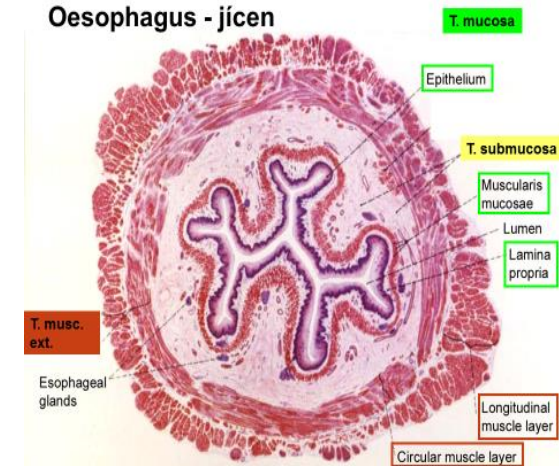
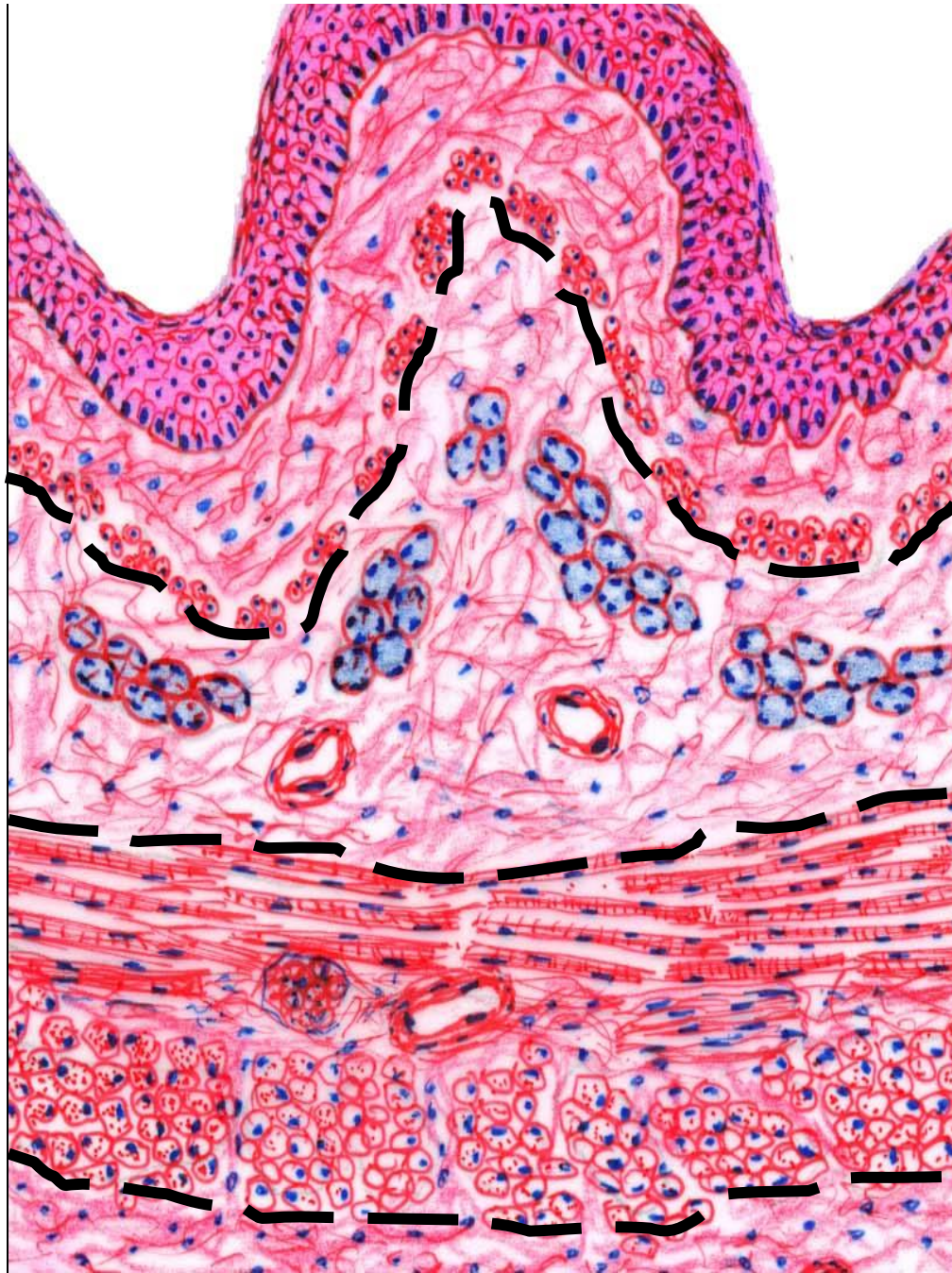




Digestive system 1

- Oral cavity:
 - Lips, cheeks
 - Tongue
 - Palate - hard
 - soft
 - Tooth

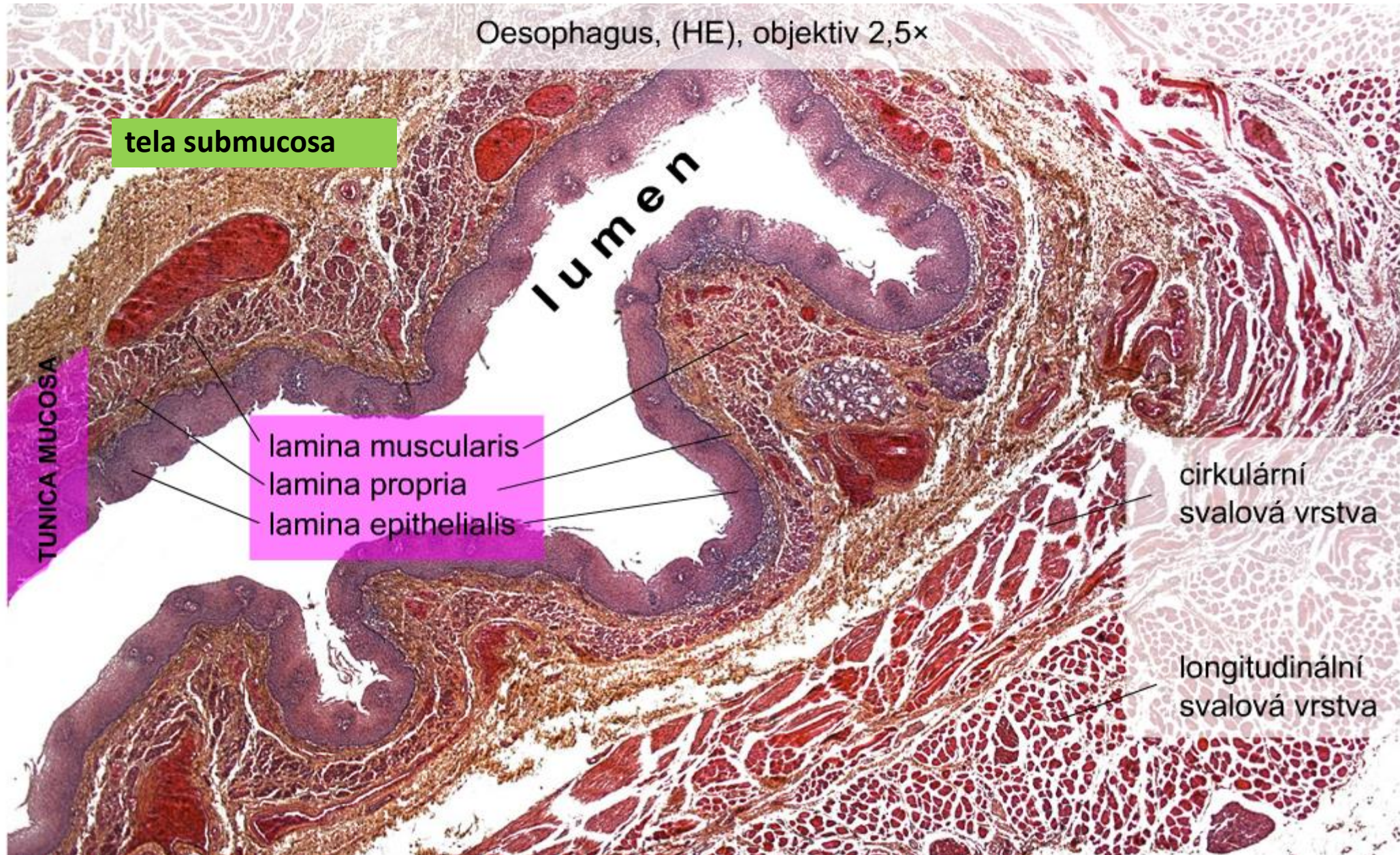
Common structure of the wall of GIT tube



