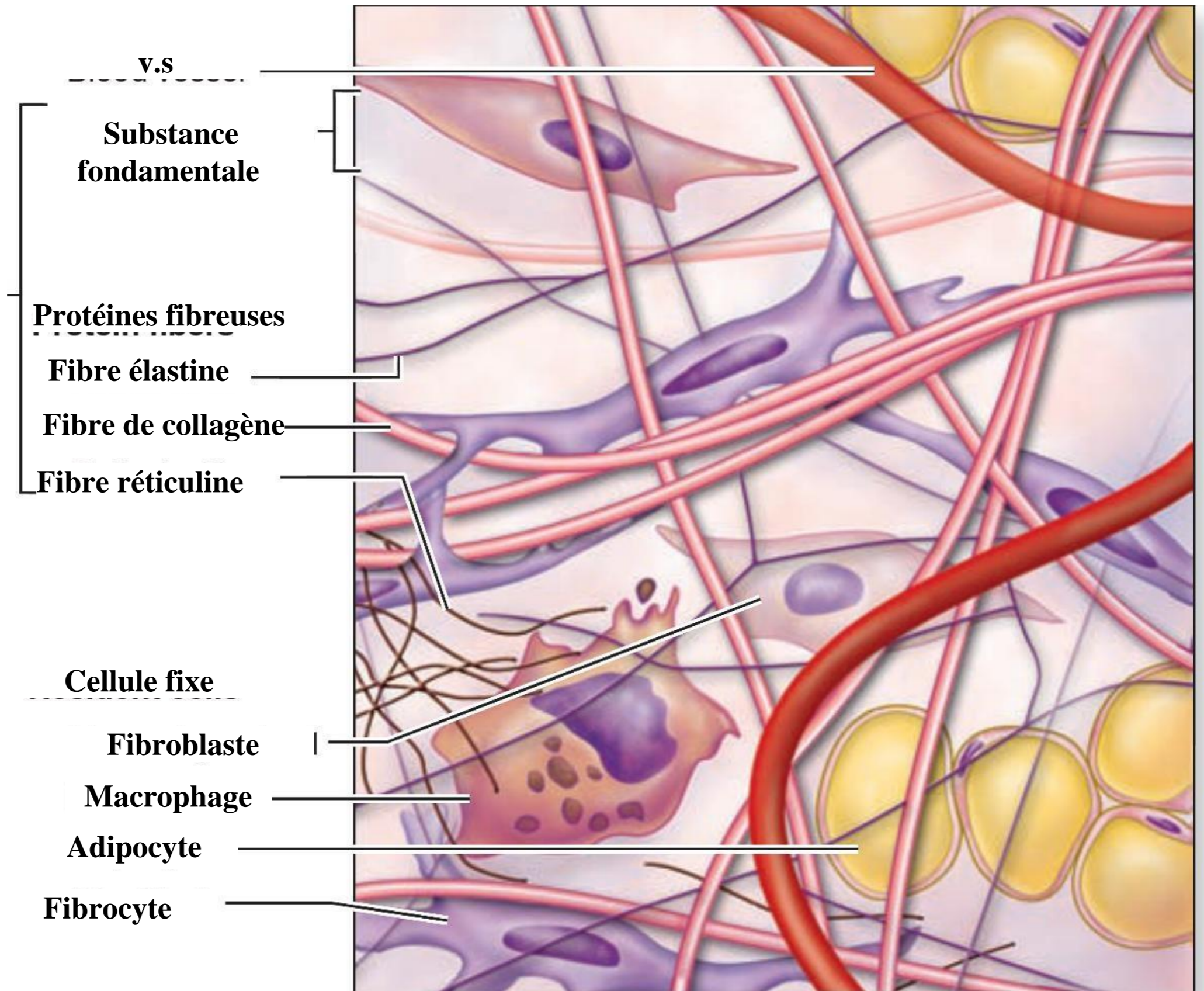


## TD d'histologie n°2

# LESTISSUSCONJONCTIFS



MEC

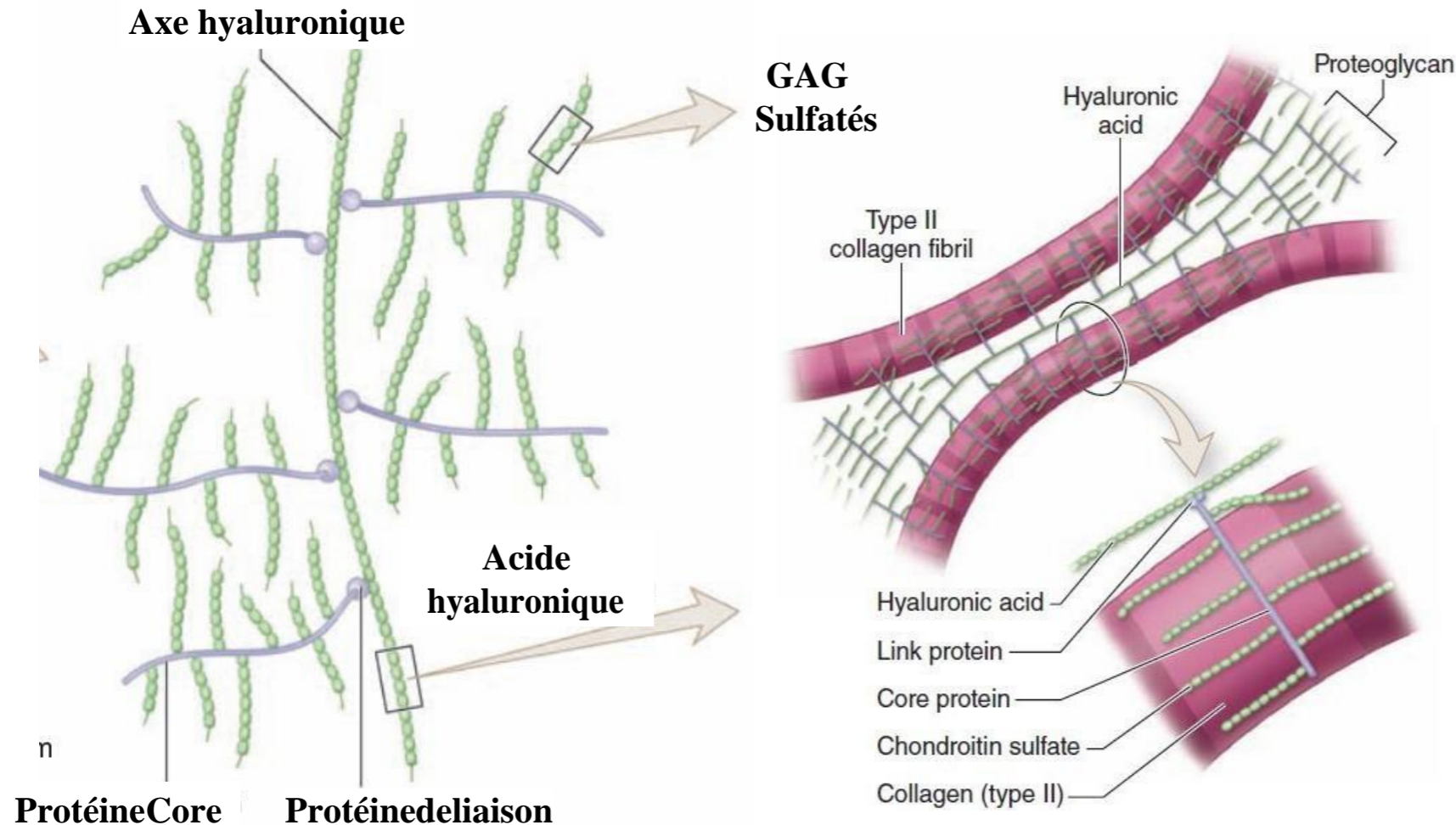




**Substance fondamentale**

Synthétisée surtout par les fibroblastes

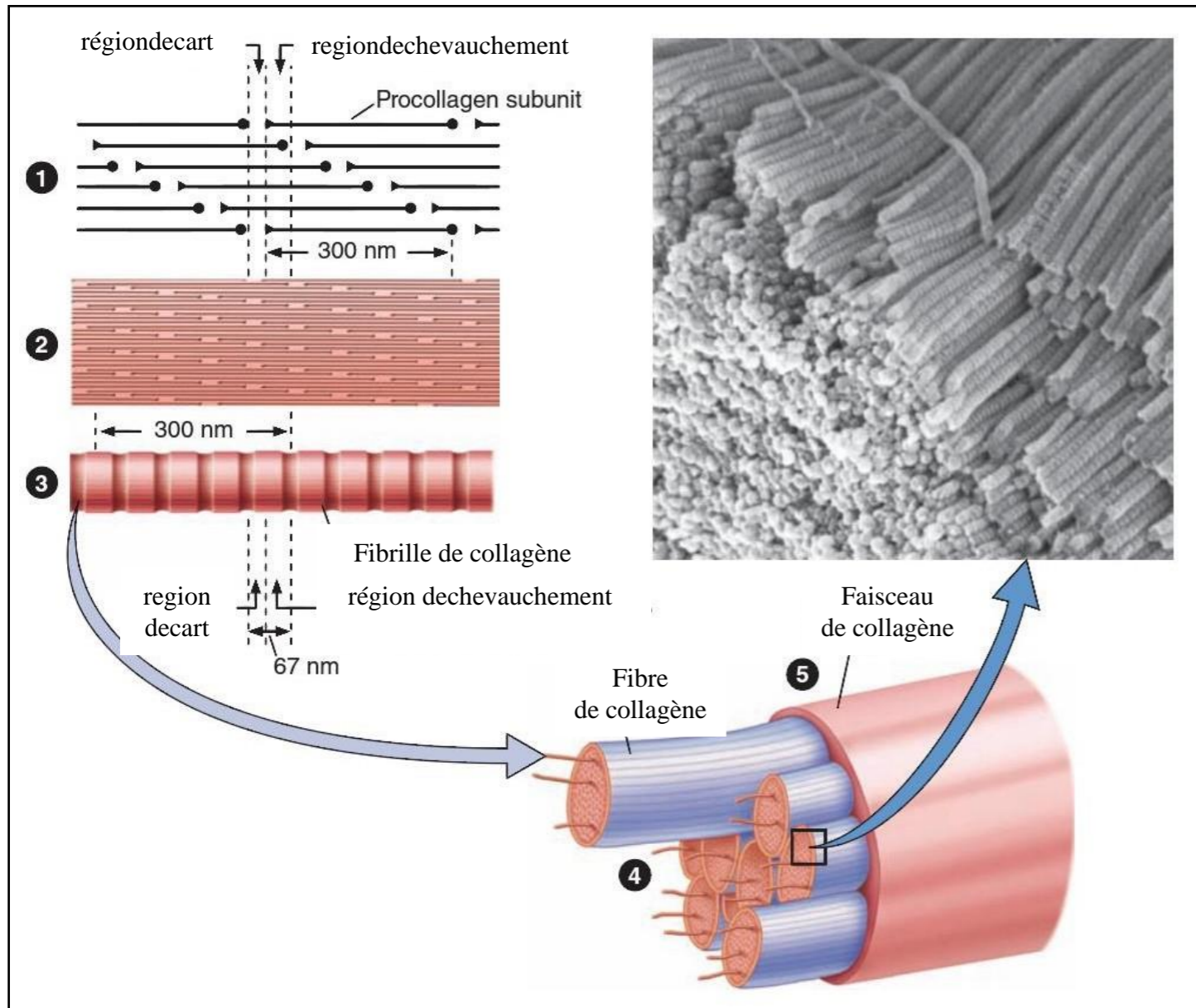
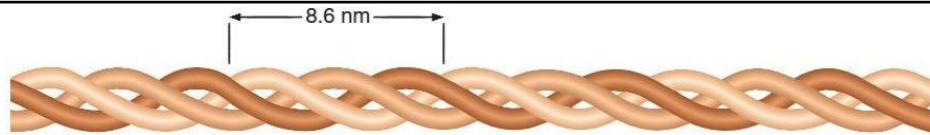
- Eau
- Sels minéraux
- Protéines non collagéniques
- Glycosaminoglycanes: GAG
  - Acide hyaluronique**
  - Chondroïtines-S**
  - Dermatane S**
  - HeparaneS**
  - Kératane-sulfate**

Isolés ou liés à des protéines → **protéoglycanes = agrécanes = aggrecans****Aggrécanes + acide hyaluronique** → complexe macromoléculaire chargé(-)ment

**Gel très hydraté capable de résister à la compression**

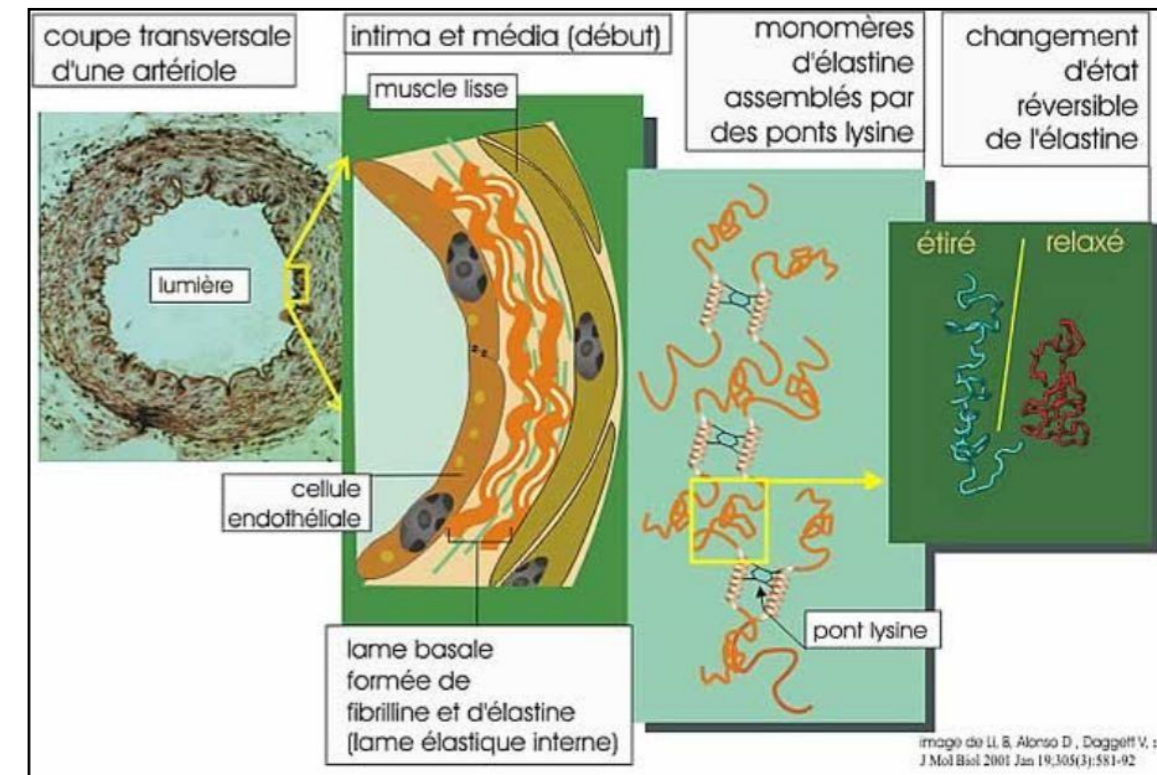
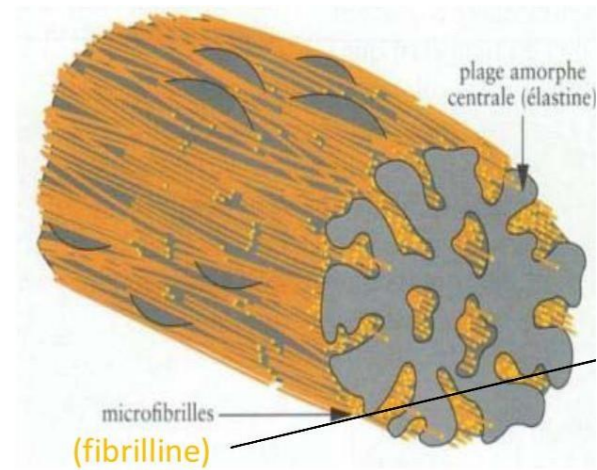
# Des différents types de fibres (Collagènes I, II, III-réticuline-,IV et élastine)

**Collagène I** : deux chaînes alpha1 et une chaîne alpha2



**Elastine**

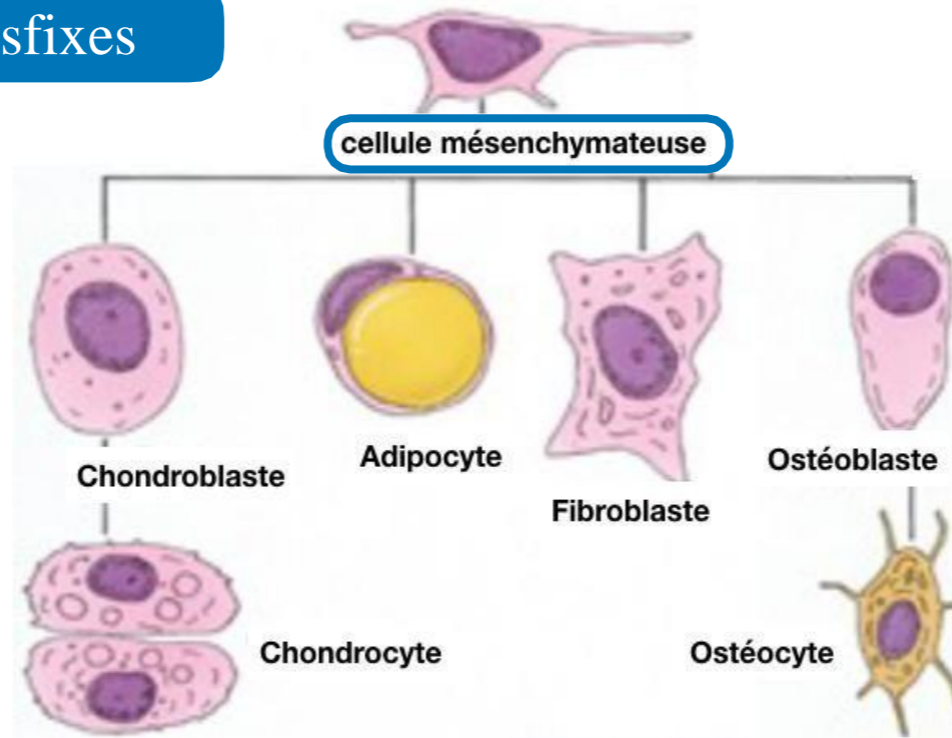
:noyau d'élastine (plage amorphe centrale) entourée de microfibrilles de fibrilline



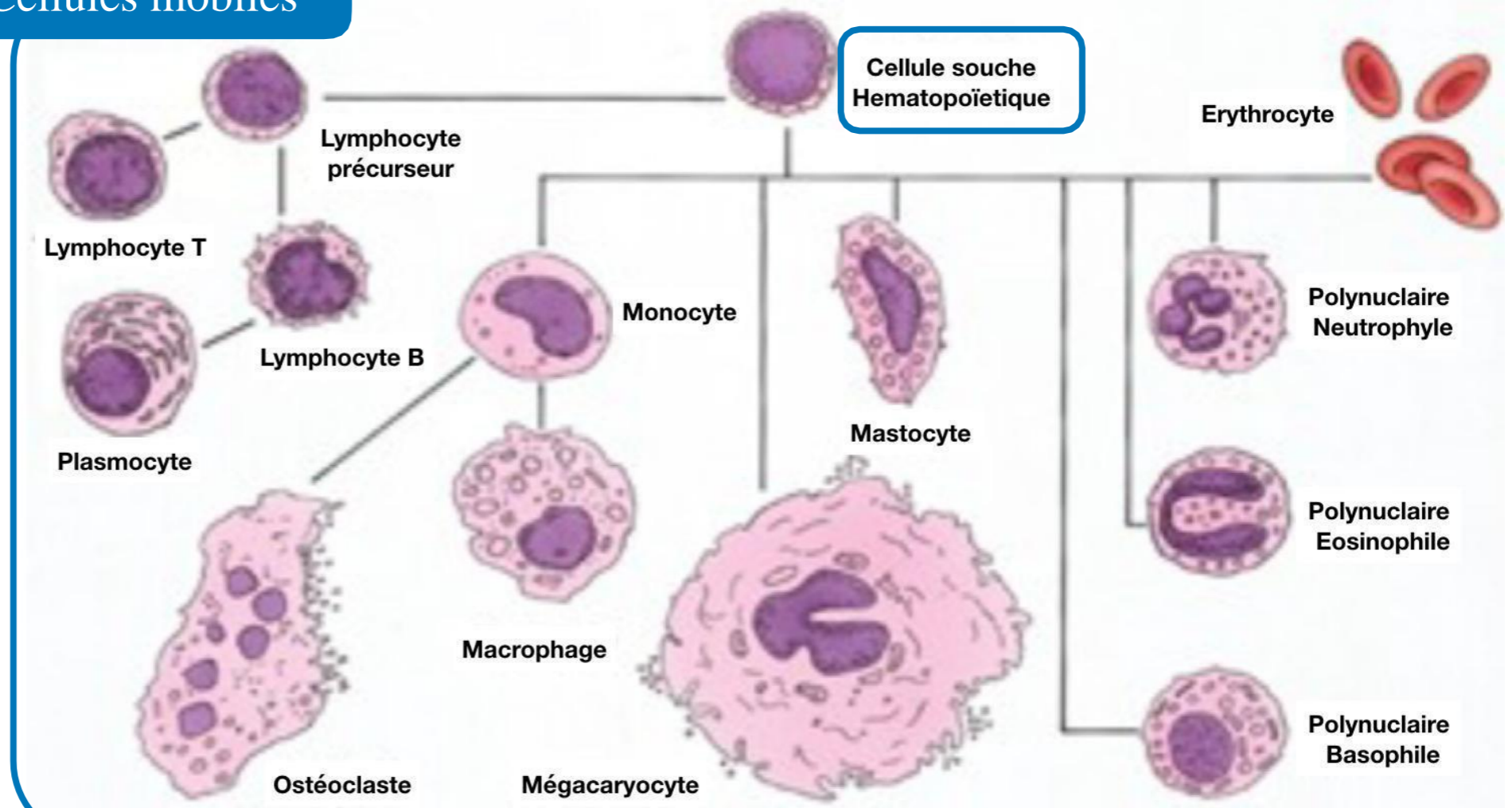


Cellules fixes

Cellules



Cellules mobiles

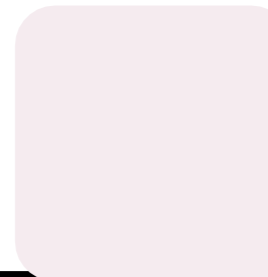
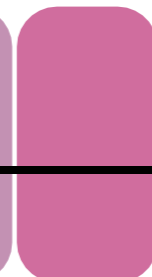
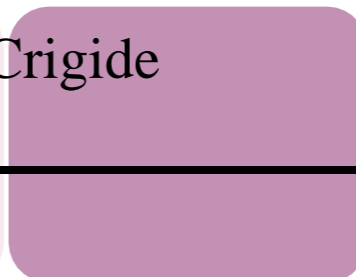
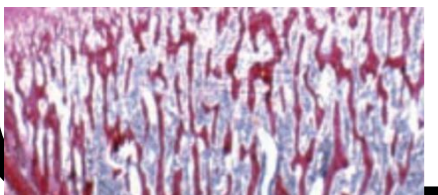
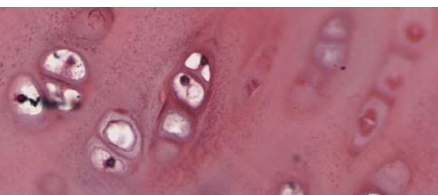
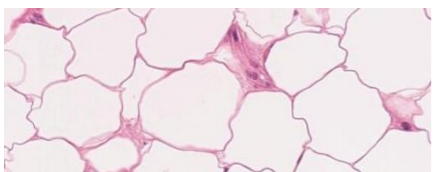
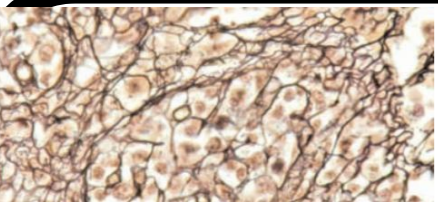
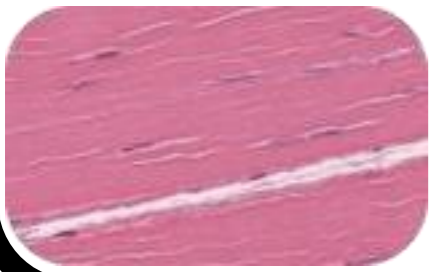
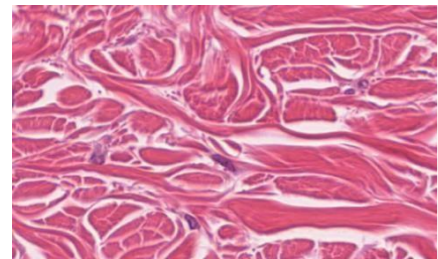


