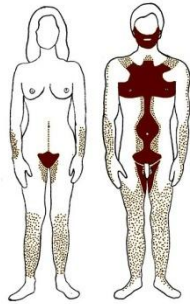


*Babies haven't any hair;
Old men's heads are just as bare;
Between the cradle and the grave
Lies a haircut and a shave.*

*Samuel Hoffenstein (1890-1947)
Songs of Faith in the Year After Next*



SKIN, HAIR, NAIL AND MAMMARY GLAND

Dr. Andrea D. Székely

Semmelweis University

Faculty of Medicine

Department of Anatomy, Histology and Embryology

Budapest

Hungary

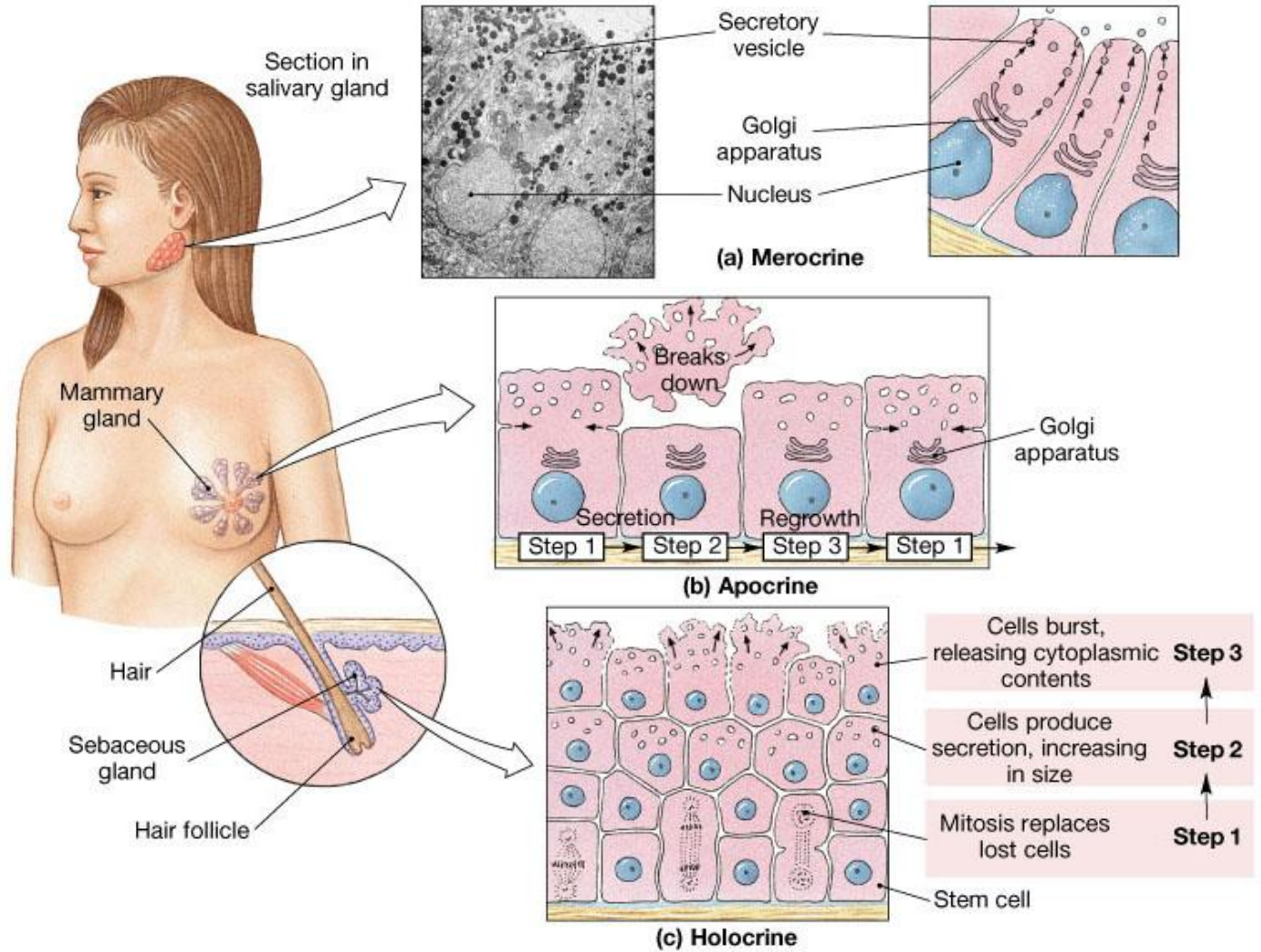


SKIN APPENDAGES

HAIR

NAILS

GLANDS

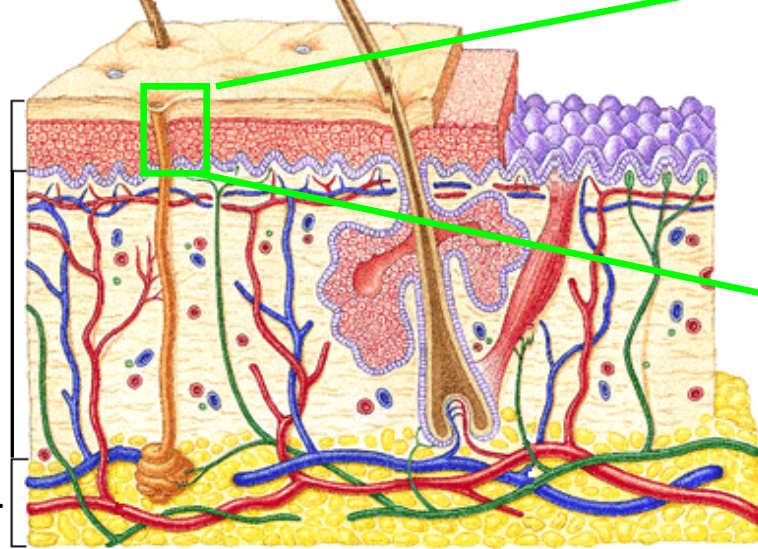


SKIN - INTEGUMENTUM COMMUNE

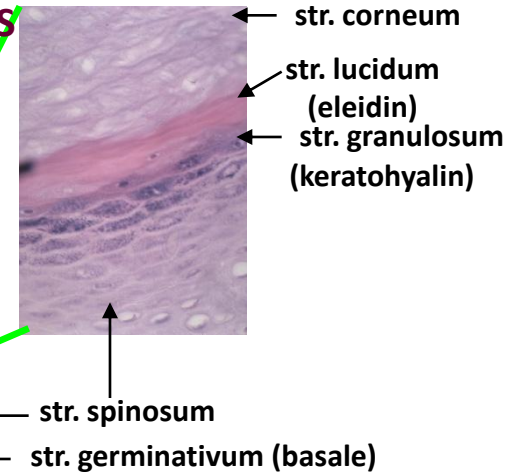
I. epidermis

II. dermis, corium

III. tela subcutanea, subcutis, hypodermis

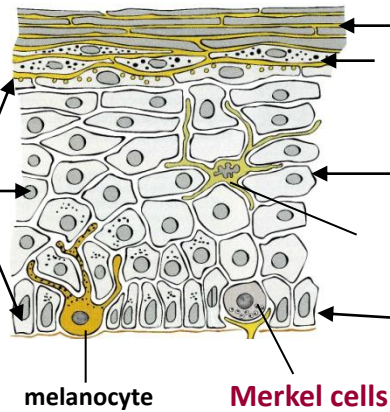


EPIDERMIS



Sweat gland, excretory duct

K
e
r
a
t
i
n
o
c
y
t
e
s



str. lucidum
str. granulosum
str. spinosum
Langerhans cell
str. basale

- Keratinocyte

- * produces keratin
- * 27-30 days cycle

- Melanocyte

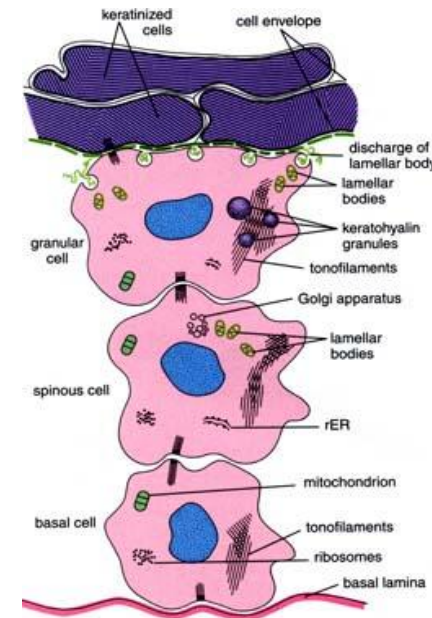
- * produces melanin from tyrosin (tyrosinase enzyme)

- Merkel cell

- * binds the touch receptor to a Nerve

-Langerhans cell

- * Antigene presentation

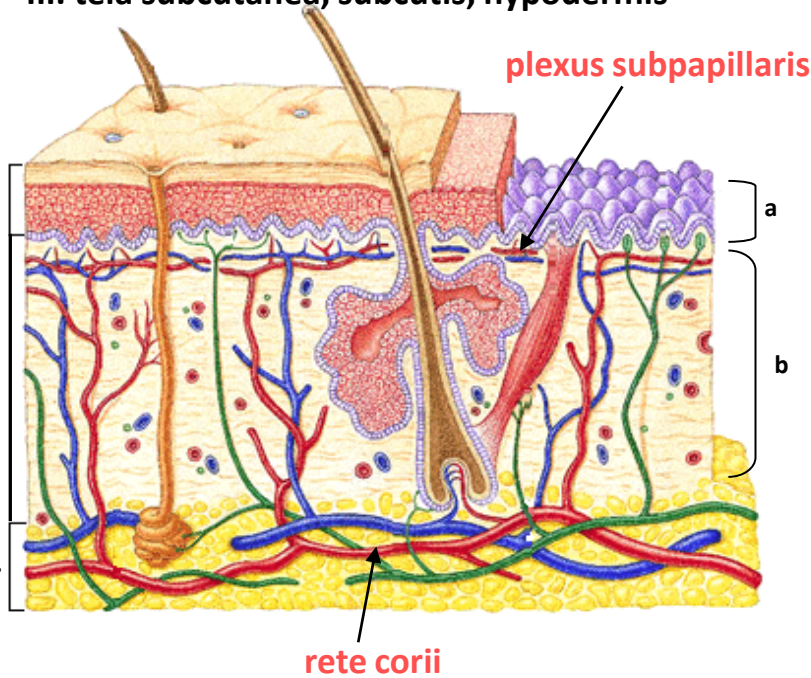


SKIN - SPECIALITIES

I. epidermis

II. dermis, corium

III. tela subcutanea, subcutis, hypodermis



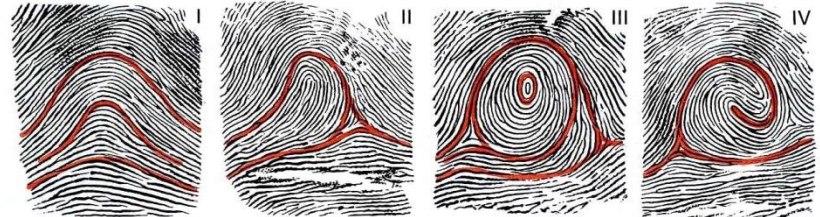
DERMIS, CORIUM

a.: stratum papillare

b.: stratum reticulare

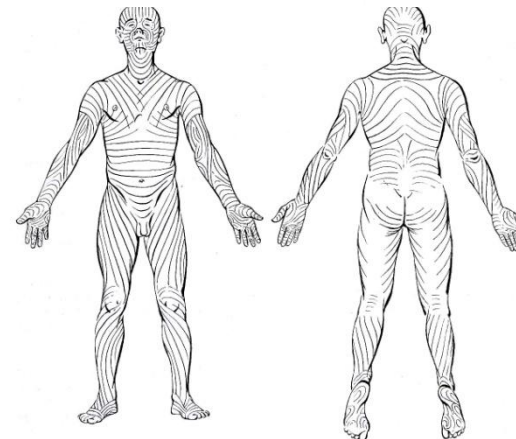
- Fine fibrous structure (coll+elast)
- plexus venosus subpapillaris
- CT papillae against the epidermis
- number of papillae - support
- the Epithelium follows the Papillae
- * cristae cutis
- * sulci cutis
- * toruli tactiles (Finger tip)