- The *tunica mucosa*
 - epithelial lining
 - *lamina propria* /loose connect. tissue/
 - *lamina muscularis mucosae*
- The *submucosa* (*tela submucosa*) /loose connect. tissue + Meissner's nerve plexus/
- The *tunica muscularis externa*
 - circular
 - myenteric nerve plexus /Auerbach/
 - longitudinal smooth muscle
- The *tunica serosa or adventitia* /loose connect. tissue -/+mesothelium/

Oesophagus

Oesophagus, (HE), objektiv 2,5x



tela submucosa

lumen

TUNICA MUCOSA

lamina muscularis
lamina propria
lamina epithelialis

cirkulární
svalová vrstva

longitudinální
svalová vrstva

The oral cavity (the *tunica mucosa*)

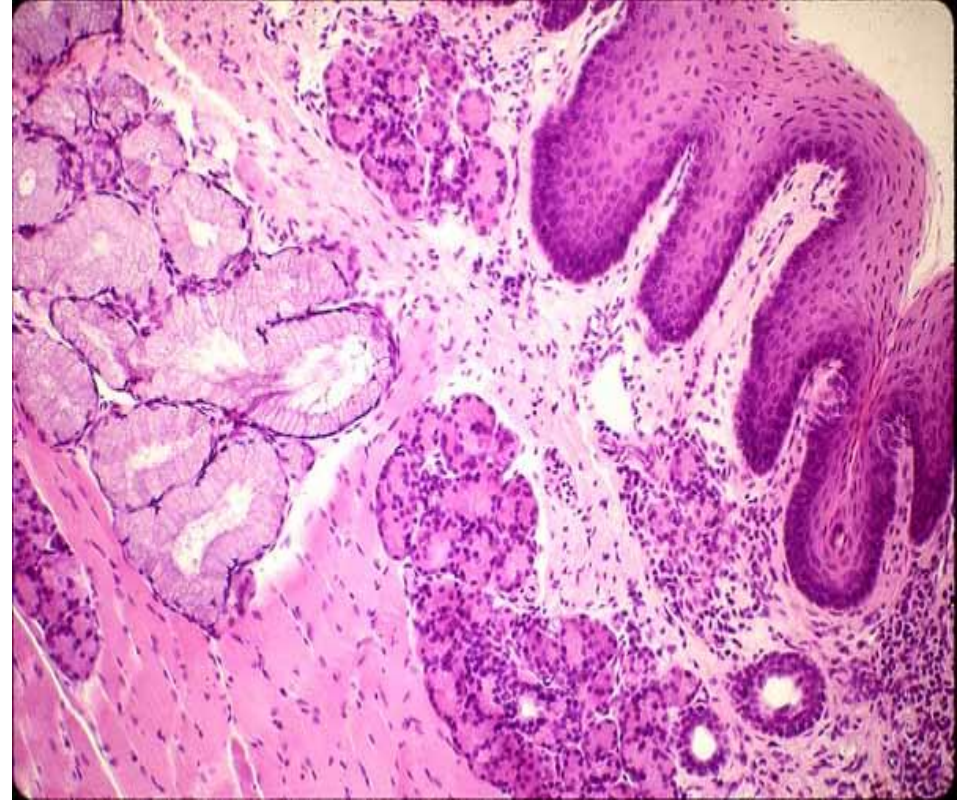
The epithelium

non-keratinized stratified squamous epithelium

Lamina propria

loose connective tissue

Lamina muscularis mucosae is missing



Lamina propria → the submucosa (loose connect. tissue) / periost / muscle

3 functional regions of oral mucosa:

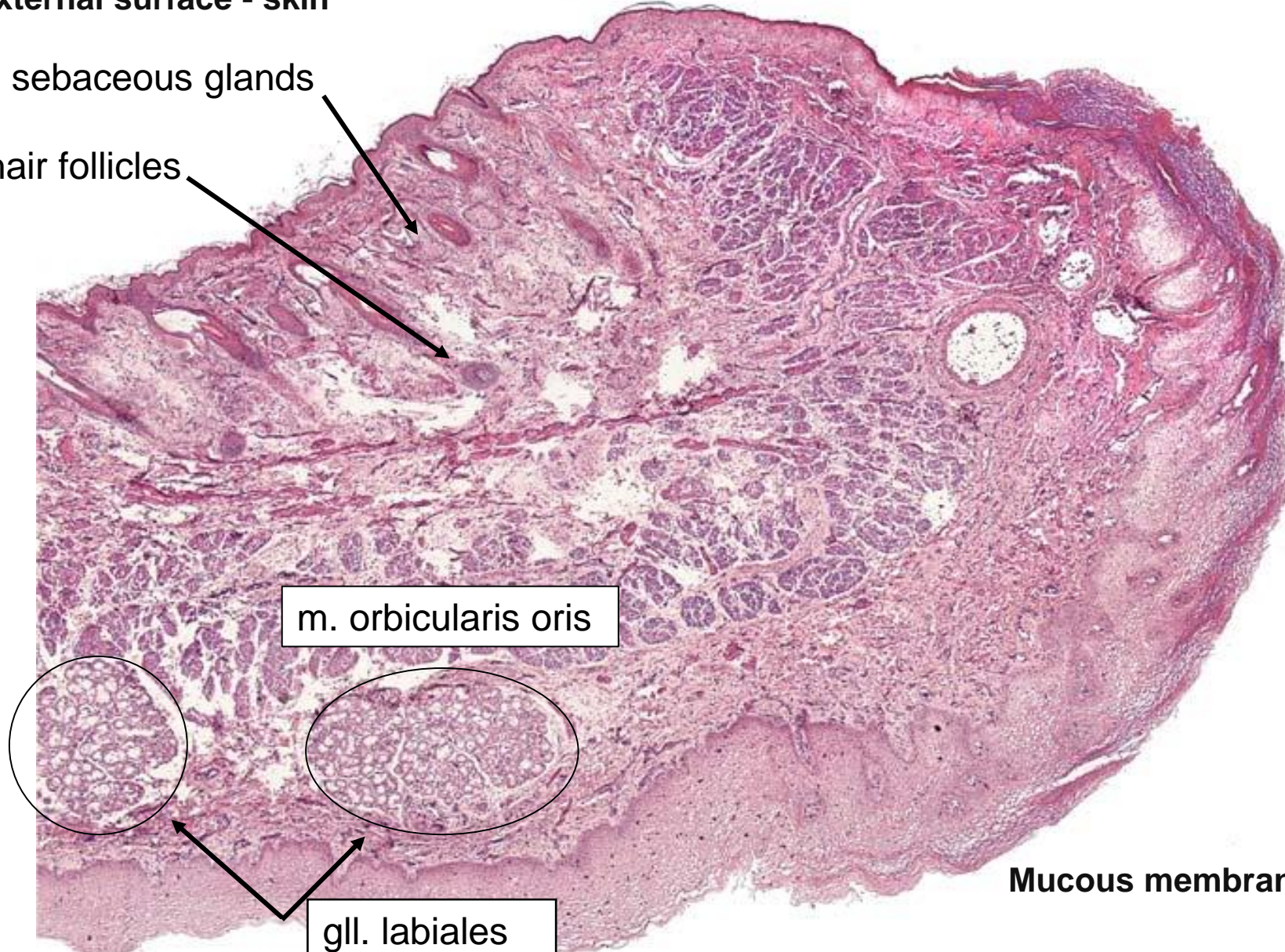
- **covering** - lined with *submucosa* (lips, cheeks, soft palate, *facies mylohyoidea* of the tongue)
- **masticatory** – submucosa is missing, mucosa firmly attached to the *periost* of the bone, so called *mucoperiost* (gingiva and hard palate)
- **specialized** – forms *papillae* (*dorsum linguae*)