<b>TC lâche(aréolaire)</b>	Sf abondante Riche en cellule <b>fibroblaste- fibrocyte- cellules sanguine</b> Peu de collagène distribution aléatoire	laminapropriaTD
<b>TC dense irrégulier</b>	Sf pauvre quelques cellules (surtout <b>fibroblastes</b> ) bcp de collagène non orienté	Derme, organe a capsule,couchesousmuqueuseTD
<b>TCdense régulier</b>	Sf pauvre faisceaux de collagène orientés fibroblastes alignés aux fibres	ligament,tendon, aponévrose
<b>TC réticulaire</b>	Réseau délicat de collagène III (réticuline)	pancréas, les organeslymphoïdes(saufthymus)
<b>TC élastique</b>	Réseau de fibre élastique anastomosé	Vaisseaux (lames élastiques)
<b>TC Adipeux</b>	Adipocytes abondants richement vascularisé	Différentes localisation Accumulant des réserves
<b>TC Cartilagineux</b>	MEC cartilagineuse avasculaire chondroblastes-chondrocytes fibres de collagène et/ou élastique	chyalin, c.élastiqueetc. fibreux

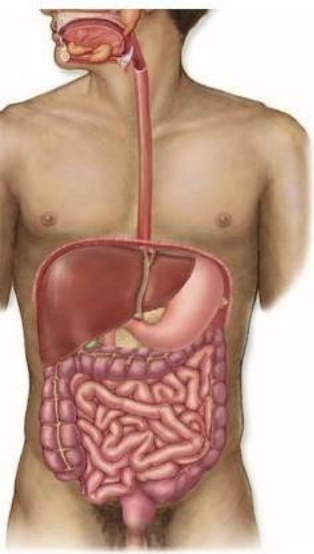
# TC Osseux

ostéoblastes-ostéocytes-ostéoclastes...MECrigide

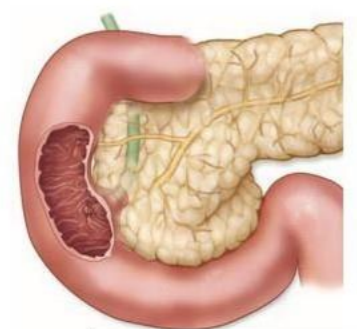
Os compact, os spongieux



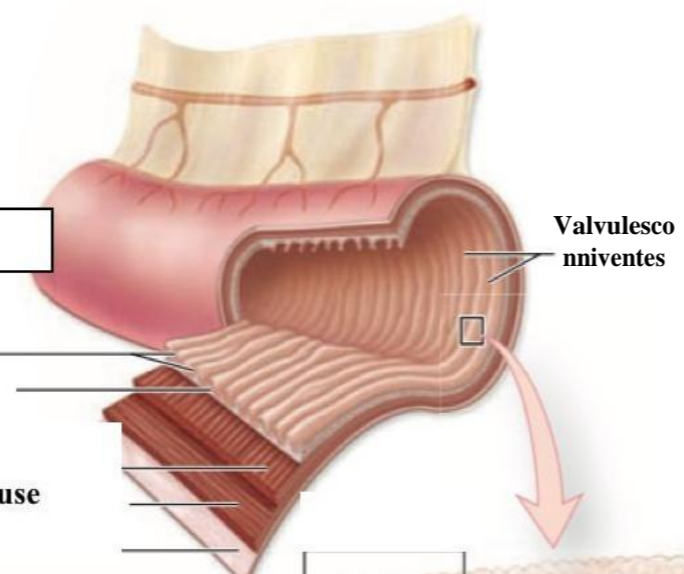




Appareil digestif



Duodénum



Valvulesco  
nniventes

Muqueuse  
sous muqueuse

Musculeuse

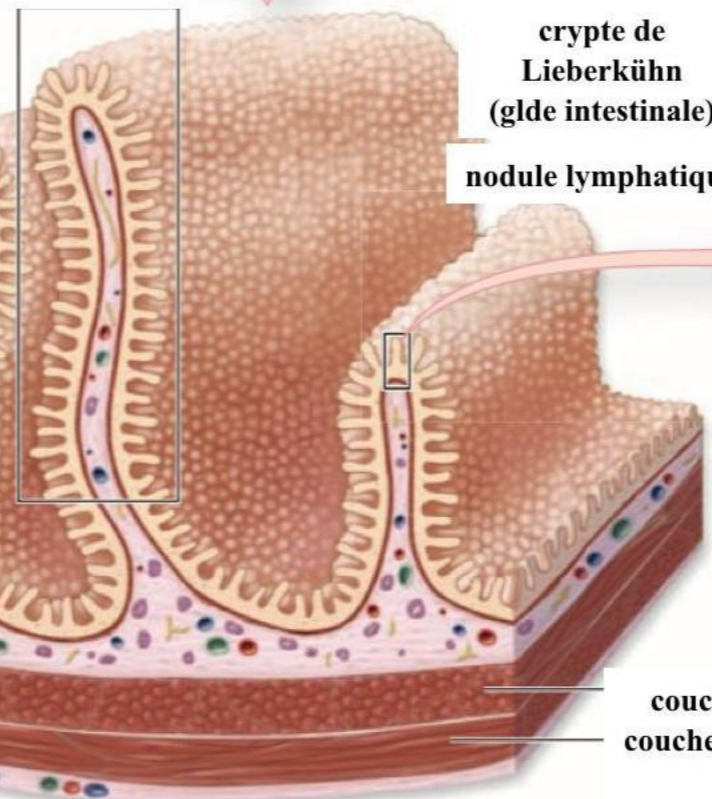
Séreuse

Villosités  
intestinales

sous muqueuse

Séreuse

Section intestin grêle



vascularisation

C. caliciforme

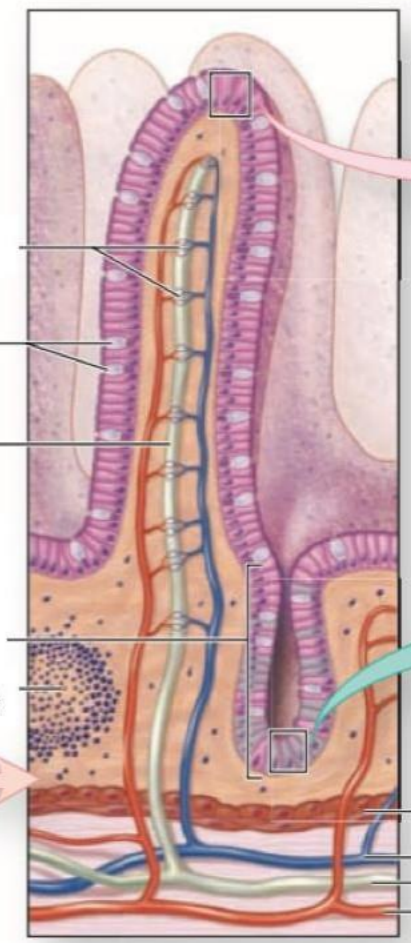
capillaire  
lymphatique  
(Chylifère)

crypte de  
Lieberkühn  
(glande intestinale)

nodule lymphatique

couche interne circulaire  
couche externe longitudinale

Musculeuse



Villosité intestinale

Enterocyte

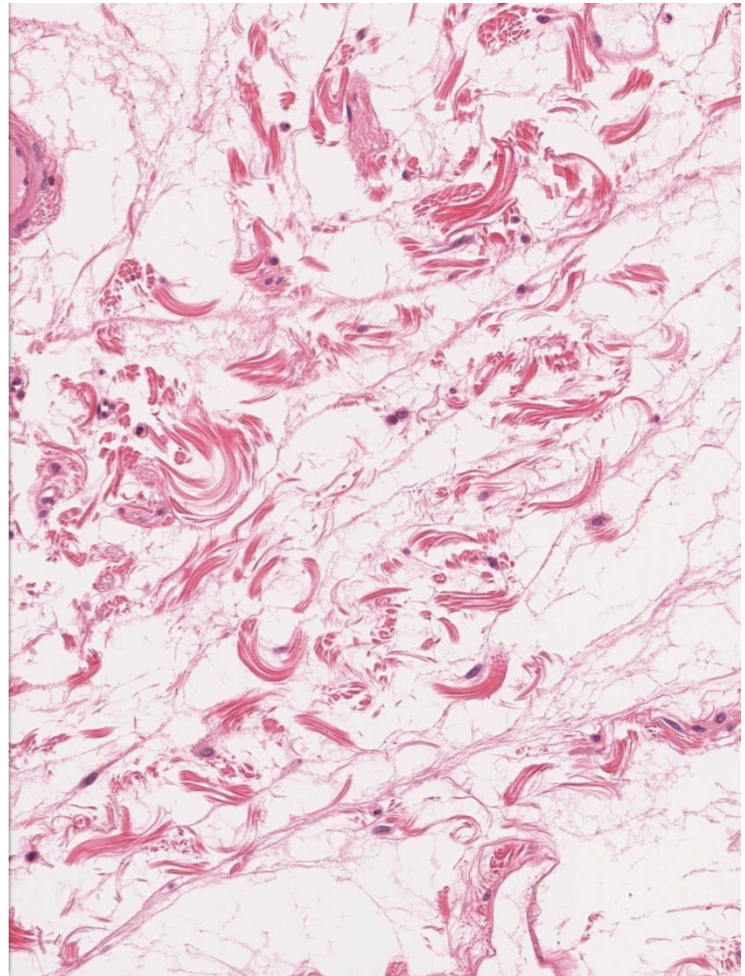
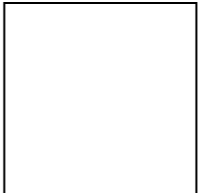
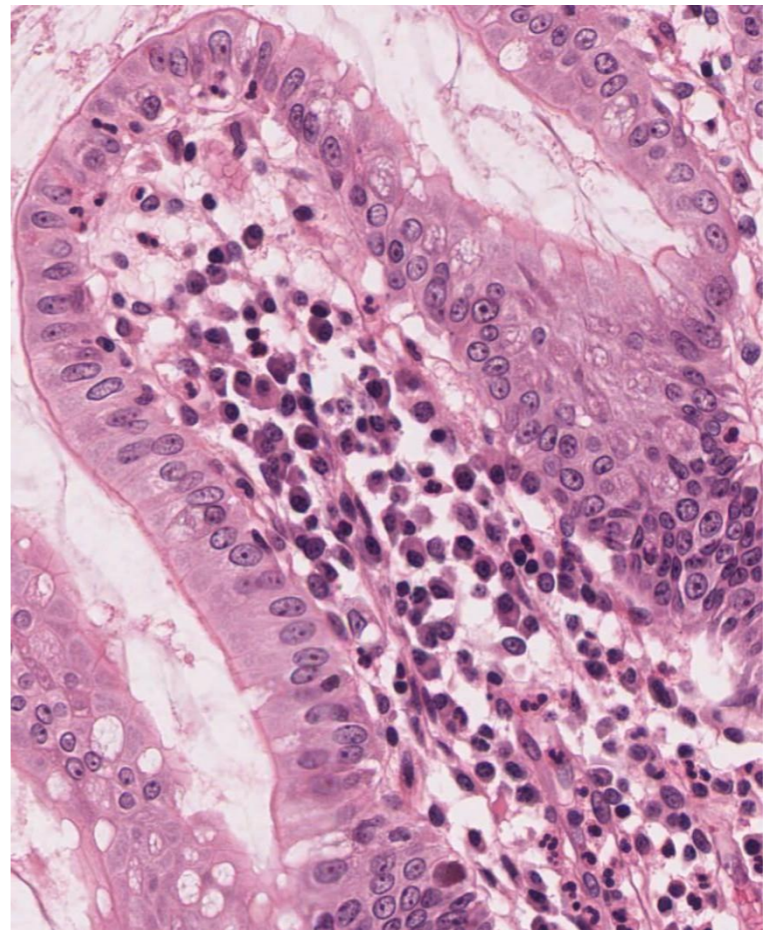
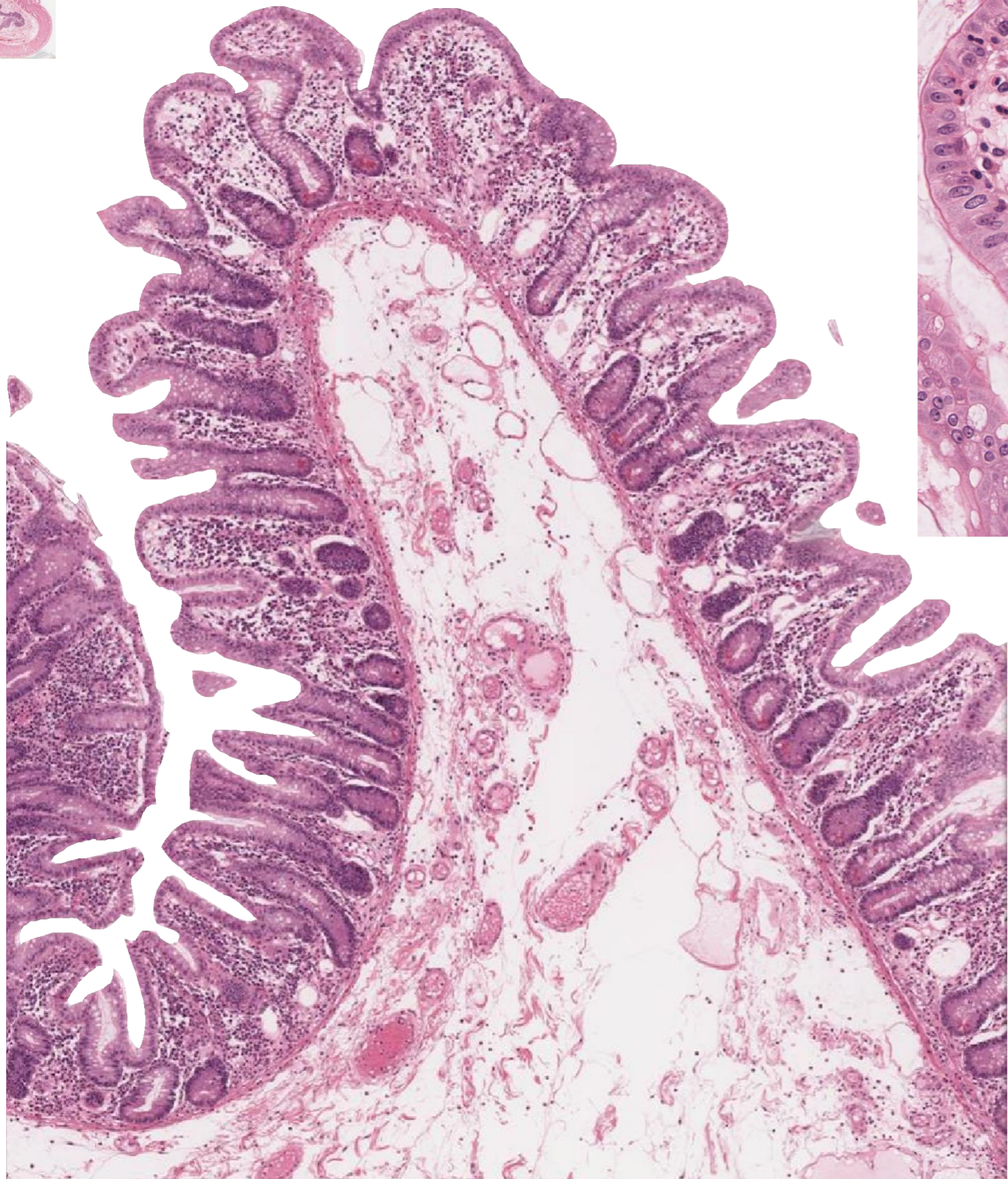


cellule de Paneth

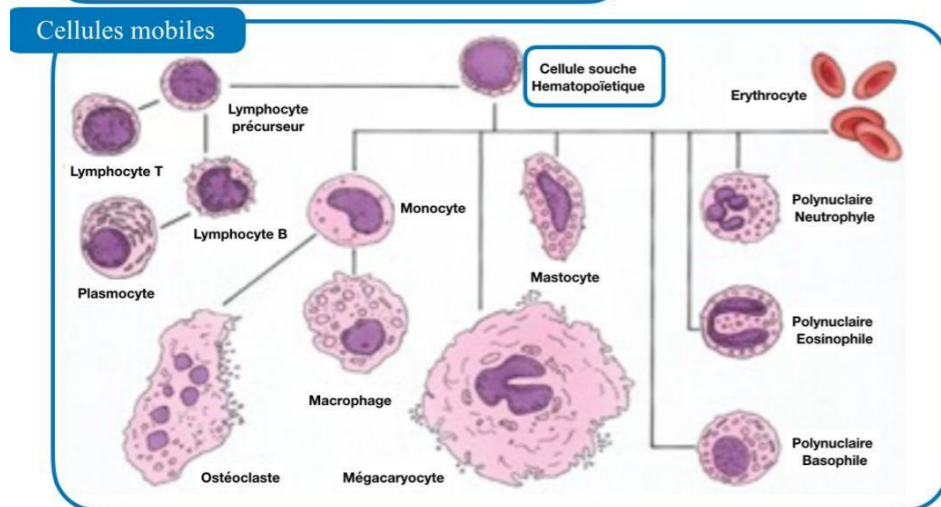
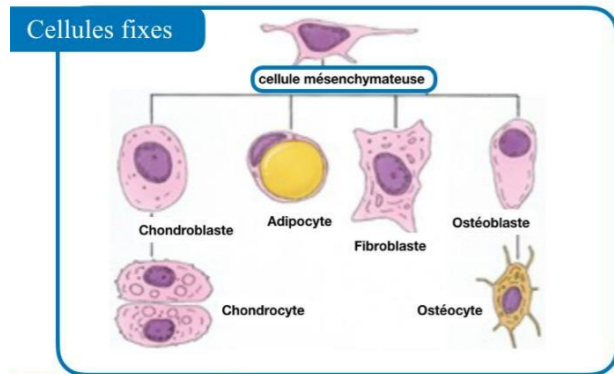
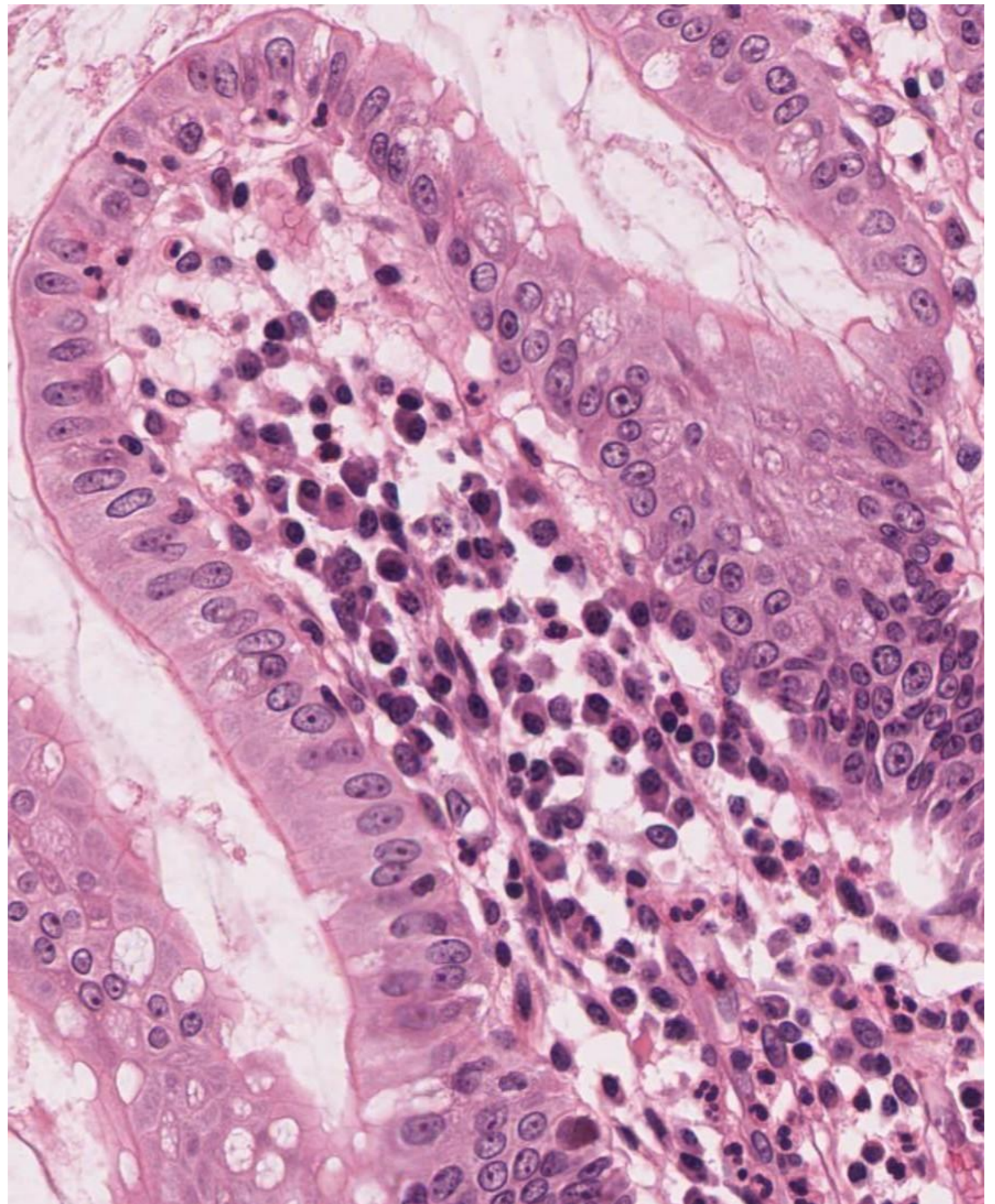
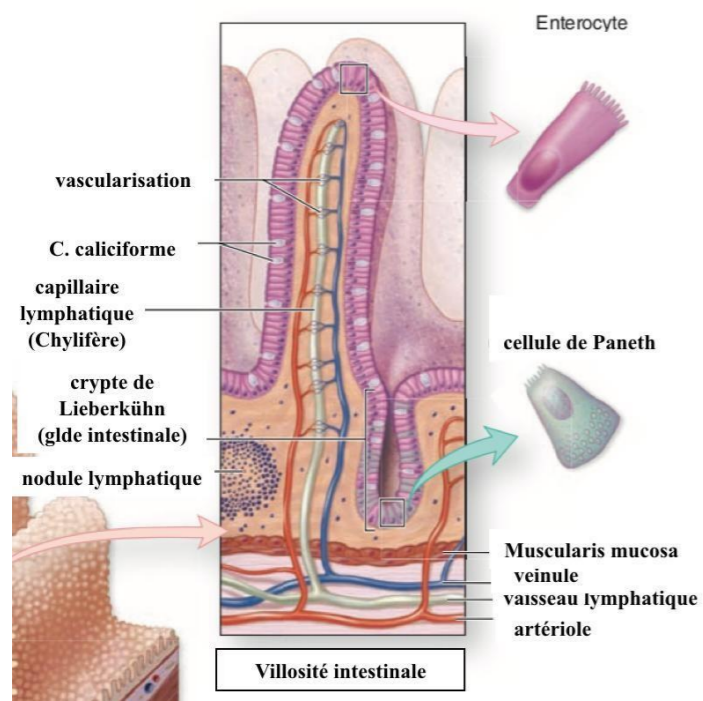