- Strong collagen fibres + elastic network
- Hair follicles
- glands, vessels
- CT cells
- Mobile Elements of the Immune system
- Nerves, Receptors

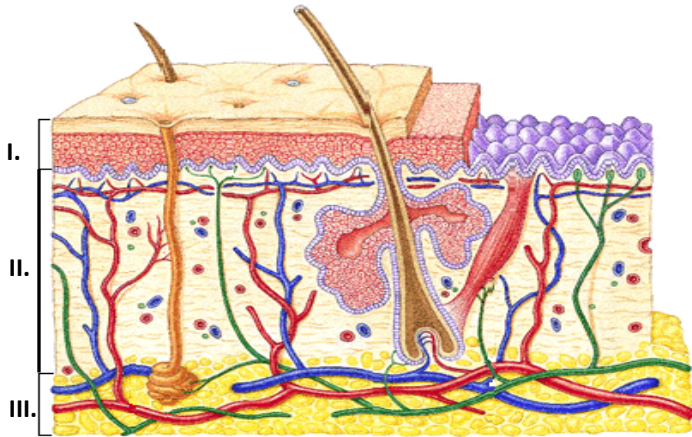


TELA SUBCUTANEA, SUBCUTIS, HYPODERMIS

- Connection between skin and CT
- Gives the skin a certain mobility
- Stress tolerance
- Difference in thickness
- Rich in fat lots of CT fibres (retinacula cutis)
- (panniculus adiposus): Fat depo; Isolator



SKIN - AS A SENSORY ORGAN

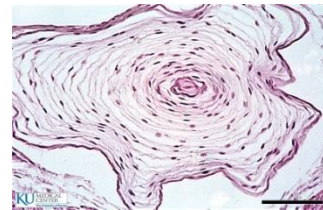
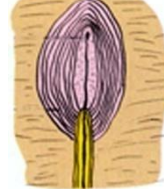


1. free nerve endings
2. follicular afferents
3. Skin receptors
 - Merkel's touch corpuscle
 - Meissner's - " -
 - Vater-Paccini - „ - (stretch and vibration)
 - Ruffini's corpuscle (stretch, temperature)
 - Krause's corpuscle (stretch, cold receptor)
4. Autonomic fibres: sudo-, vaso-, pilomotor axons

Freie Nervendigungen



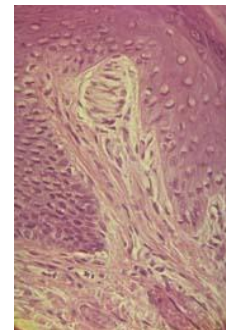
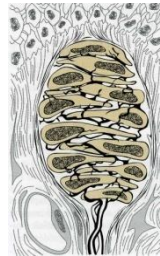
Vater-Paccini



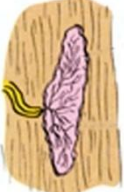
Merkel



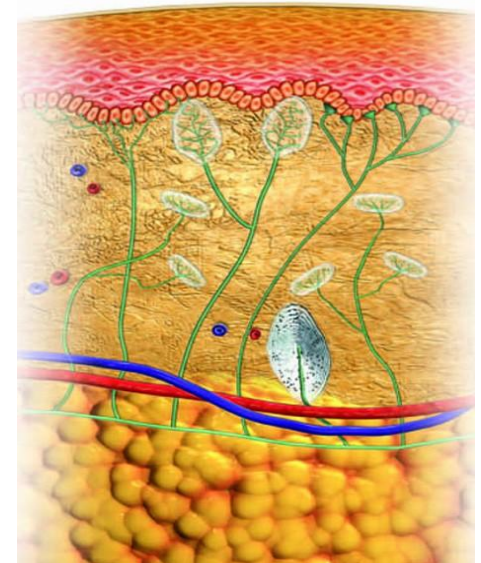
Meissner



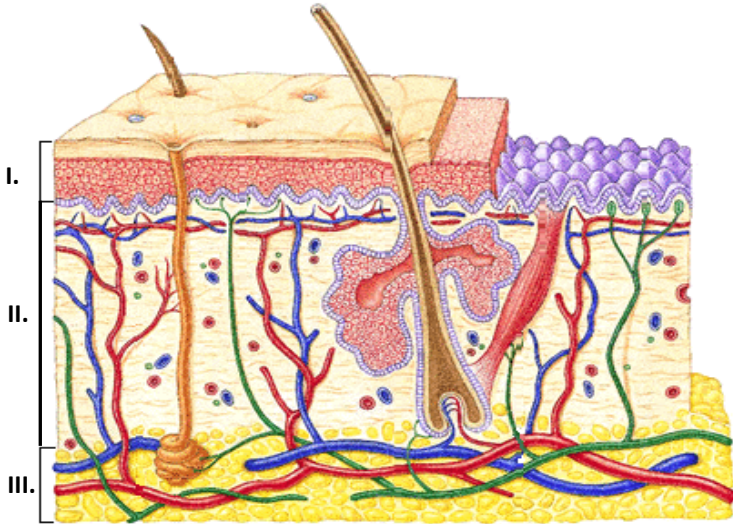
Ruffini



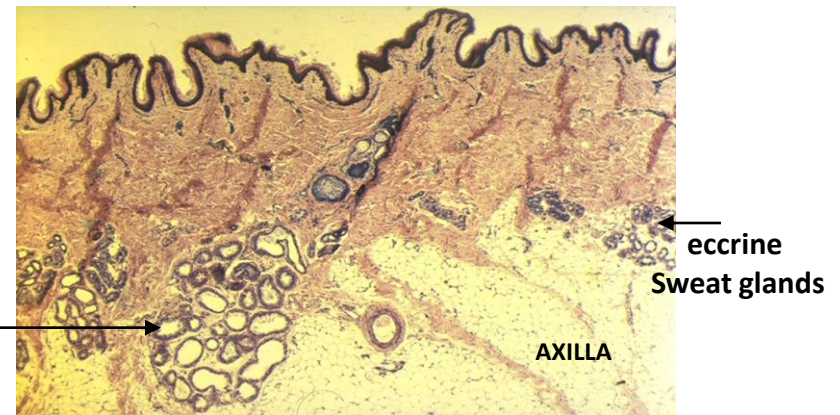
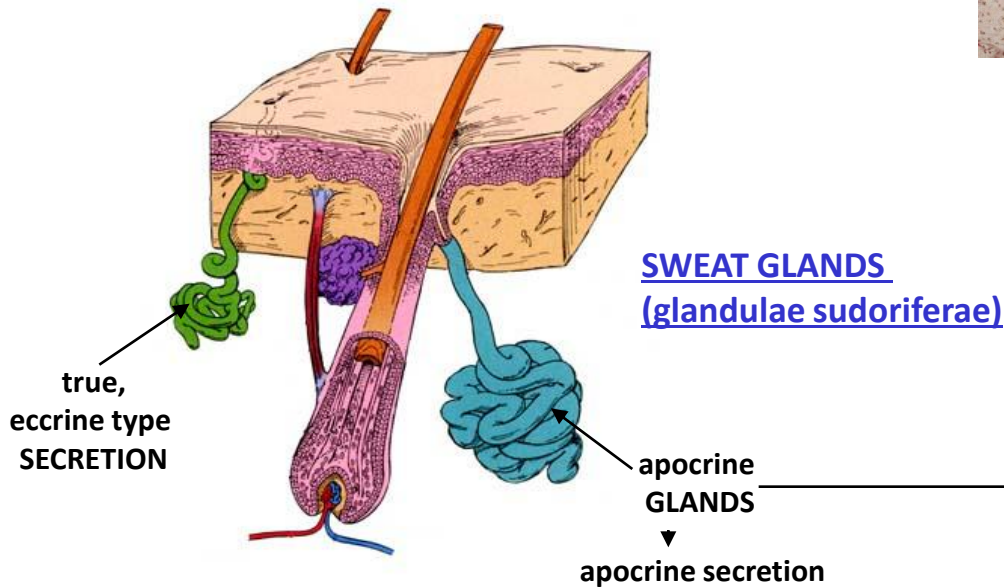
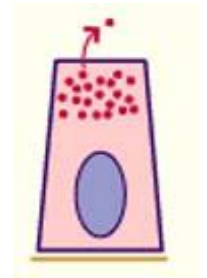
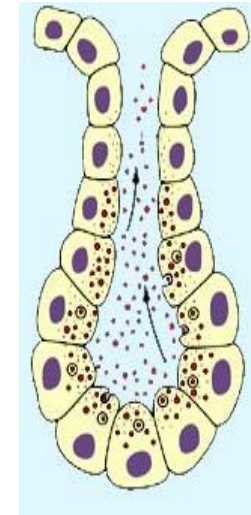
Krause



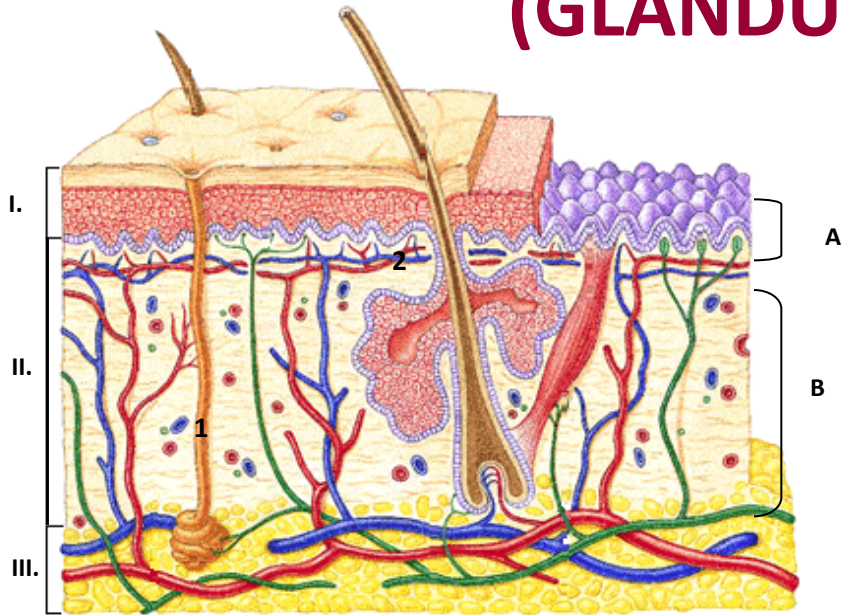
SKIN – GLANDS 1. (GLANDULAE CUTIS)



Merocrine secretion



SKIN – GLANDS 2. (GLANDULAE CUTIS)