Labium oris

External surface - skin

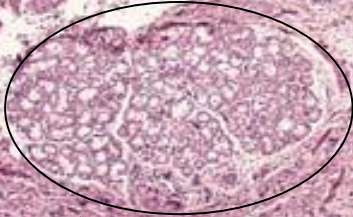
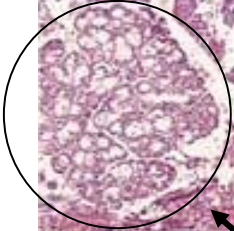
sebaceous glands

hair follicles



Transitional zone (vermilion)

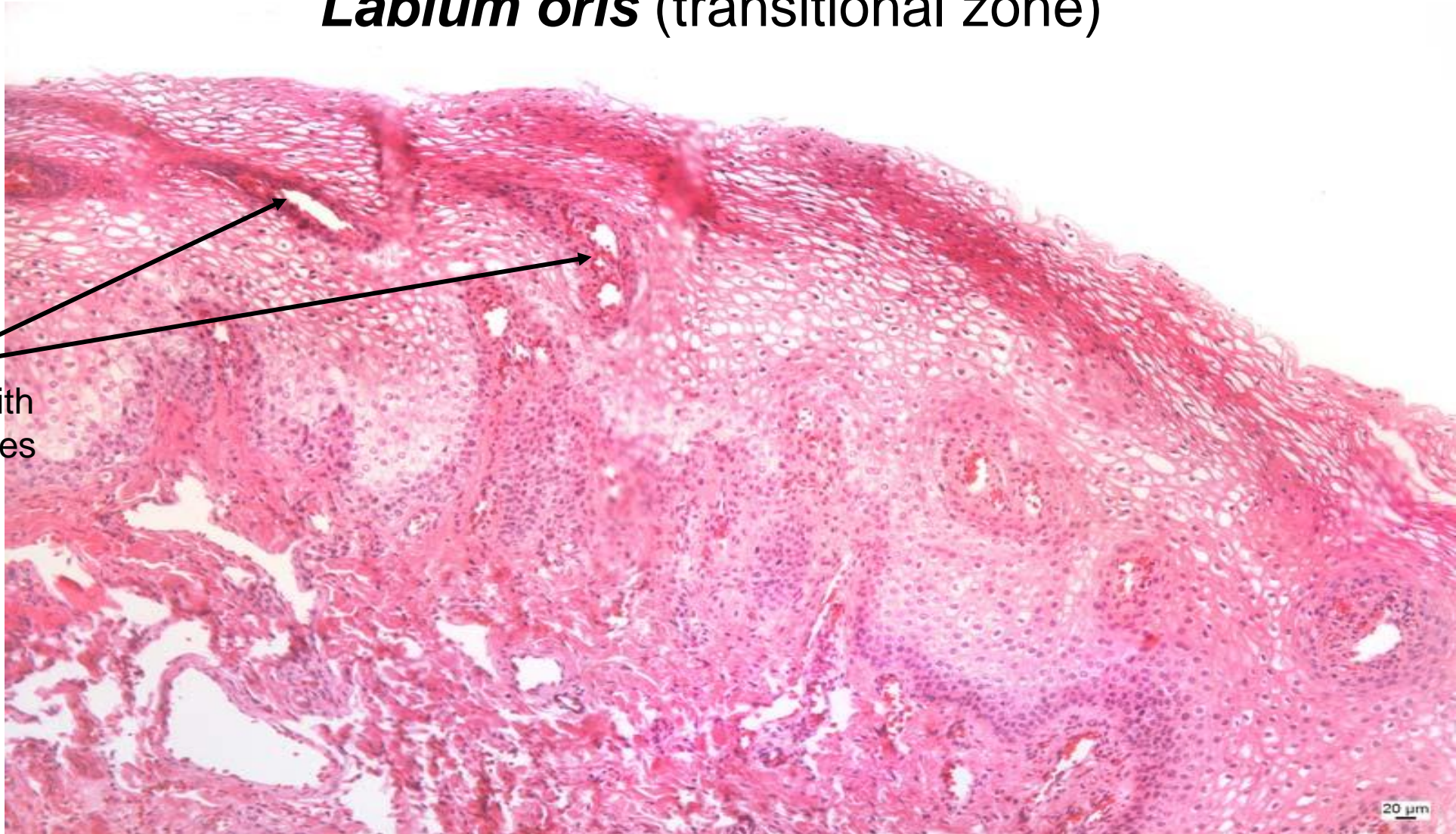
m. orbicularis oris



gll. labiales

Mucous membrane

Labium oris (transitional zone)