Muscularis mucosa  
veinule  
vaisseau lymphatique  
artériole

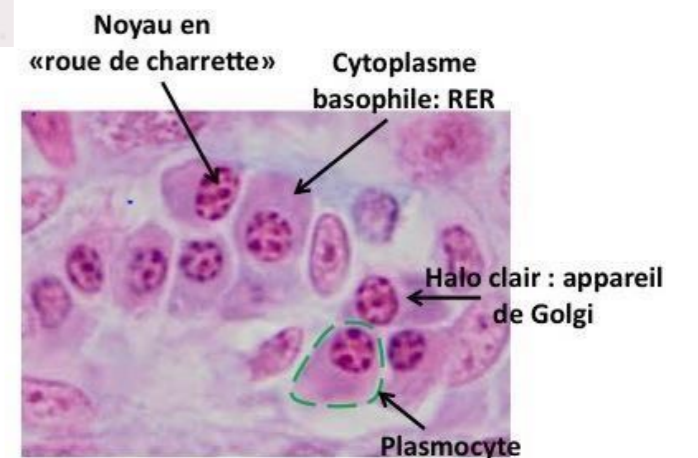
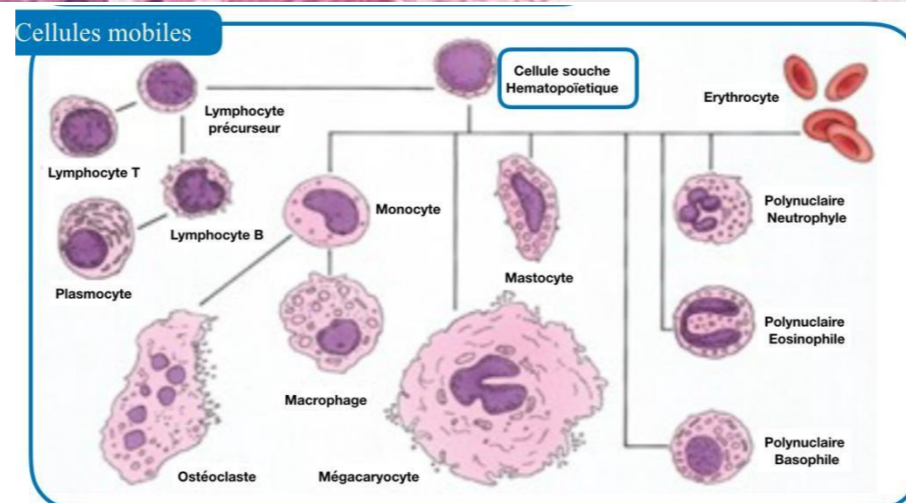
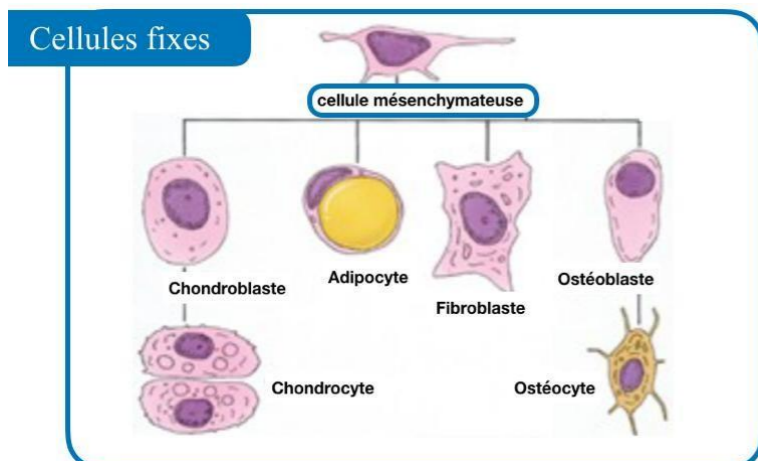
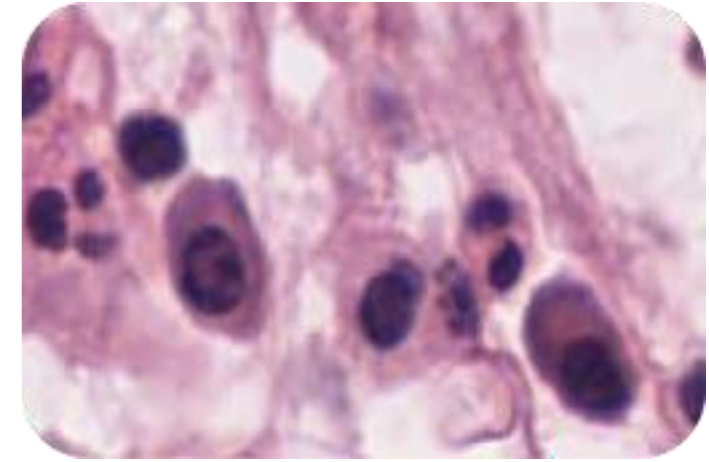
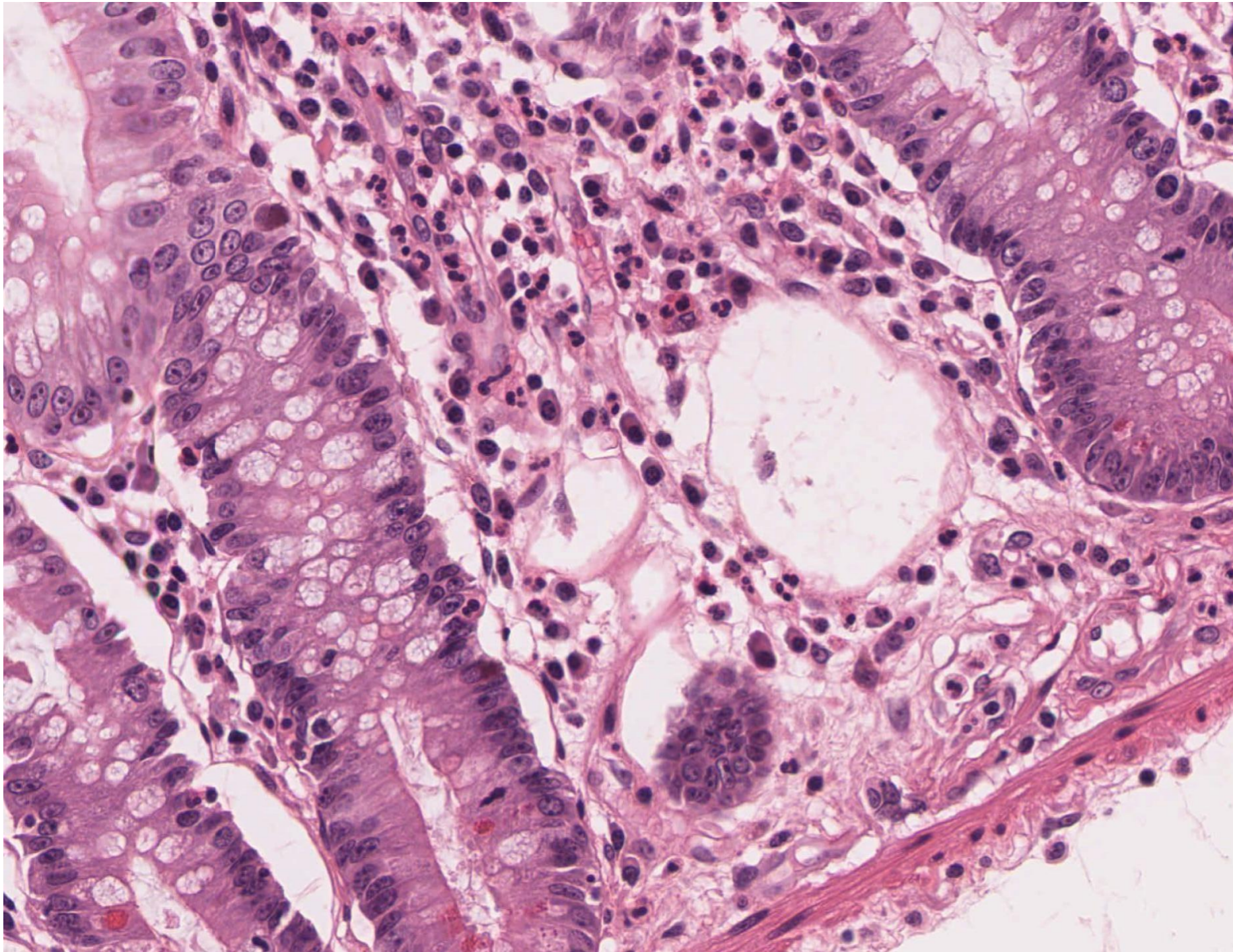




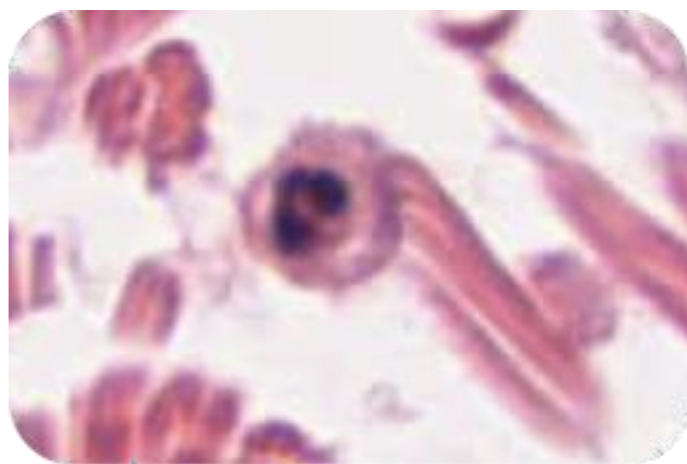
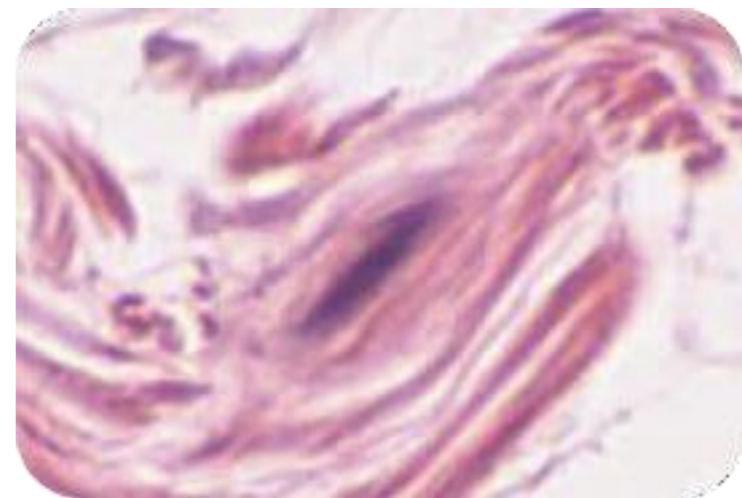
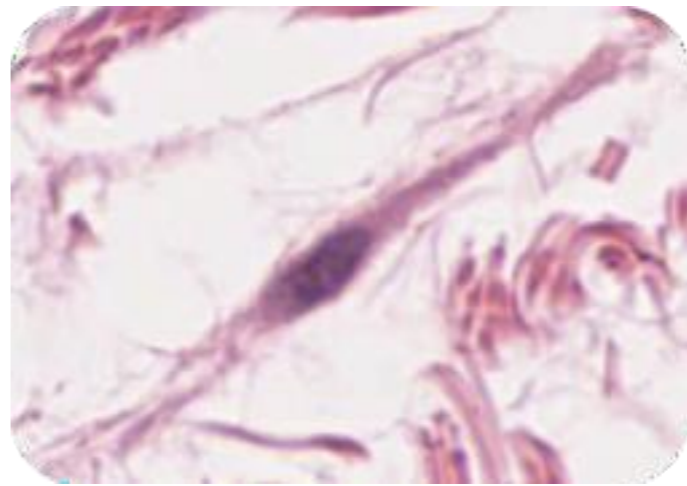
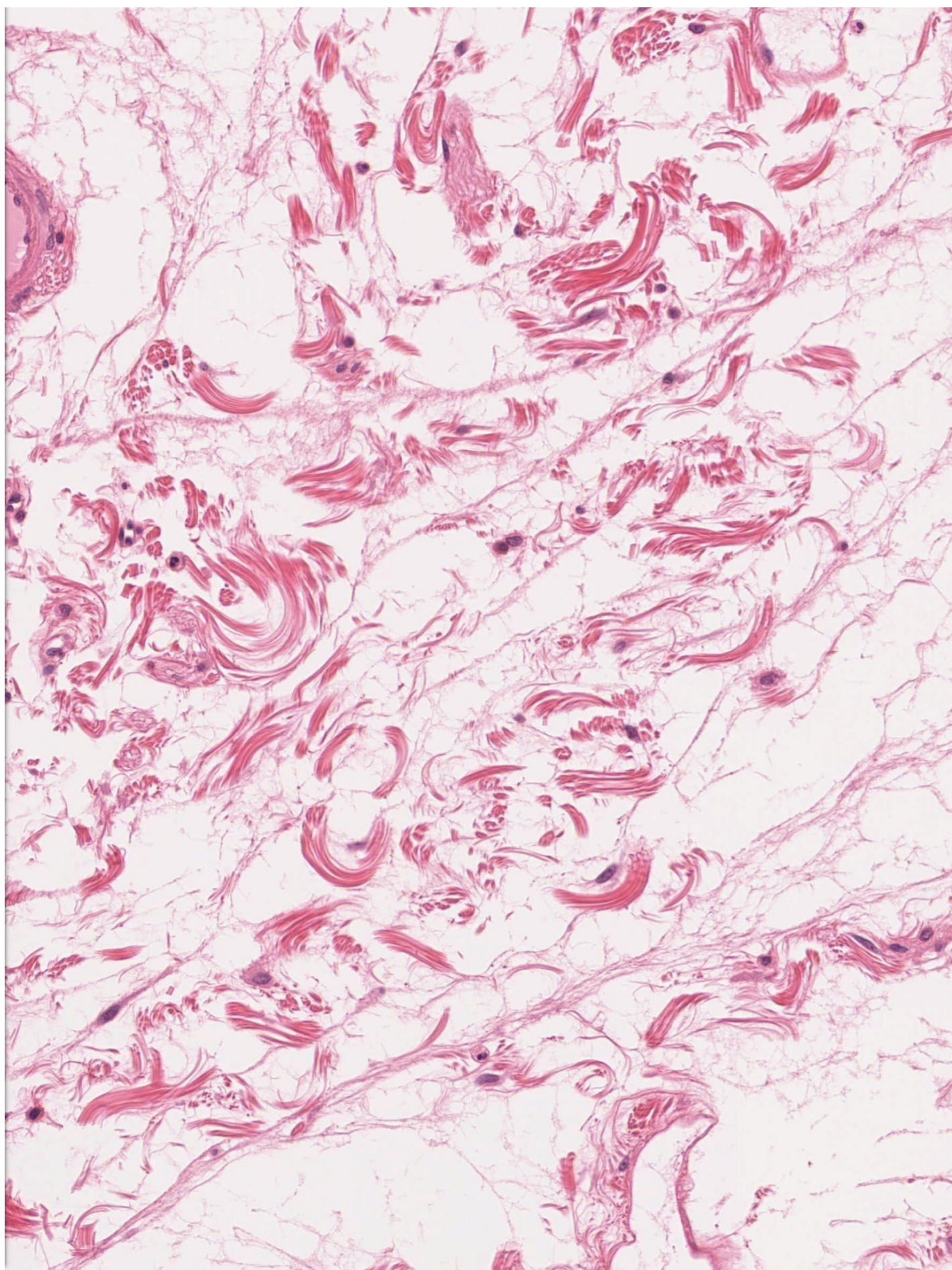




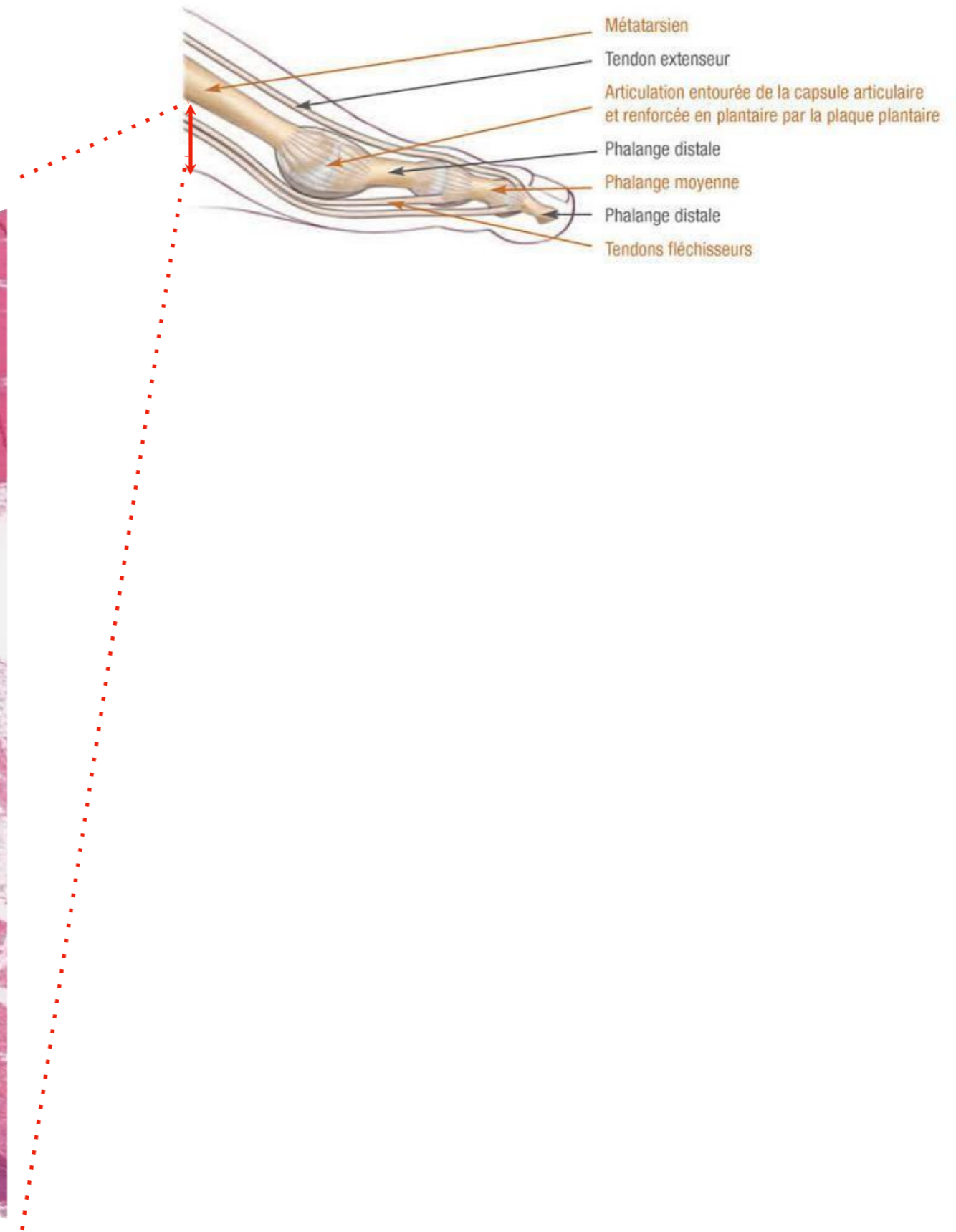
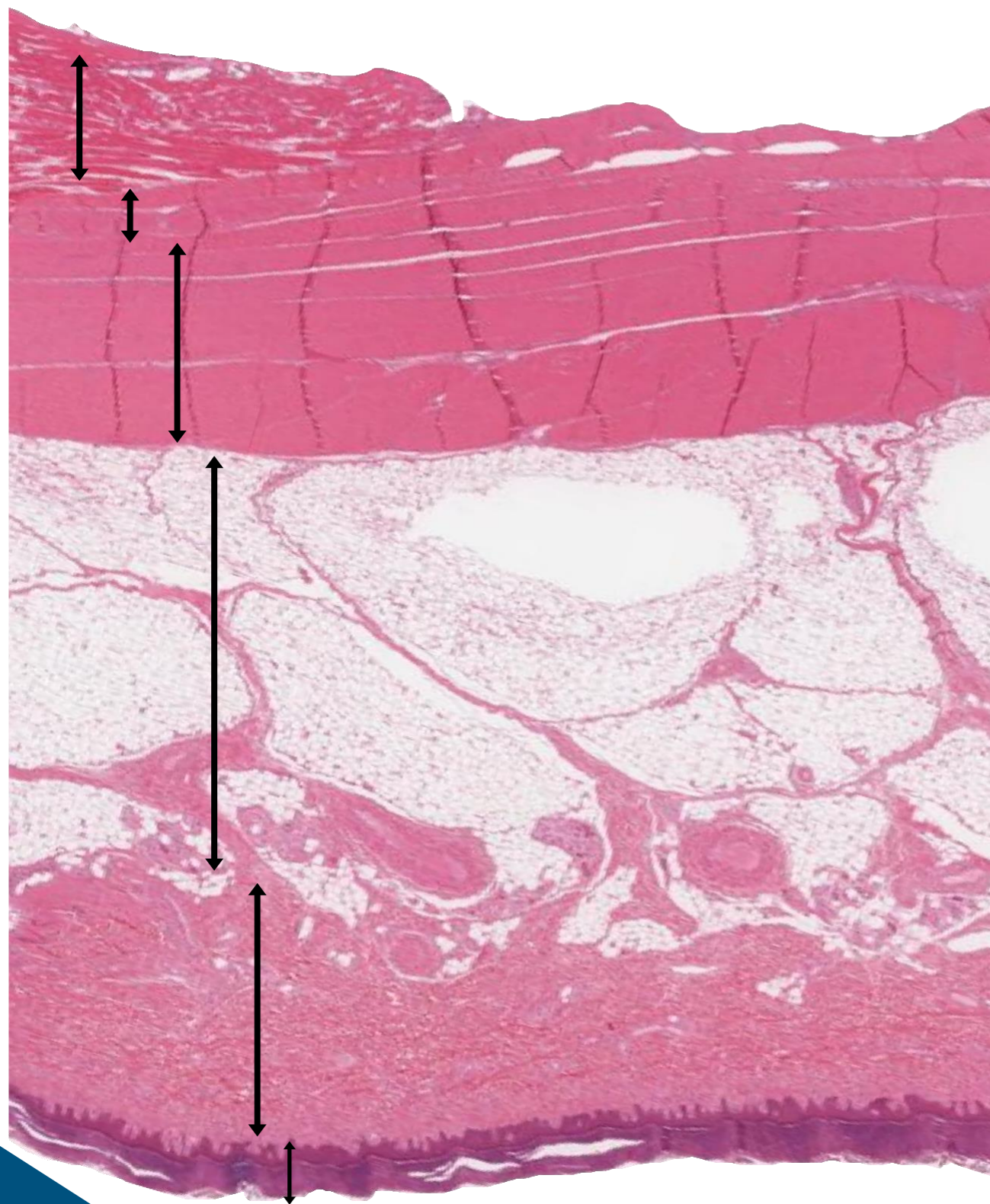




