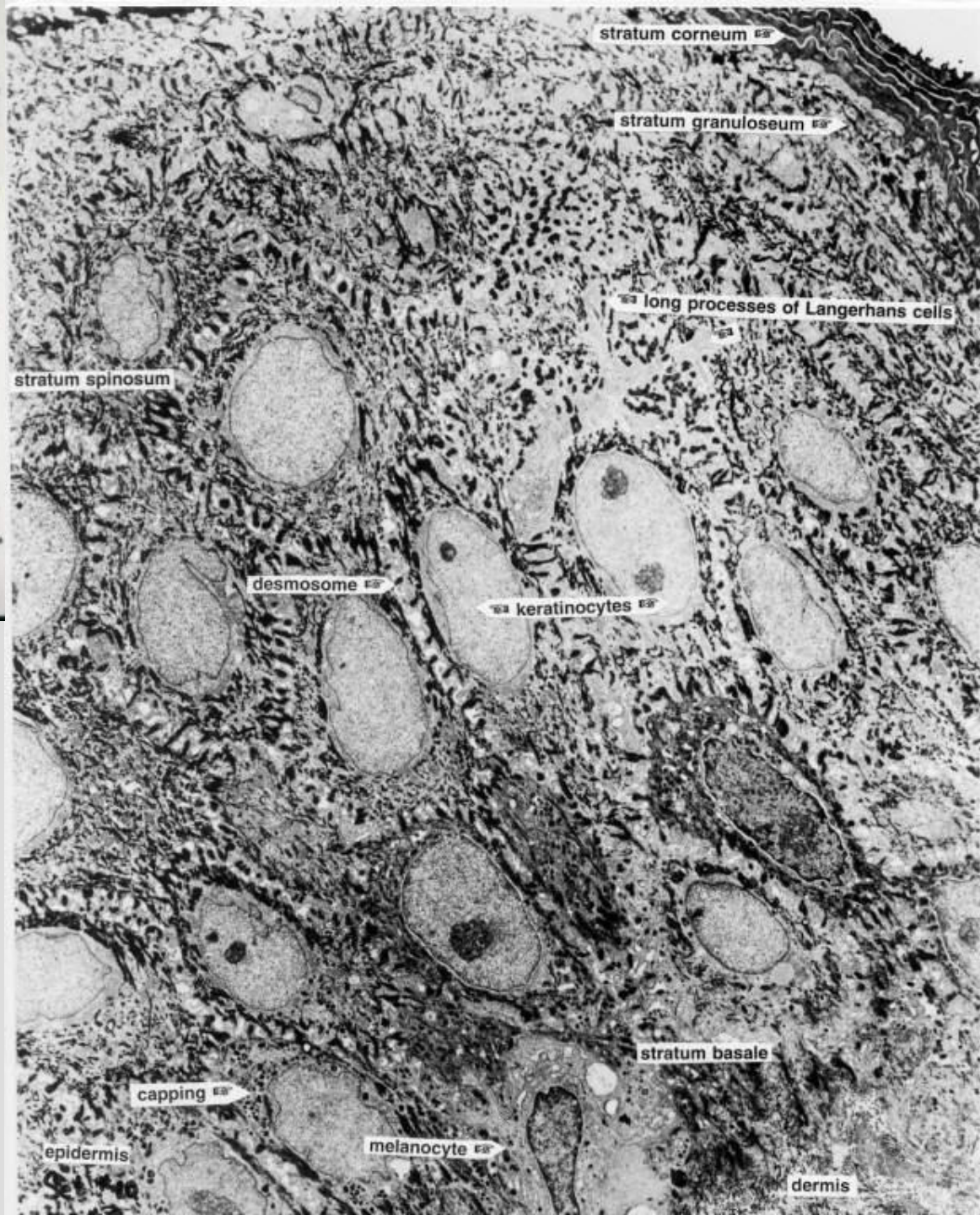
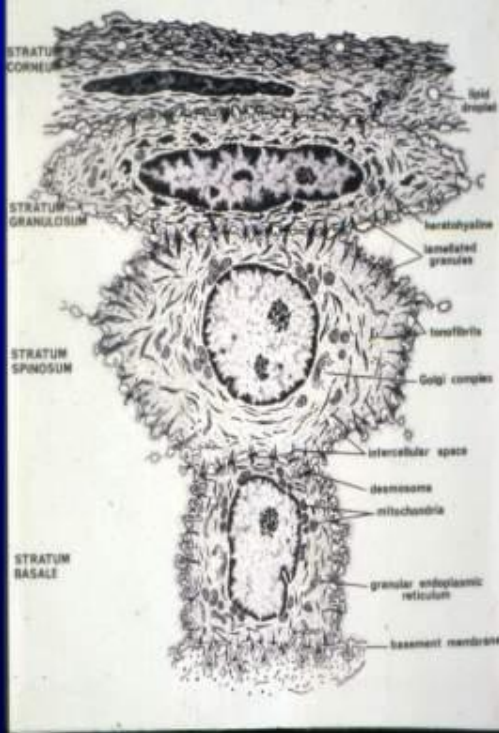


STRATUM CORNEUM

STRATUM GRANULOSUM

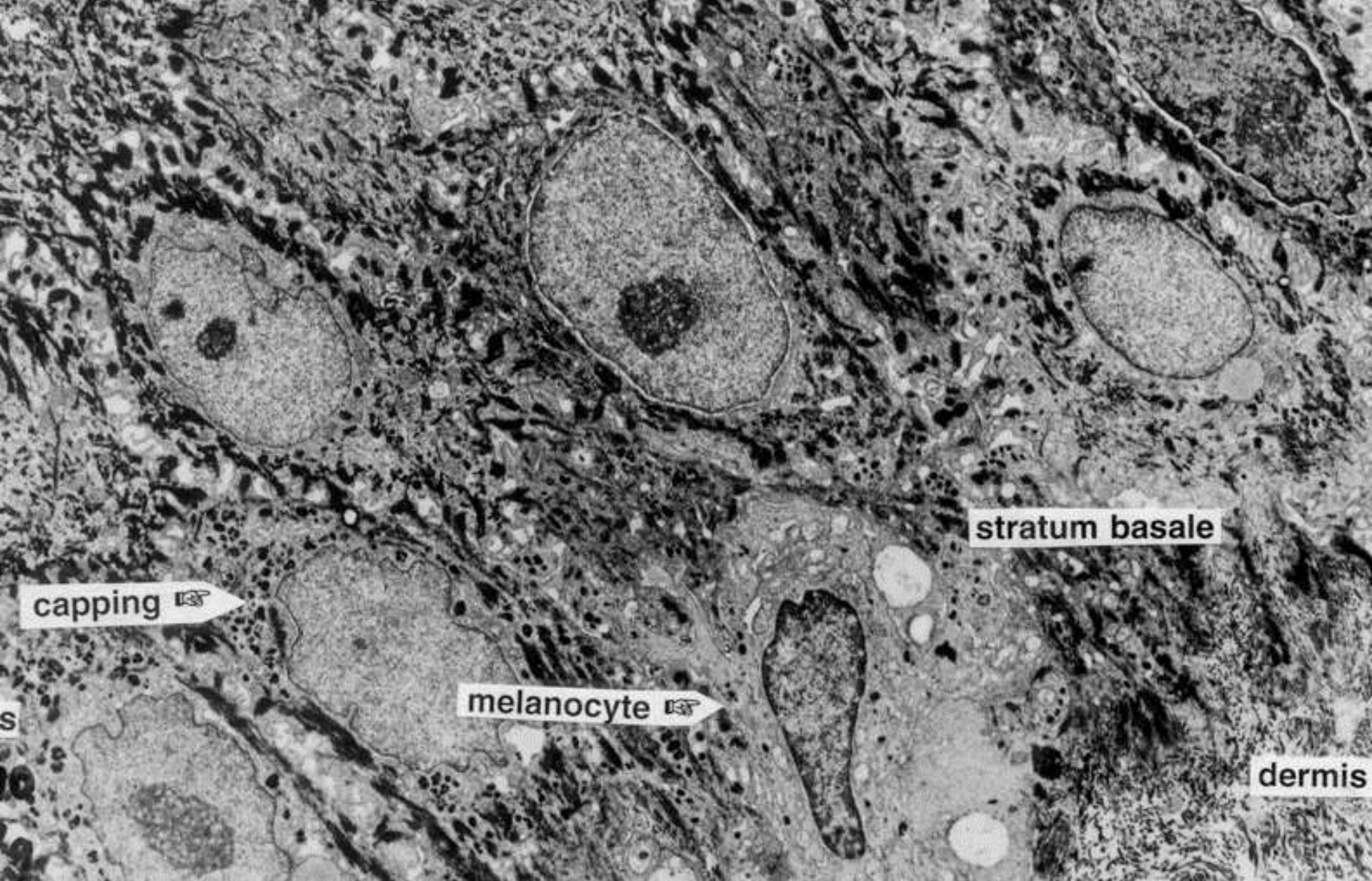
STRATUM SPINOSUM

STRATUM BASALE



EM 8g of skin: Note the different layers and the cellular contents of each

1. Stratum corneum
2. Startum granulosum
3. Stratum spinosum



2. Desmosome
3. Melanocyte

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Skin abdomen



THREE TYPES OF GRANULES IN KERATINOCYTES

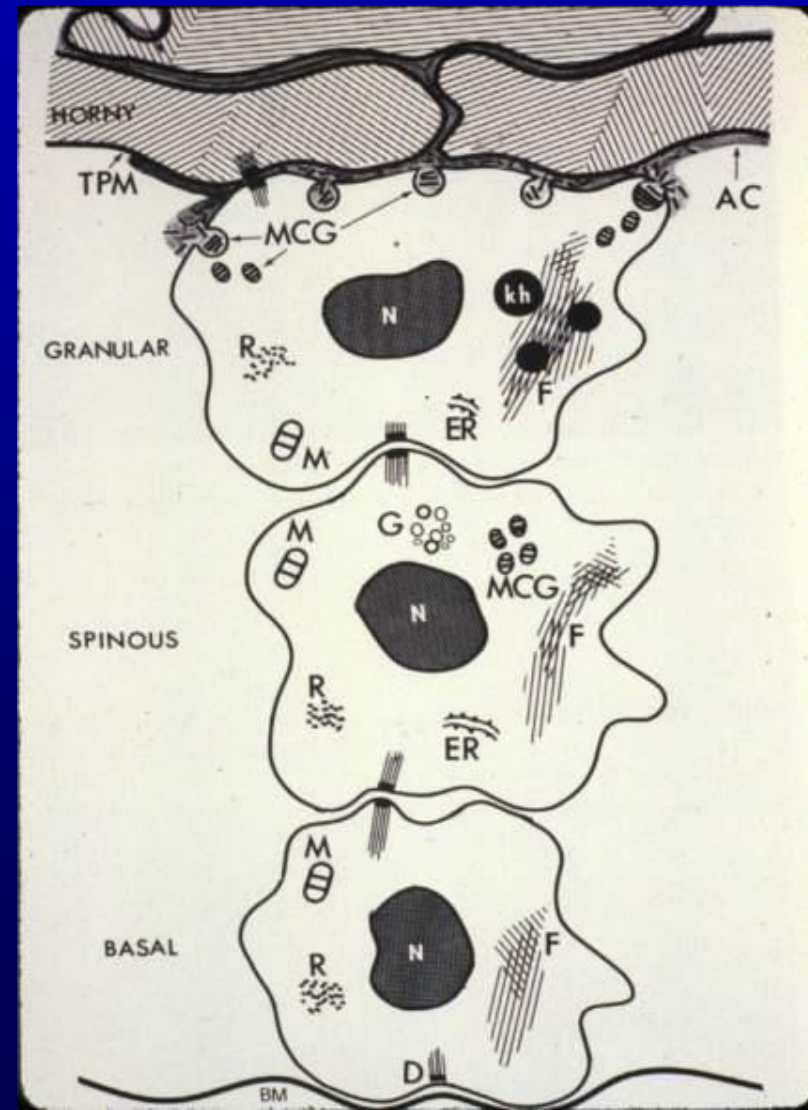
MELANIN

- SKIN PIGMENT
- PRODUCED BY MELANOCYTES AND PASSED BY CYTOCRINE SECRETION TO KERATINOCYTES

MEMBRANE COATING GRANULES (LAMELLATED GRANULES)