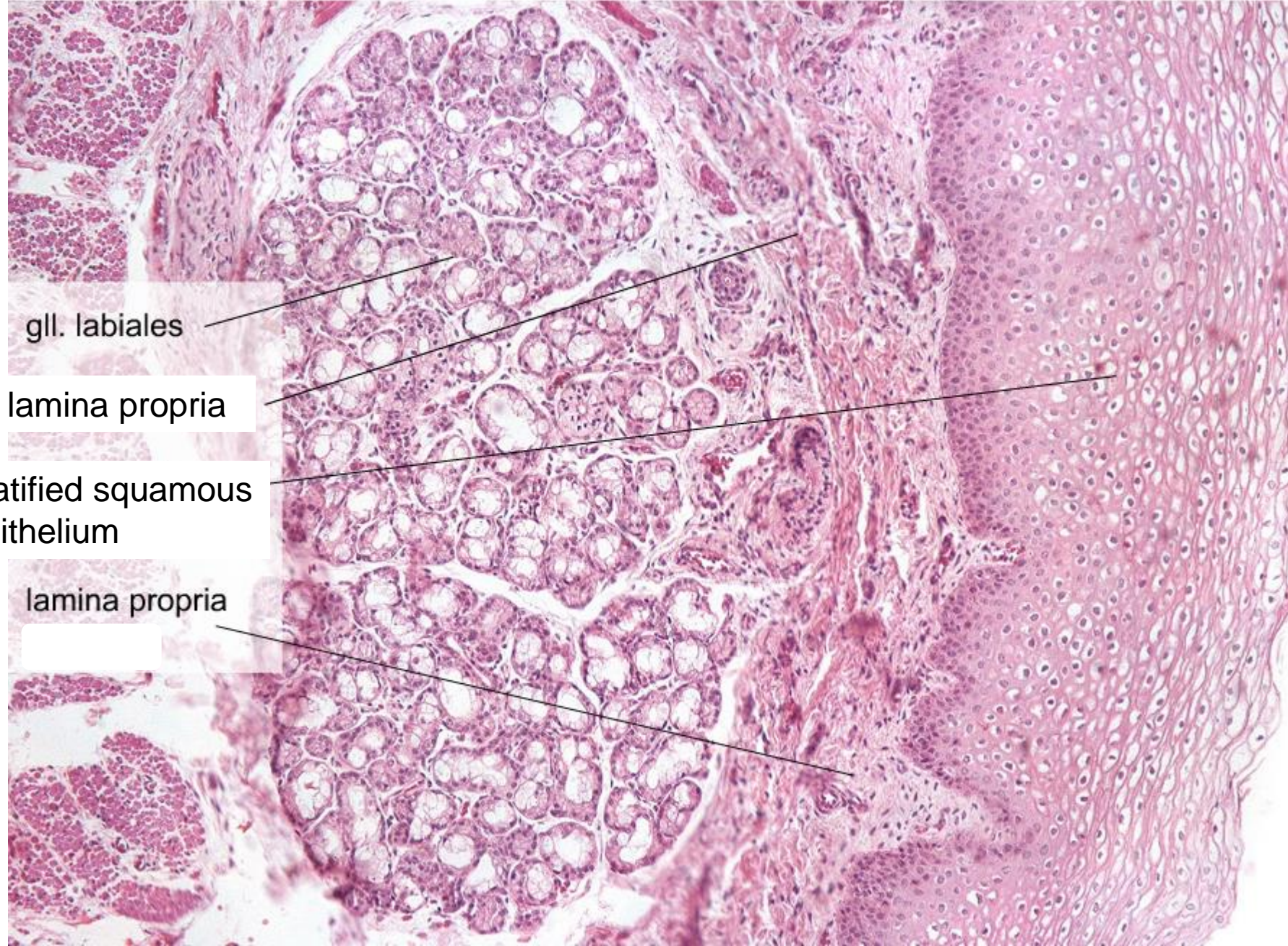


c.t. papillae with
blood capillaries

The epithelium is somewhat thicker than in other parts of the facial skin.

C.t. papilla extend deep into the epithelium and are heavily vascularized. It is the proximity of these vessels to the surface of the epithelium which gives the prolabium it's **red** appearance (+ presence of protein eleidin in the epithelial cells).