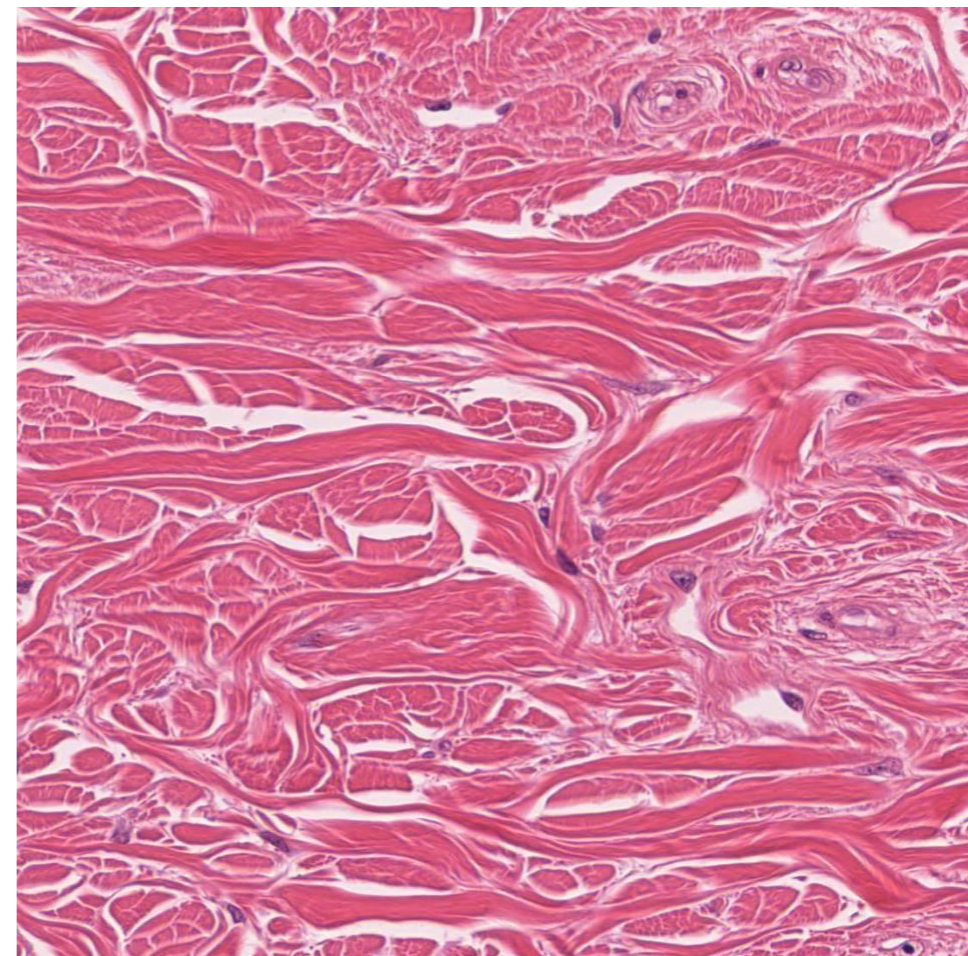
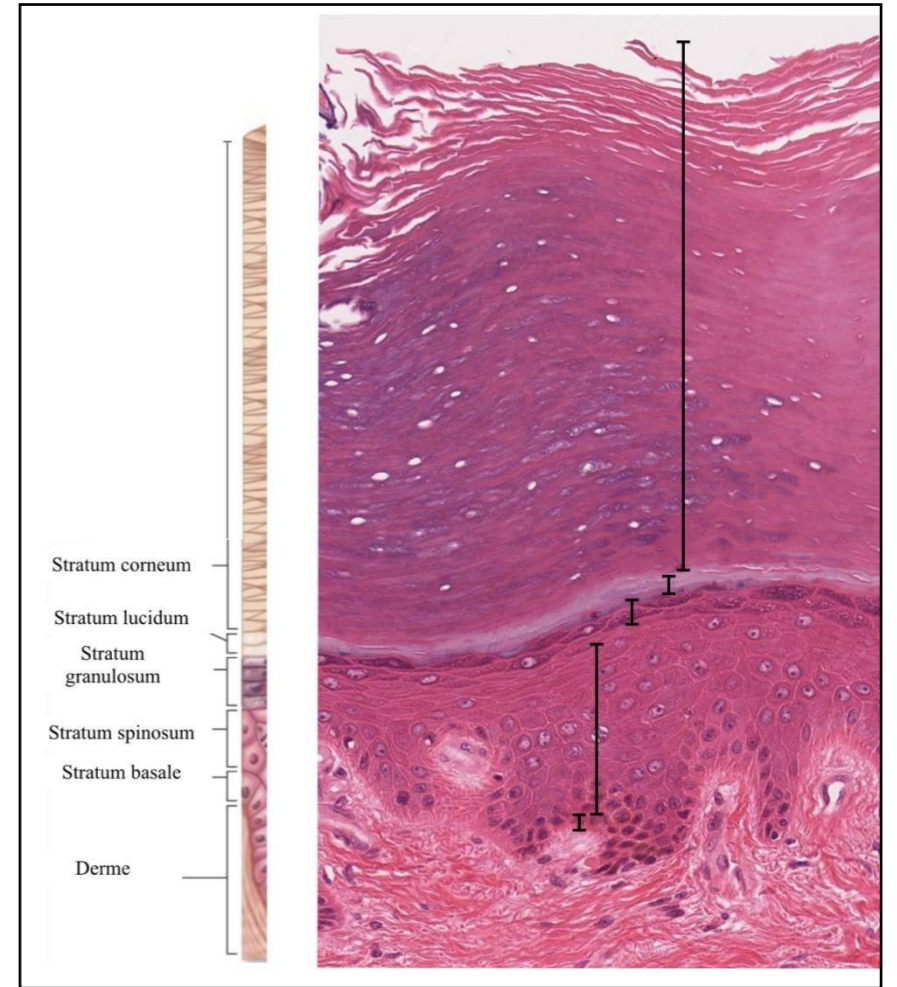
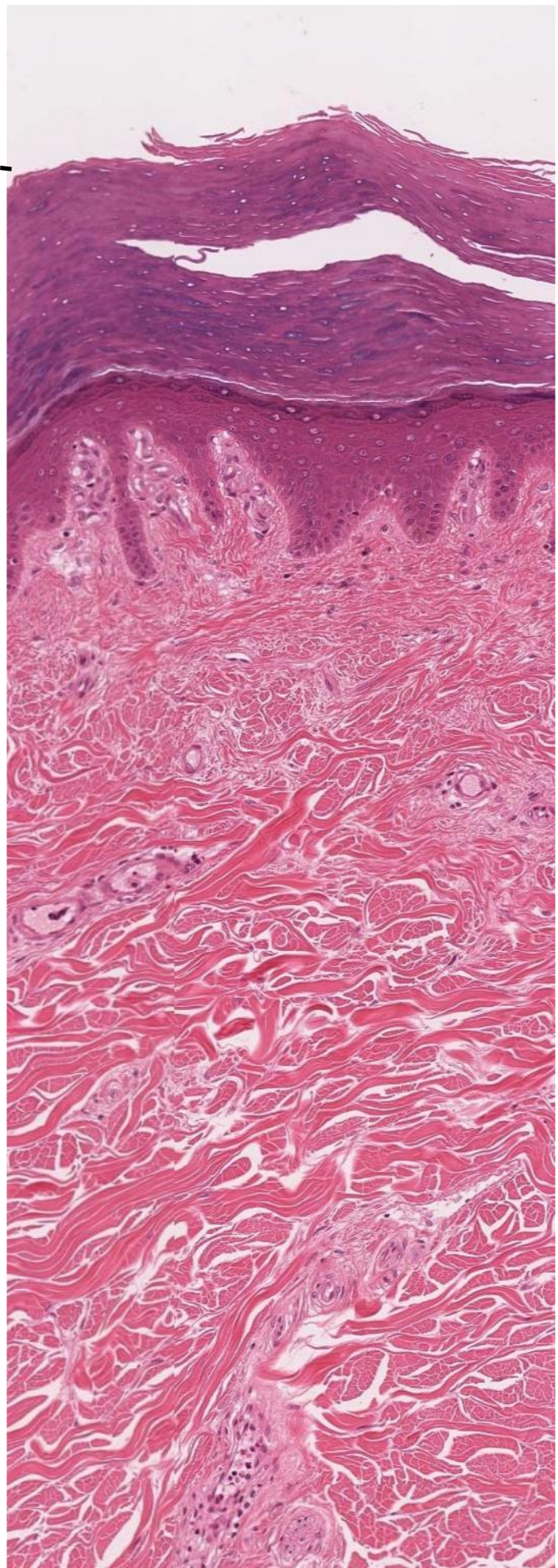
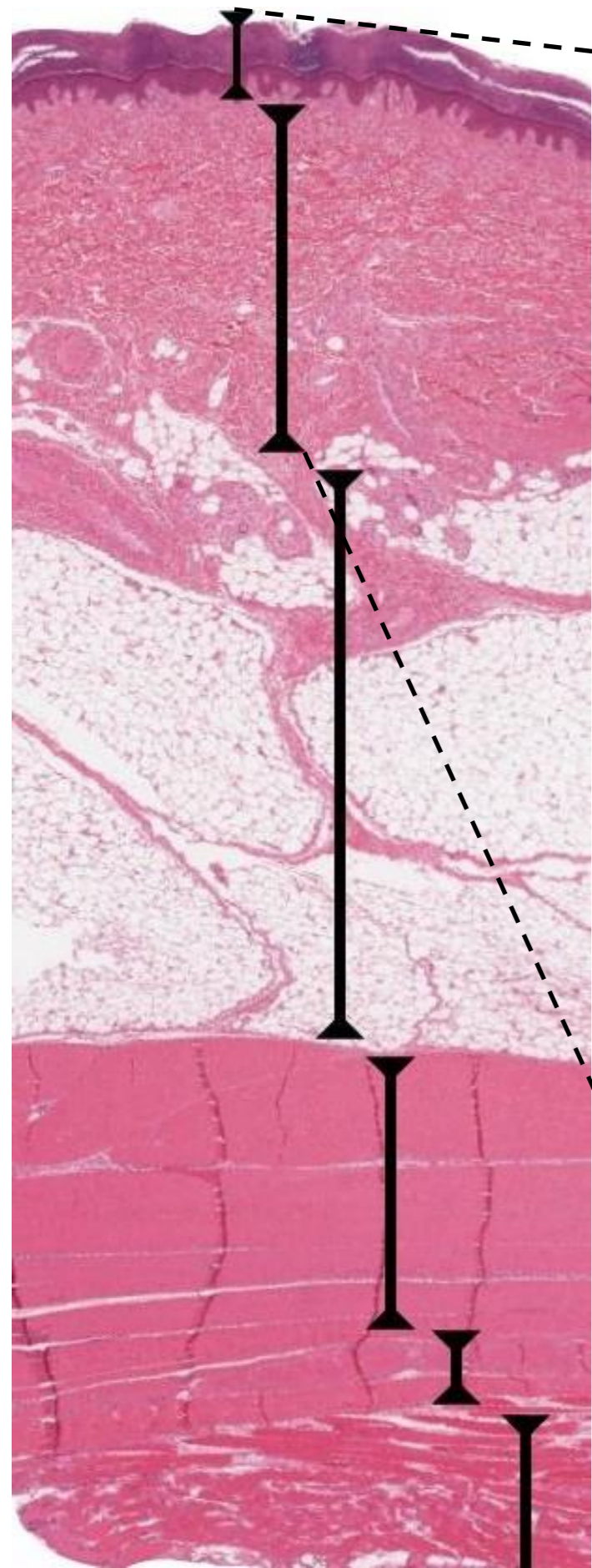




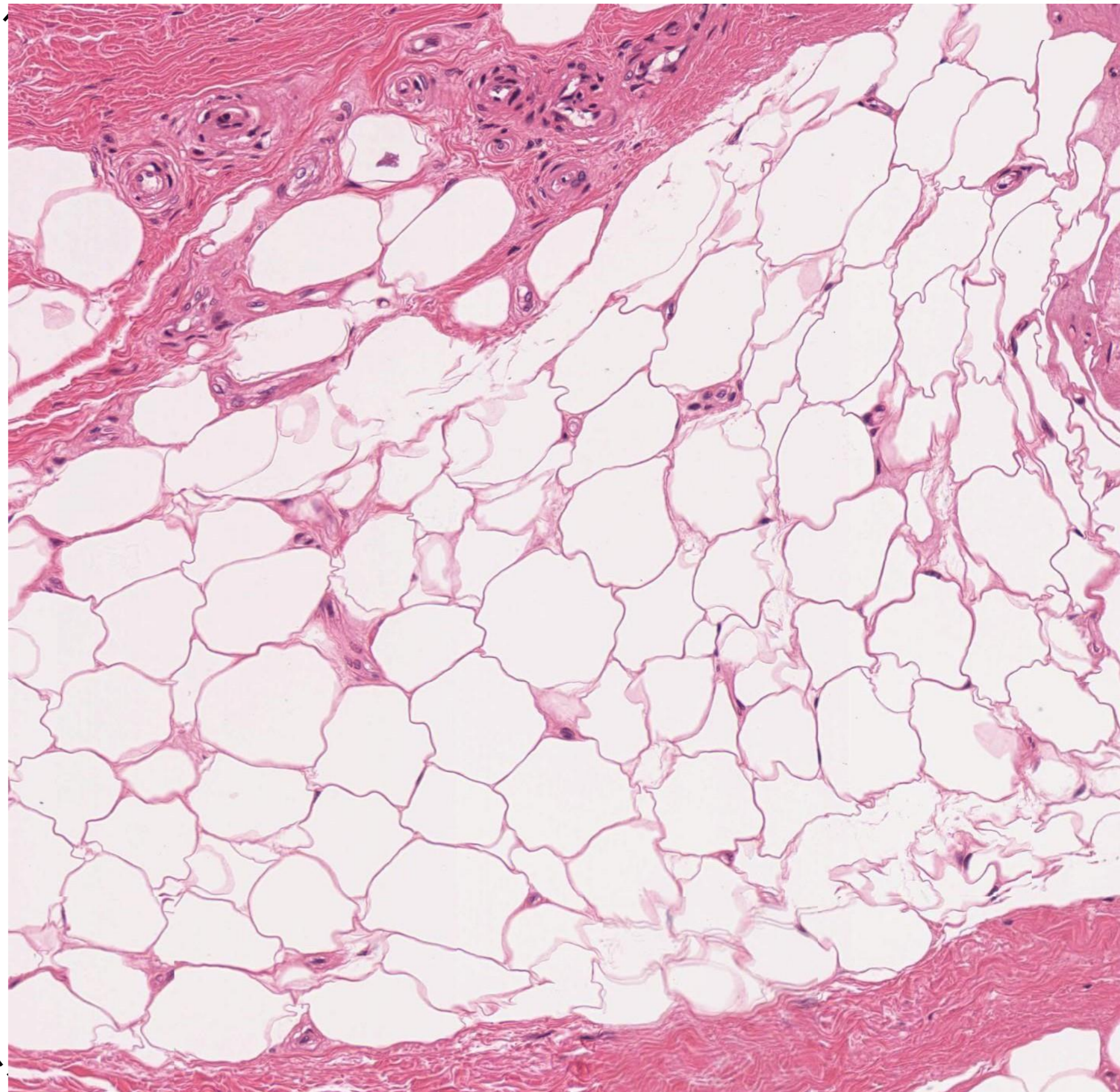
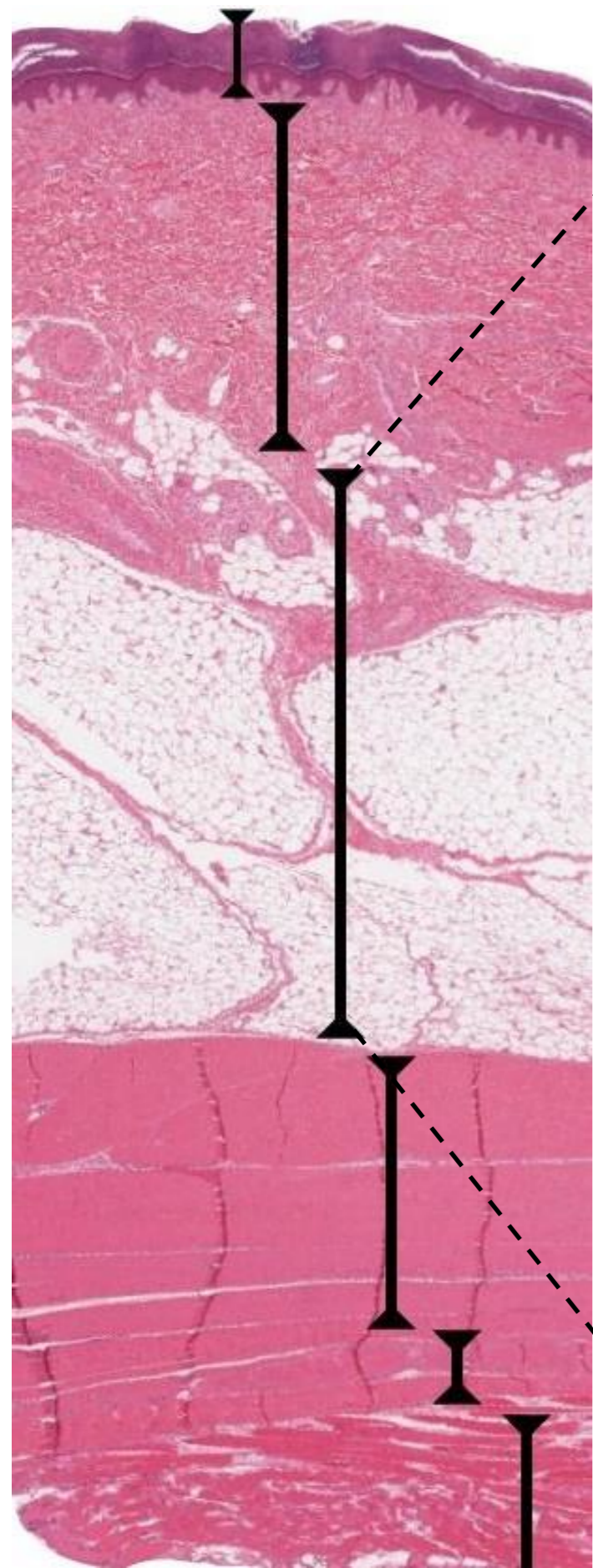
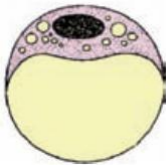




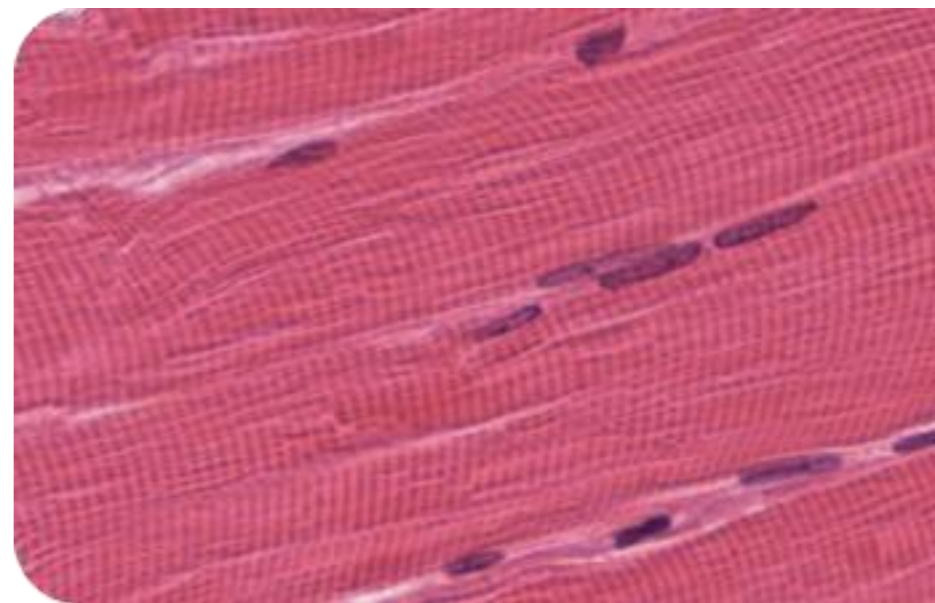
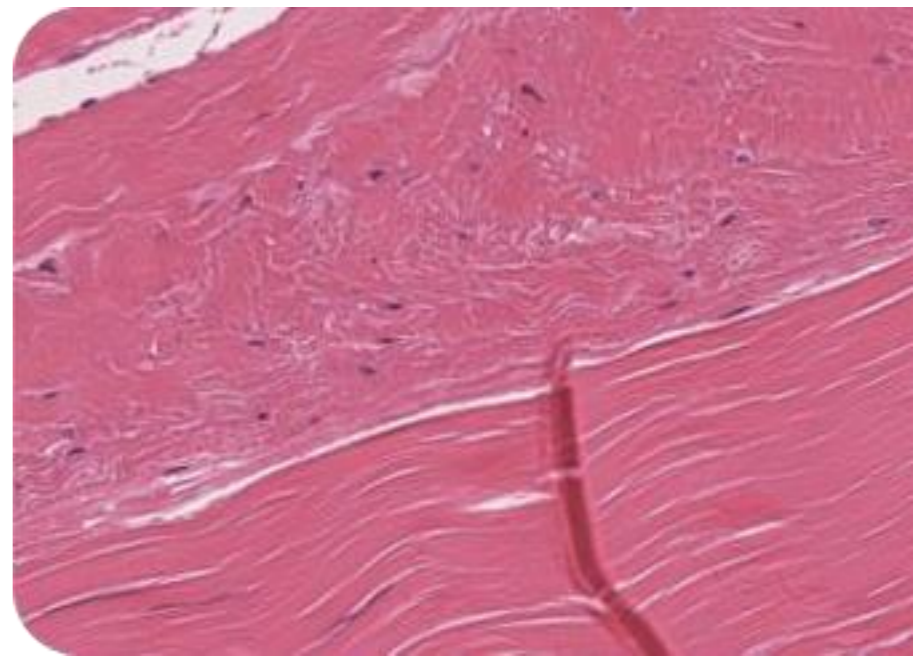
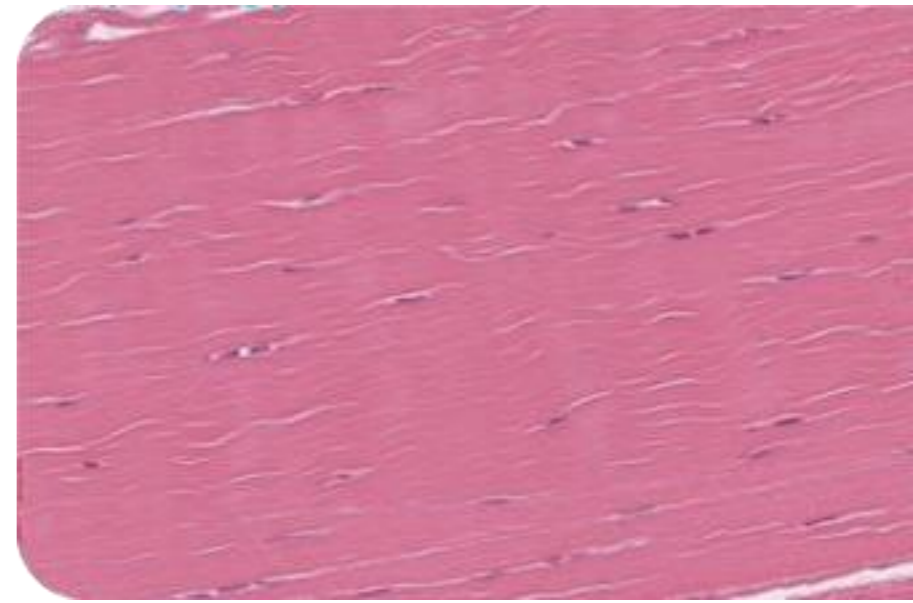
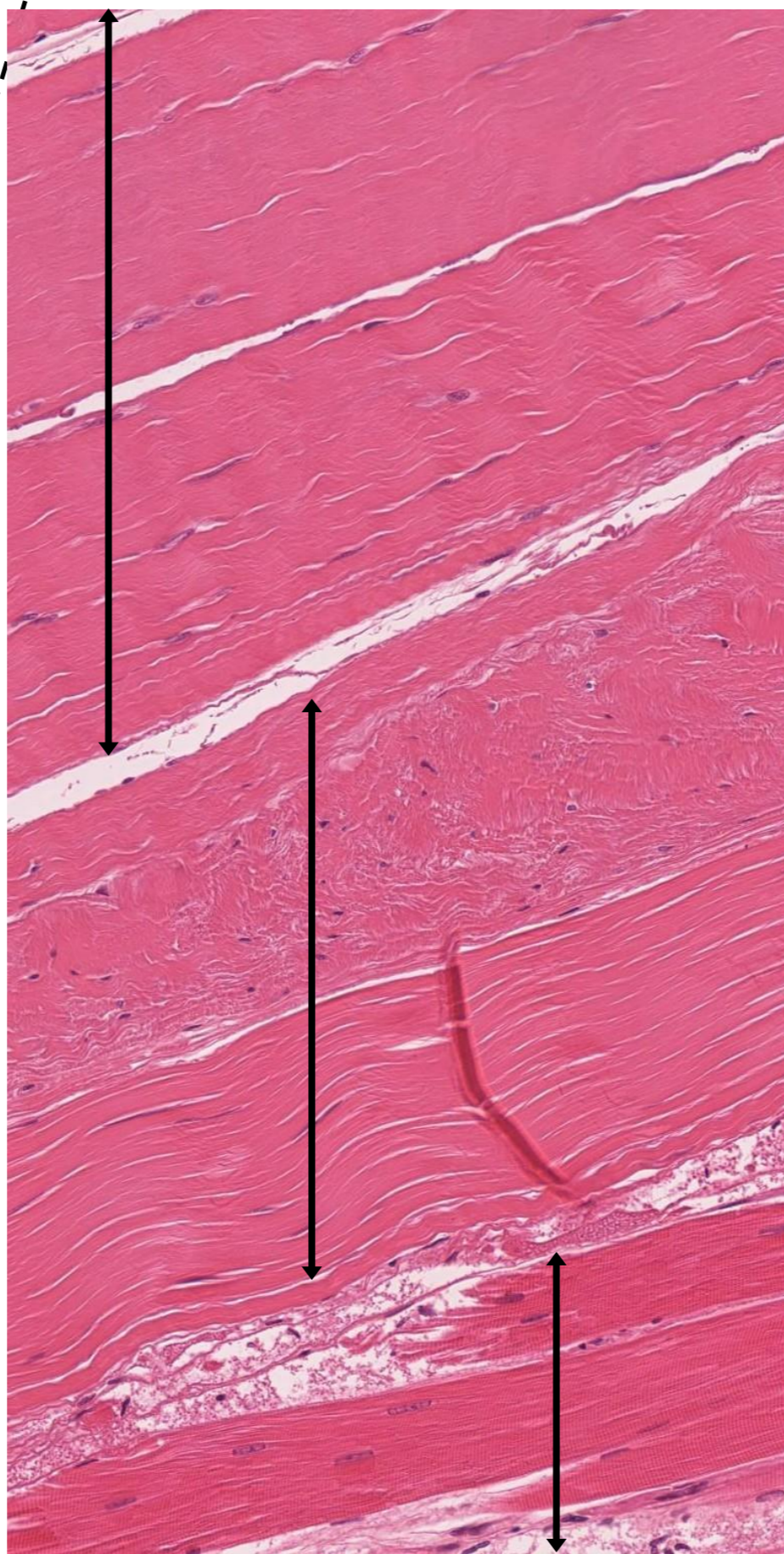
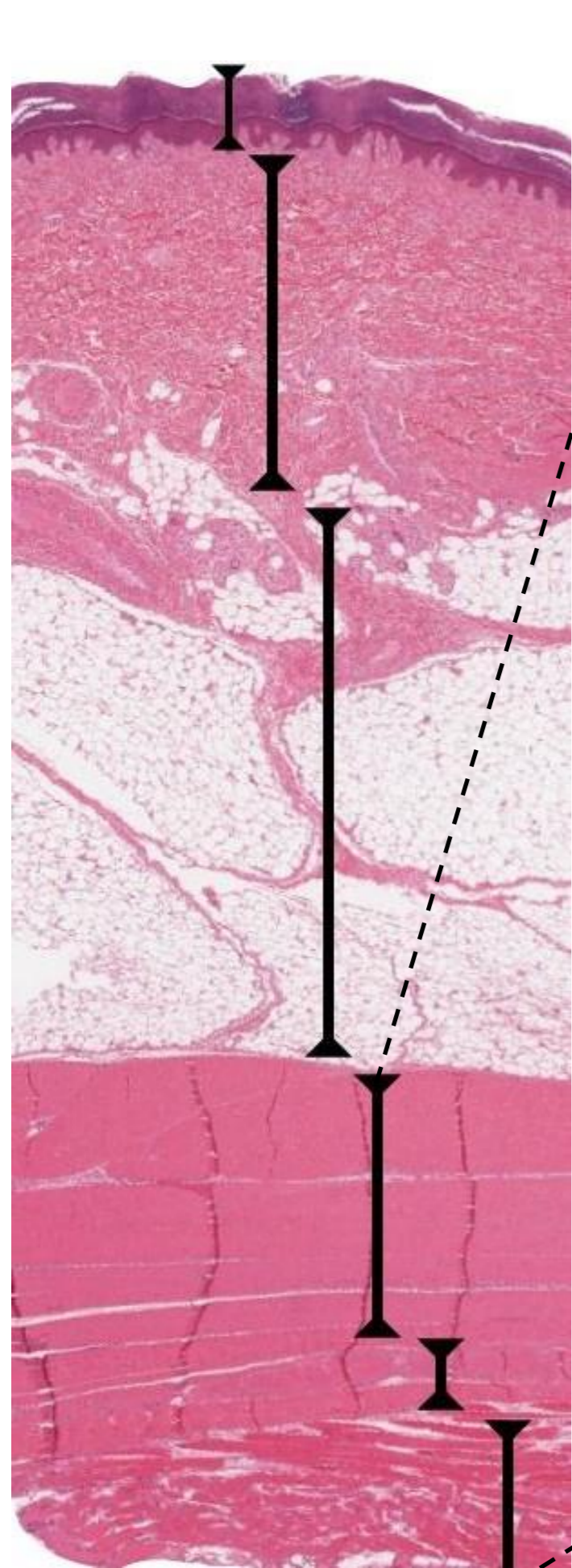