1. SALIVARY GLANDS (GLANDULAE SUDORIFERAE)

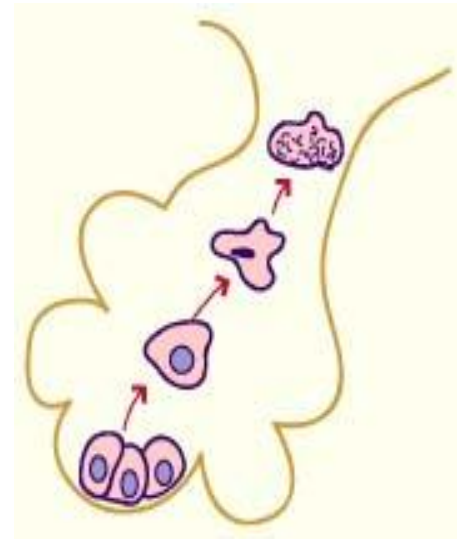
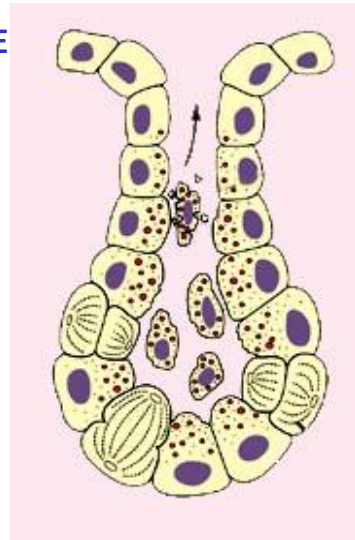
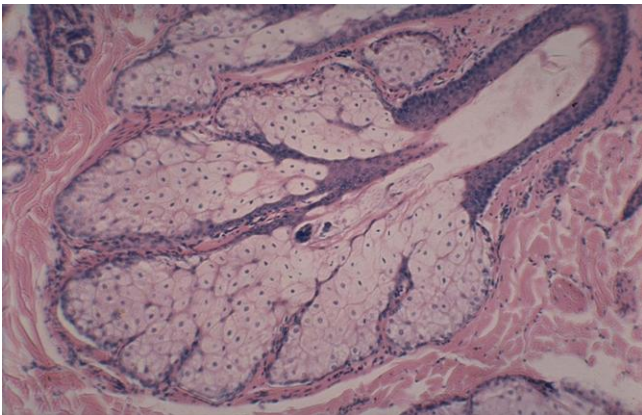
- TRUE, ECCRINE TYPE

-APOCRINE TYPE SWEAT GLANDS
(GLANDULAE ODORIFERAE)

2. SEBACEOUS GLAND (GLANDULAE SEBACEAE)

2. SEBACEOUS GLANDS (GLANDULAE SEBACEAE)

HOLOCRINE SECRETION



HAIR 1.

DISTRIBUTION

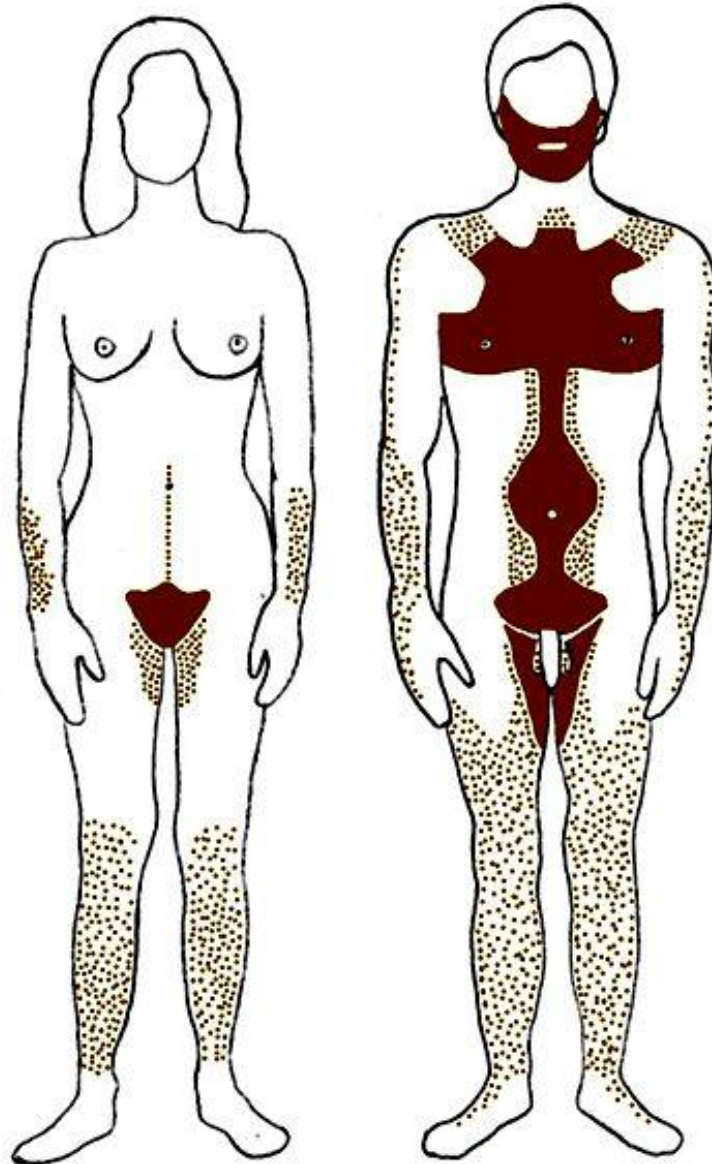
ALL OVER, *except* : t

Hair is most obvious
groin, and (in men)

On average, a
baby's head
By the age
Between th

Each follicle gr
reach **over a m**

Each hair falls



Babies haven't any hair;
Old men's heads are just as bare;
Between the cradle and the grave
... a haircut and a shave.

muel Hoffenstein (1890-1947)
gs of Faith in the Year After Next

some people), the armpits, the

ave as many as 150,000.

physical type)
and so it continues...)

ws for several years, and can

TERMINAL

Hirci, pubes, barba, mystax,
trissae, tragi, cilia, supercilia, capilli

TYPES

lanugc



HAIR 2.

COMPOSITION

keratin (dead keratinocytes), **fat**, **pigment** (melanin), small amounts of **vitamins**, traces of **zinc** or other **metals**, **water** (10-13%)

PARTS

shaft (above the skin)

root (below the surface).

follicle (indentation of the epidermis)

sebaceous gland

arrector pili

(WHY: keep warm or look bigger to impress the other sex or intimidate enemies)

COLOUR

due to melanin, (melanocytes in the bulb of the hair follicle)

- **Dark hair** - contains true melanin, **blond** and **red** hair result from types of melanin that contain sulfur and iron

- **Gray hair** - melanocytes age and lose the enzyme necessary to produce melanin.

- **White hair** occurs when air bubbles become incorporated into the growing hair.

TEXTURE

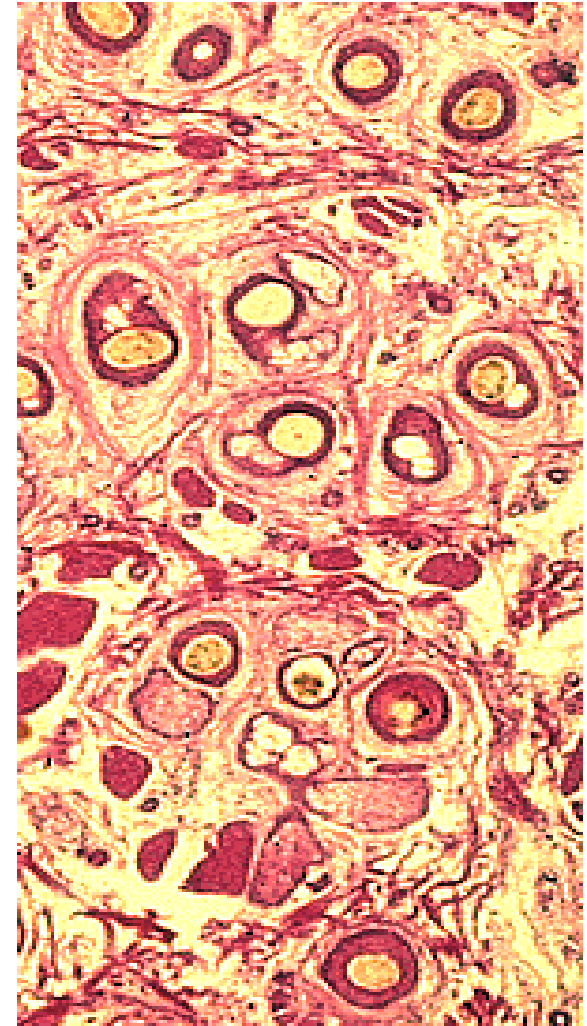
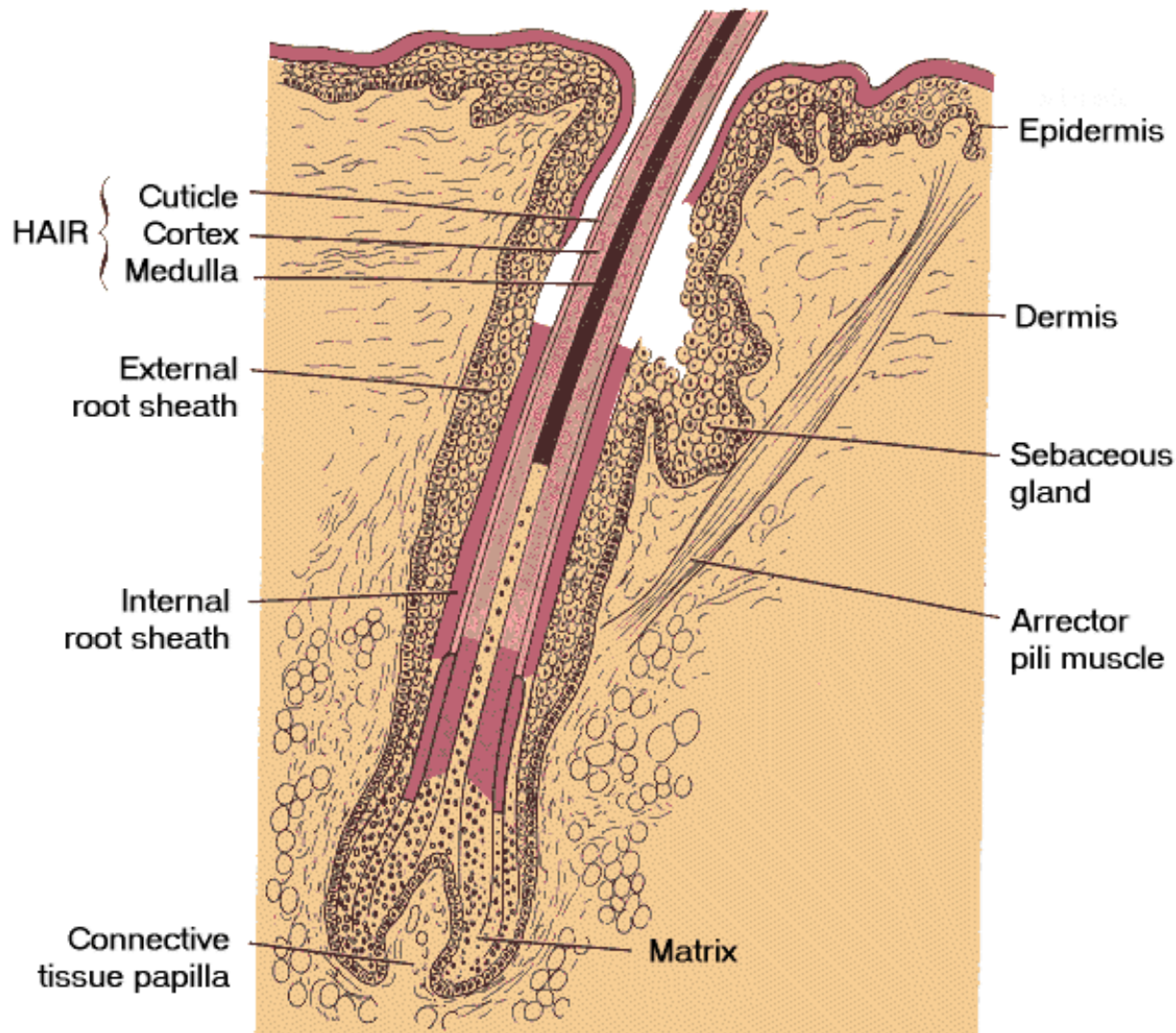
(defined by the shape of the hair shaft)