- WATER PROOFING FUNCTION
- PRODUCED BY KERATINOCYTES

KERATINOHYALIN GRANULES



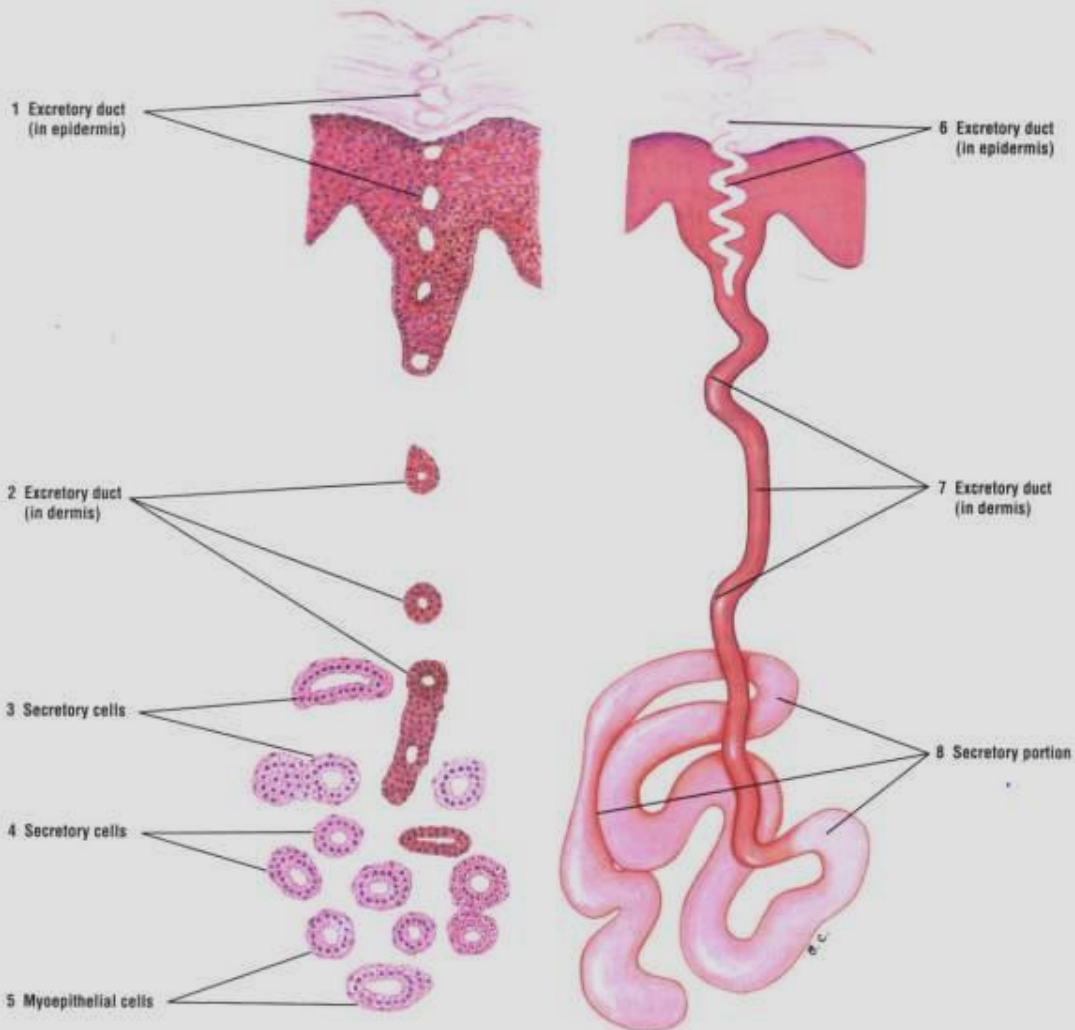


Fig. 9-3 Sweat Glands. Stain: hematoxylin-eosin. Low magnification.

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Skin, scalp - sweat glands and ducts

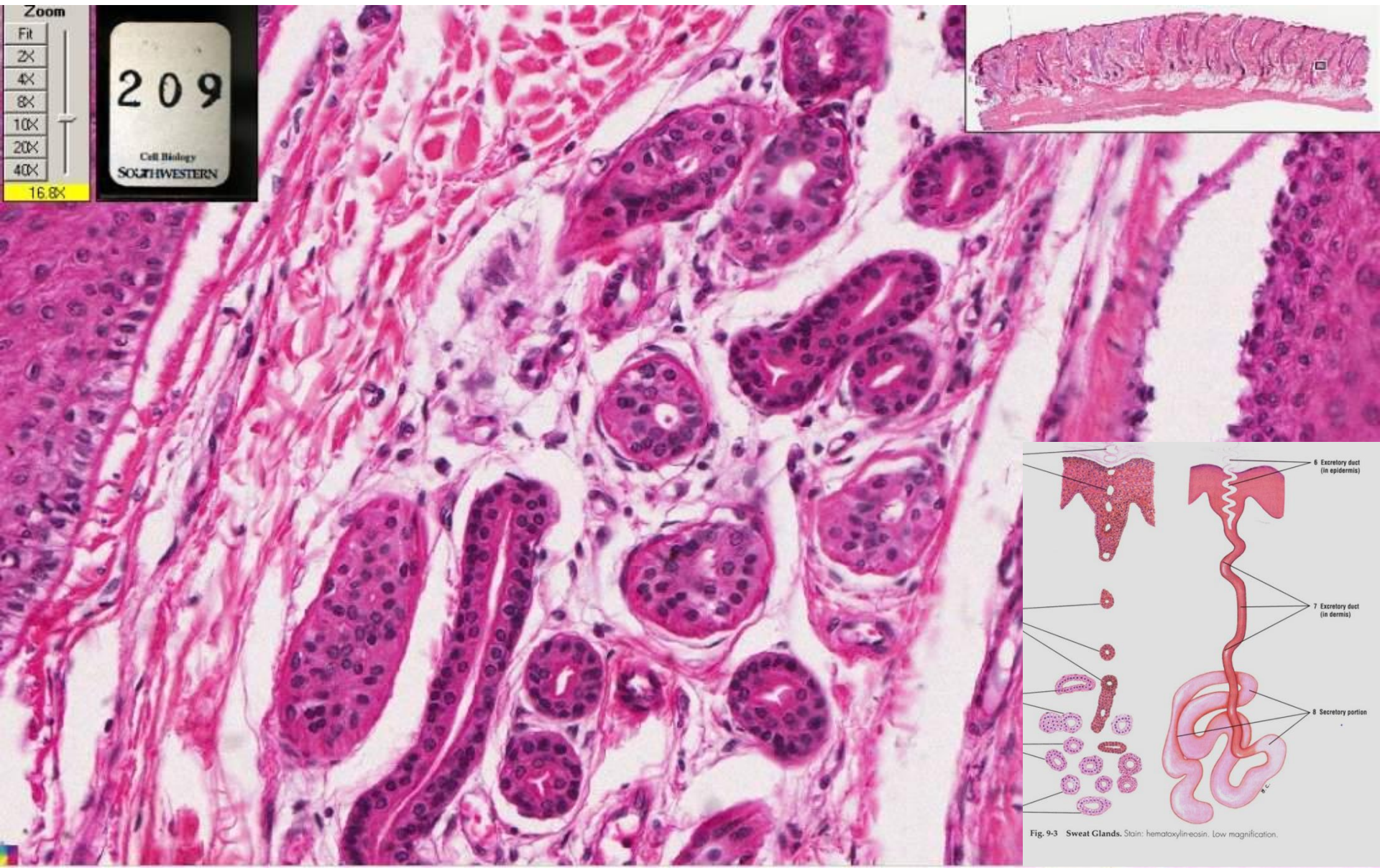
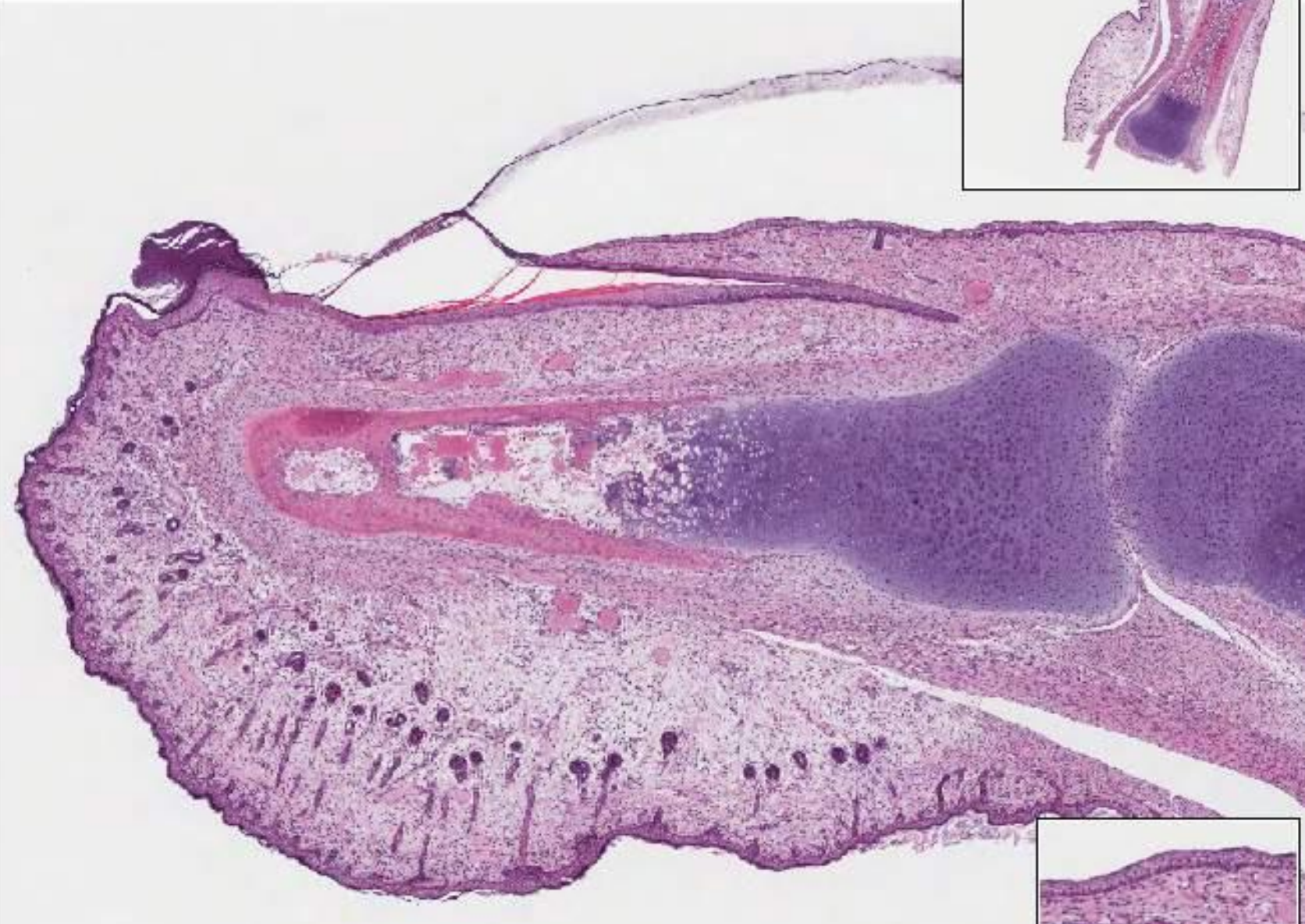


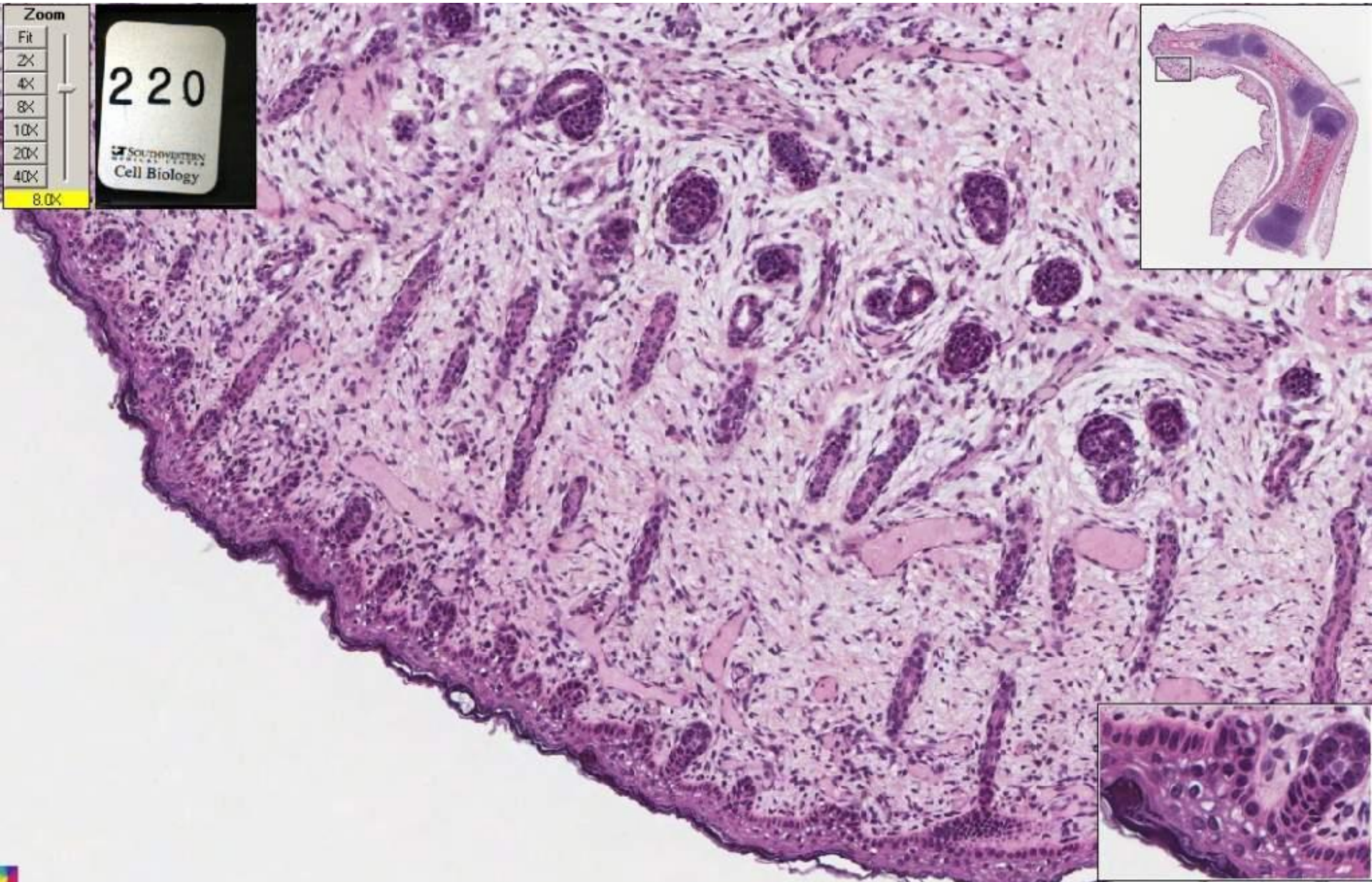
Fig. 9-3 Sweat Glands. Stain: hematoxylin-eosin. Low magnification.