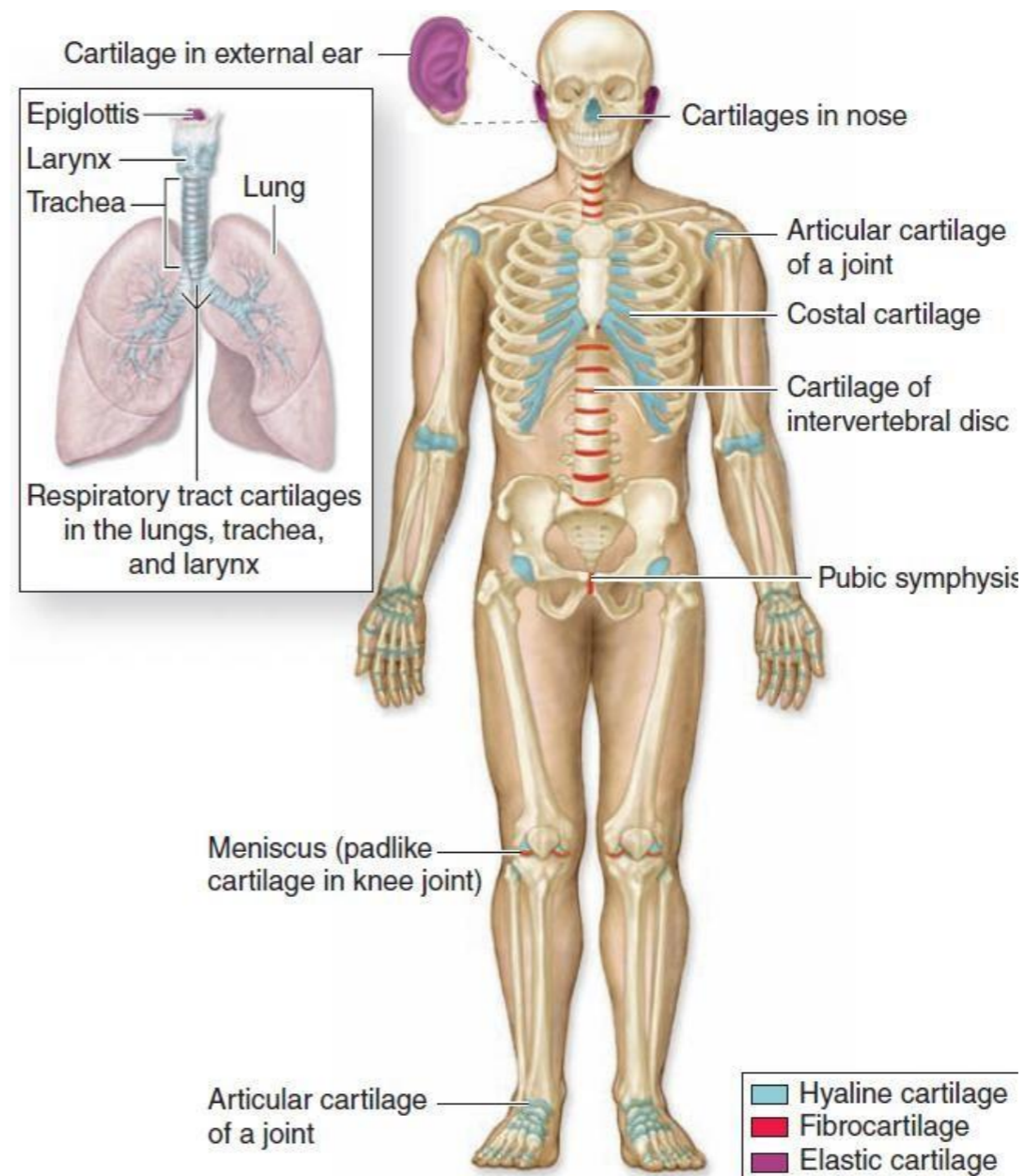


# TISSUCARTILAGINEUX

Lecartilage  
hyalin

Lecartilage  
élastique

Fibrocartilage





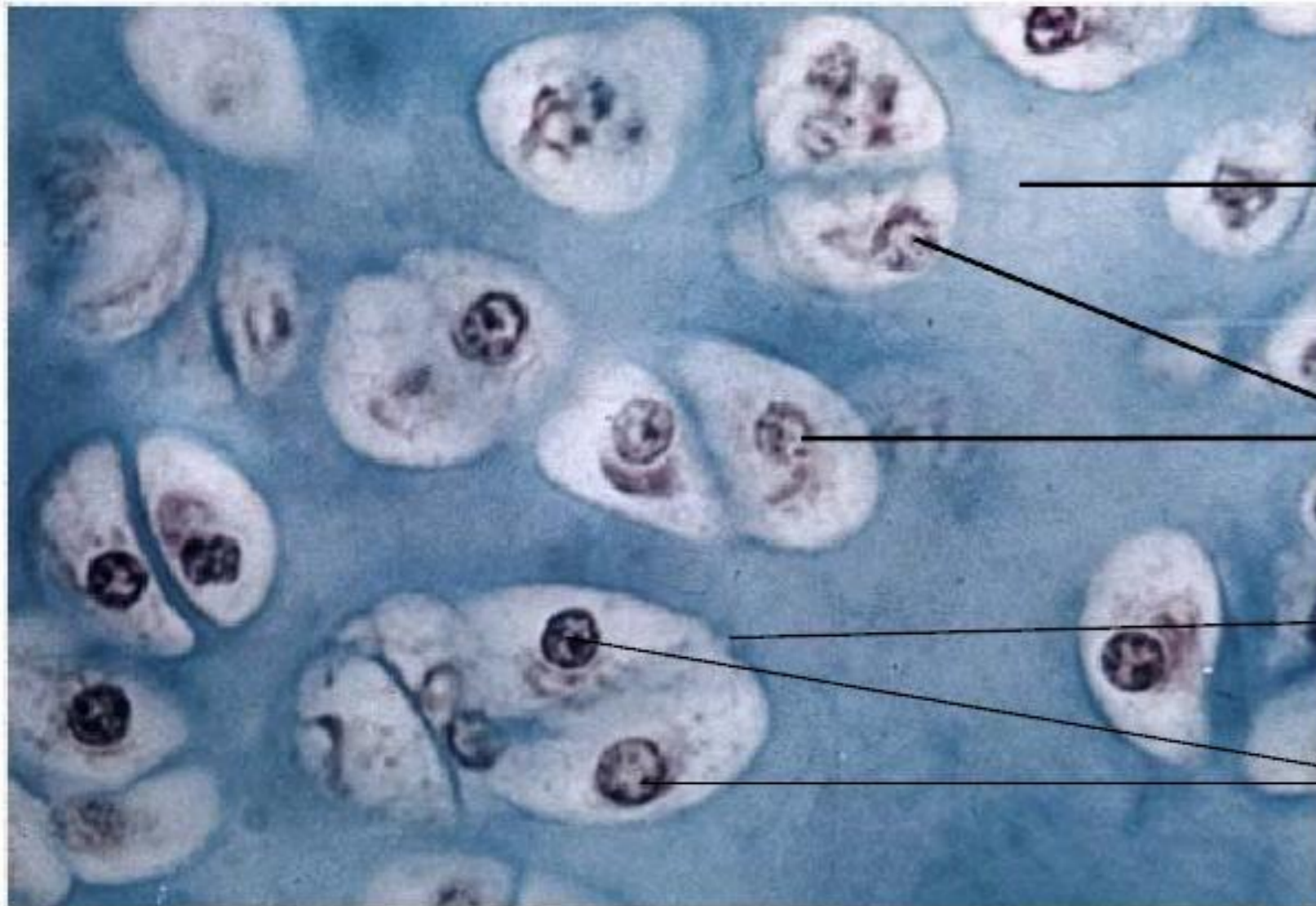
## 1/Constitution

### Cellules

- Chondroblastes et chondrocytes
- 2 états fonctionnels de la même cellule
- **Cellulesouchemésenchymateuse**→**chondroblastes**→**chondrocytes**
- Chondrocytes situés dans logettes=chondroplastes

### Microscopieoptique:

- cellulessphériquesouovoïdes
- $\emptyset = 10-40\mu\text{m}$
- noyau central,assezvolumineux



matrice cartilagineuse

chondrocytes dans  
leur chondroplaste

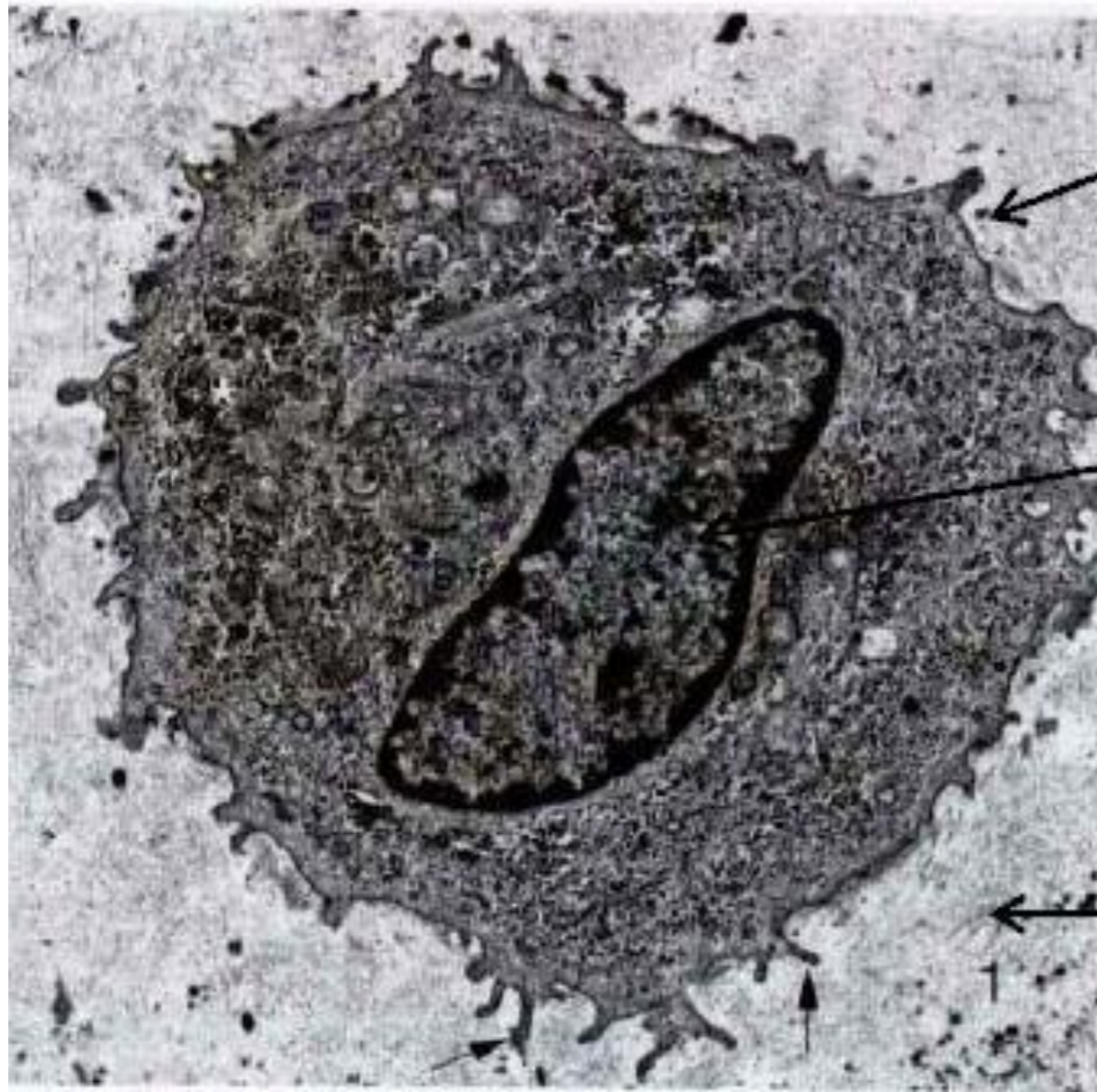
chondroplaste

noyaux des chondrocytes



## Microscopie électronique

- Membrane plasmique irrégulière, courts prolongements cytoplasmiques
- Organites habituels, selon l'état d'activité cellulaire
- Inclusions lipidiques et de glycogène



Chondrocyte moulé dans son chondroplaste

Noyau

Matrice cartilagineuse



# 1/Constitution

Matrice cartilagineuse

Synthétisées surtout par les chondroblastes

## • Chondrocytes:

- Petite activité de synthèse
- Activité de dégradation composante M.E.C.
- Activité de résorption normalement très faible chez l'adulte  
→ les chondrocytes maintiennent l'intégrité de la matrice cartilagineuse

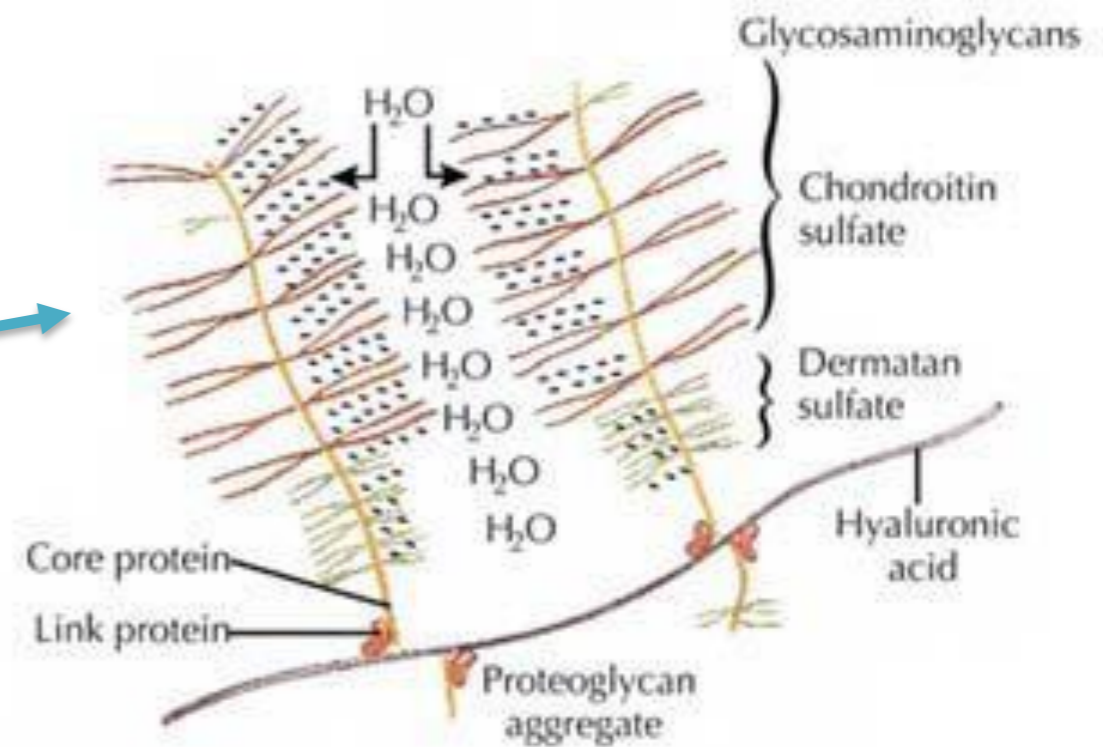
Substance fondamentale

Fibres

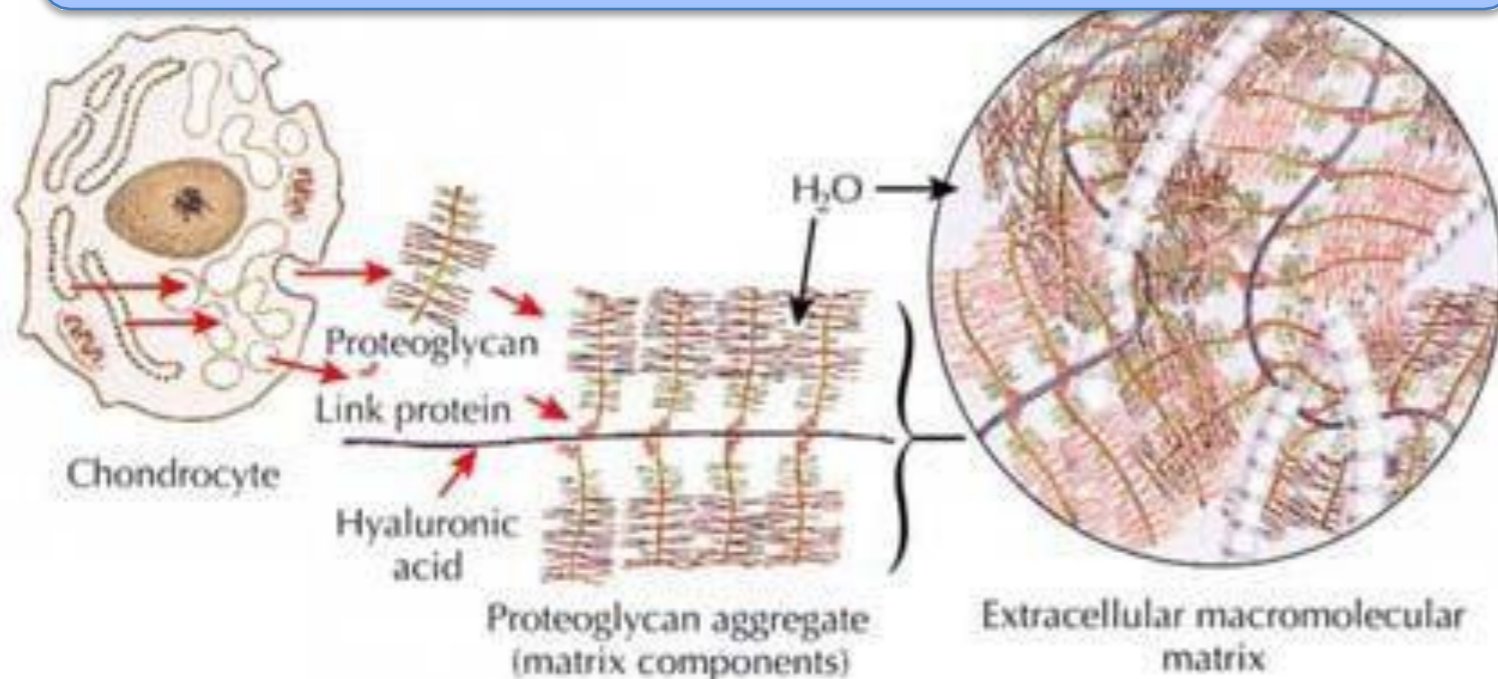
## Substance fondamentale

- Eau (70-80% masse)
- Sels minéraux
- Protéines non collagéniques
- Glycosaminoglycans: GAG  
**chondroïtines-sulfates et kératane-sulfate**  
Isolés ou liés à des protéines  
→ **protéoglycans = agrégans = aggrecans**

Nombreuses charges négatives attirent de grandes quantités d'eau



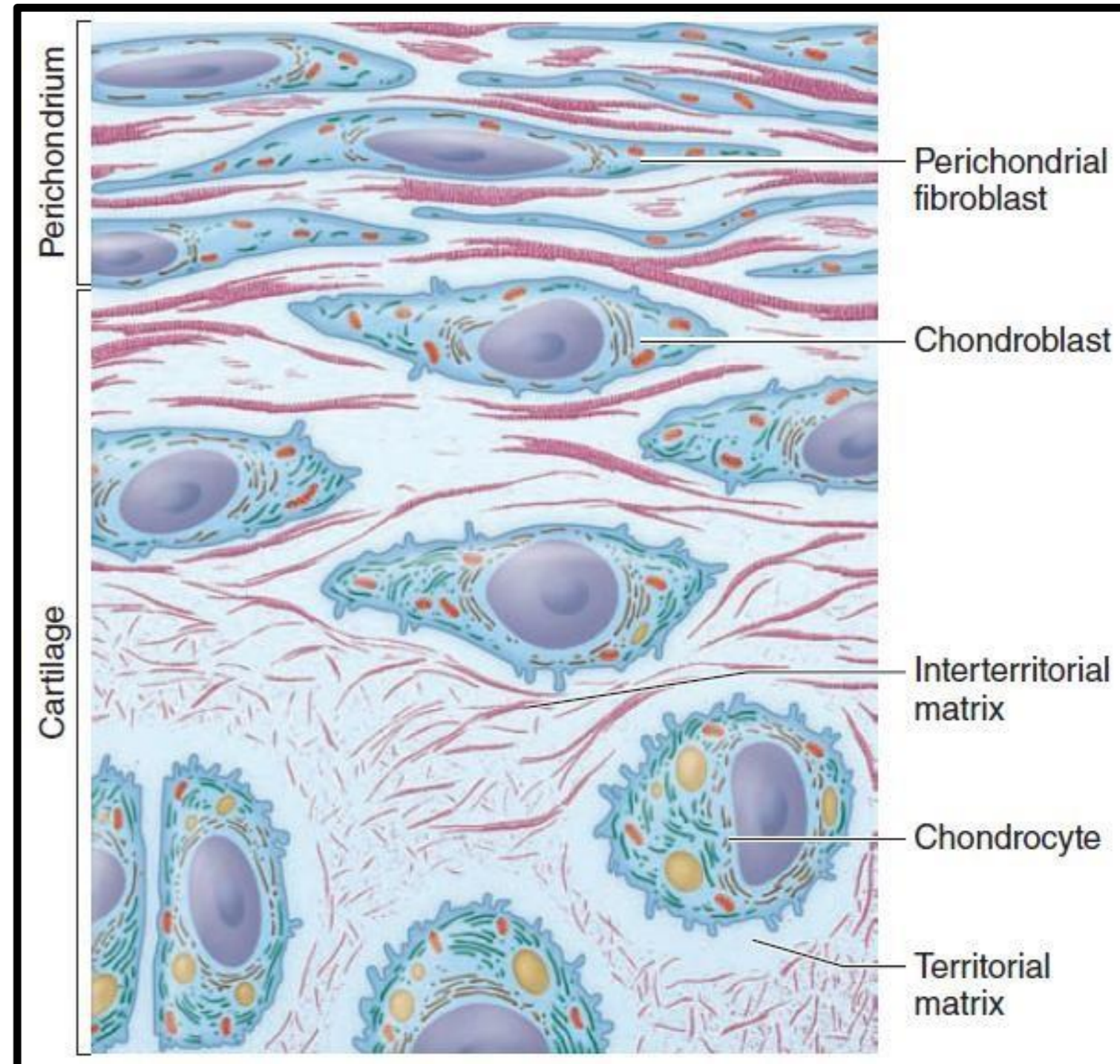
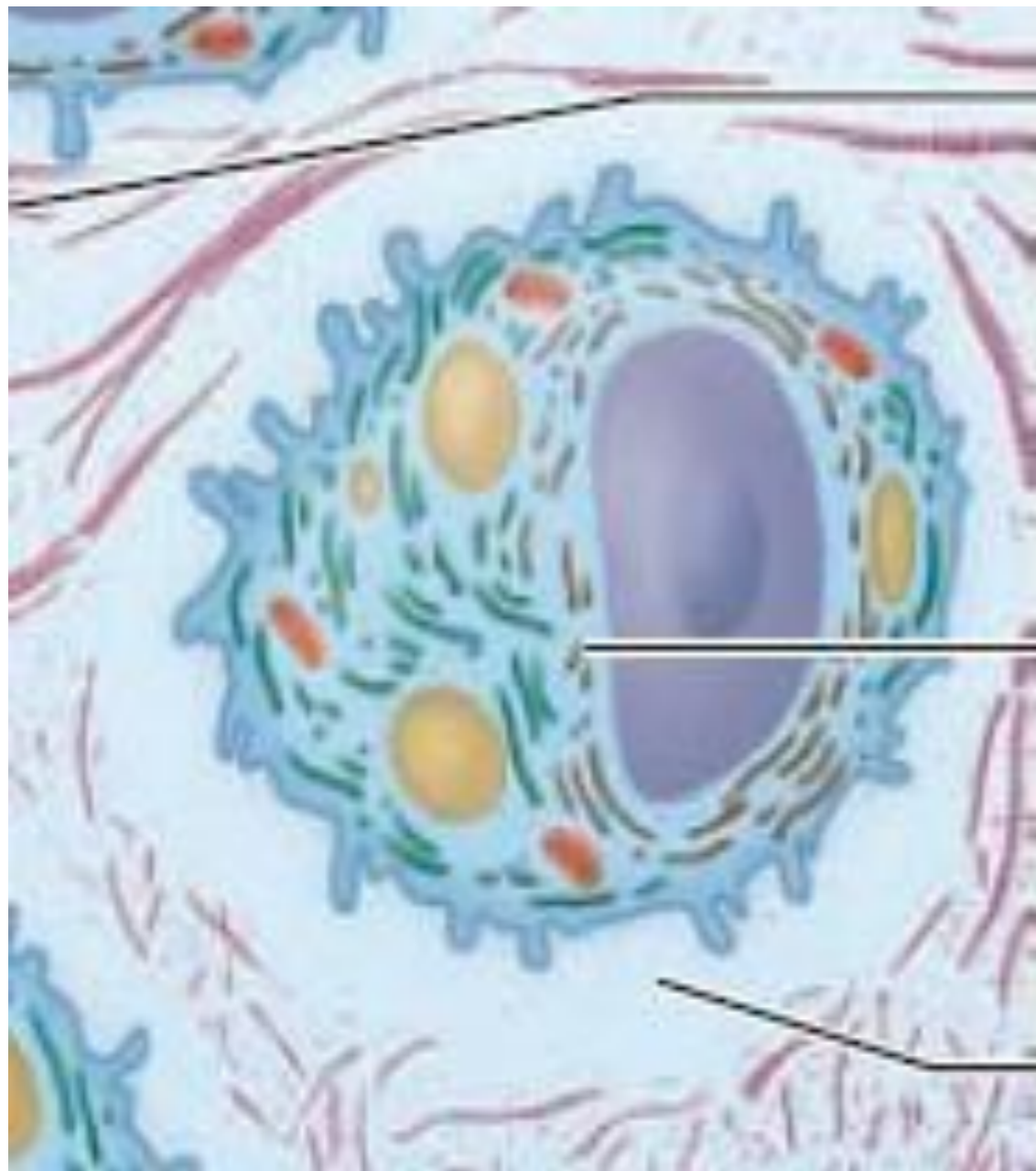
Aggrégans + acide hyaluronique  
→ **complexe macromoléculaire chargé (-) ment**