Labium oris – inner surface , (HE), objektiv 10x



gll. labiales

lamina propria

stratified squamous
epithelium

lamina propria

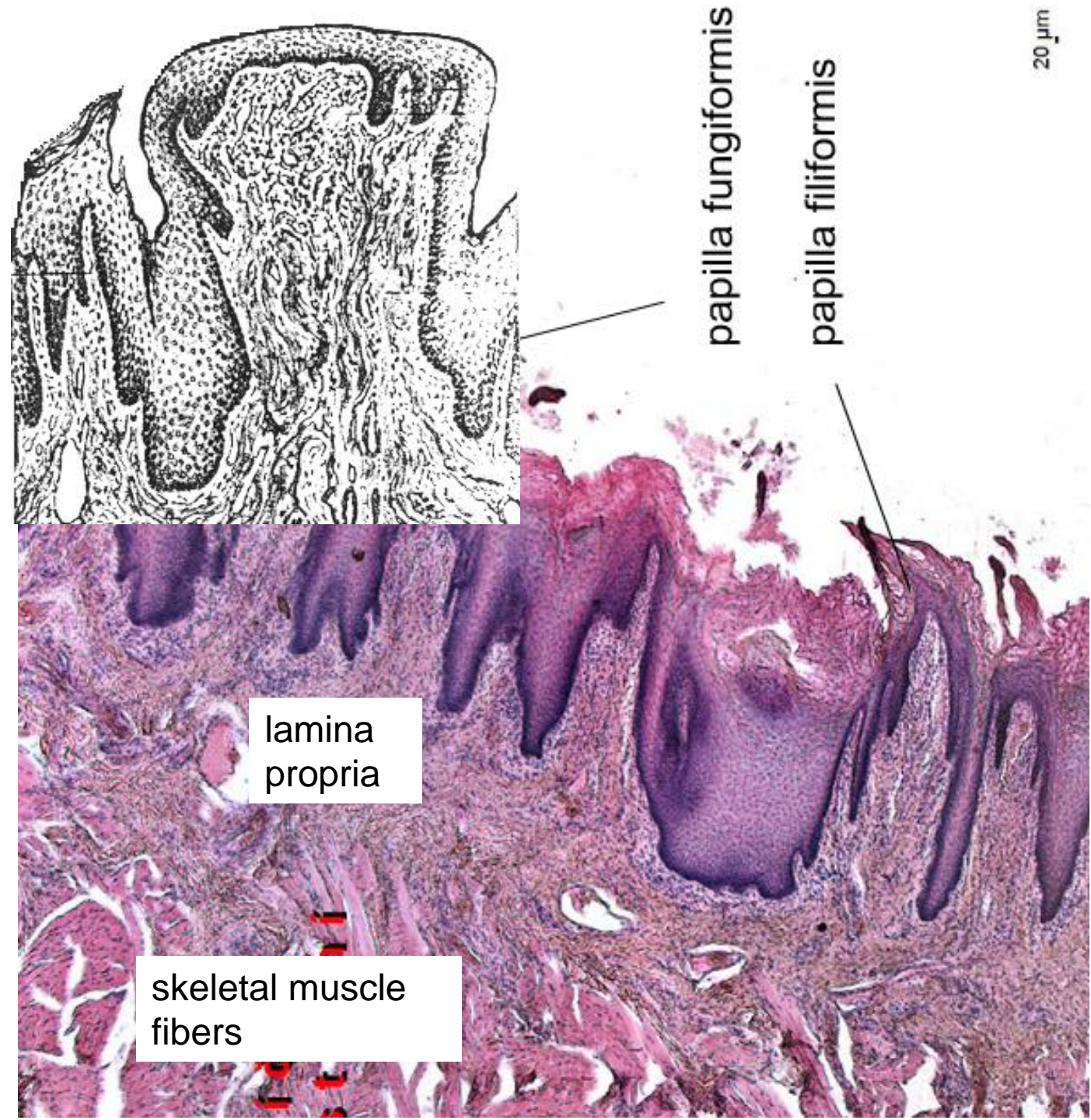
Tongue

dorsal surface

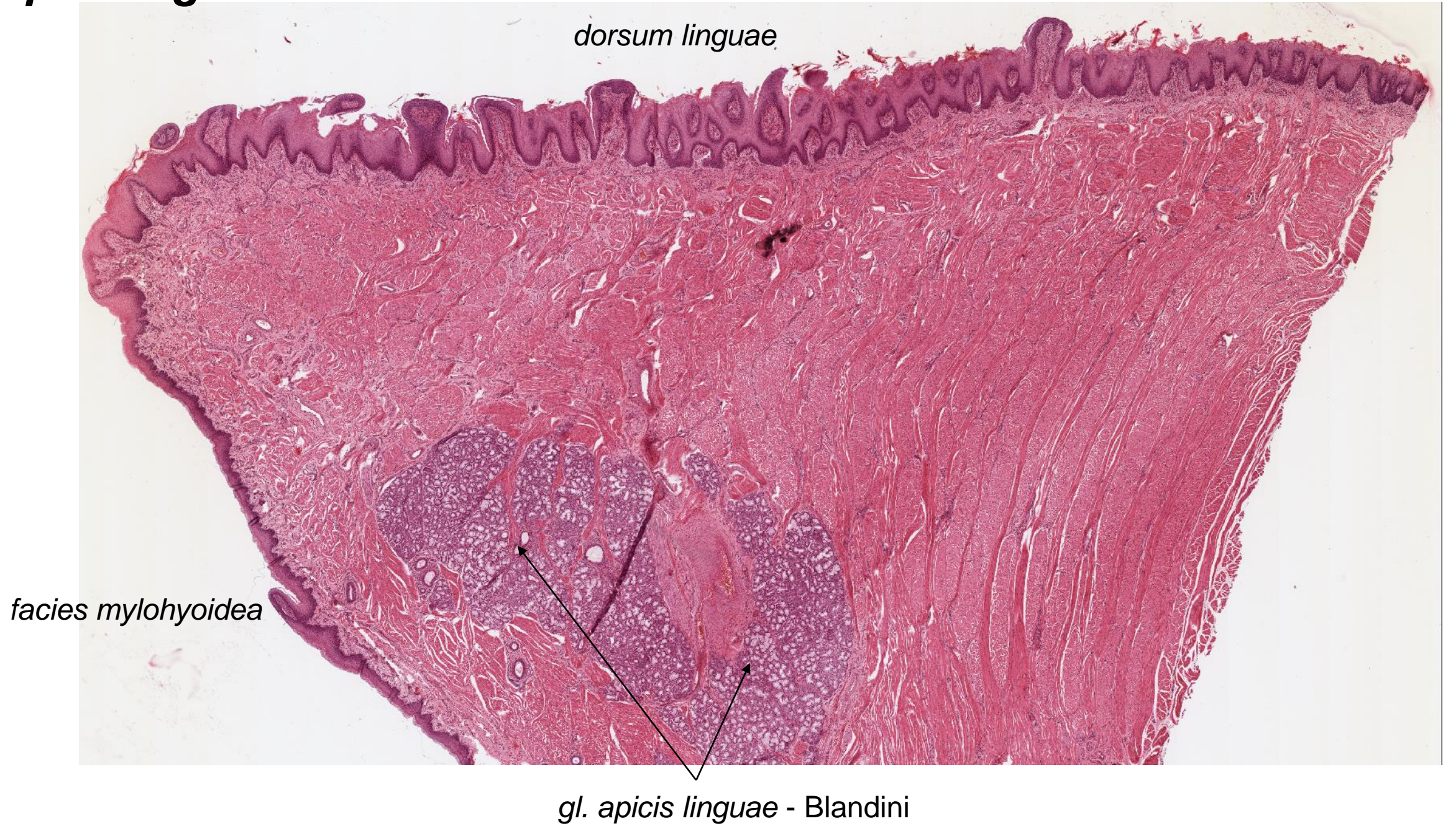
the *tunica mucosa* – ***papillae filiformes, fungiformes, circumvallatae, foliatae***
(*papillae* = elevations of the oral epithelium and *lamina propria*)
the **submucosa is missing**
aponeurosis linguae

inferior surface (*facies mylohyoidea*)