220 Skin of Fetal finger

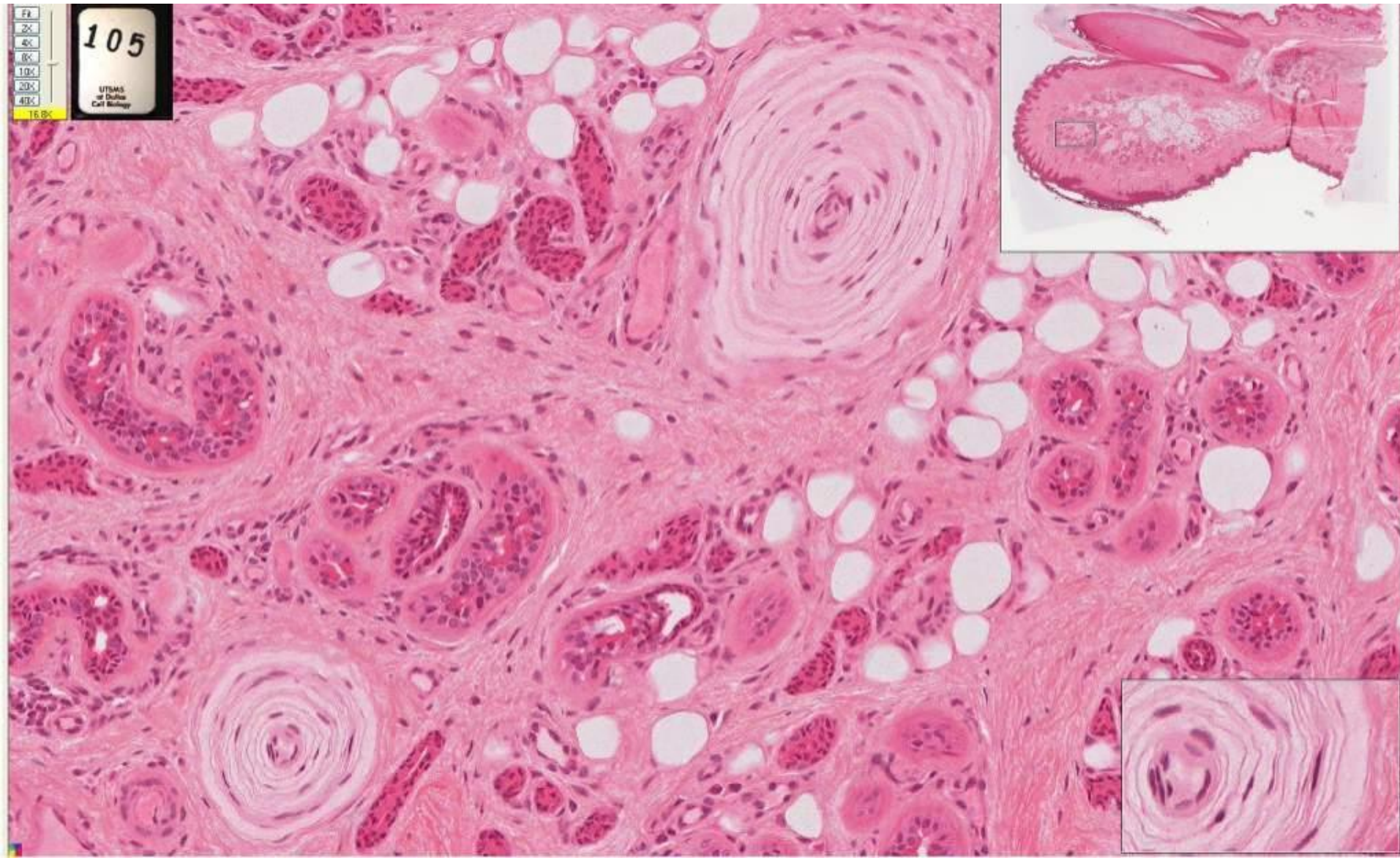


220

Skin of Fetal finger

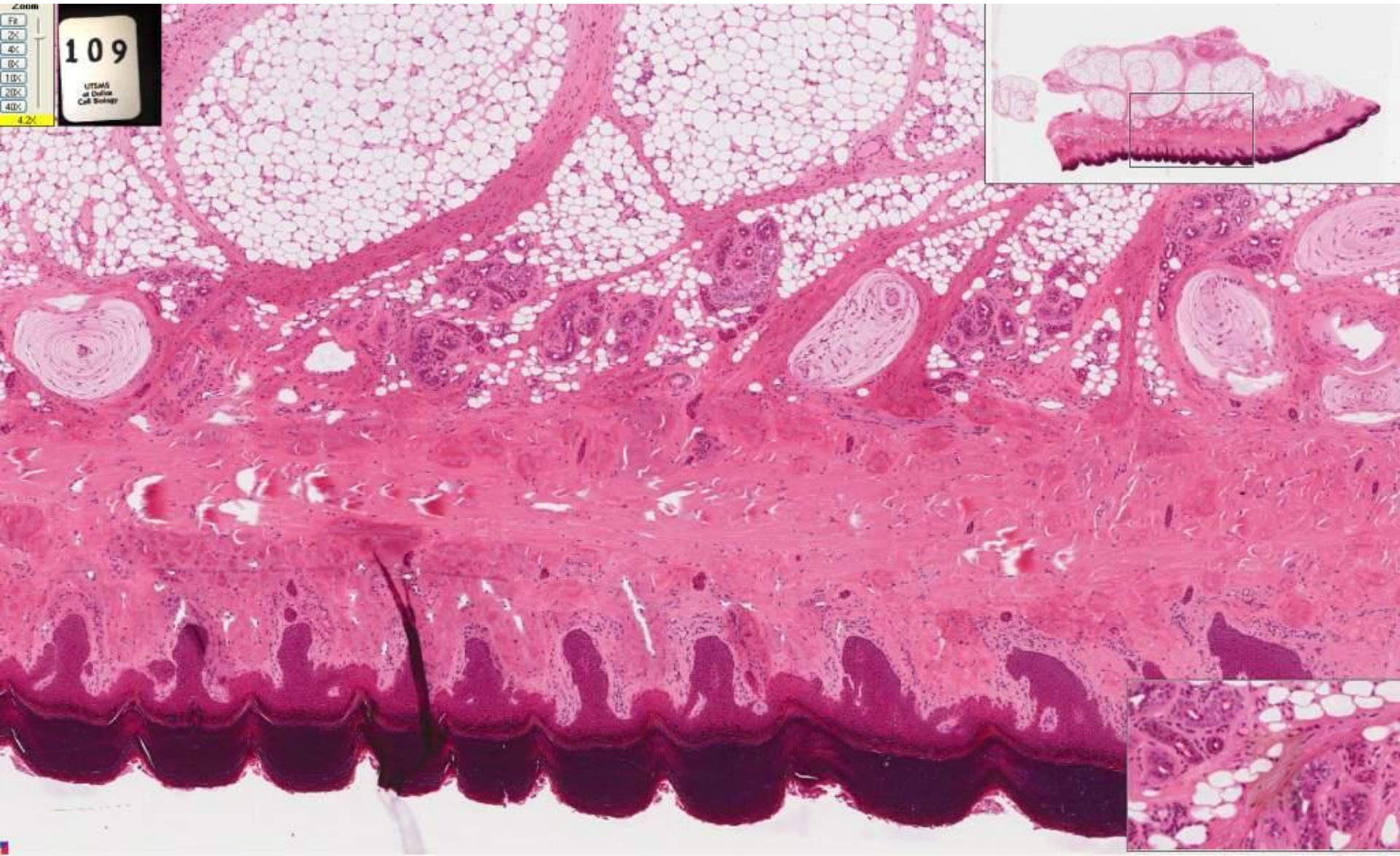


105 Fingertip, monkey - sweat glands and ducts among Pacinian corpuscles



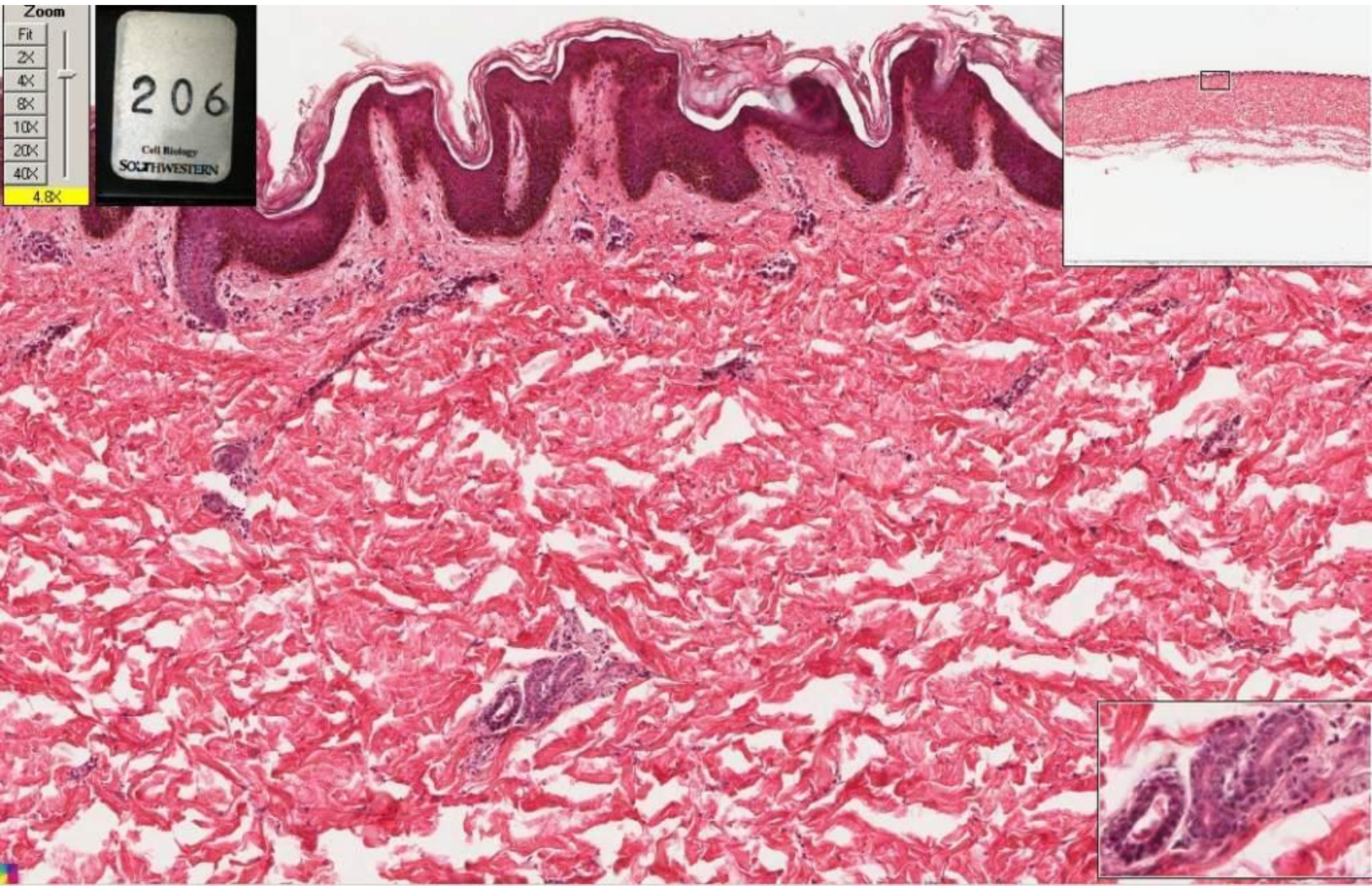
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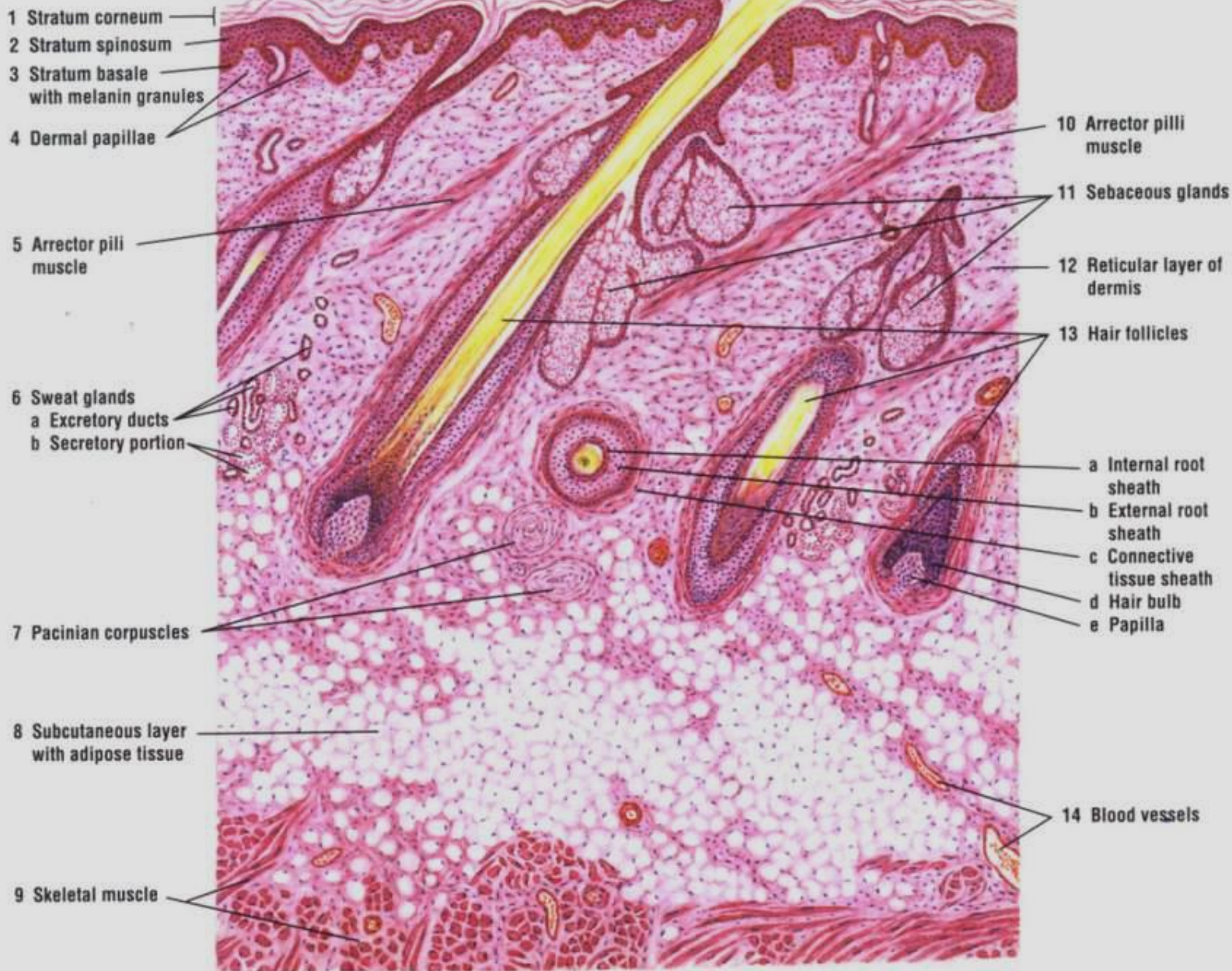
Skin hand monkey