**Gel très hydraté capable de résister à la compression et à la déformation**

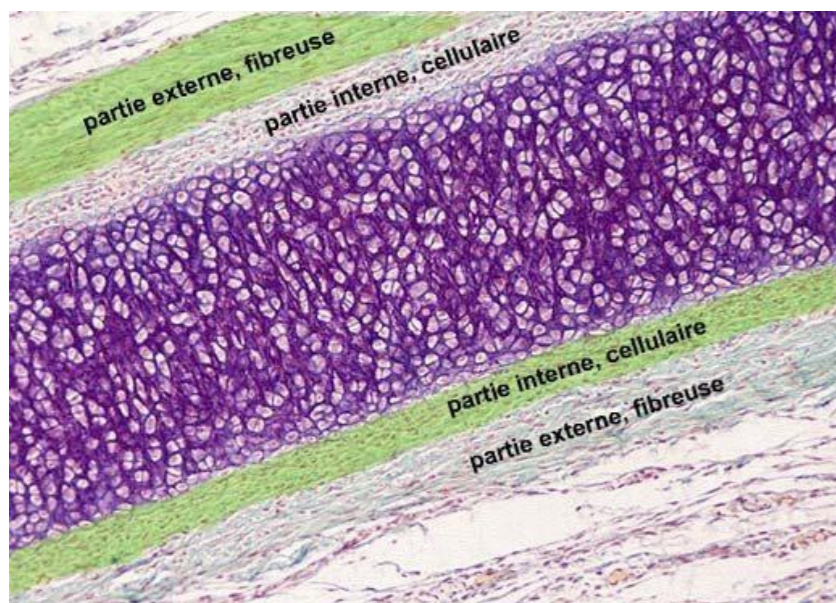
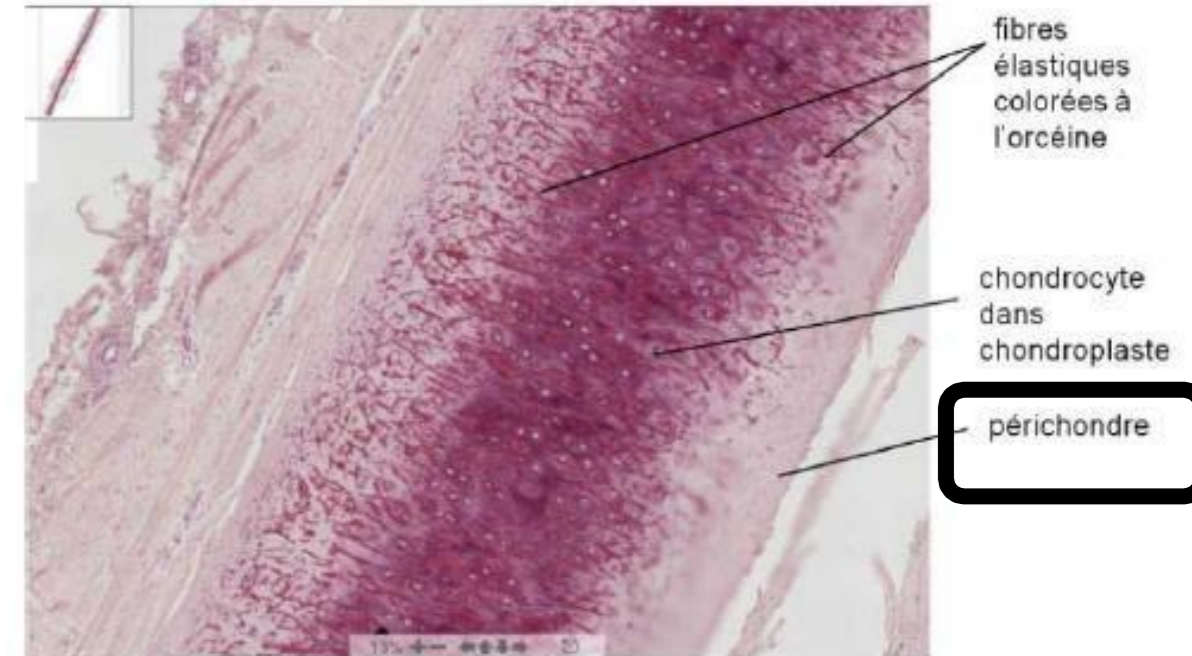
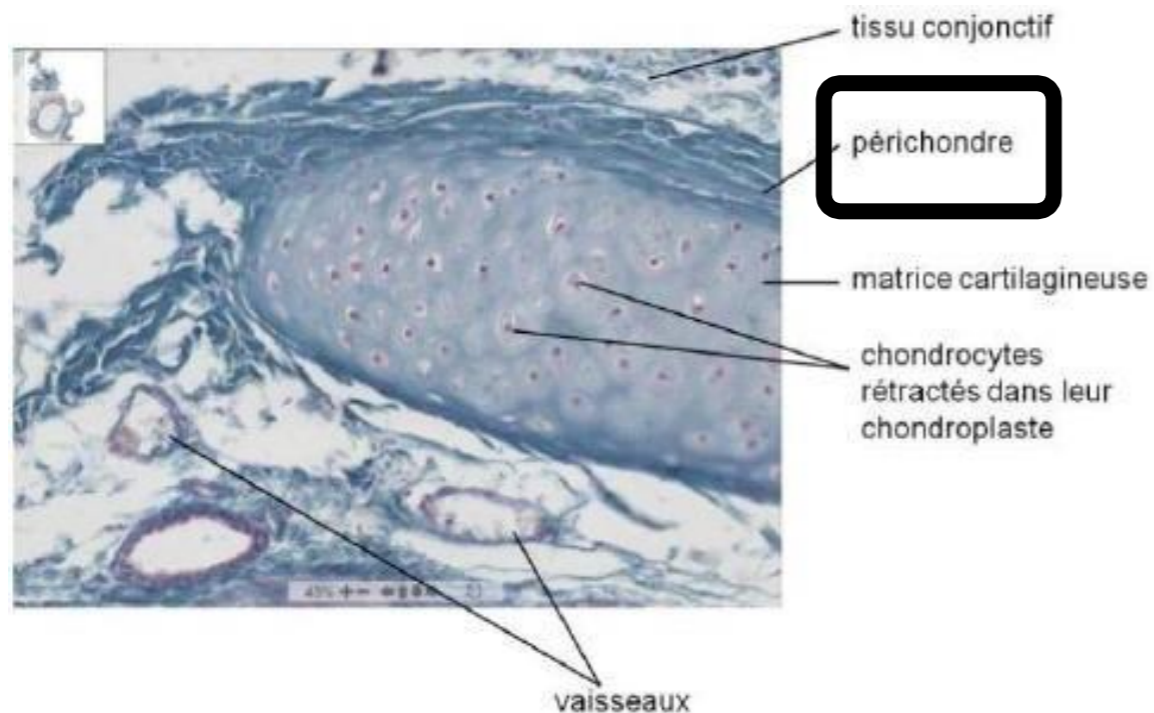


Selon nature et proportions de la **substance fondamentale** et des **différents types de fibres** (**Collagènes I et II, élastine**) au sein de la M.E.C.





- Tissu conjonctif dense (**TCD**) **régulier unidirectionnel uni tendu** vascularisé
- Entoure le tissu cartilagineux partout **sauf au niveau du cartilage hyalin articulaire**  
**Sauf au niveau du fibrocartilage**
- Essentiel pour nutrition, croissance, maintien & réparation du tissu cartilagineux



Couche externe, fibreuse:

- TC dense
- se poursuit avec le TC environnant
- vascularisée

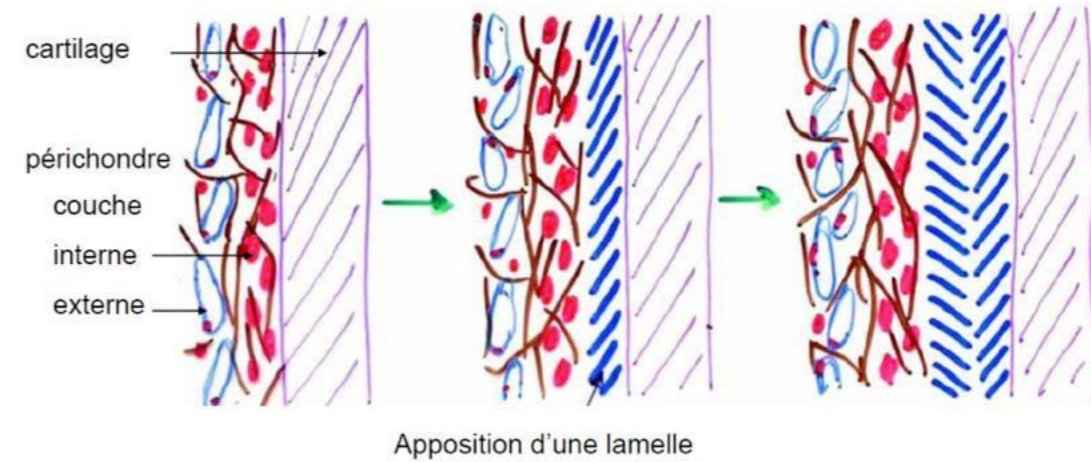
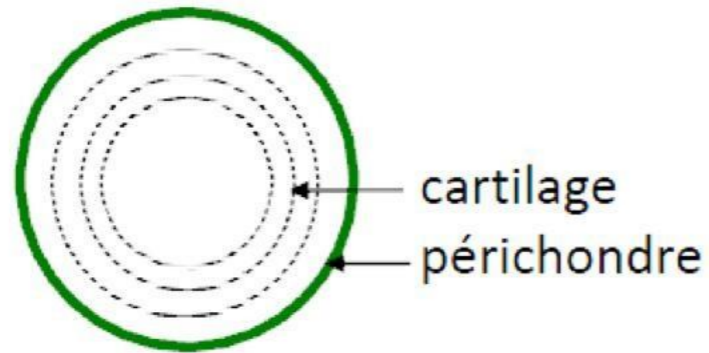
Couche interne, cellulaire:

- cellules mésenchymateuses à l'origine des cellules cartilagineuses
- se confond peu à peu avec le tissu cartilagineux
- **fibres de Sharpey amarrent** le périchondre au cartilage



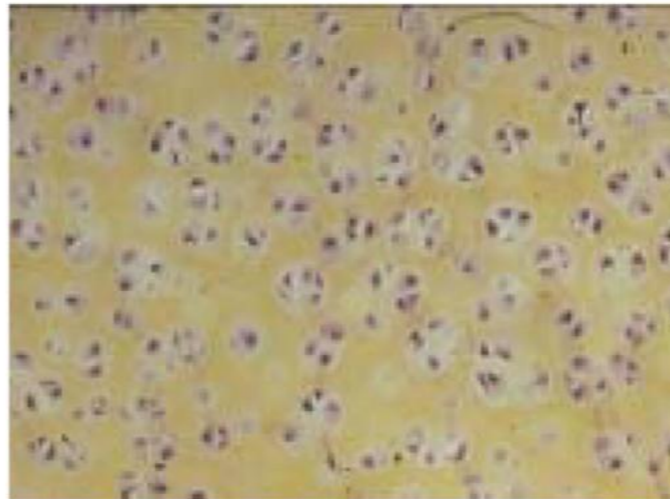
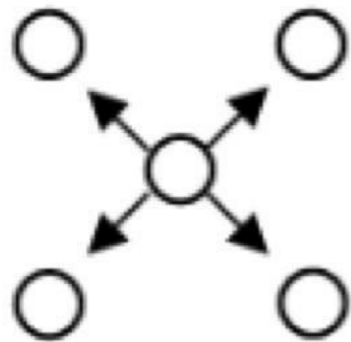
## CROISSANCE APPPOSITIONNELLE = PÉRICHONDRALE

- à partir des **cellules mésenchymateuses du périchondre**
- croissance en **épaisseur**

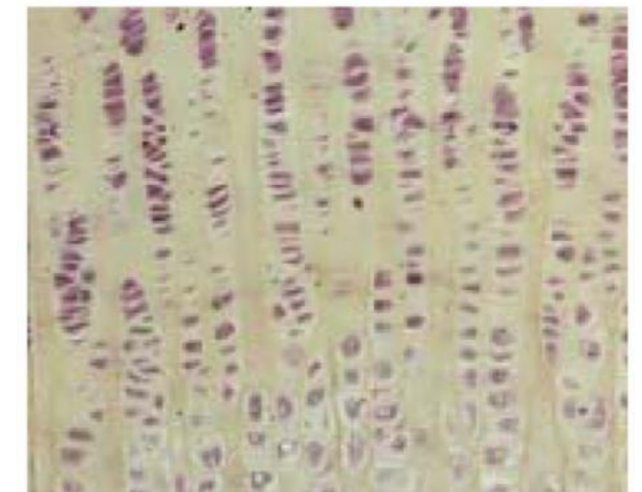


## CROISSANCE INTERSTITIELLE PAR MITOSES DES CHONDROCYTES

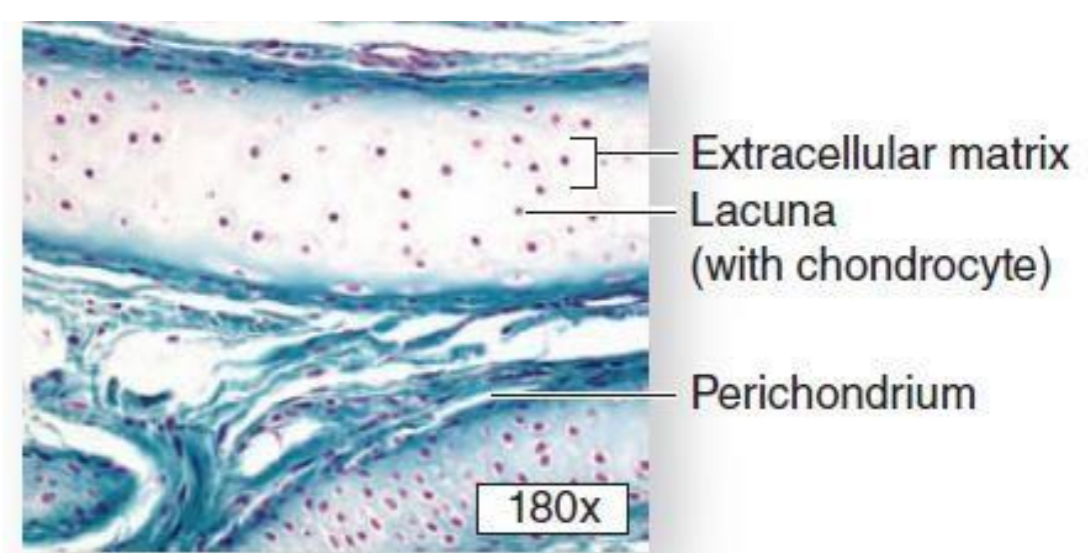
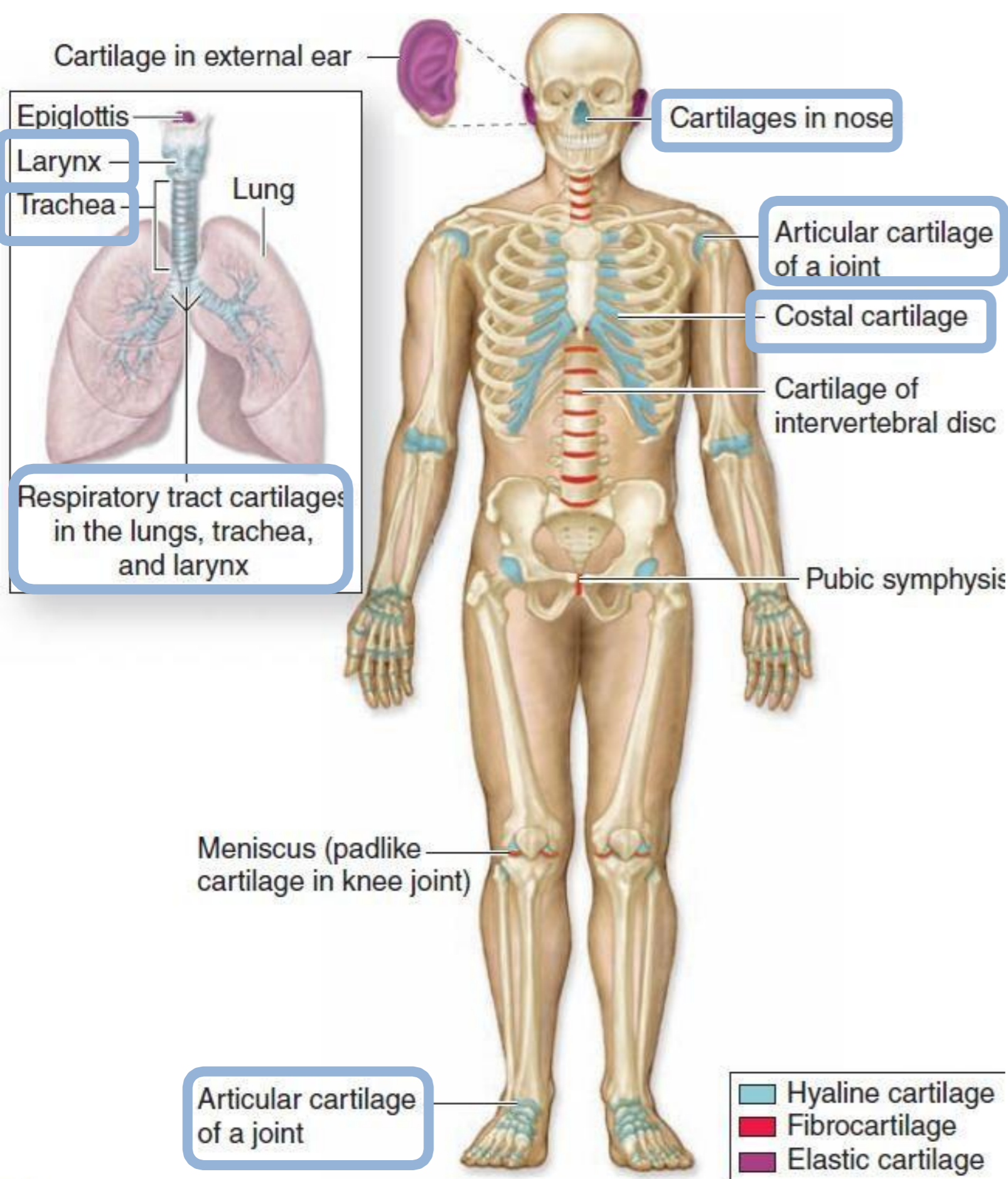
- dans diverses directions : groupe isogénique coronaire
  - croissance en **épaisseur**



- suivant une seule direction : groupe isogénique axial
  - croissance en **longueur**
  - **cartilages de croissance** (de conjugaison)





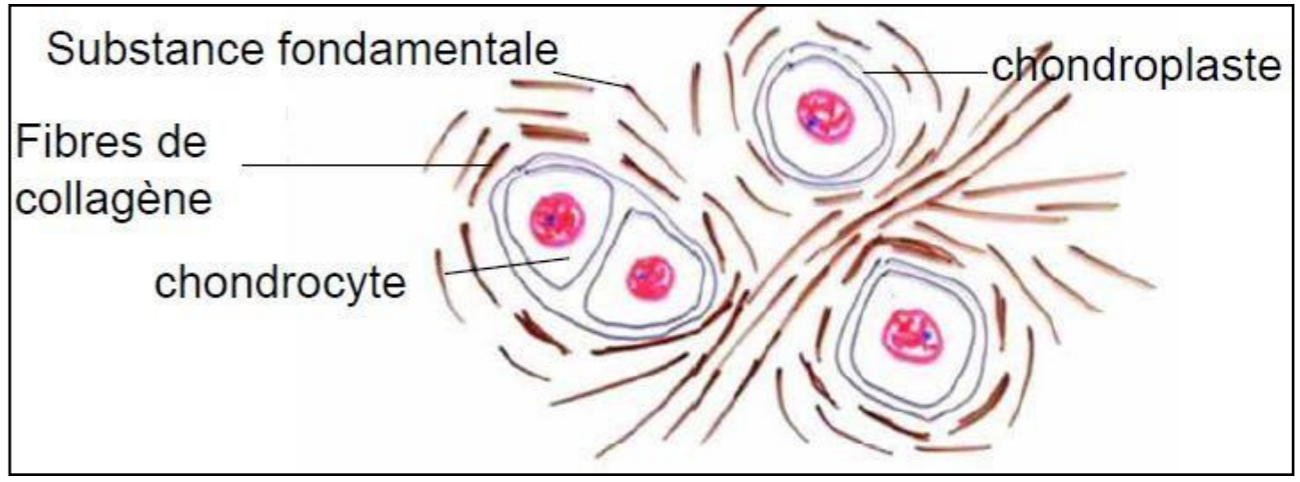
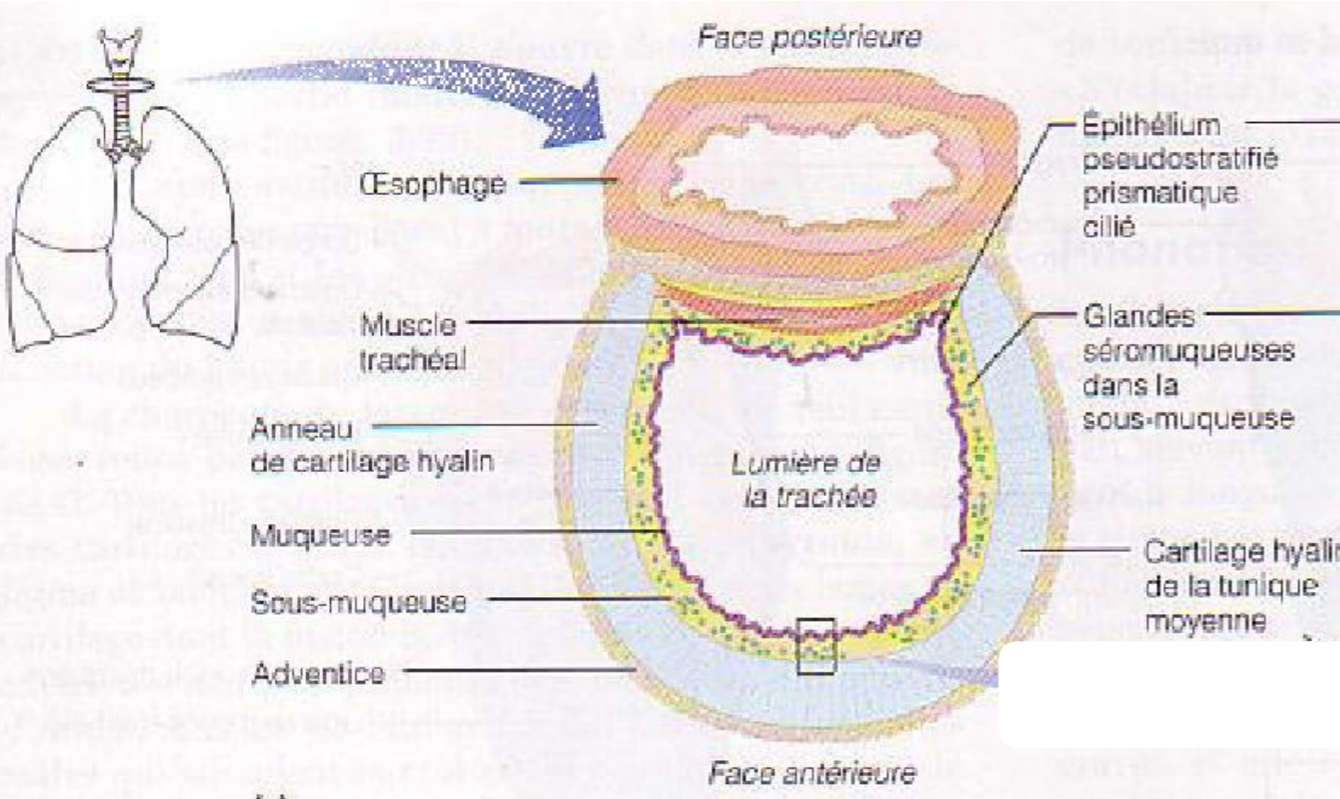