straight hair - round in cross section,

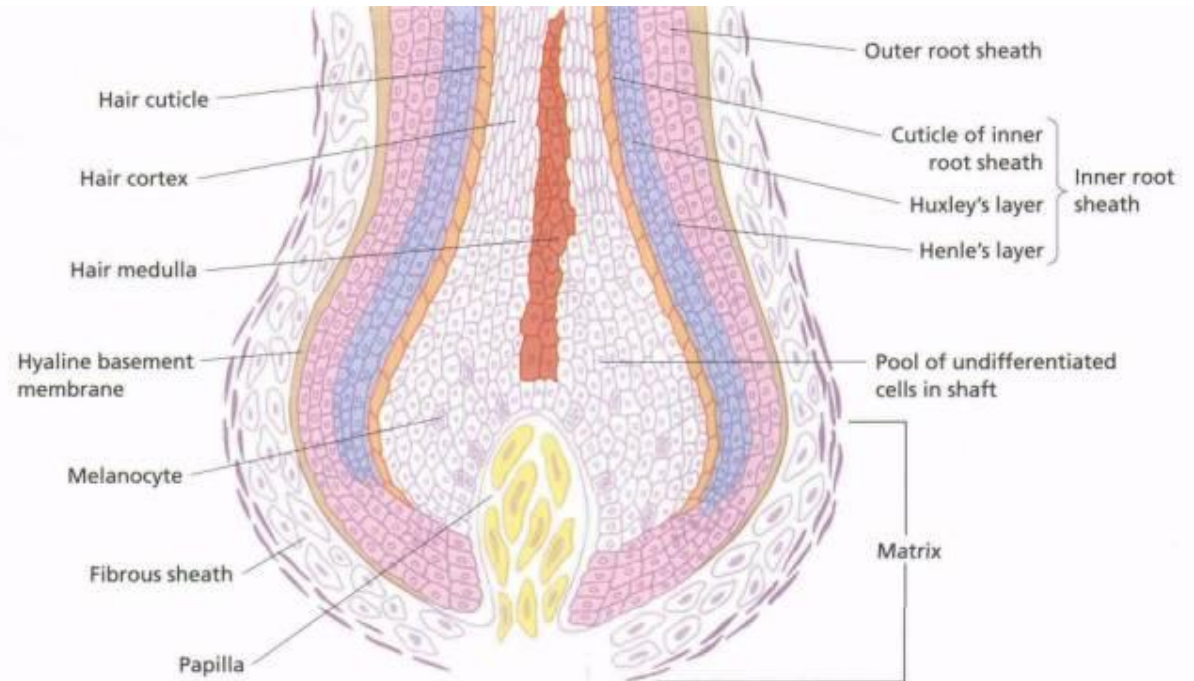
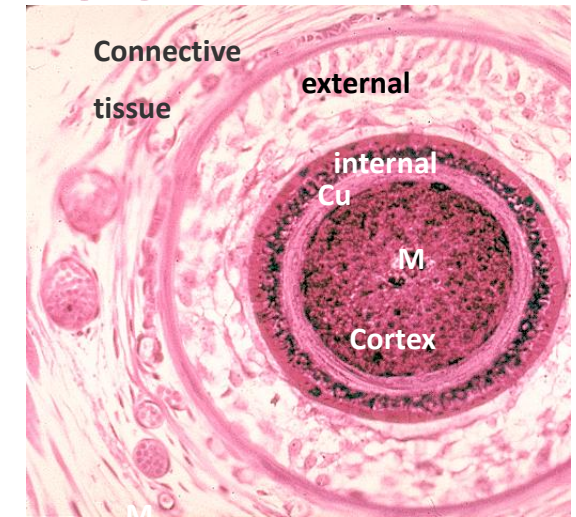
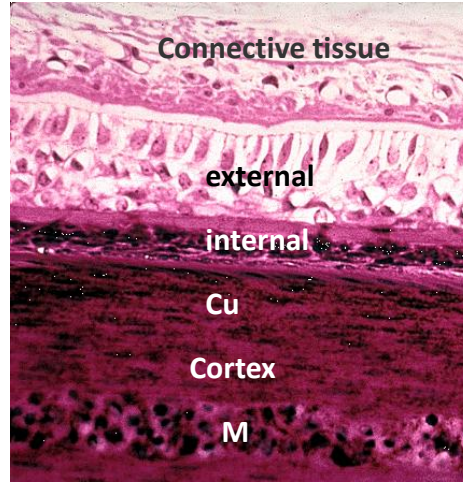
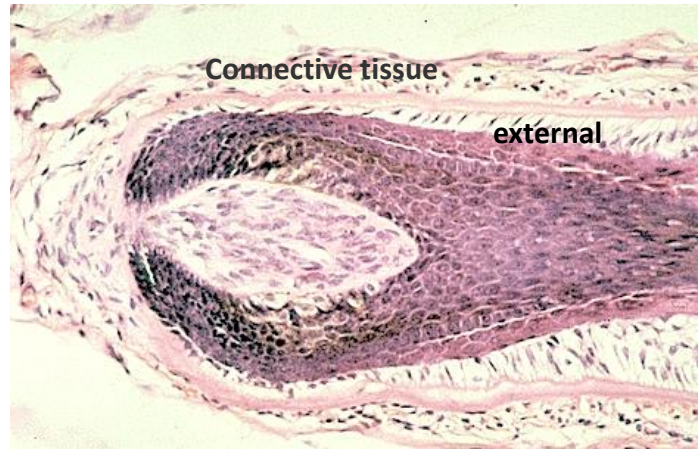
wavy hair - oval shape in cross section,

curly hair - elliptical or kidney-shaped

HAIR FOLLICLE – GENERAL OVERVIEW

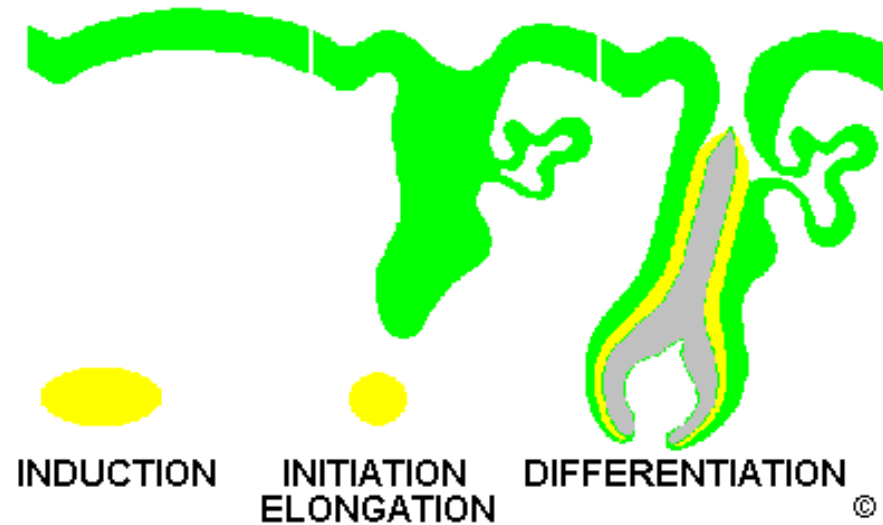


HAIR FOLLICLE – HISTOLOGY

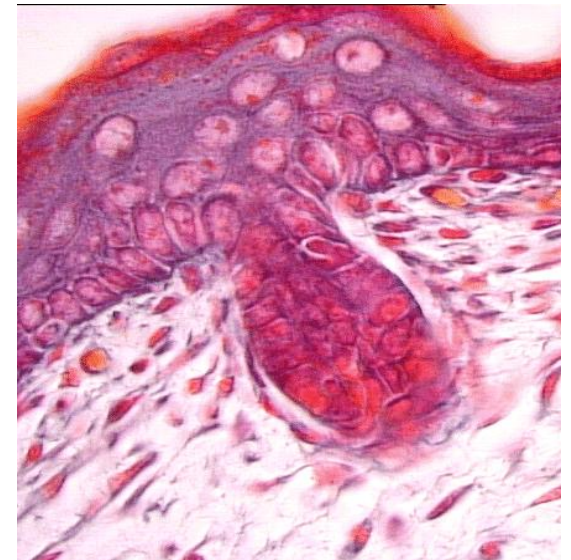
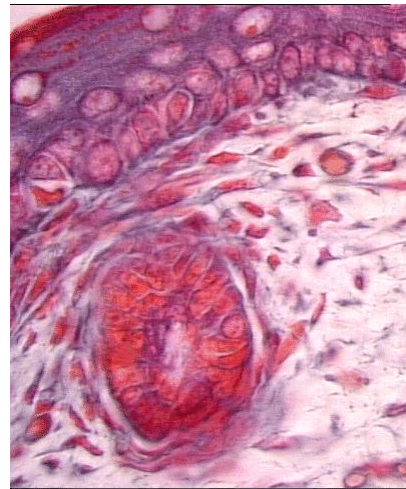