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Skin abdomen





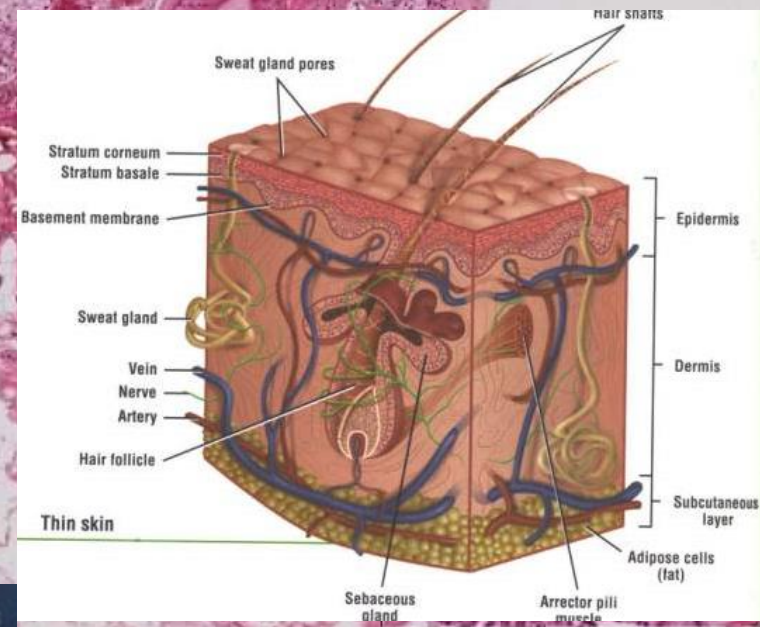
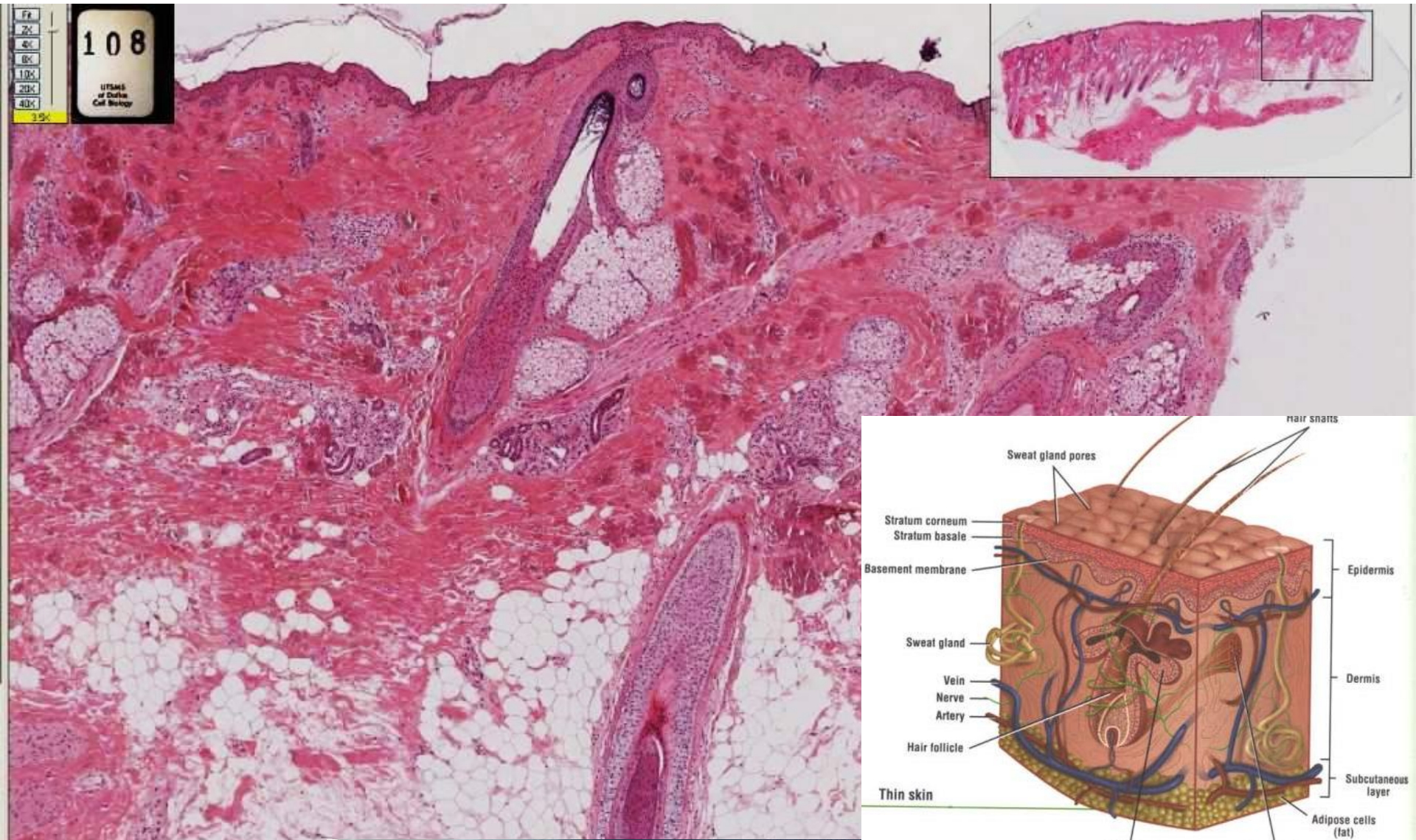
in: Scalp. Stain: hematoxylin-eosin. Low magnification.

209

Skin, scalp



Skin, scalp



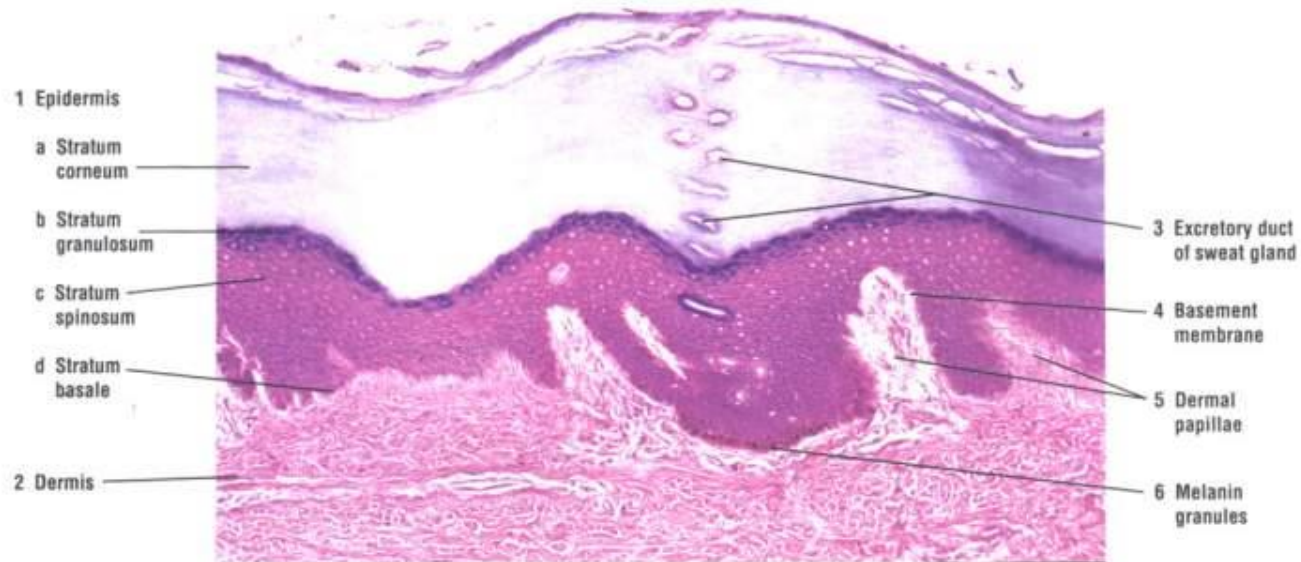


Fig. 9-10 Thick Skin: Epidermis and Superficial Cell Layers. Stain: hematoxylin-eosin, 40X