# Lecartilagehyalin

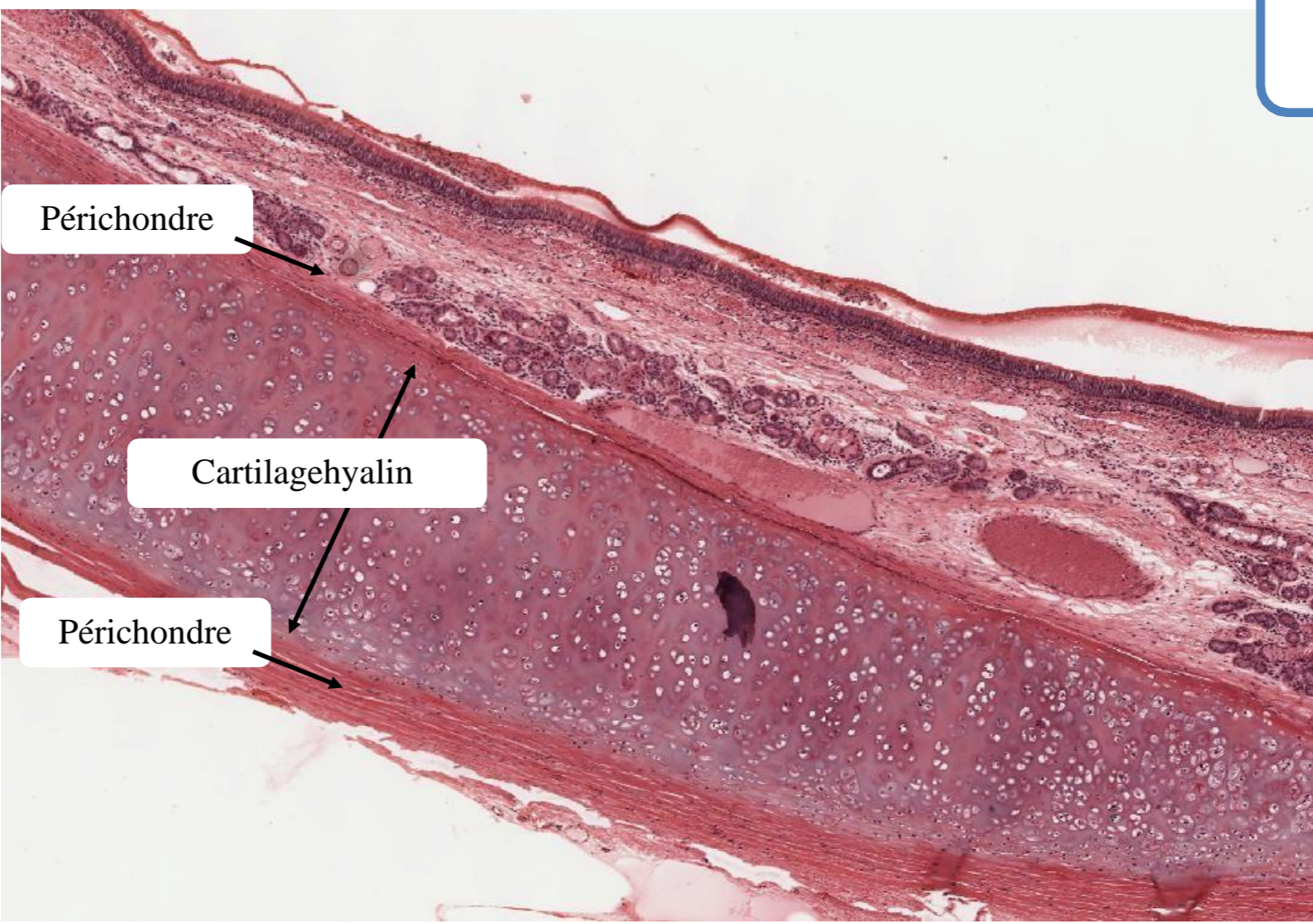
## Leplus répandu

- Embryon
  - maquette cartilagineuse pour led développement osseux
- Enfant & adolescent
  - cartilages de conjugaison (cartilages de croissance)
- Adulte
  - surfaces articulaires,
  - paroi des voies respiratoires (cloisons nasales, larynx, trachée & bronches)
  - extrémités sternales des côtes

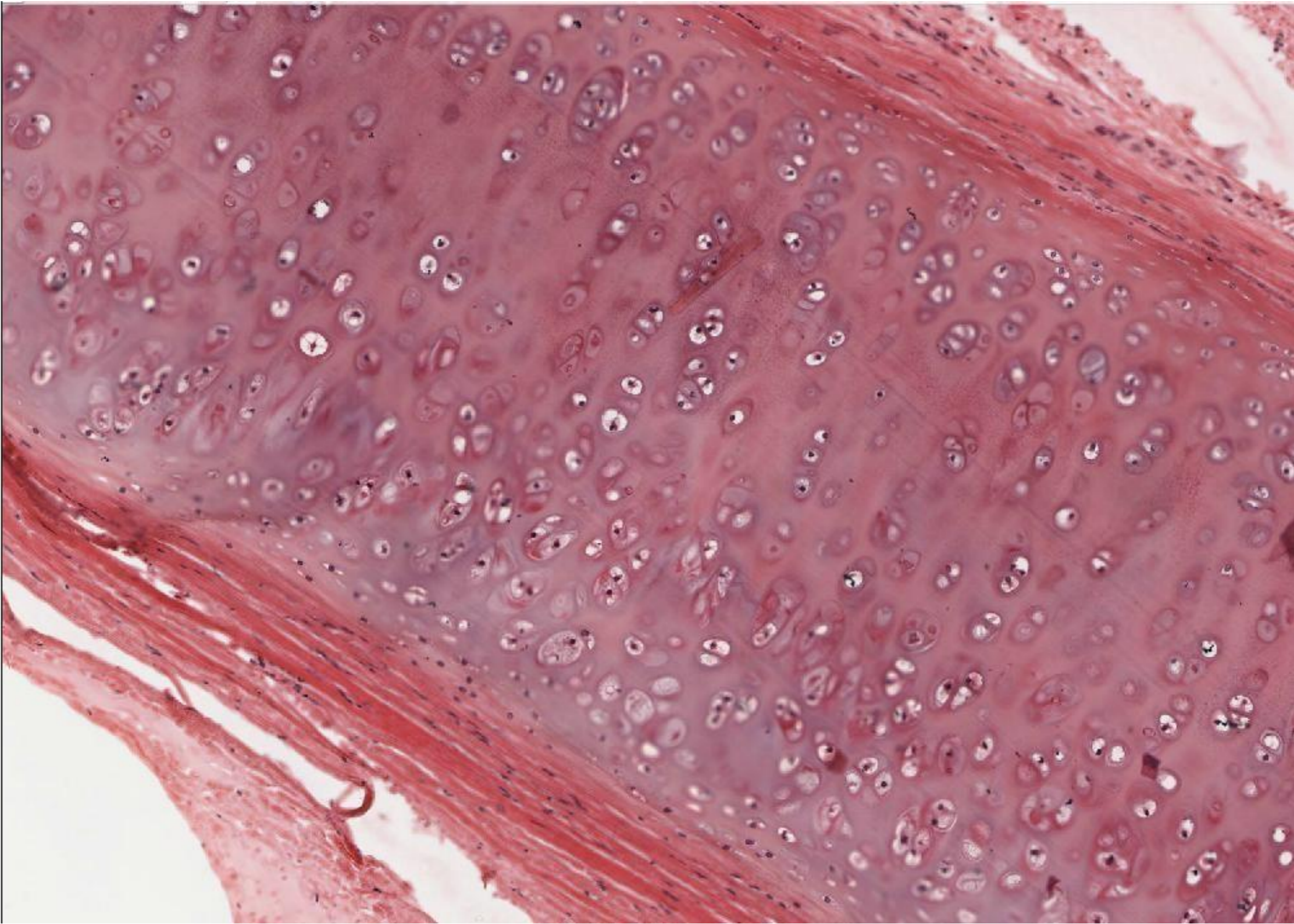




TRACHÉE







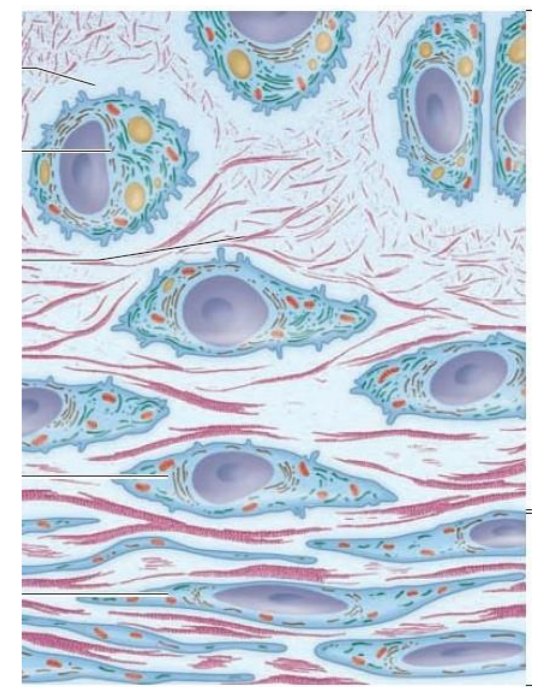
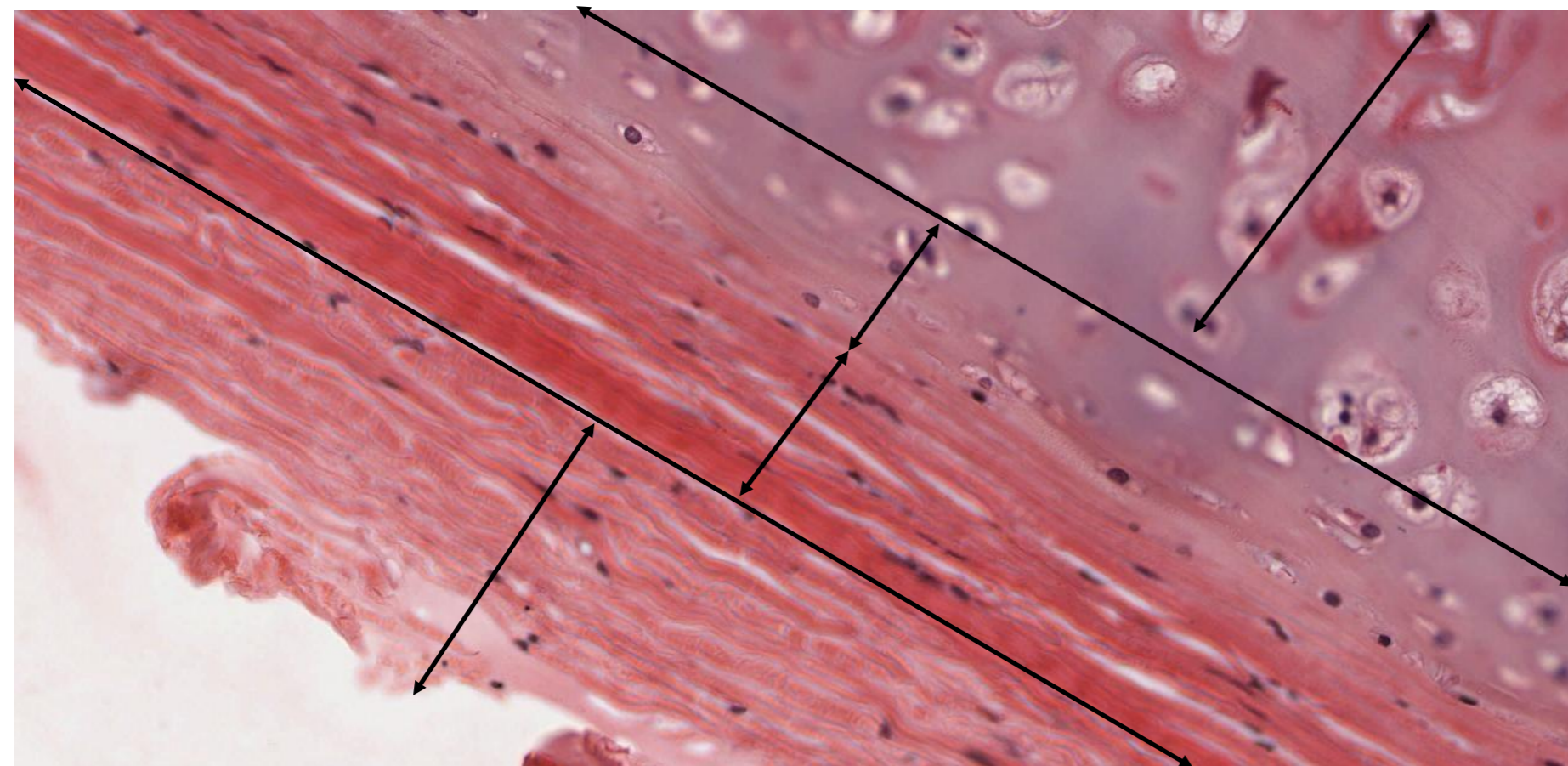


groupe isogénique coronaire  
↗<sup>ce</sup> interstitielle dans diverses directions

Groupe isogénique axiale  
↗<sup>ce</sup> interstitielle dans une direction

chondroplaste

chondrocyte



↗<sup>ce</sup> Appositionnelle perichondrale



Cartilage in external ear



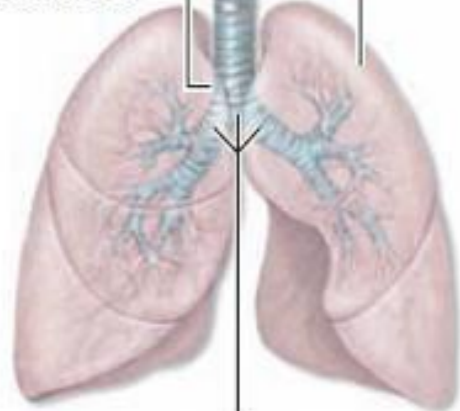
Cartilages in nose

Epi-glottis

Larynx

Trachea

Lung



Respiratory tract cartilages in the lungs, trachea, and larynx

Articular cartilage of a joint

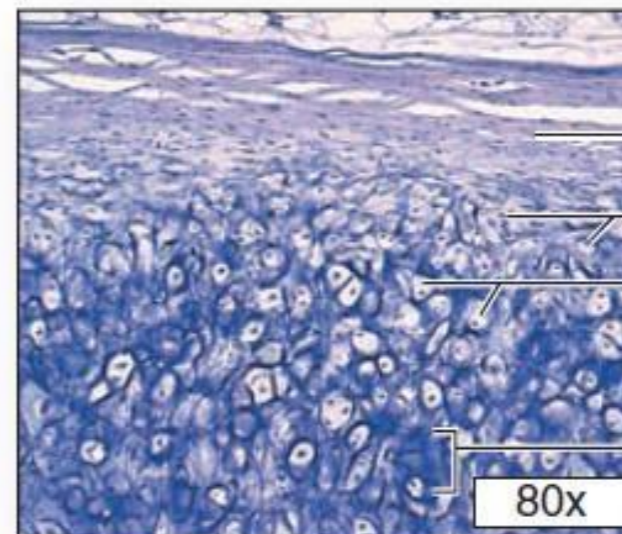
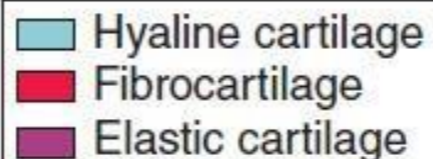
Costal cartilage

Cartilage of intervertebral disc

Pubic symphysis

Meniscus (padlike cartilage in knee joint)

Articular cartilage of a joint



Perichondrium

Elastic fibers

Lacunae (with chondrocytes)

Extracellular matrix

80x

## Lecartilageélastique

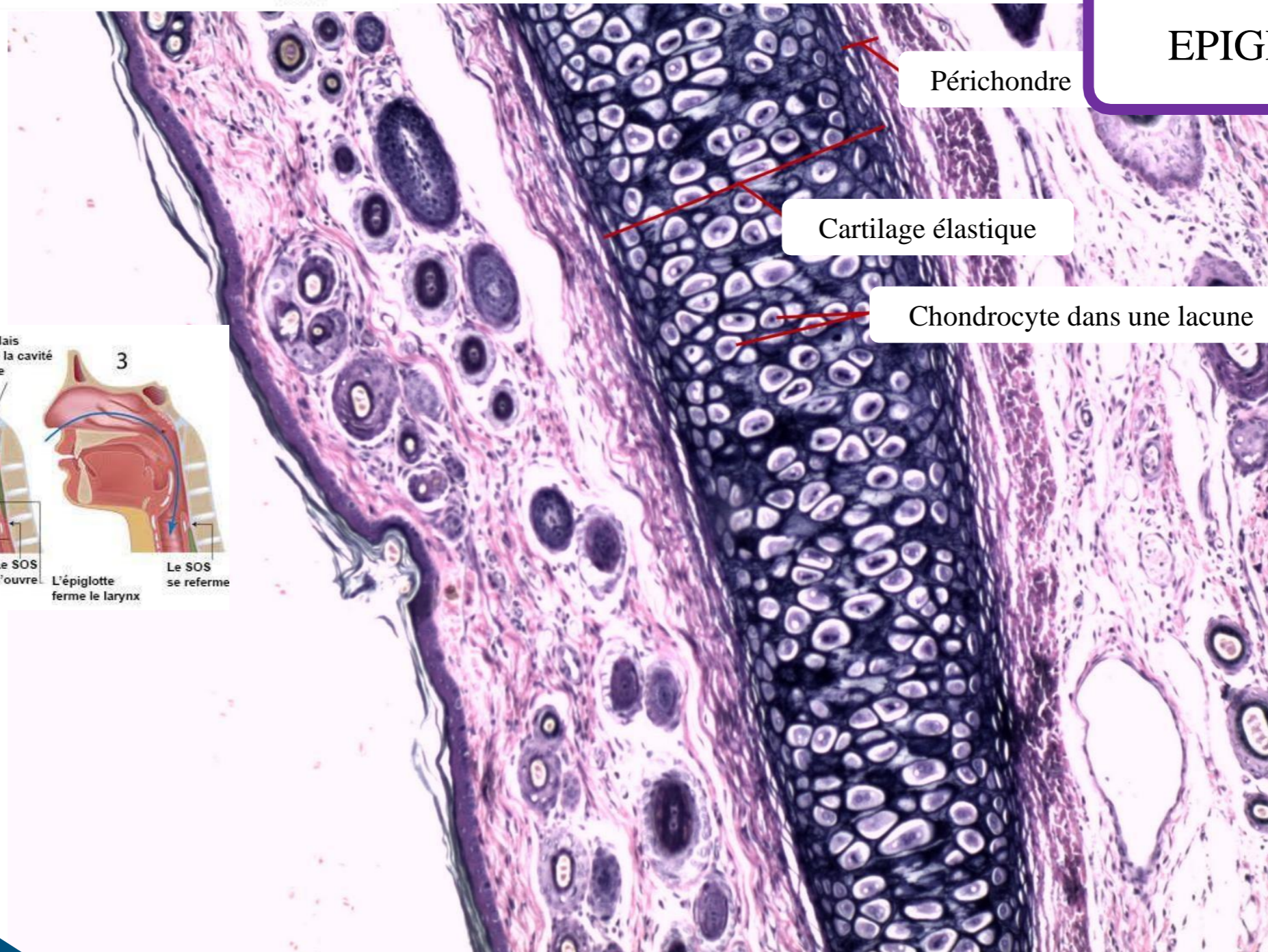
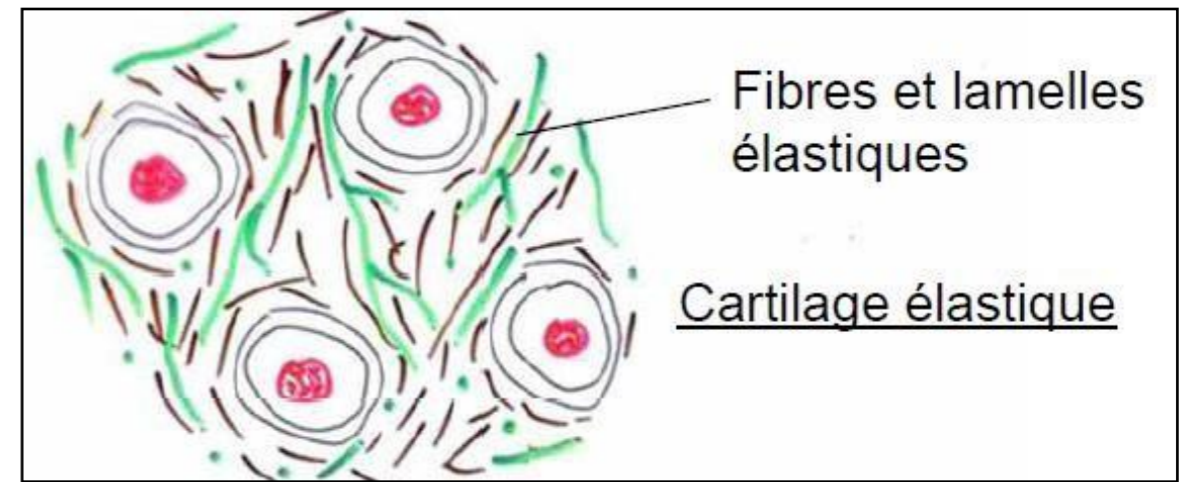
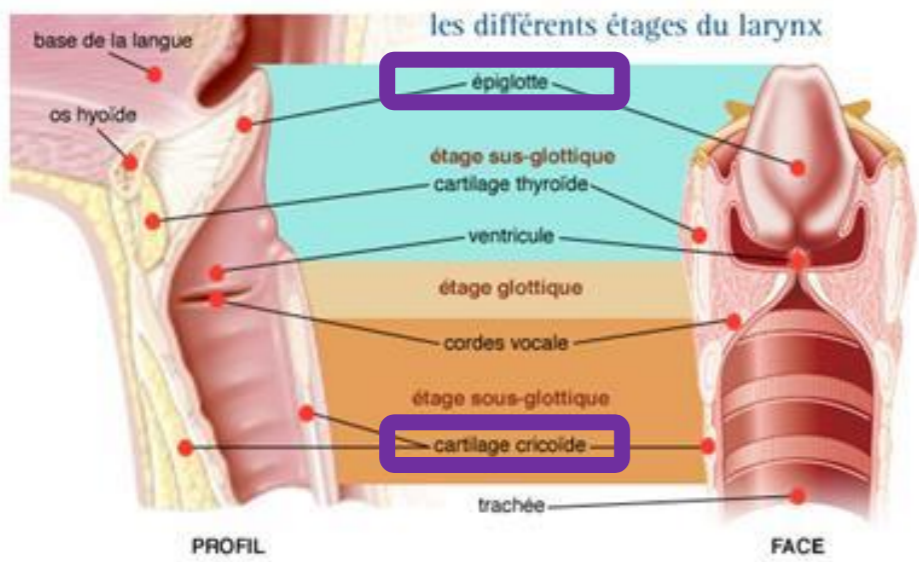
### Localisation

- oreilleexterne(pavillon,conduitauditifexterne),
- épiglote,
- trompesd'Eustache,
- certainspetitscartilagesdularynx