HAIR FOLLICLE – EMBRYOLOGY

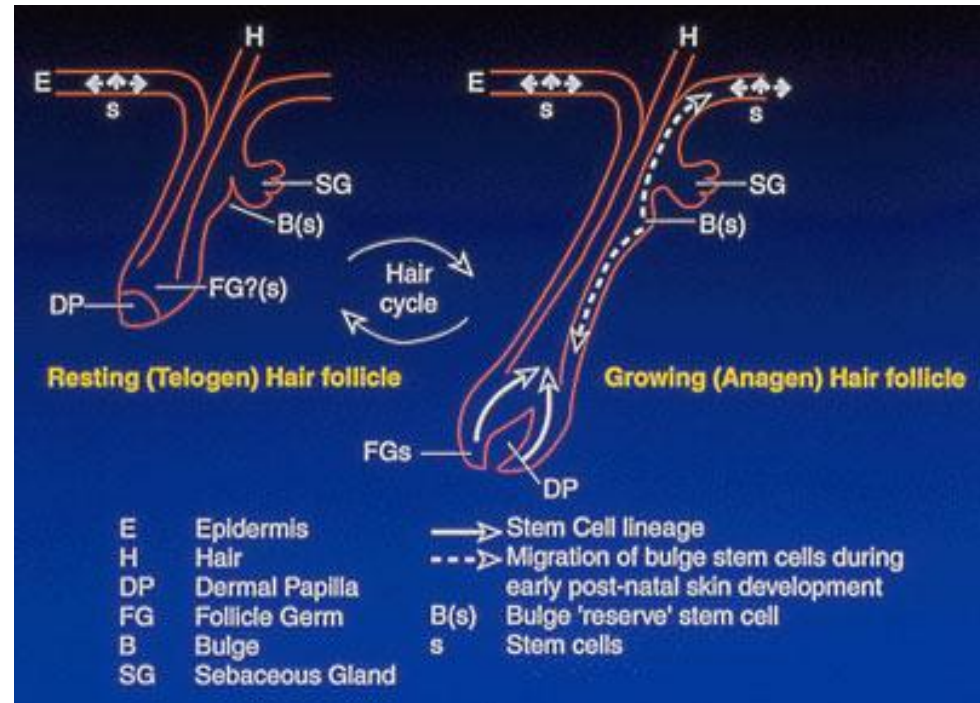
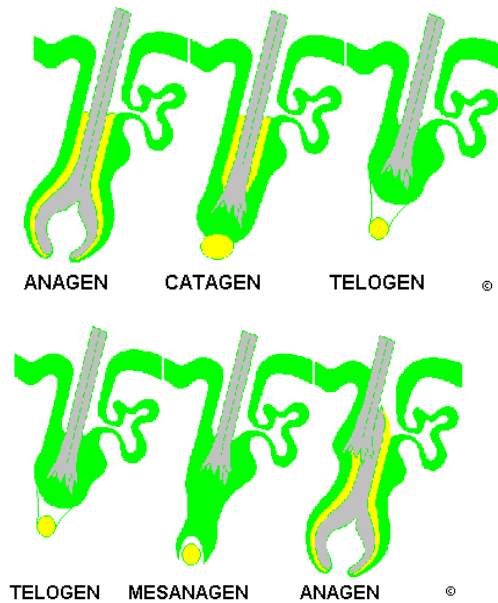
The dermal papilla (DP) induces the hair follicle and retains this instructive ability throughout the life of a hair follicle (removal of the DP stops hair growth but the lower third of the dermal sheath induces the regeneration of a new DP (hair follicle regrowth)).



The DP cells retain their embryonic functional abilities and are able to induce new hair fibre growth in mature, adult skin when implanted into previously deactivated hair follicles and in close association with ORS epidermal cells.



HAIR GROWTH



PHASES OF THE HAIR GROWTH CYCLE:

Anagen is the **active growth** phase when hair fibre is produced.

- **proanagen** marks initiation of growth with RNA and DNA synthesis in a follicle which then quickly progresses through
- **mesanagen** then to
- **metanagen** - **maximum follicle length** and girth. In this mature state of proliferation and differentiation the hair follicle consists of a total of eight concentric layers and melanogenesis occurs within pigmented hair follicles.

Catagen - a period of **controlled regression** of the hair follicle, then ultimately follows the **Telogen** – the period, when the follicle reaches the **resting** state.

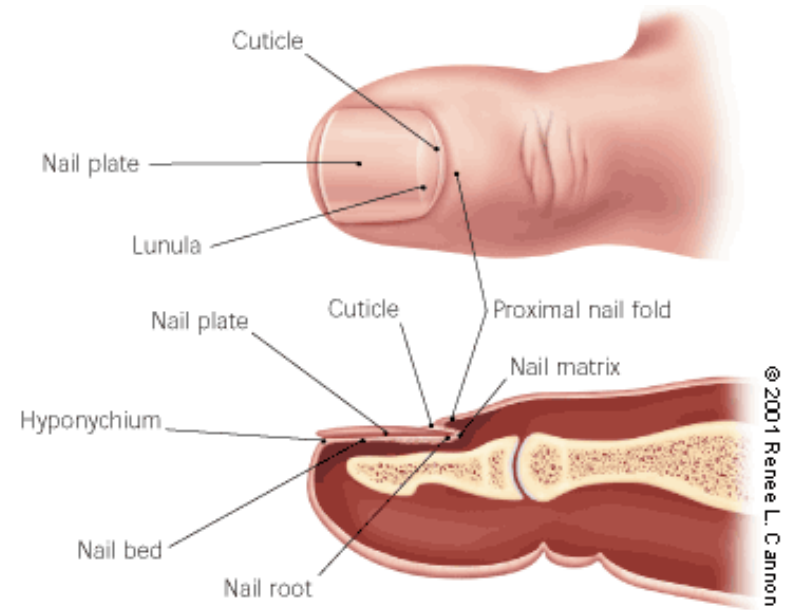
NAIL – GENERAL OVERVIEW

Nails are flattened, elastic but hard keratin structures that protect the tips of the terminal phalanges (toes and fingers).

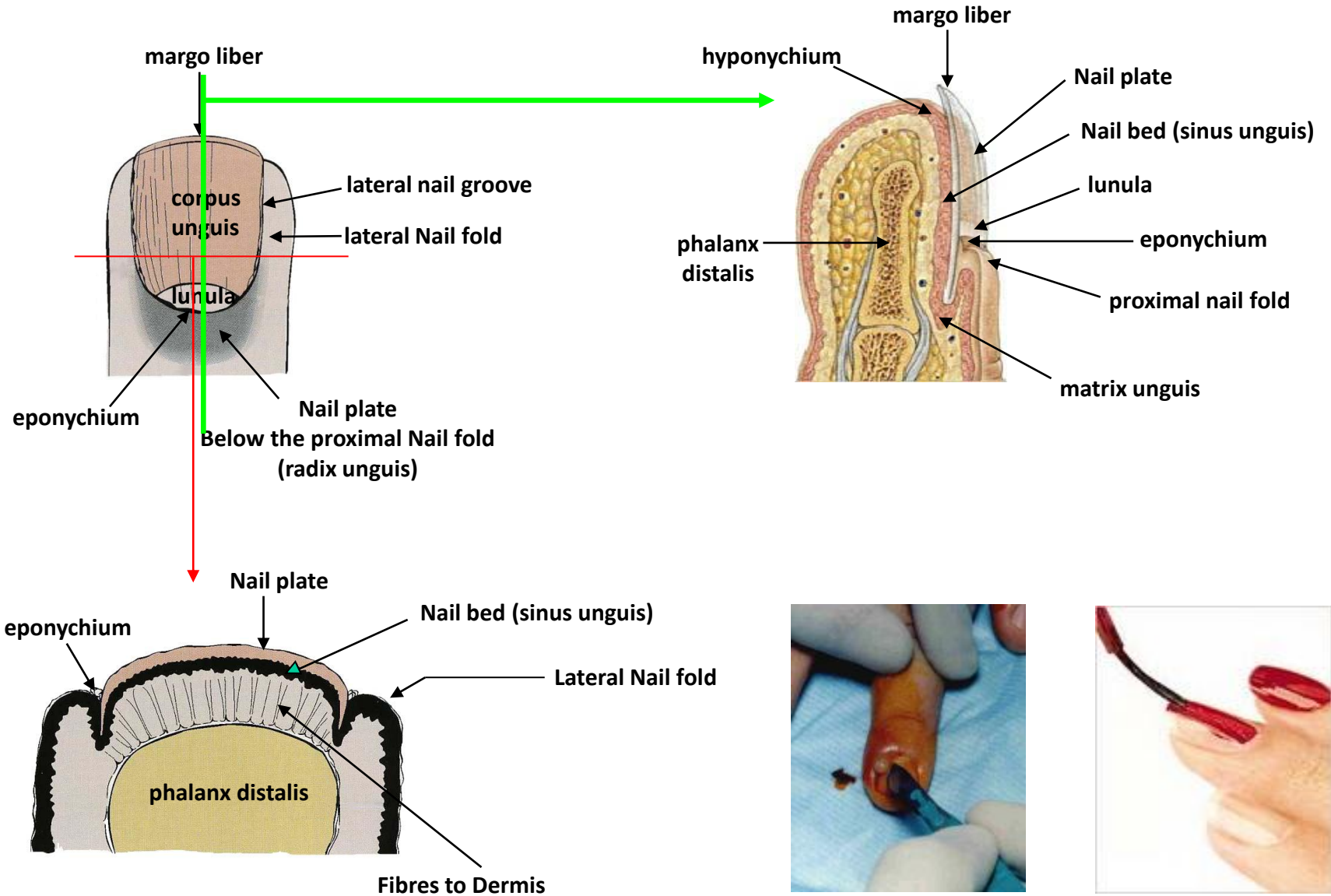
Convex on the outer surface and concave within, human nails are implanted by their root into a groove in the skin (nail sulcus). The nail matrix, underlying the body and root of the nail, is the source of new nail production. The white part of the nail, the lunula, represents the portion of the nail that is not firmly attached to the connective tissue base and contrasts with the redder, highly vascularized majority of the nail that is attached to the thick matrix.

Cuticles are continuous with the keratin substance of the nail as part of the epidermis.

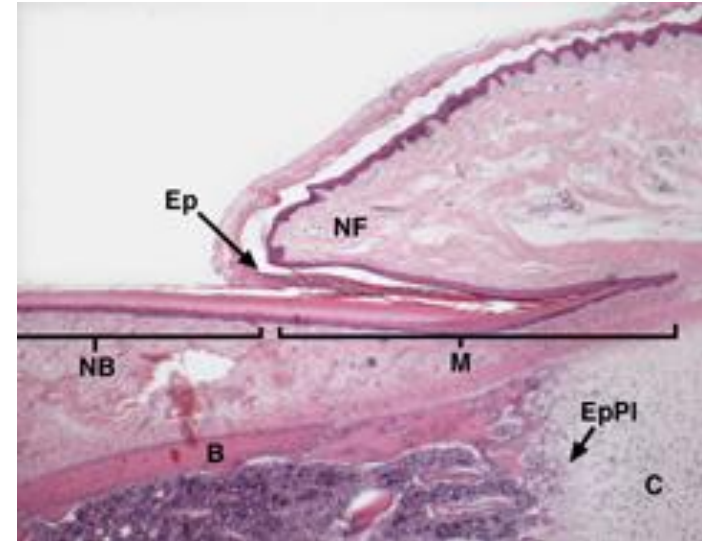
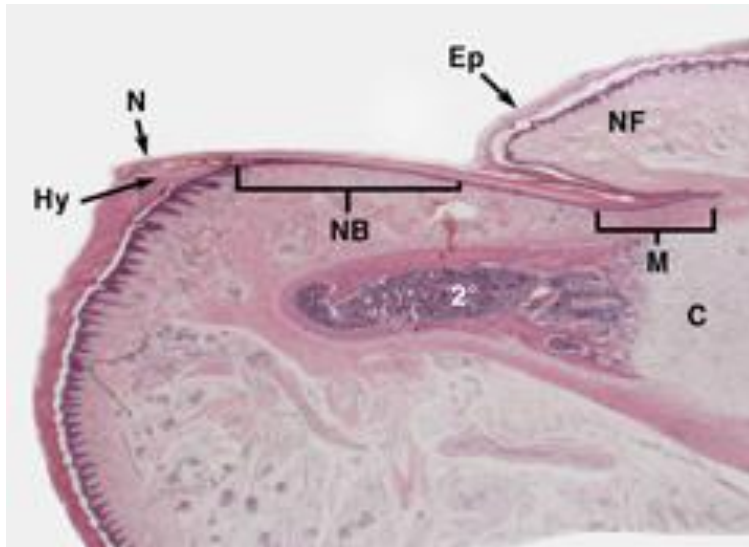
Nails grow in length by producing new cells at the root of the nail, and at the distal free edge, the oldest nail cells reside.