the *tunica mucosa* – without specific papillae
the **submucosa is present**



Apex linguae



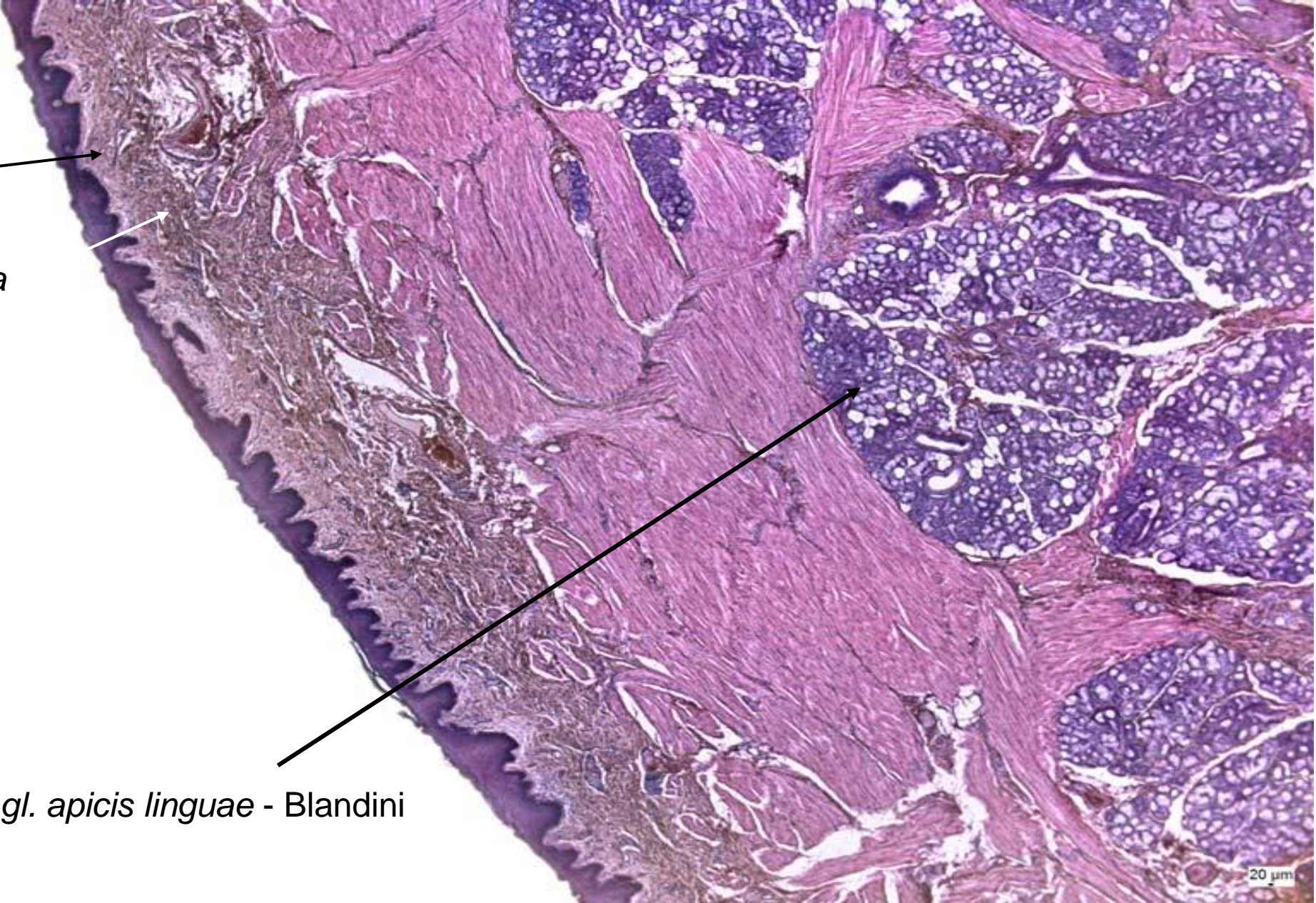
Apex linguae – facies inferior

lamina propria

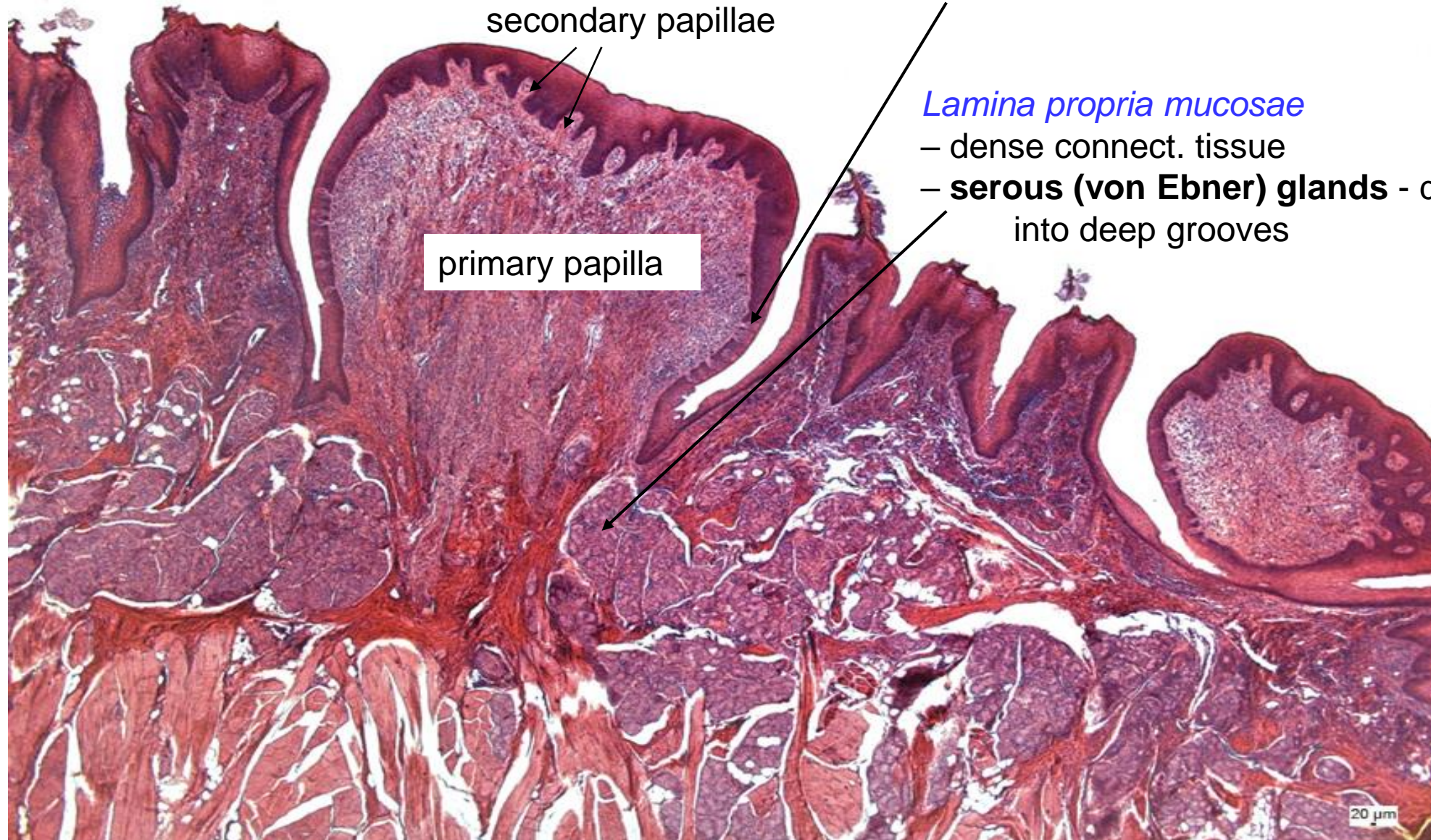
tela submucosa

facies mylohyoidea

gl. apicis linguae - Blandini



Papillae circumvallatae



secondary papillae

primary papilla

The epithelial lining

- stratified squamous epithelium
- **taste buds**

Lamina propria mucosae

- dense connect. tissue
- **serous (von Ebner) glands** - drain into deep grooves

20 μm

Papilla circumvallata (HE)

taste bud

groove

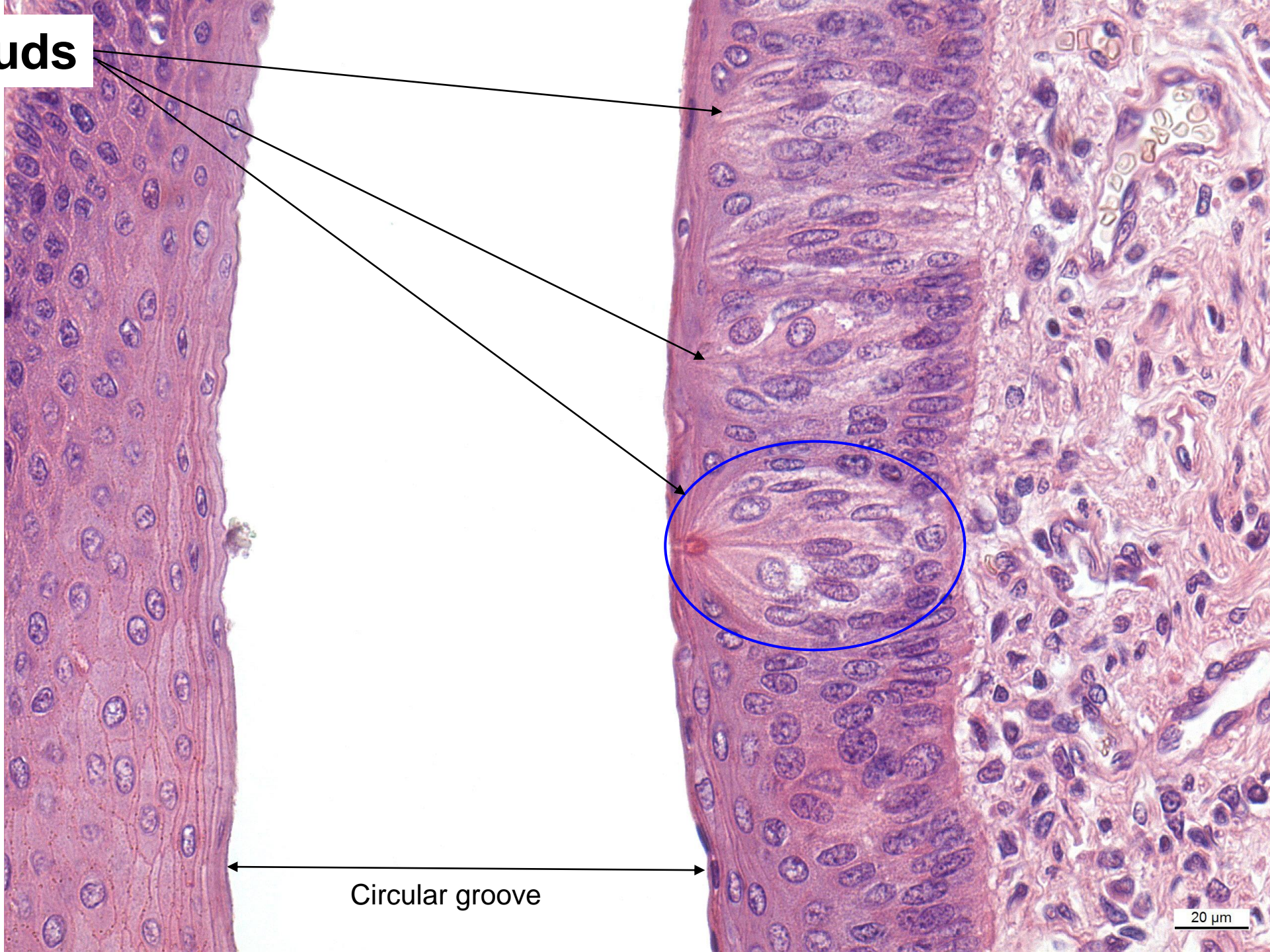
gland duct



gll. gustatoriae (Ebneri)