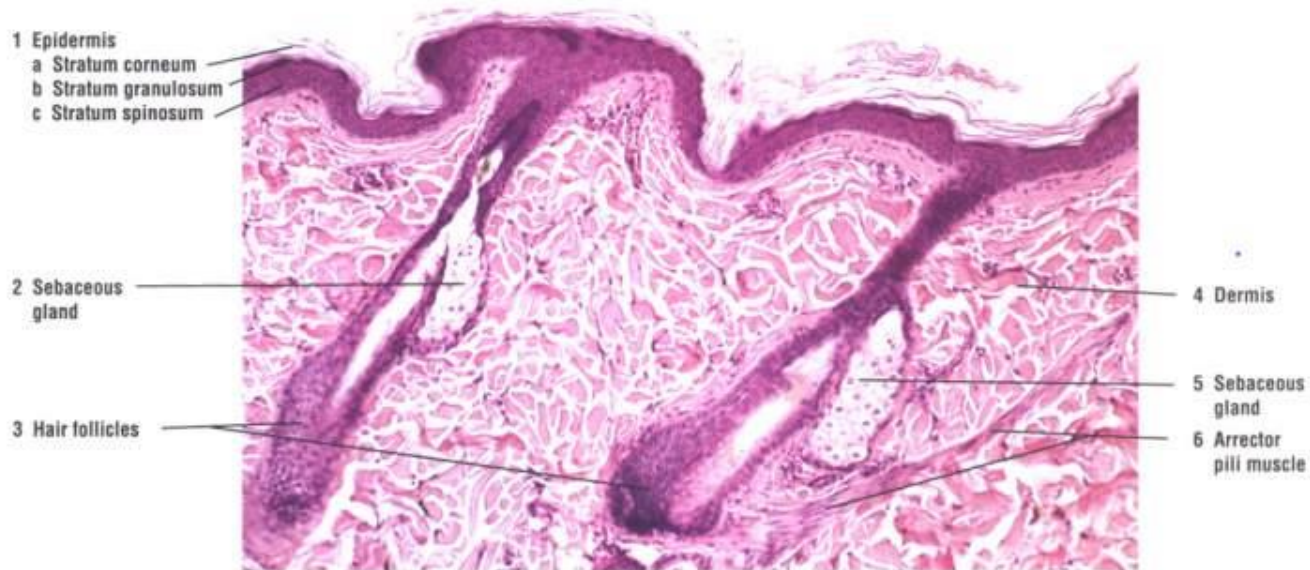
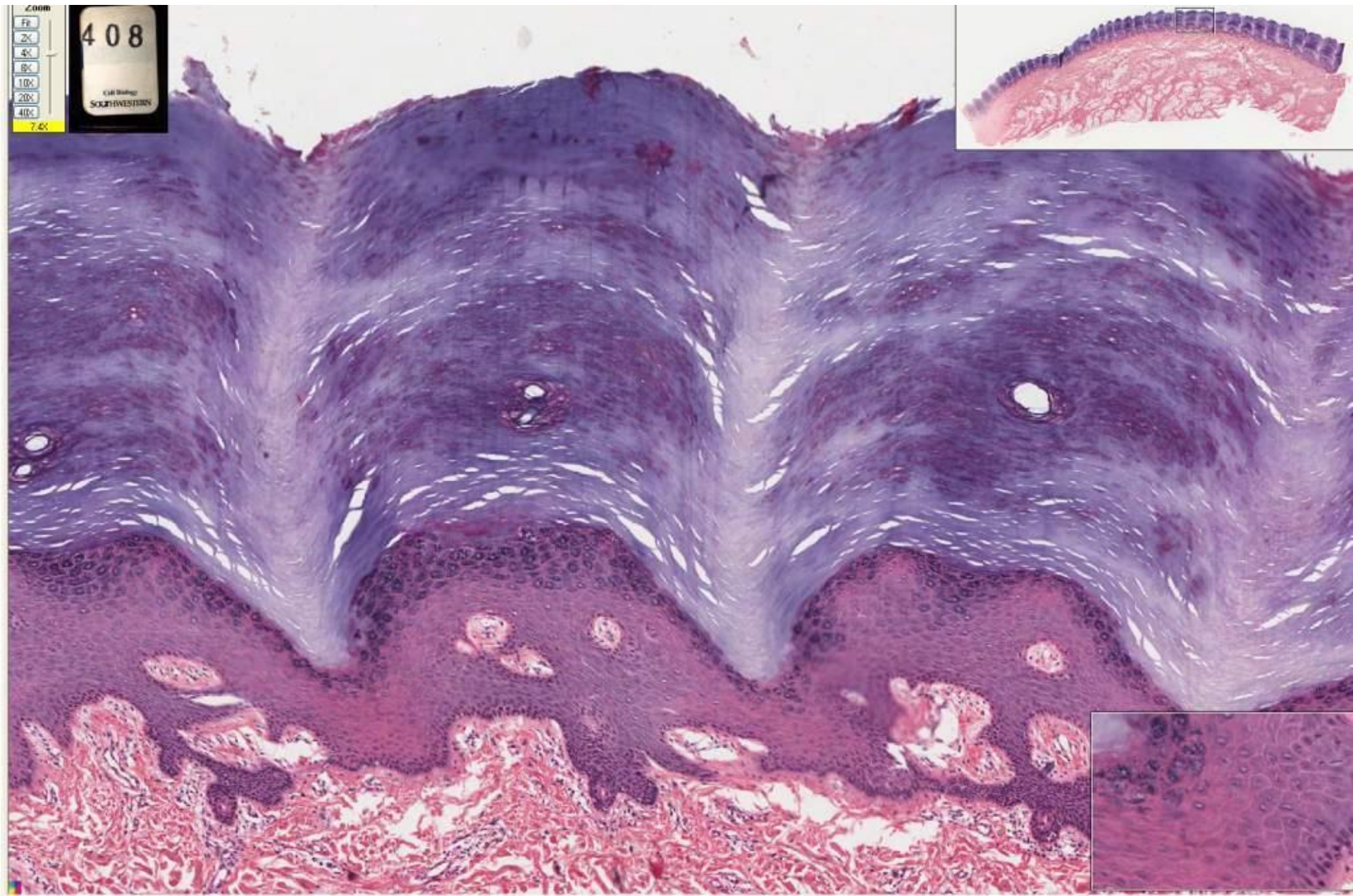


Fig. 9-11 Hair-Thin Skin of the Scalp: Hair Follicles and Surrounding Structures. Stain: hematoxylin-eosin,

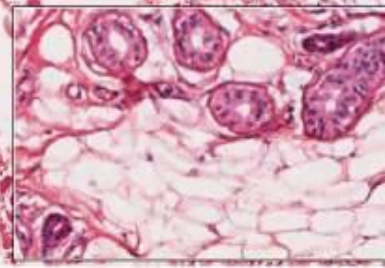
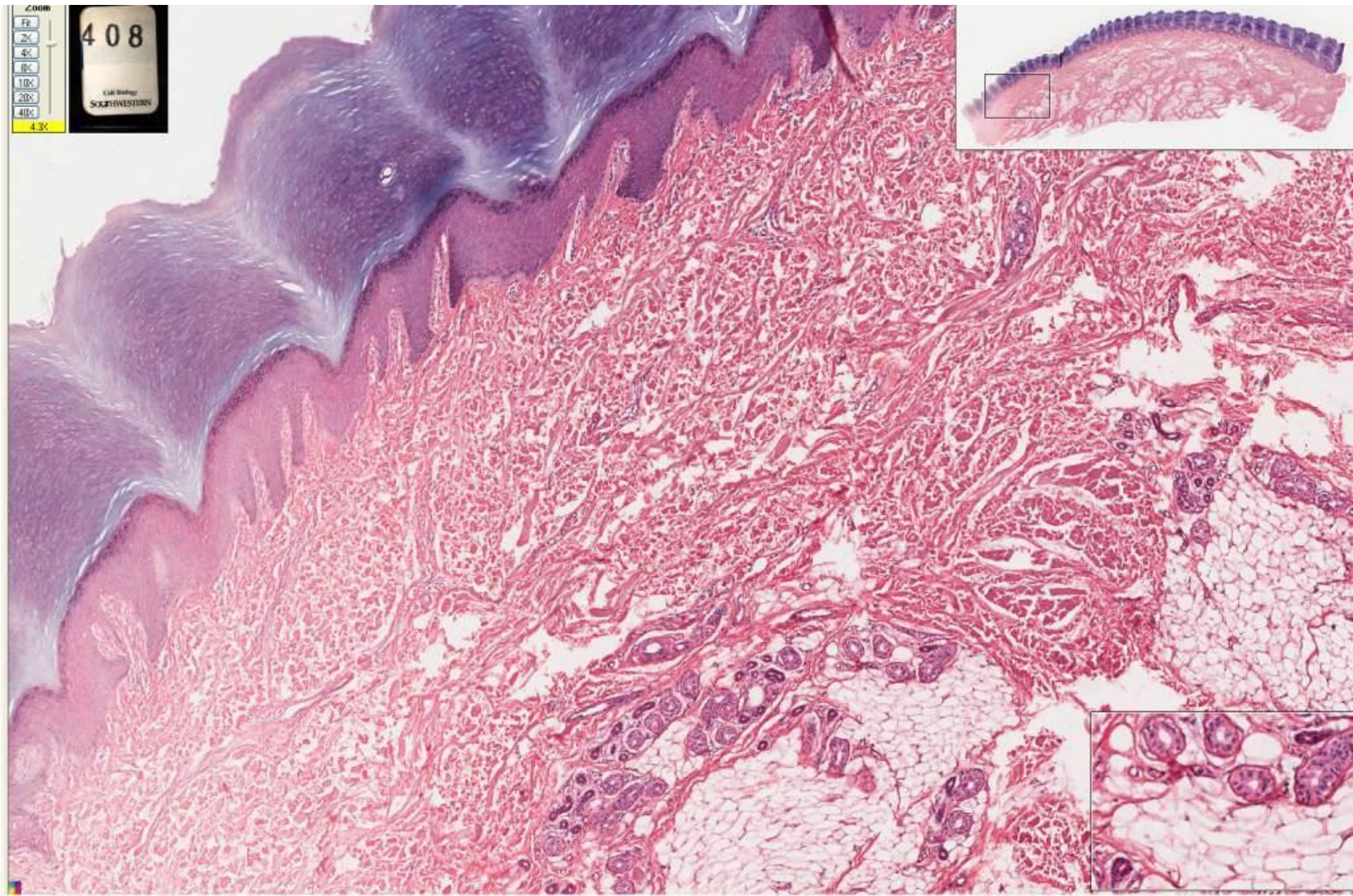
408

Skin, foot



408

Skin, foot



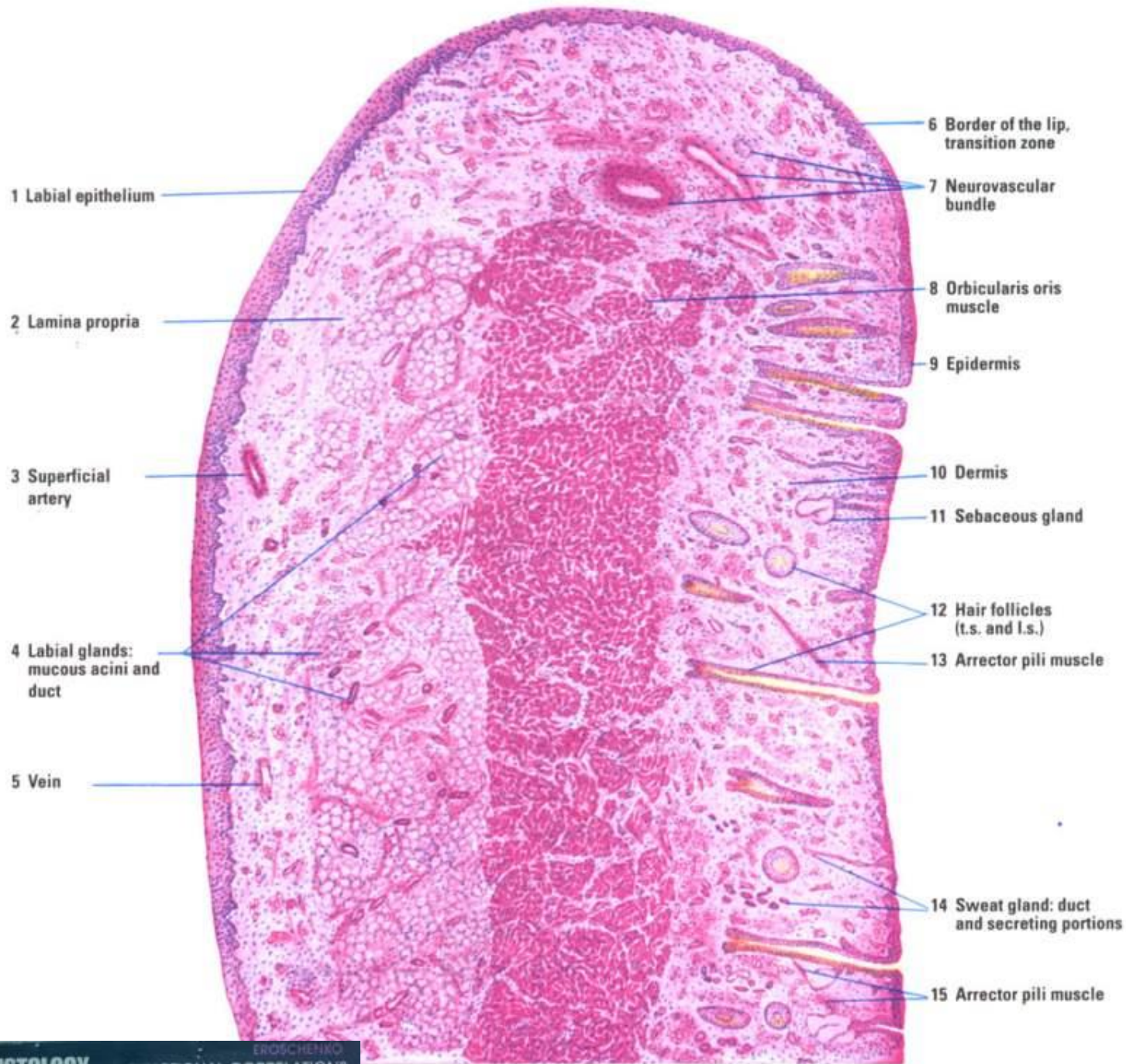
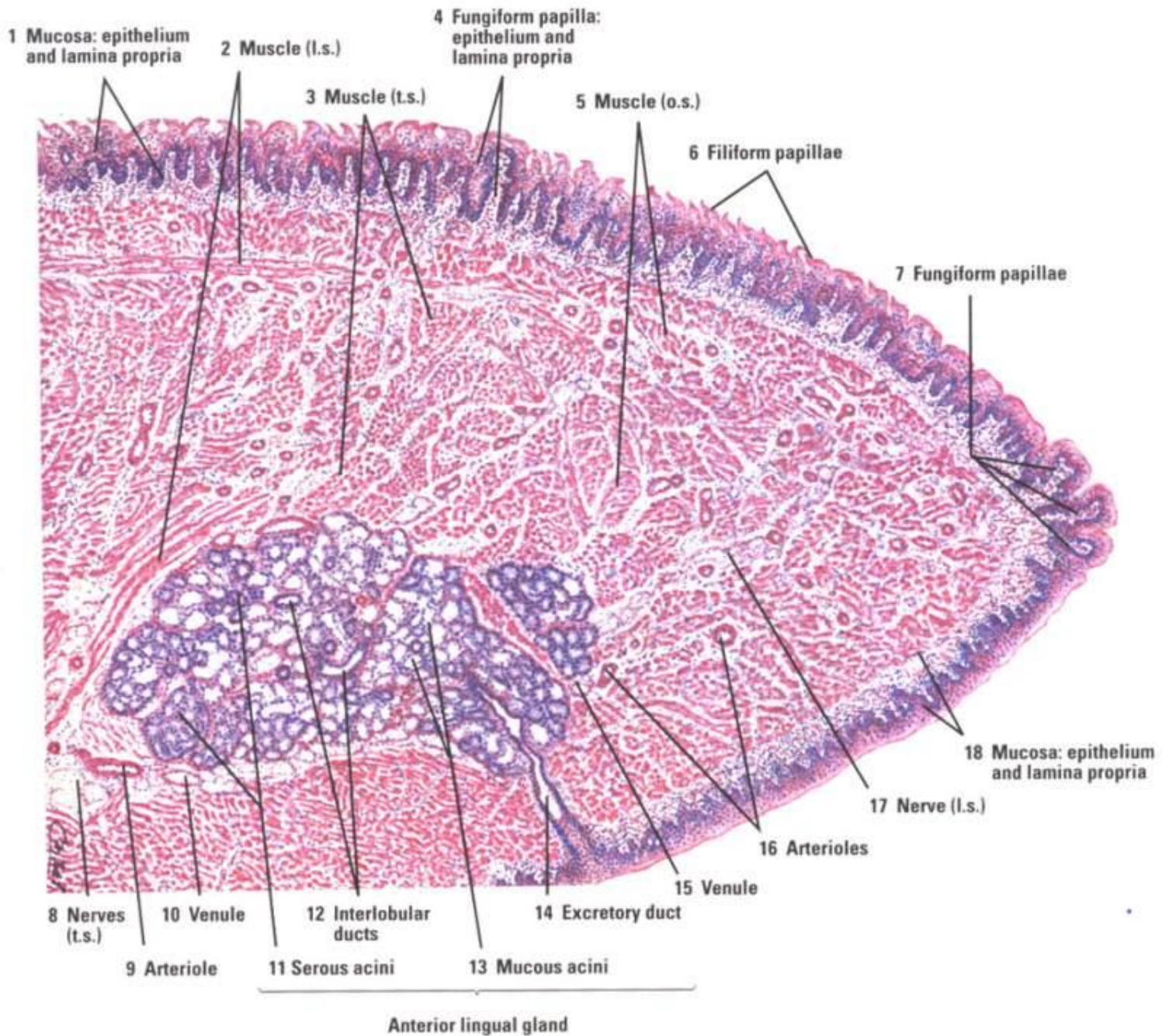