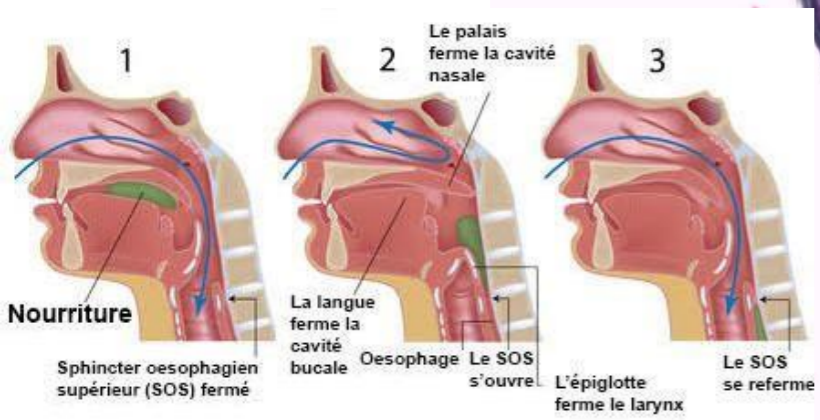
Opaque,macroscopiquementjaunâtre

- Flexibilité:reprensaforme
- Nombreusesfibresélastiques(faisceauxouulames)
- Colorationà l'Orcéineou Fuschine-résorcine

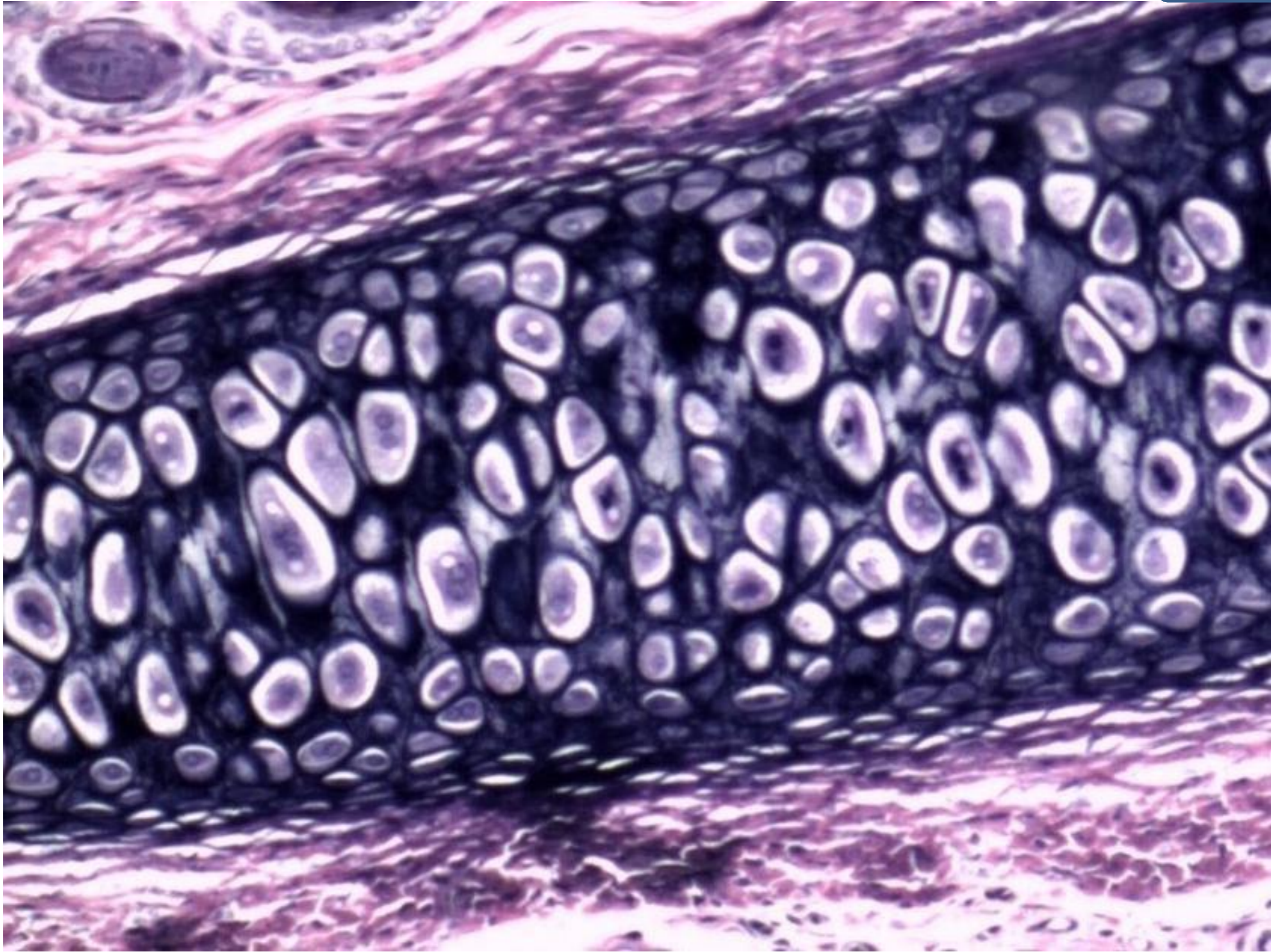




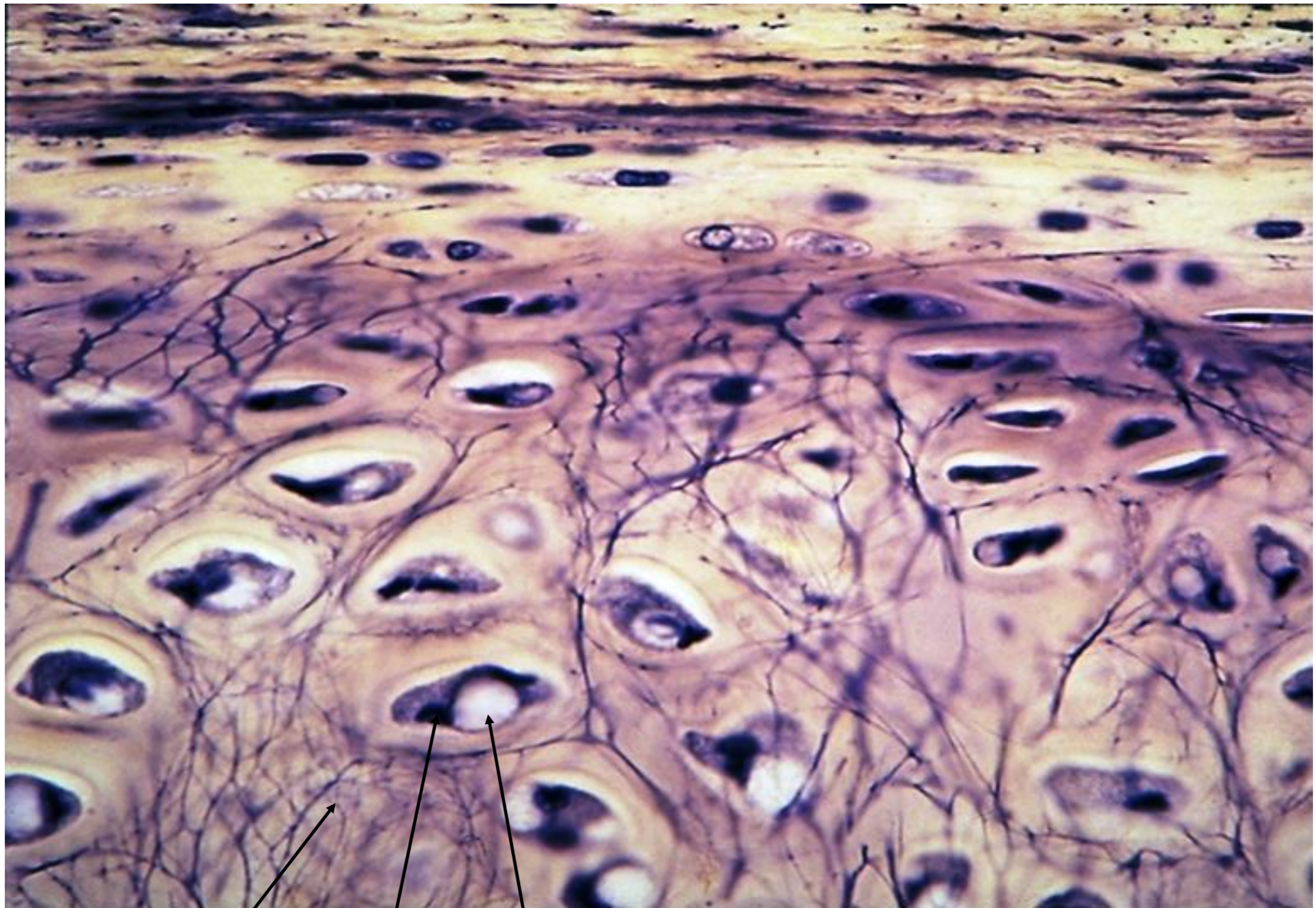
**EPIGLOTTE**











Fibre élastiques  
(Orceine)

Noyau

Vacuole lipidique





Cartilage in external ear



Cartilages in nose

Articular cartilage of a joint




Costal cartilage

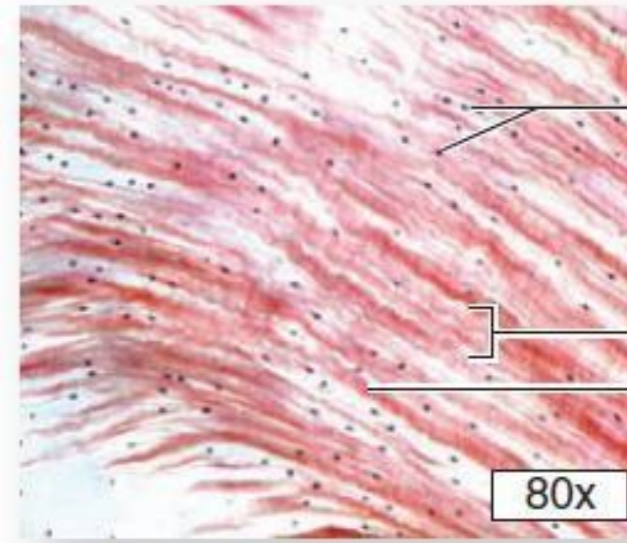
Cartilage of intervertebral disc

Pubic symphysis

Meniscus (padlike cartilage in knee joint)

Articular cartilage of a joint

-  Hyaline cartilage
-  Fibrocartilage
-  Elastic cartilage



Lacunae (with chondrocytes)

Extracellular matrix  
Collagen fibers

80x

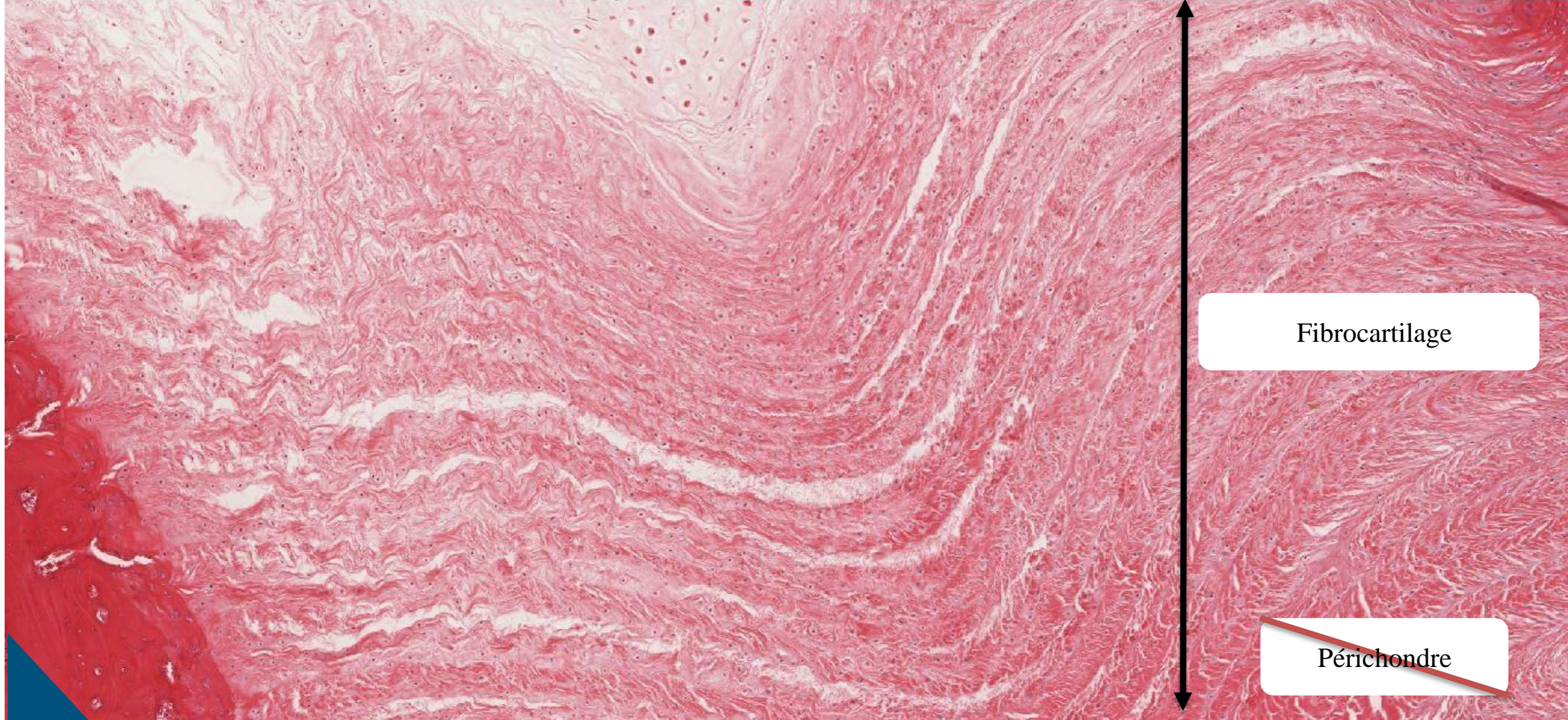
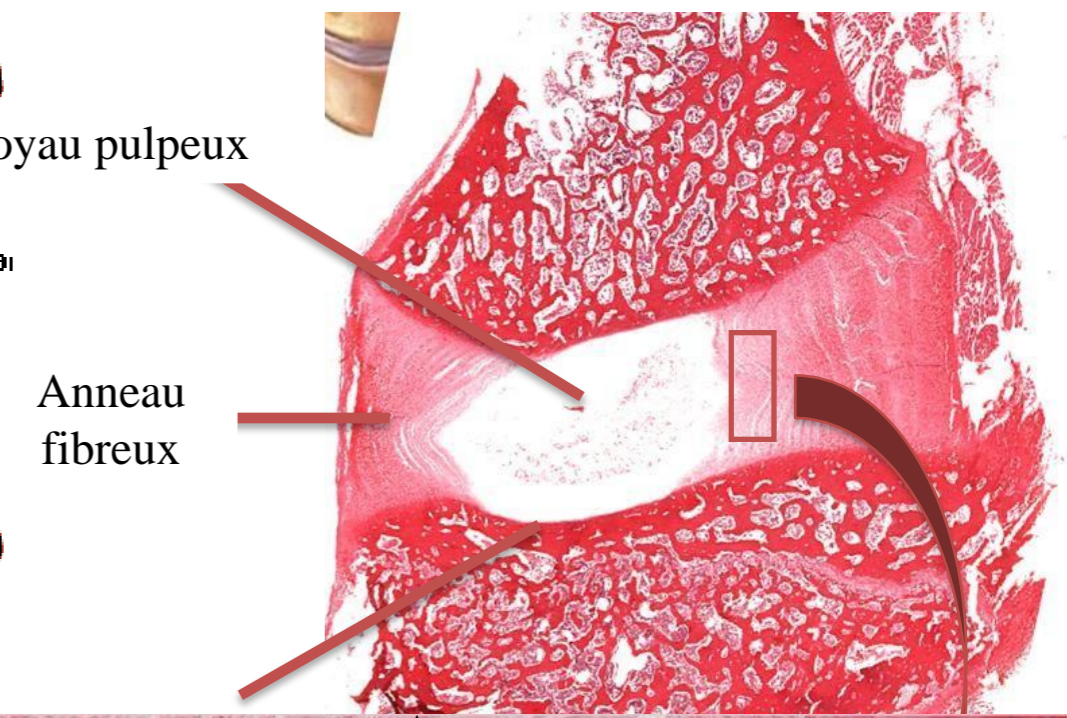
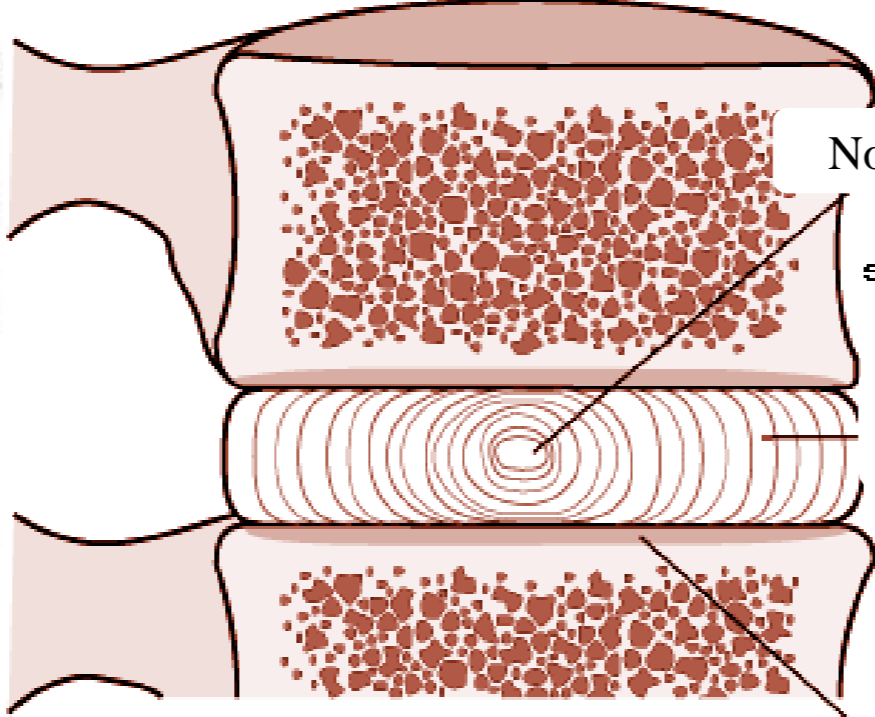
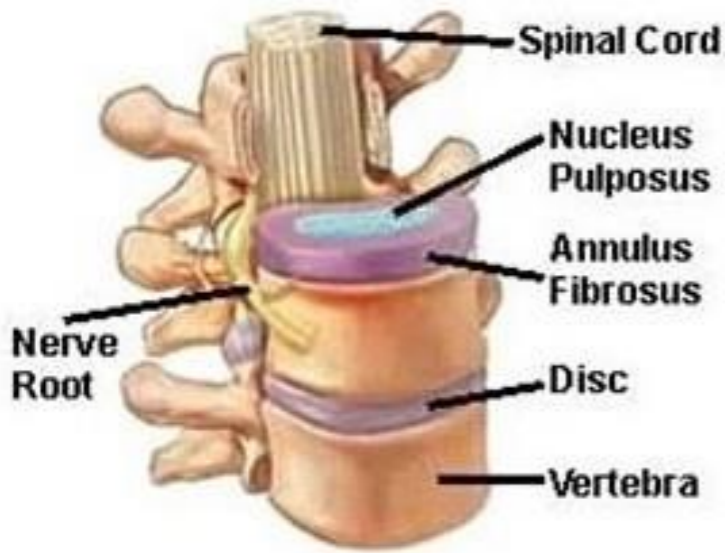
## Fibrocartilage

### Localisation

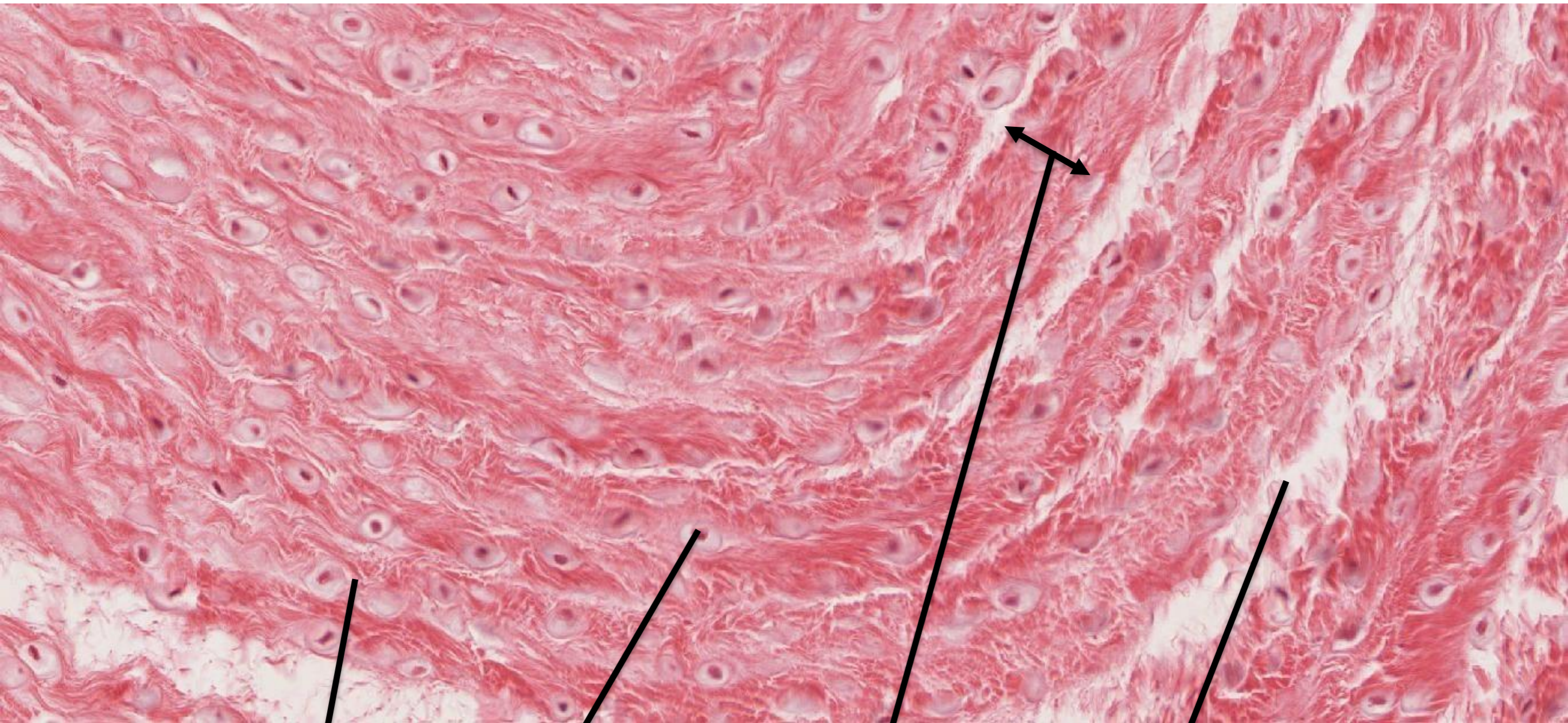
- Disques intervertébraux
- ménisques
- symphyse pubienne
- sites d'insertion des ligaments et des tendons sur l'os
- capsules articulaires

- Faisceaux de **collagène I** orientés selon les forces de tension, visibles en M.O.
- Pas de périchondre distinguable du T.C. voisin







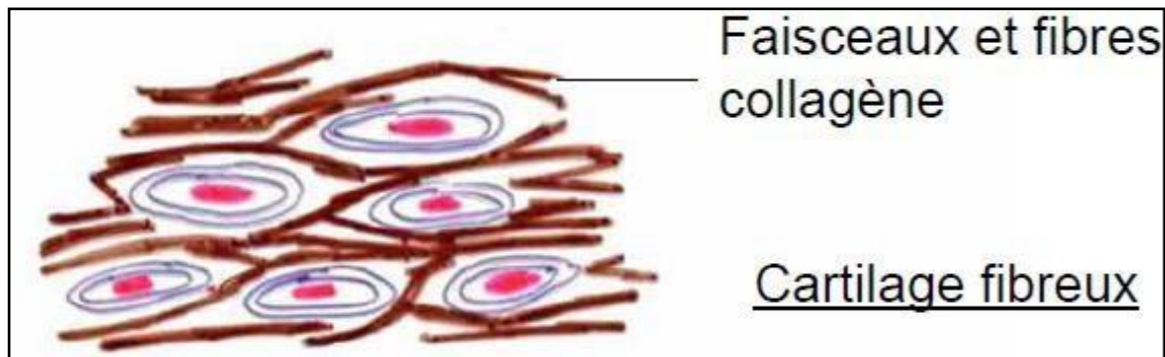


chondroplaste

chondrocyte

Fibre de collagène  
organisées en faisceau

Matrice extracellulaire



Faisceaux et fibres  
collagène

Cartilage fibreux