20 μ m

Taste buds



Circular groove

20 μ m

Soft palate

nasal surface

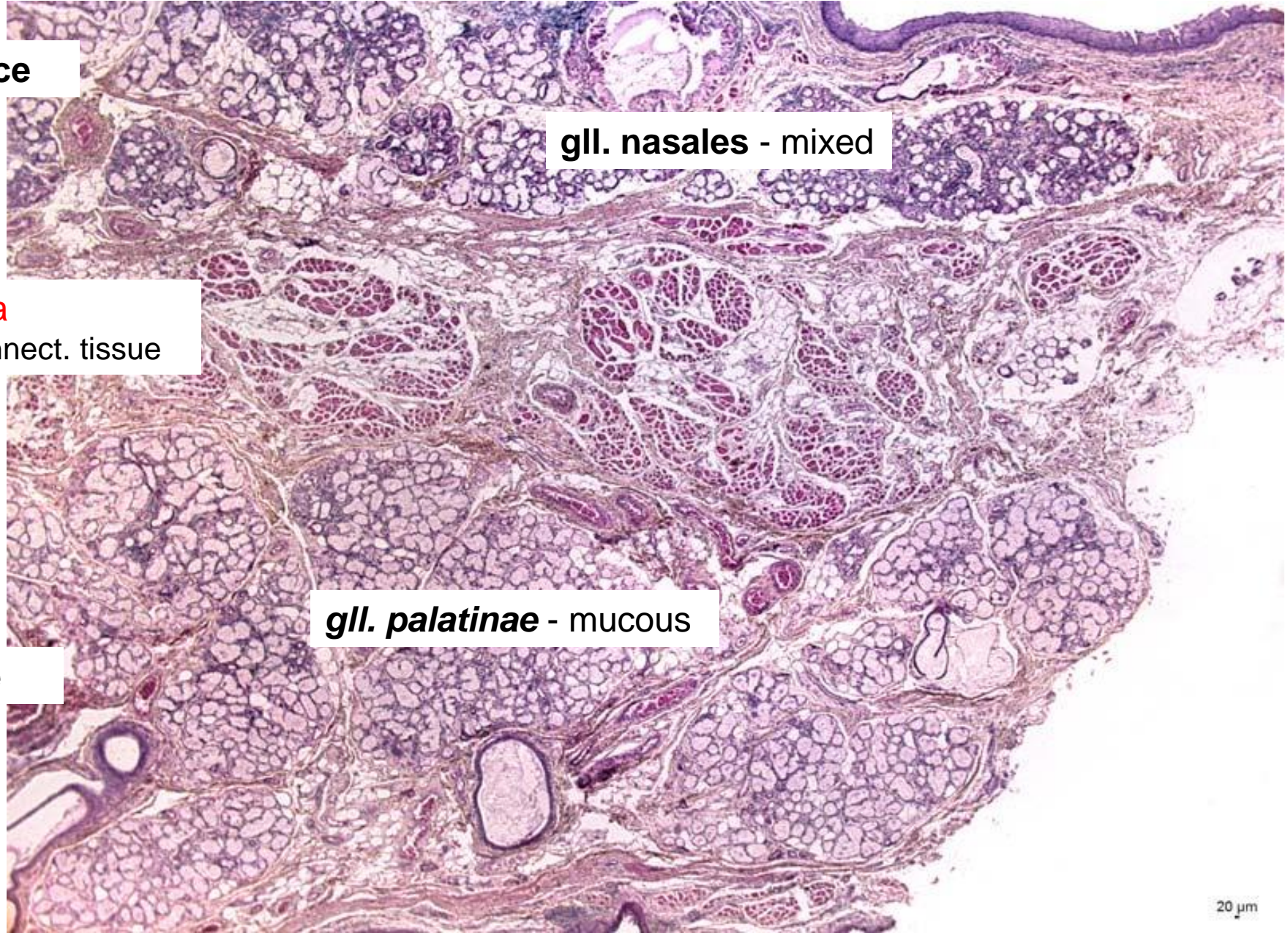
gll. nasales - mixed

aponeurosis palatina

- skeletal muscle + connect. tissue

gll. palatinae - mucous

oral surface



Palatum molle

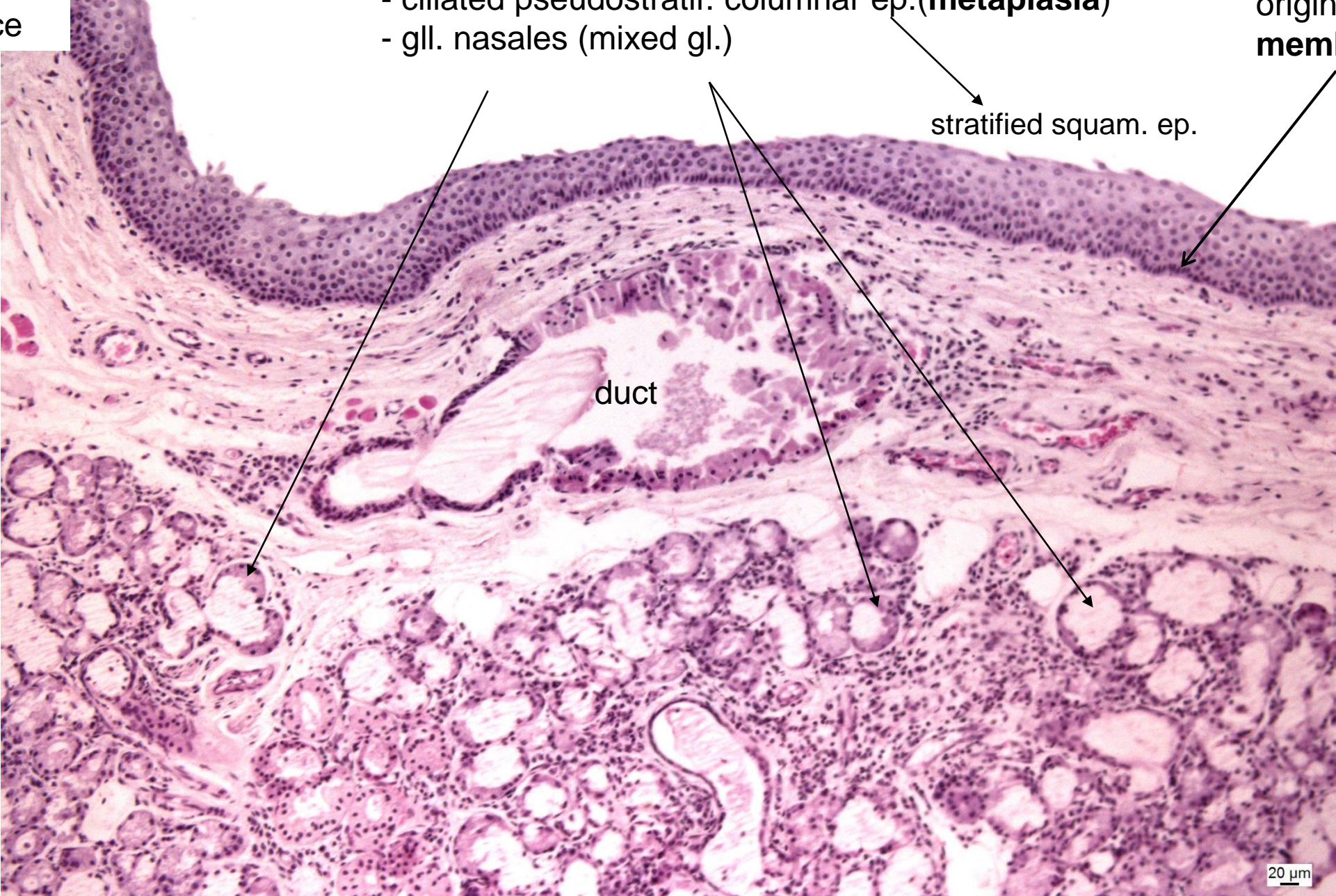
- nasal surface

- ciliated pseudostrat. columnar ep. (metaplasia)
- gl. nasales (mixed gl.)

original basement membrane

stratified squam. ep.

duct



20 µm

Palatum molle

- oral surface

stratified squamous epithelium

basement membrane

duct

gll. palatinae – mucous



Tooth (*dens*)

Deciduous
(baby) teeth
- 20

Permanent teeth
- 28-32

radix (root)



Anatomy

Corona dentis (crown)

Collum (neck)

Radix (root)

Cavum et canalis radialis dentis
(pulp cavity)

Pulpa dentis

Apex radialis dentis

+ *foramen apicis radialis dentis*
(apical foramen)