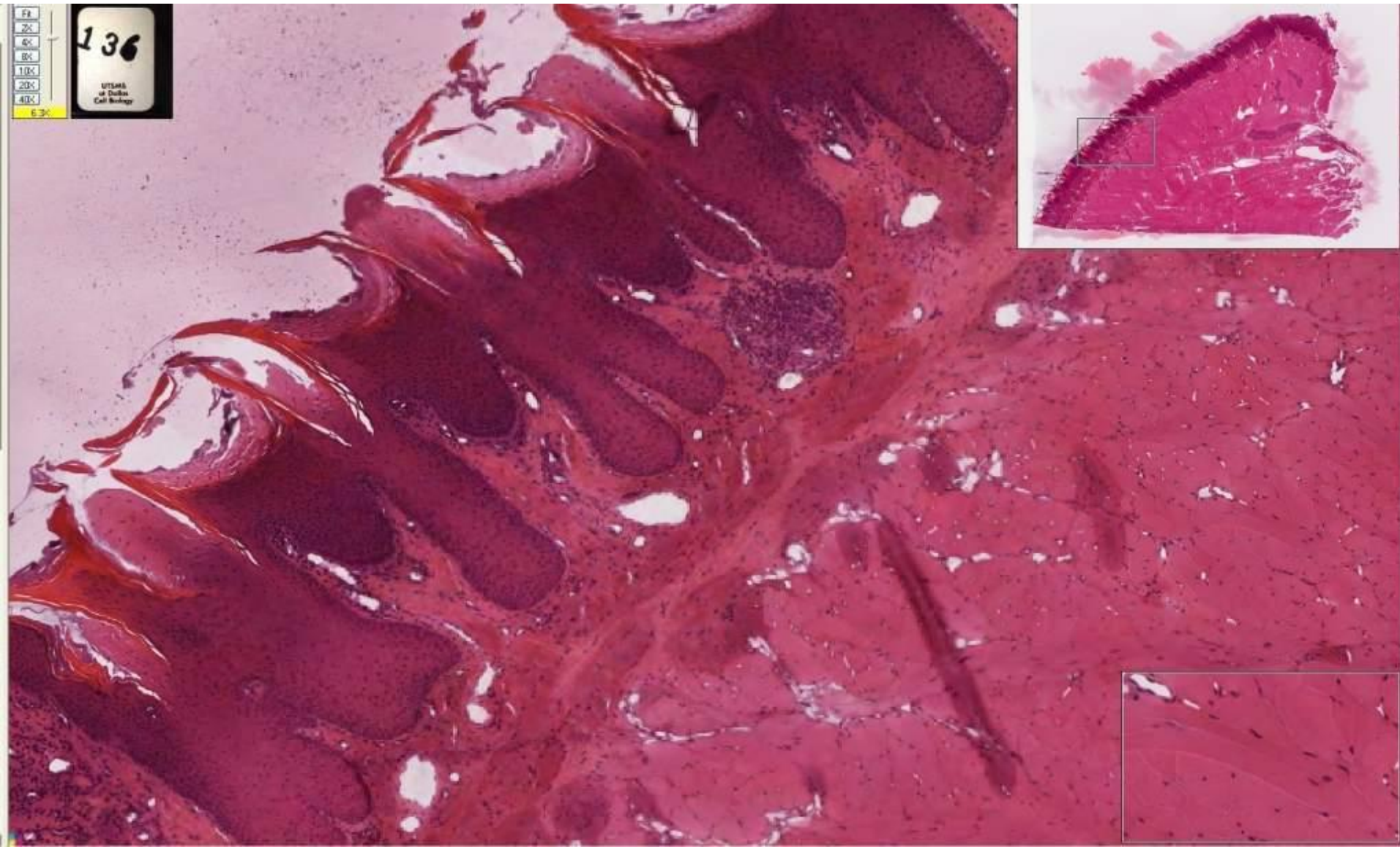
FIG. 10-1 Lip (longitudinal section). Stain: hematoxylin-eosin. Low magnification.



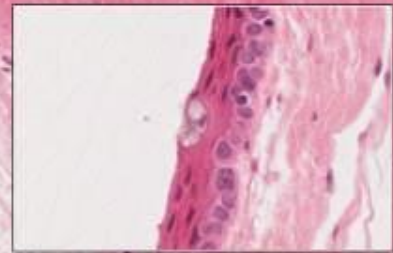
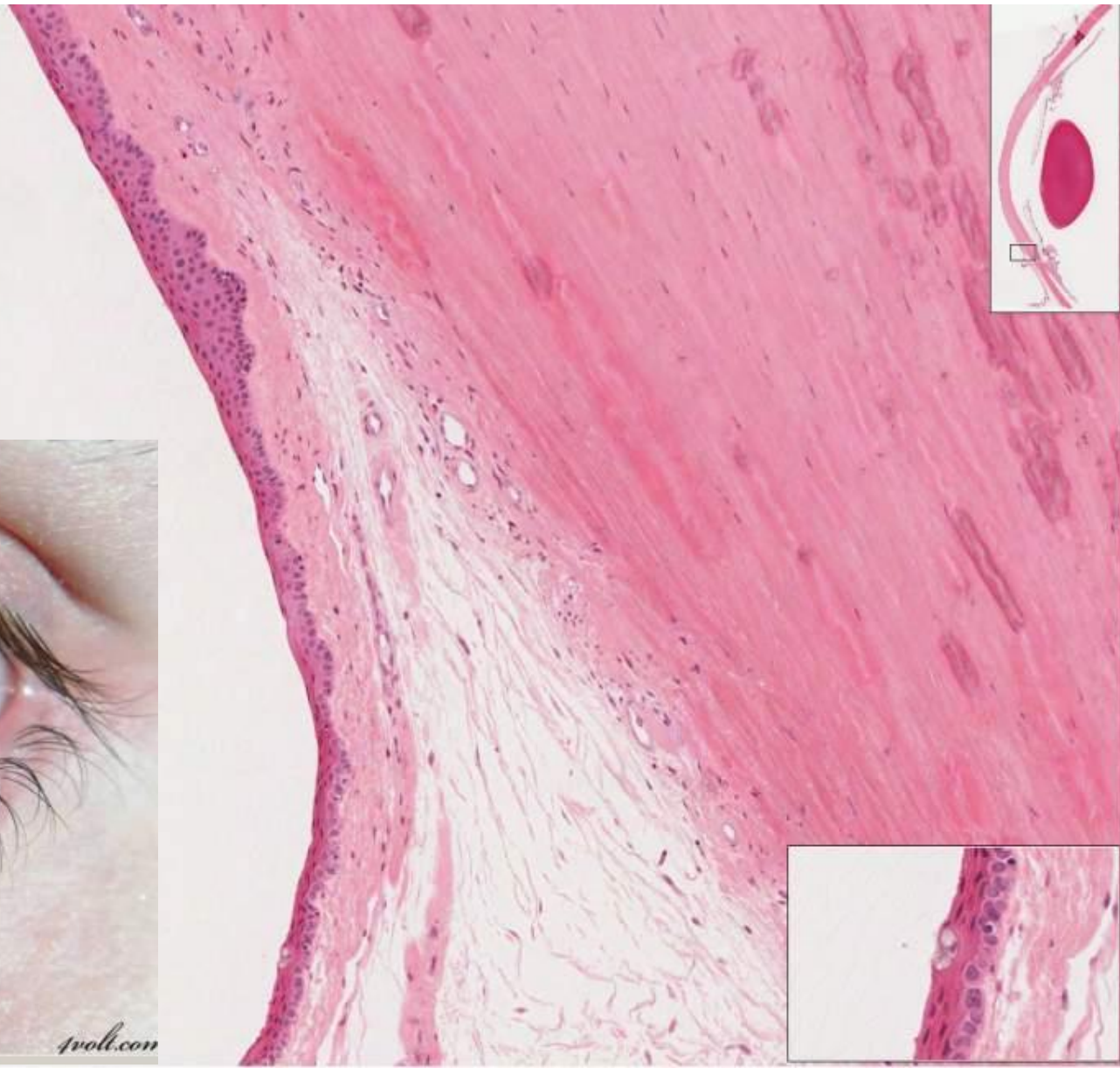
Anterior lingual gland