NAIL (UNGUIS, ONYX)



NAIL – HISTOLOGY AND EMBRYOLOGY



nail fold (NF), matrix region of the nail root (M), nail bed (NB), nail proper (N), eponychium (Ep)
hyponychium (Hy), cartilage (C), epiphysial plate (EpPI), bone (B)



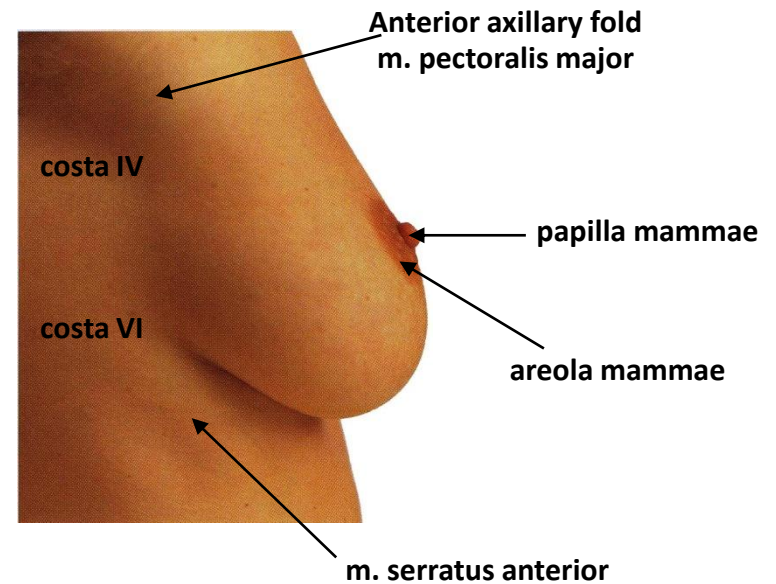
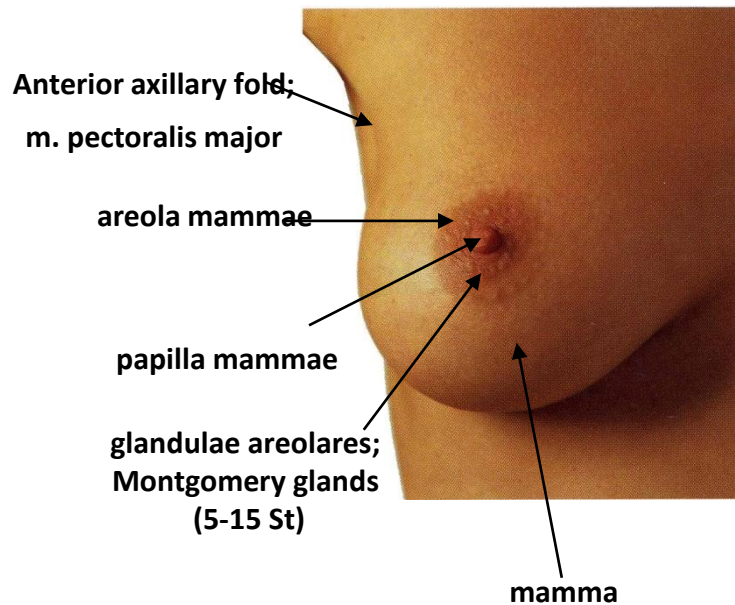
week 10 of human development, the fetus develops its **fingernails**

week 14 the ten **toenails** follow

Originally, the **nail fields** appear at the tips of the digits and then **migrate** toward the dorsal surfaces. While the surrounding cells form the nail folds, keratinization of the proximal nail folds forms the nail plates.

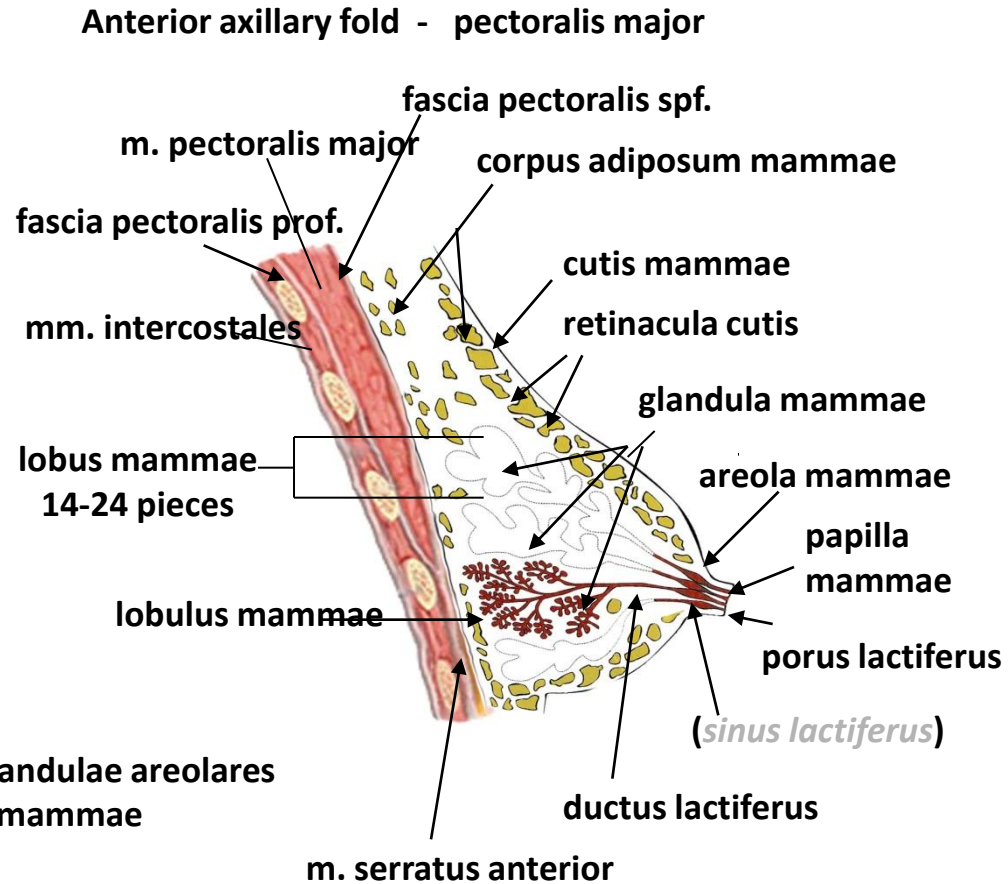
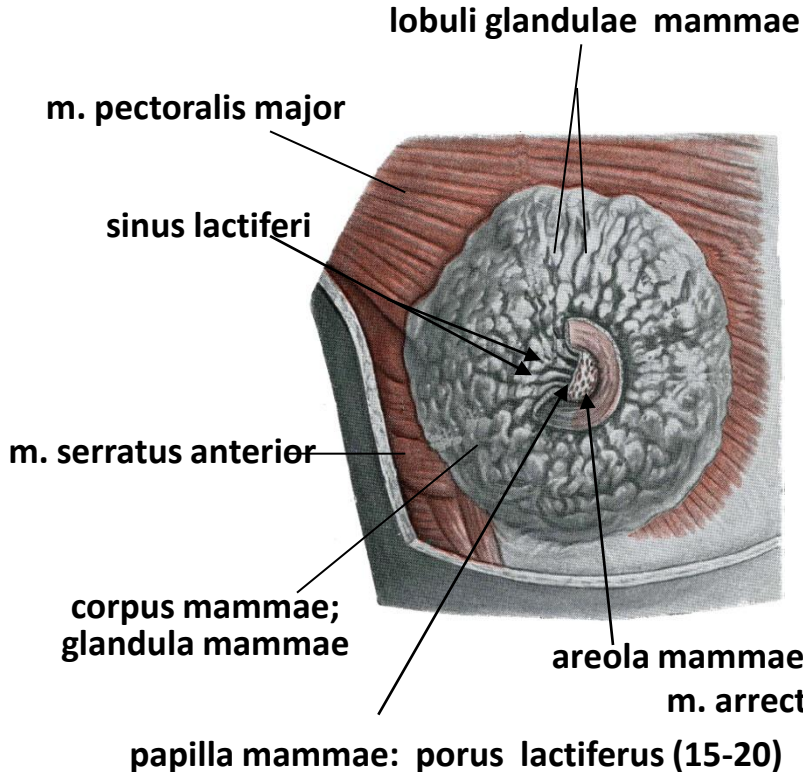
By **week 32**, the fingernails, and by **week 36**, toenails, reach the tips of the digits. (**indicator of the degree of maturity or prematurity**)

MAMMARY (OR BREAST) GLAND

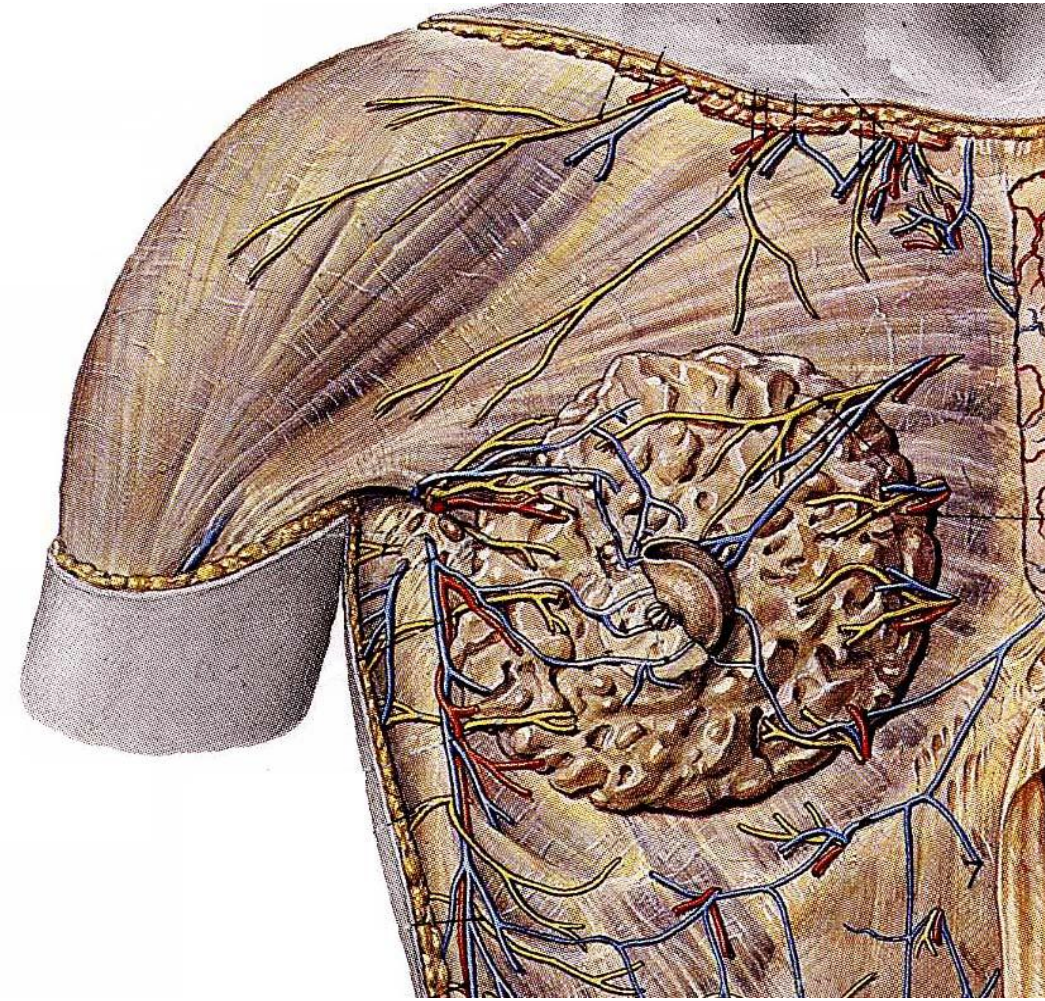


MAMMARY GLAND

- paired organs
- regional borders: sternum and anterior axillary fold
- in males - reduced (**mamma virilis**) – breast cancer cases are more and more frequent
- consists of glandular lobes (**glandula mammae**) and dense fatty CT (**corpus adiposum mammae**)
- produces milk