136

Tongue, monkey

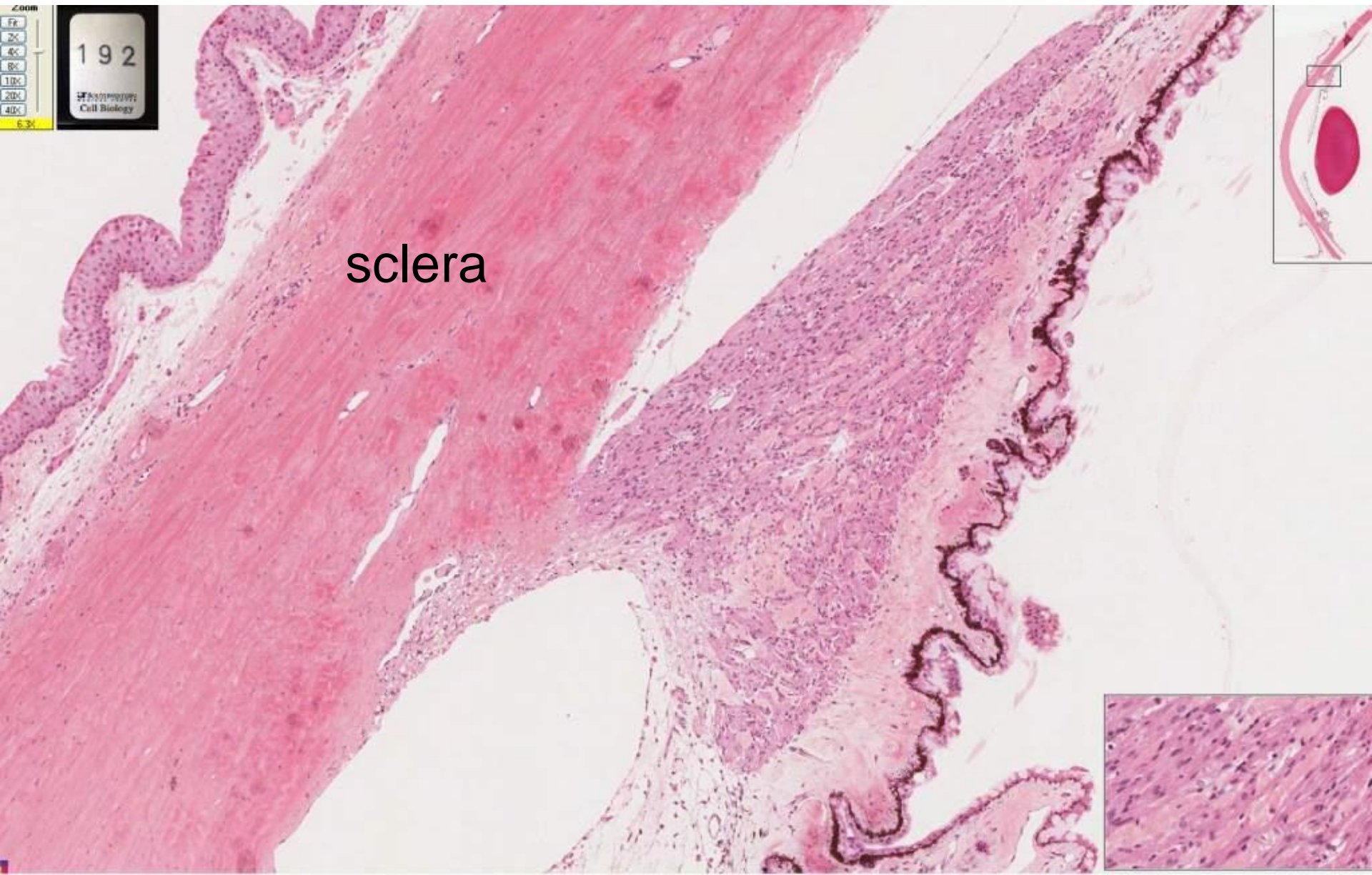


192 Eye – conjunctiva on white of eye



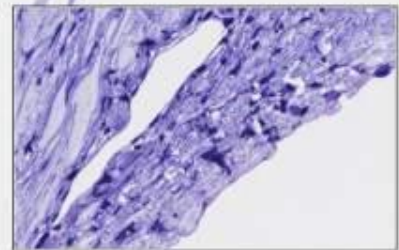
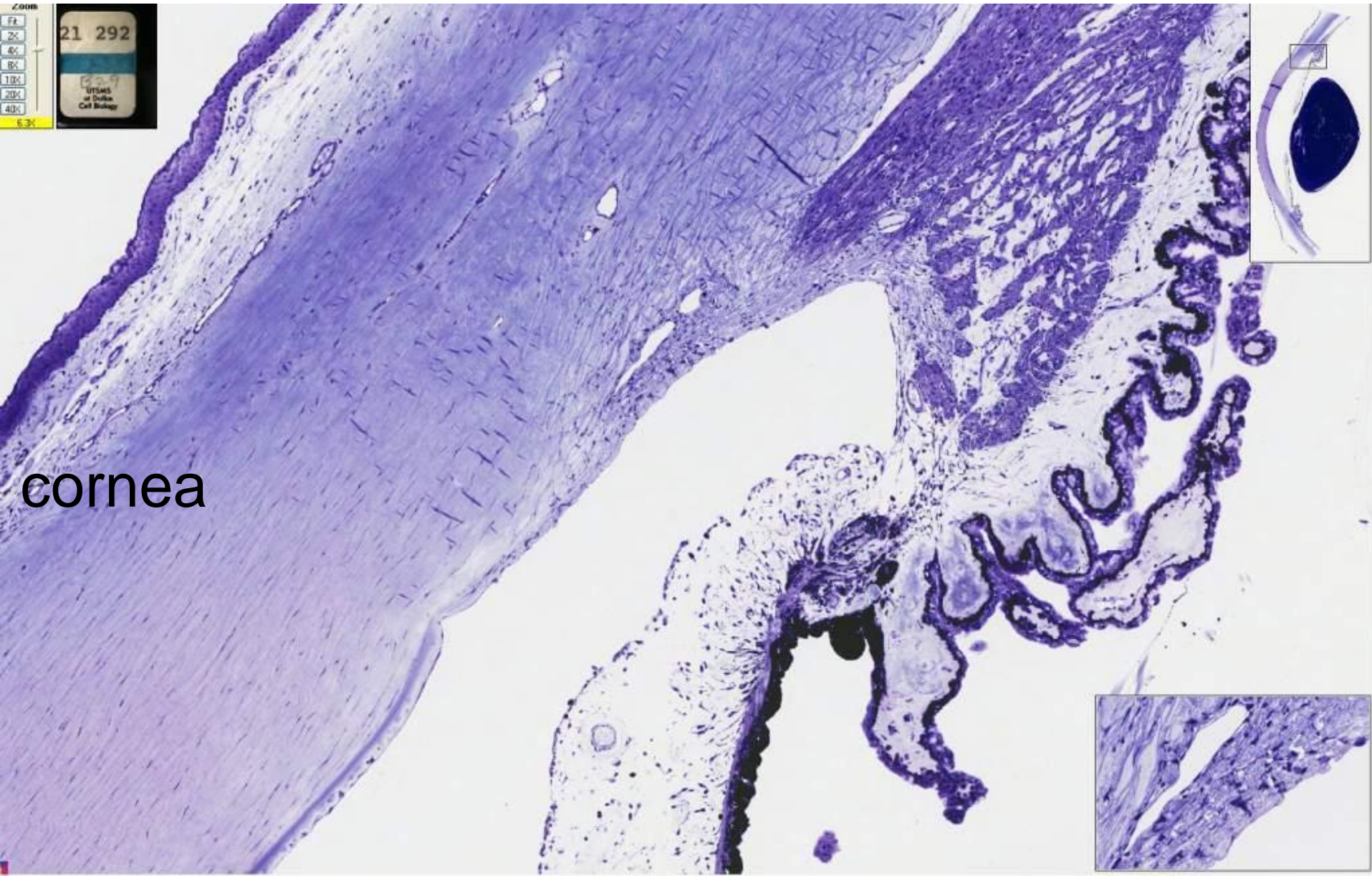
192

Eye – sclera



292

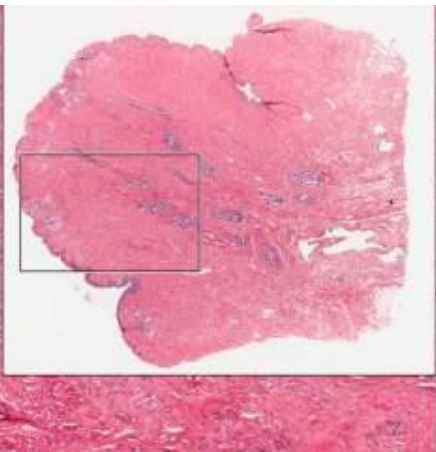
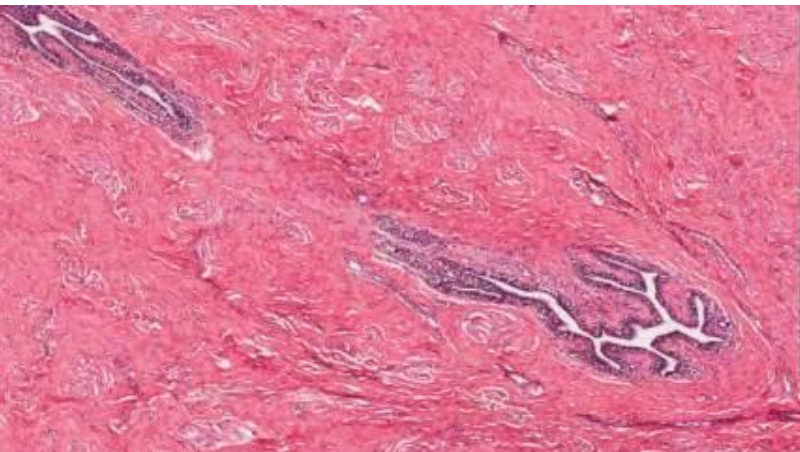
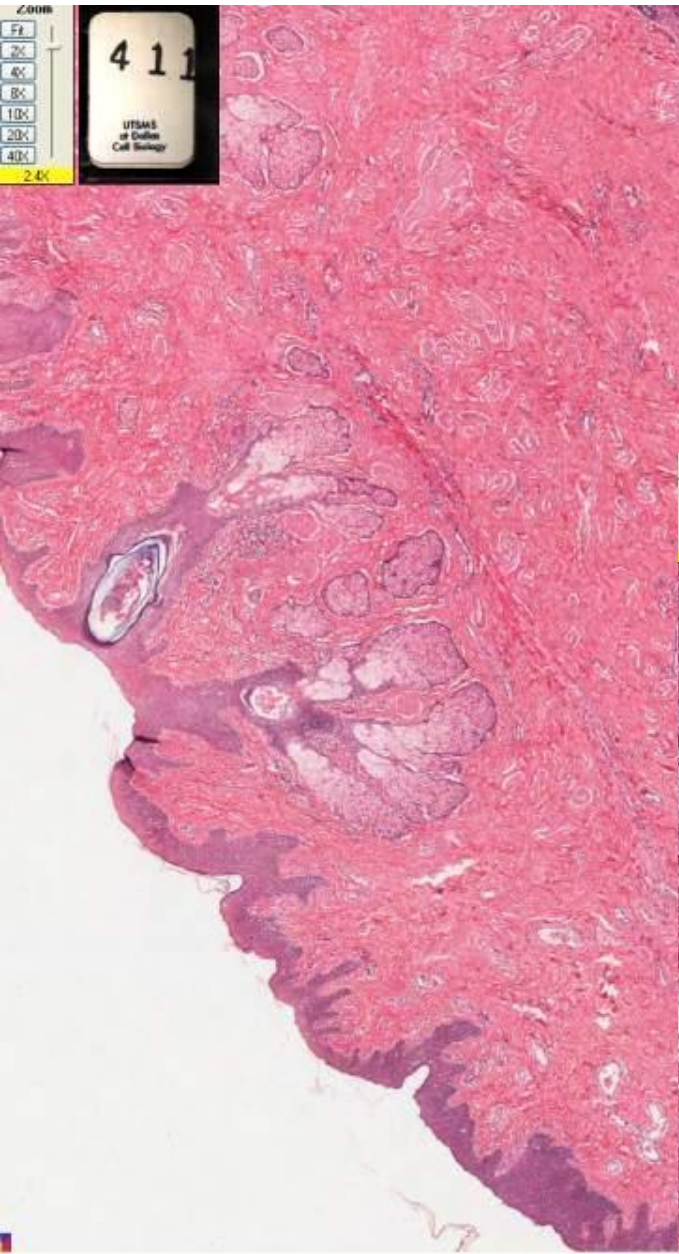
Eye (toluidine blue)



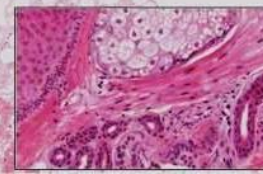
cornea

411

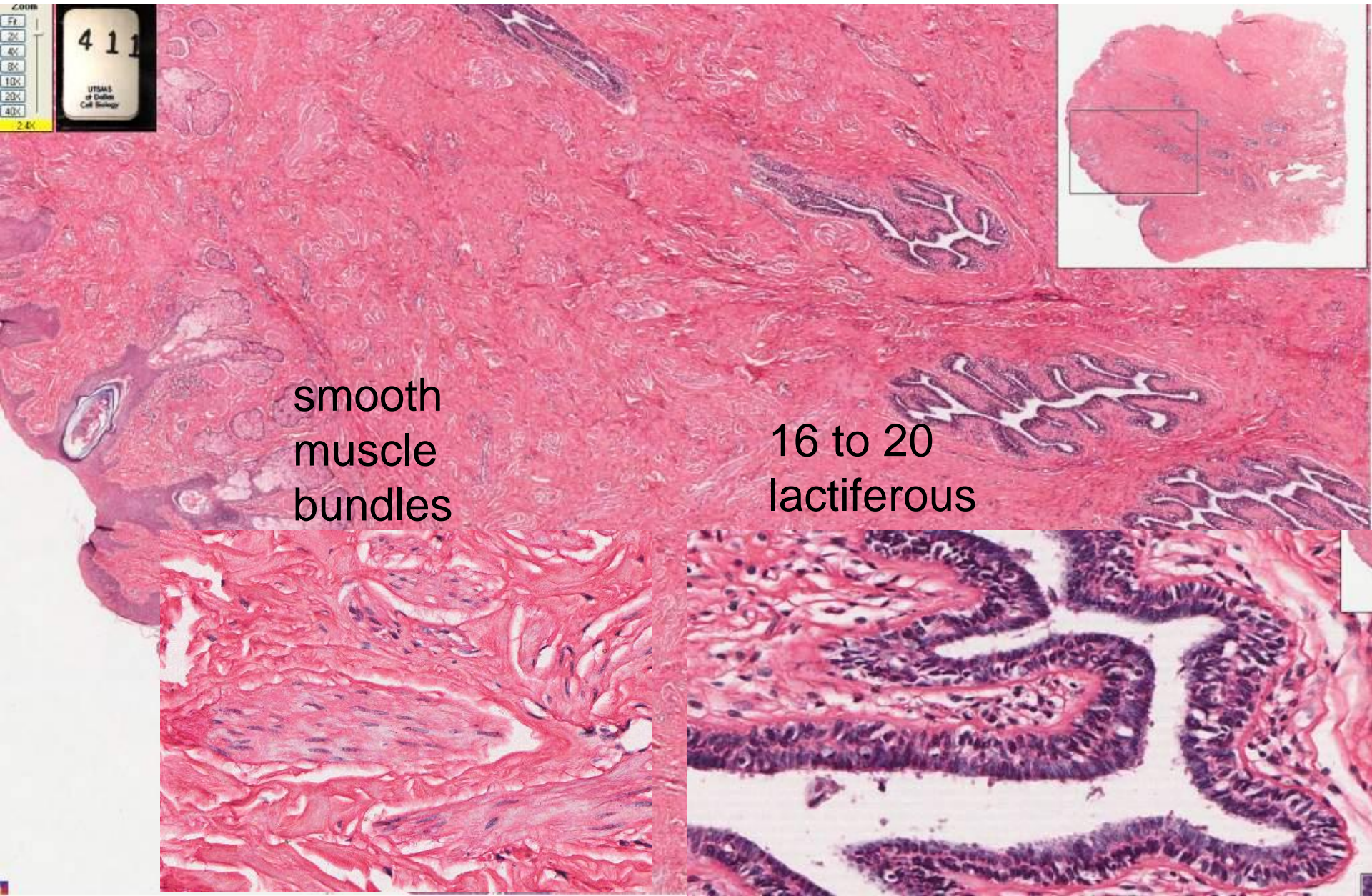
Mammary Gland (nipple)