MAMMARY GLAND



ARTERIES:

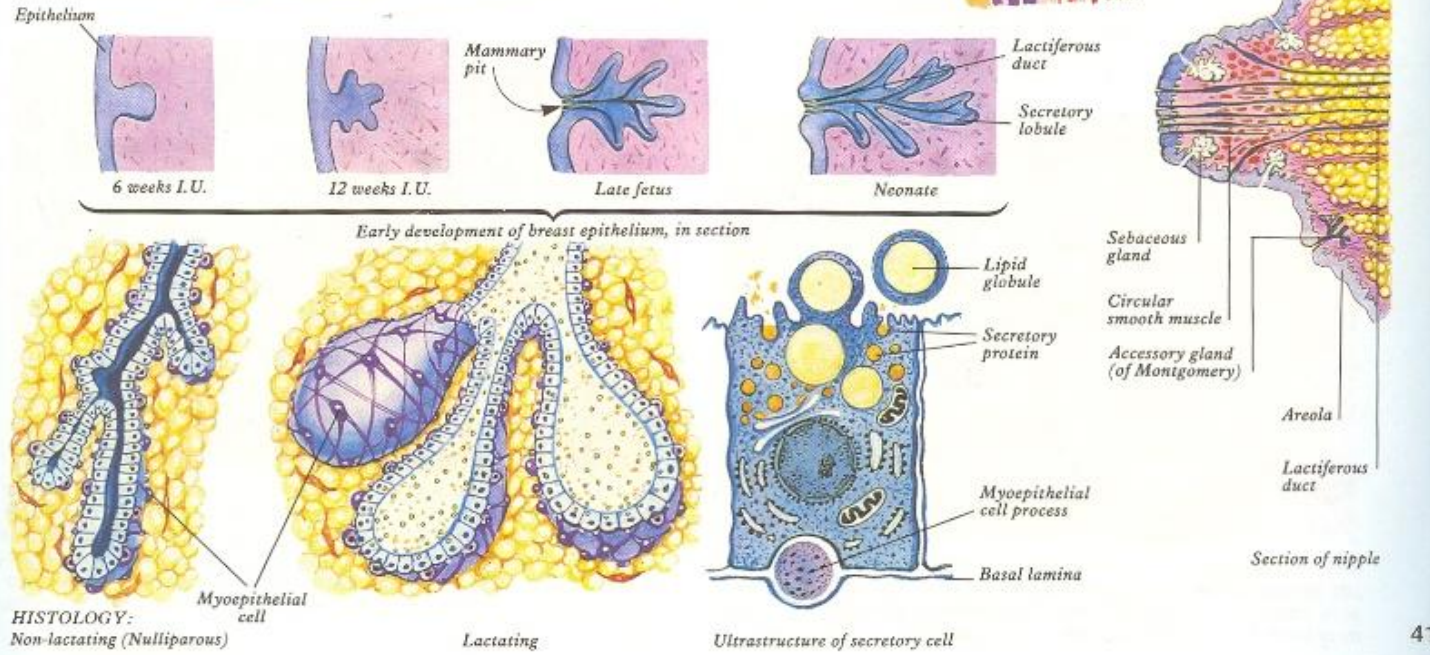
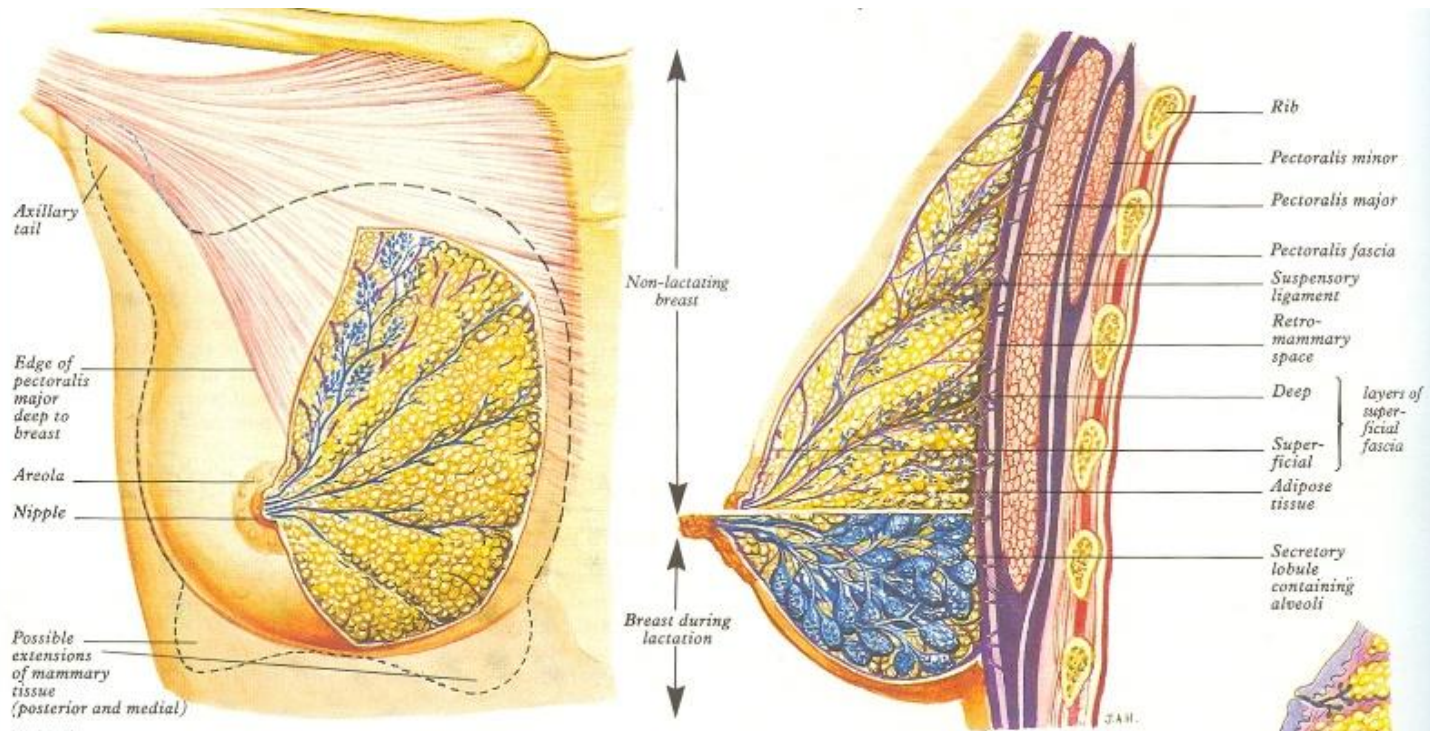
- a. thoracica interna
- a. thoracica lateralis
- aa. intercostales posteriores

VEINS:

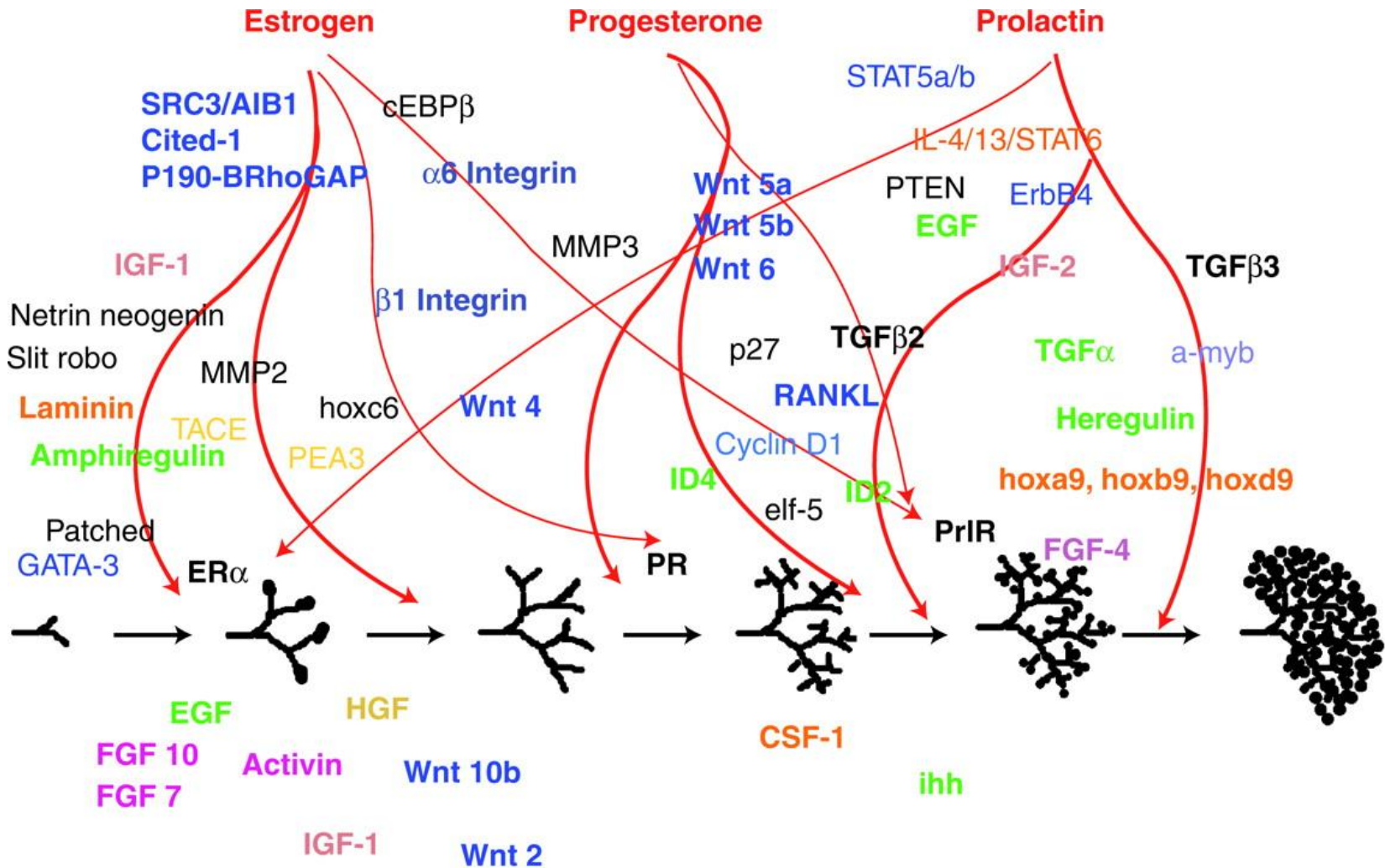
- v. thoracica interna
- v. thoracica lateralis
- vv. intercoastales posteriores
- v. thoracoepigastrica

NERVES:

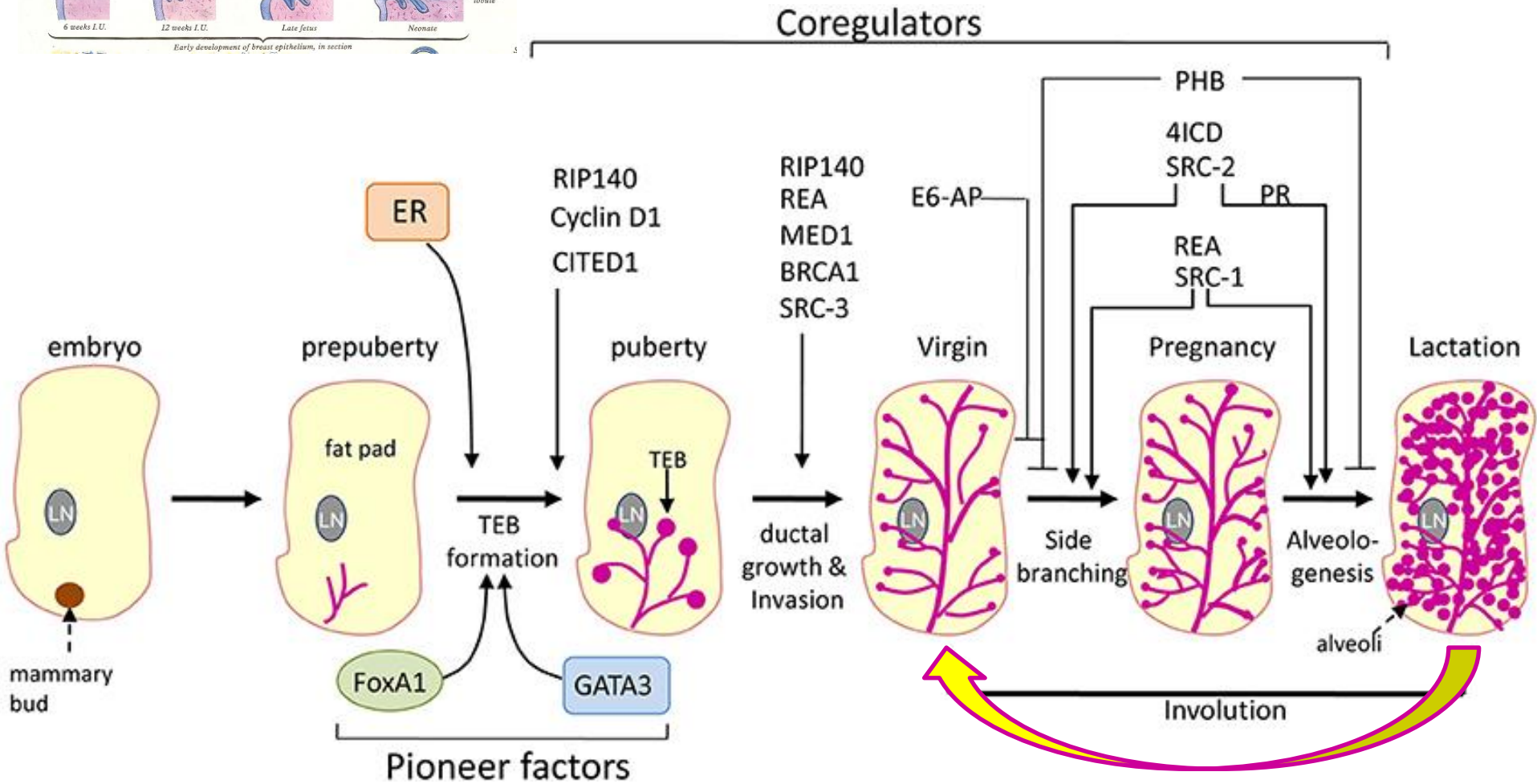
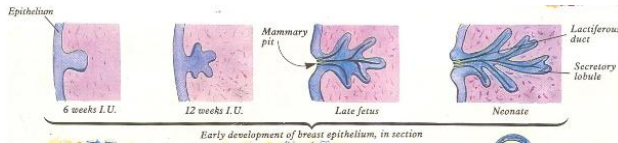
- nn. supraclaviculares
- nn. intercostales



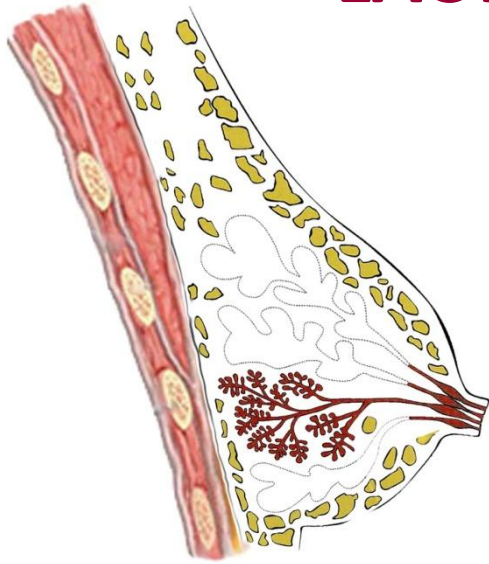
REGULATION OF LACTATION



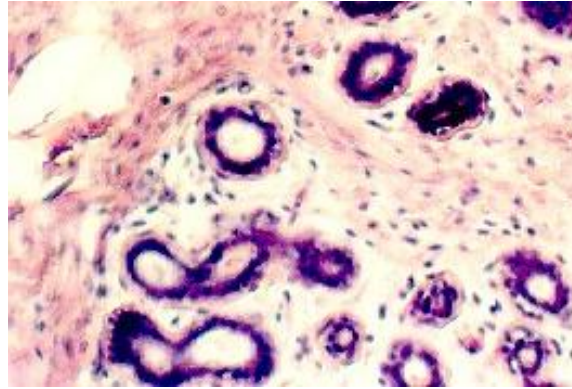
AGE RELATED CHANGES WITHIN THE MAMMARY GLAND



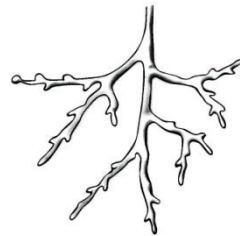
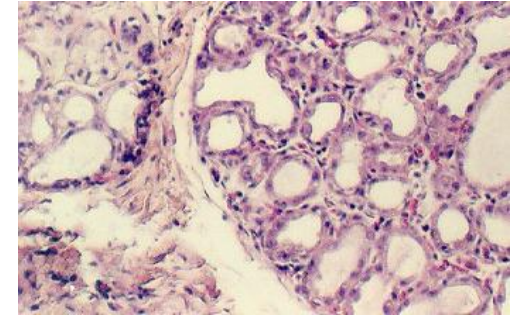
LACTATING MAMMARY GLAND



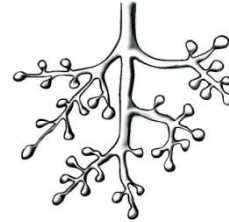
Mamma non lactans



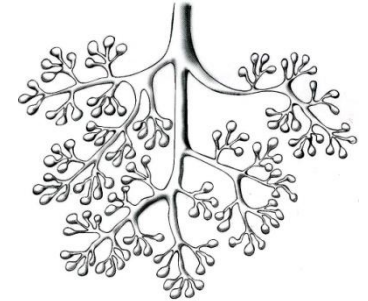
Mamma lactans



nullipara

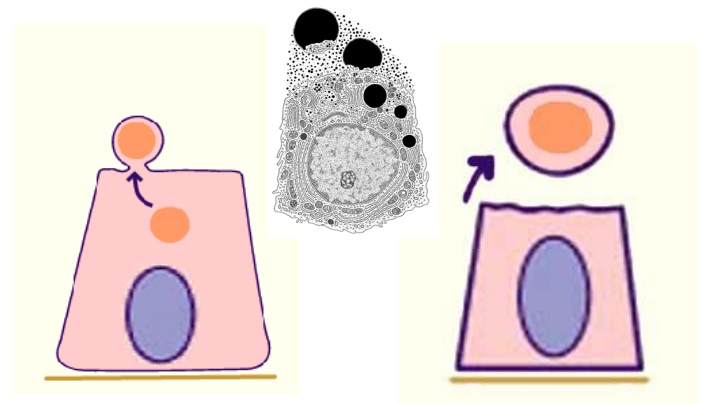
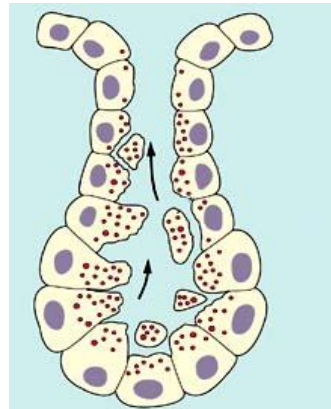
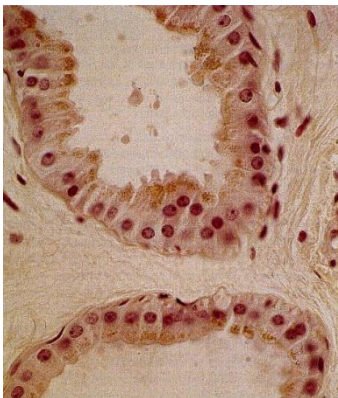


pregnancy



Mamma lactans

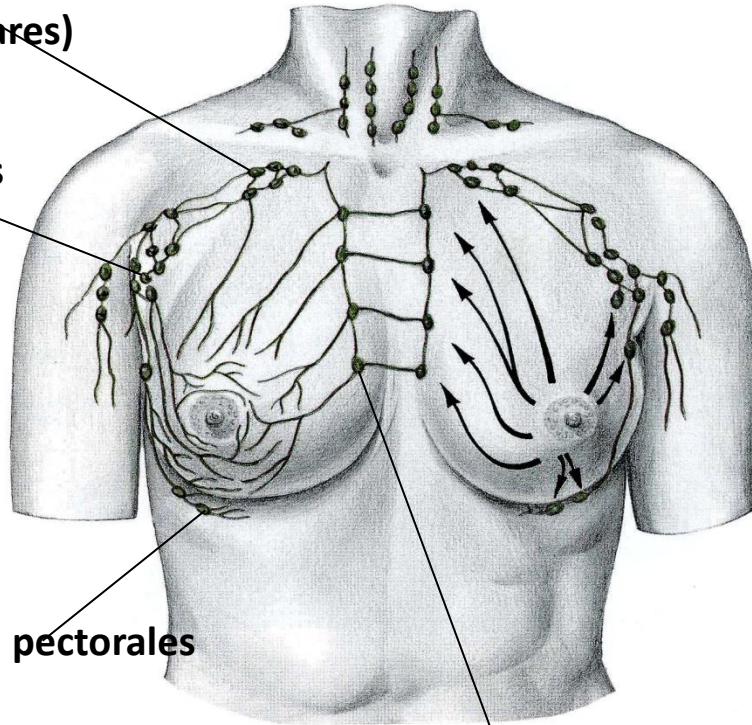
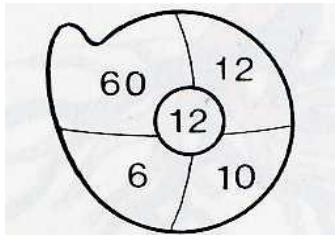
Apocrine secretion



MAMMARY GLAND

nodi lymphatici deltoideopectoriales
(infraclaviculares)

nodi lymphatici axillares



nodi lymphatici pectorales

nodi lymphatici
parasternales

Self examination



Ultrtrasound



Mammography