Sebaceous glands,
of skin

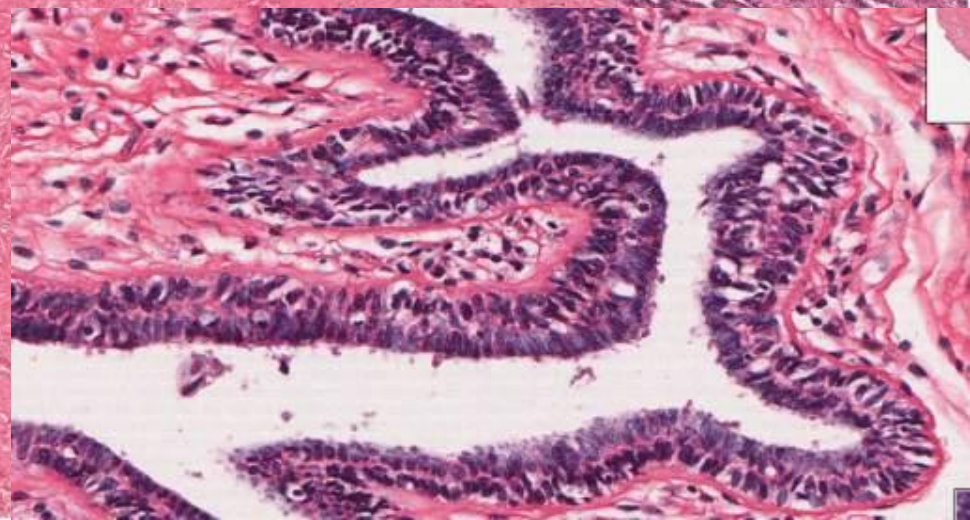
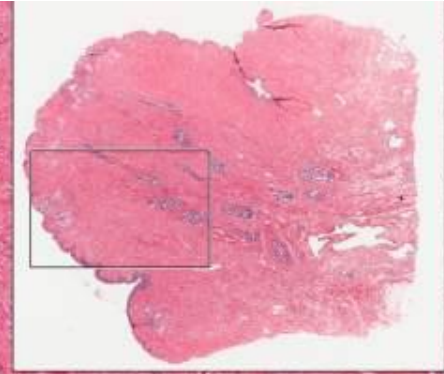


411 Nipple of mammary gland



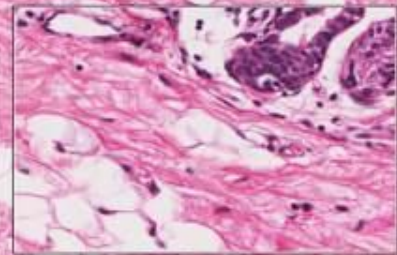
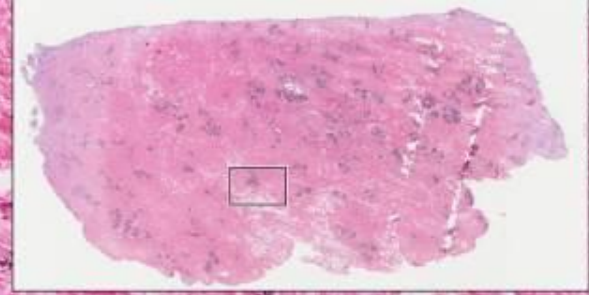
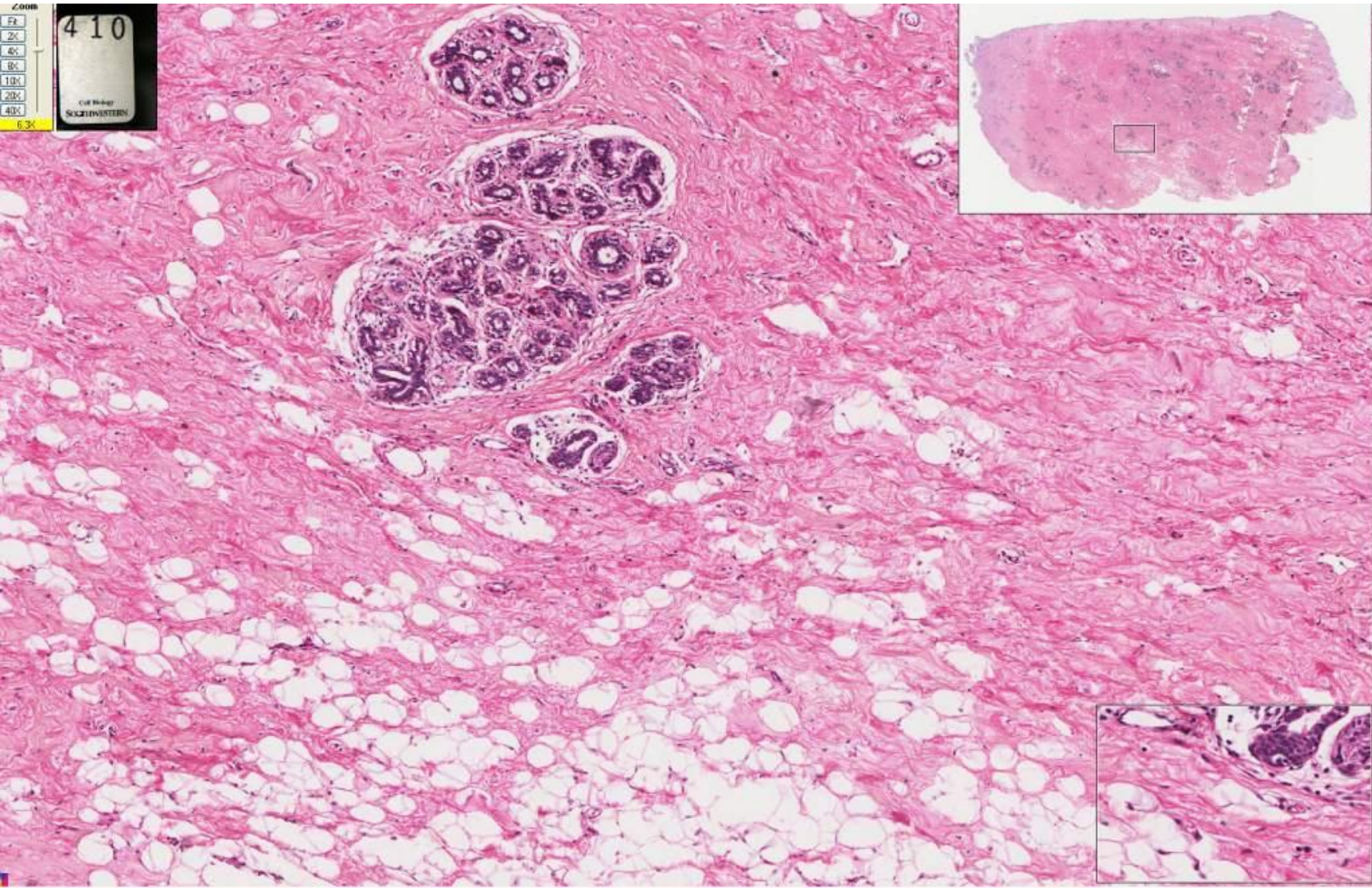
smooth
muscle
bundles

16 to 20
lactiferous



410

Mammary Gland



Mammary Gland

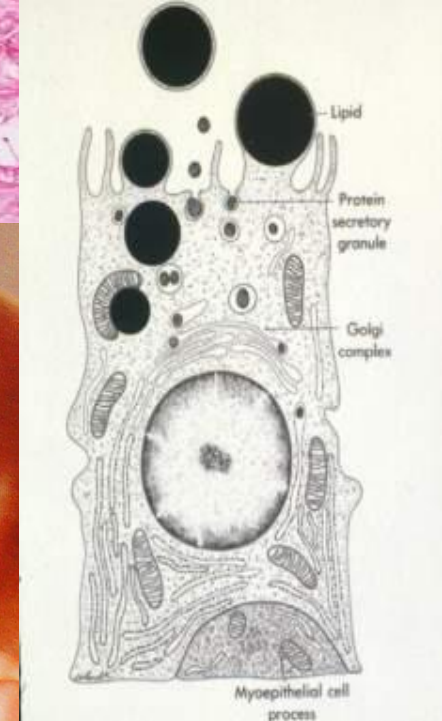
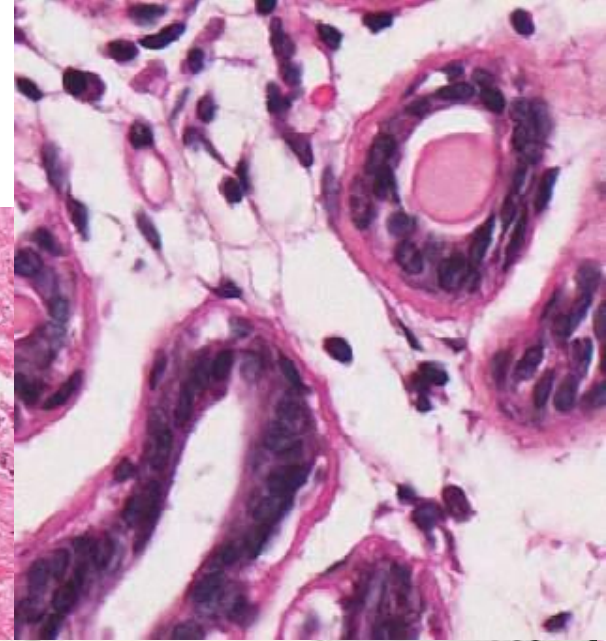
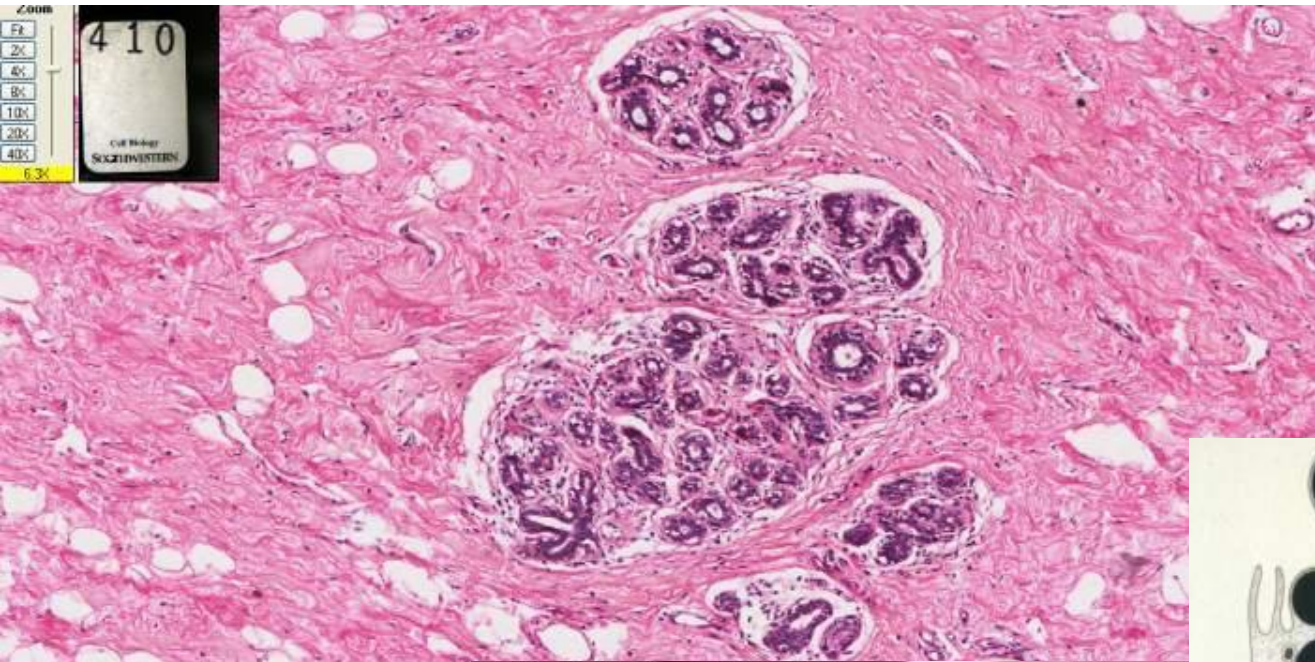


Figure 33-9. Electron micrograph of a mammary gland cell, showing several vacuoles containing milk protein. One (at arrow) is in process of secretion. (Micrograph courtesy of A. Ichikawa.)

Figure 33-8. Diagrammatic representation of a cell from a lactating mammary gland, showing large lipid droplets being cast off enclosed in a layer of cytoplasm, and small protein secretory granules. (Micrograph courtesy of A. Ichikawa.)



Nourish
offspring

Functional diversity of skin

PROTECTS

MAINTENANCE OF WATER BALANCE

EXCRETES (secretes milk)

THERMOREGULATION

RECEIVES STIMULI

FAT METABOLISM