Alveolus

Periodontal ligament

- dense connective tissue

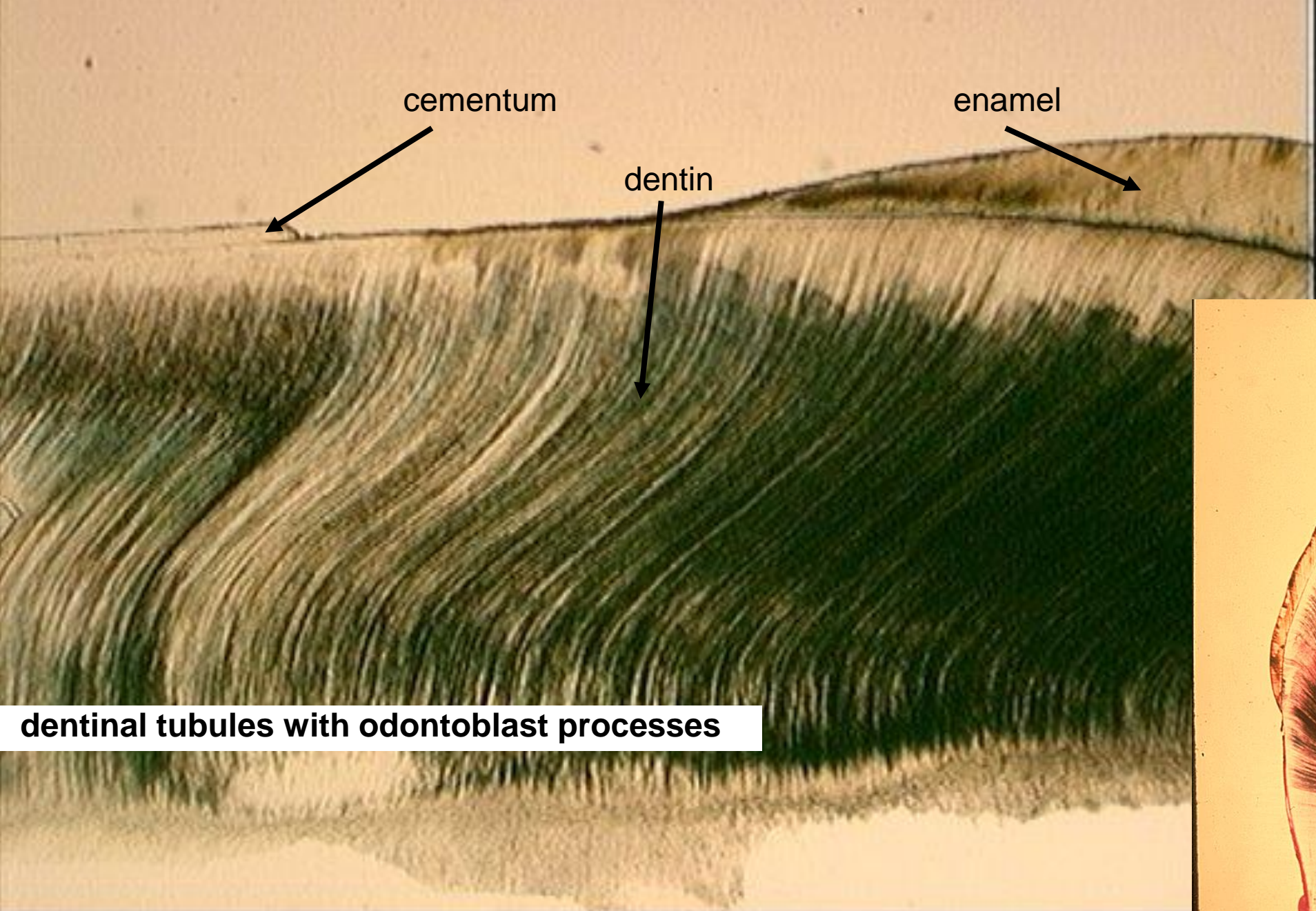
Yellow
marrow

Vein

Artery

Nerve

Tooth – grinding



cementum

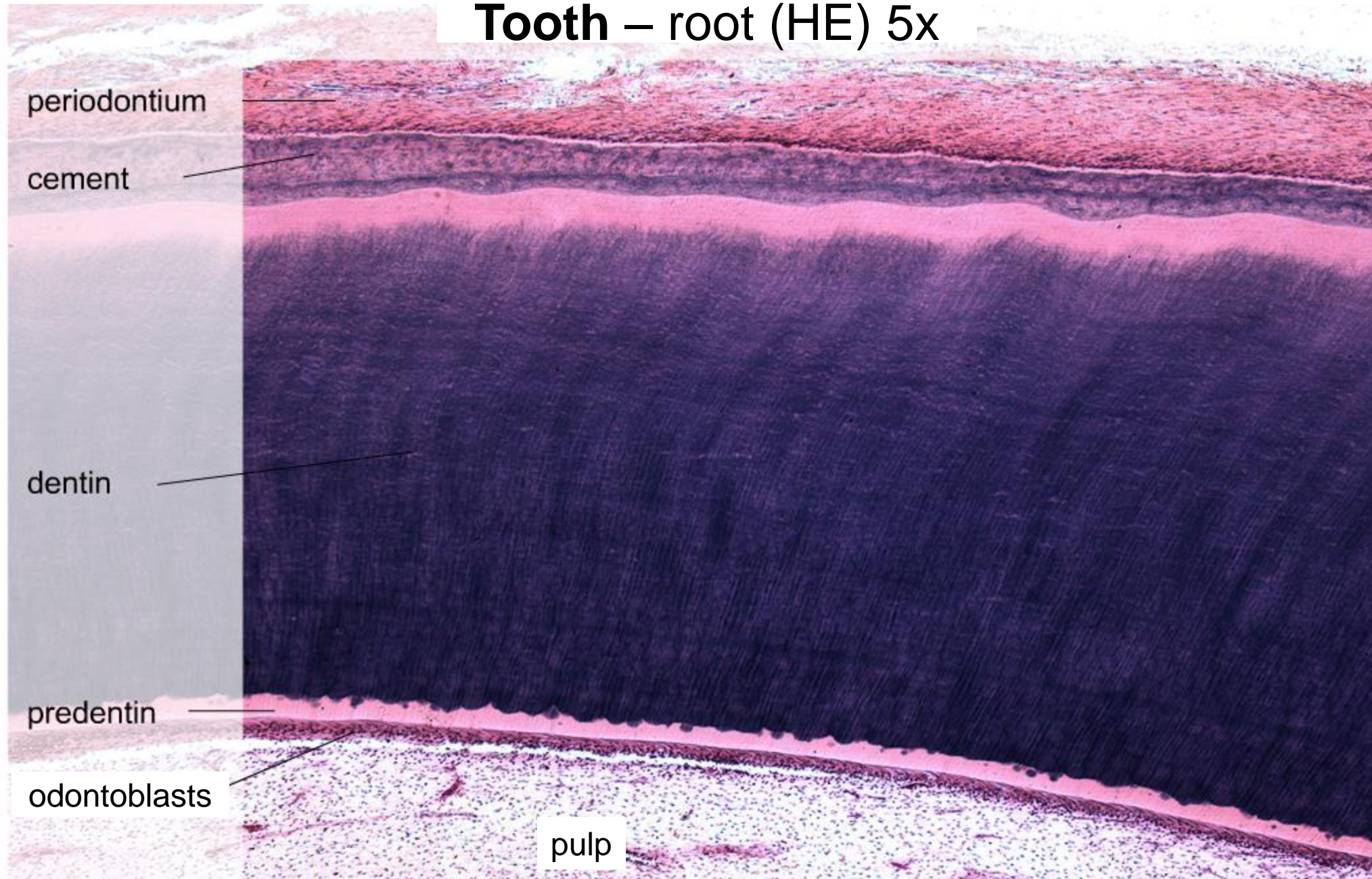
enamel

dentin

dentinal tubules with odontoblast processes



Tooth – root (HE) 5x

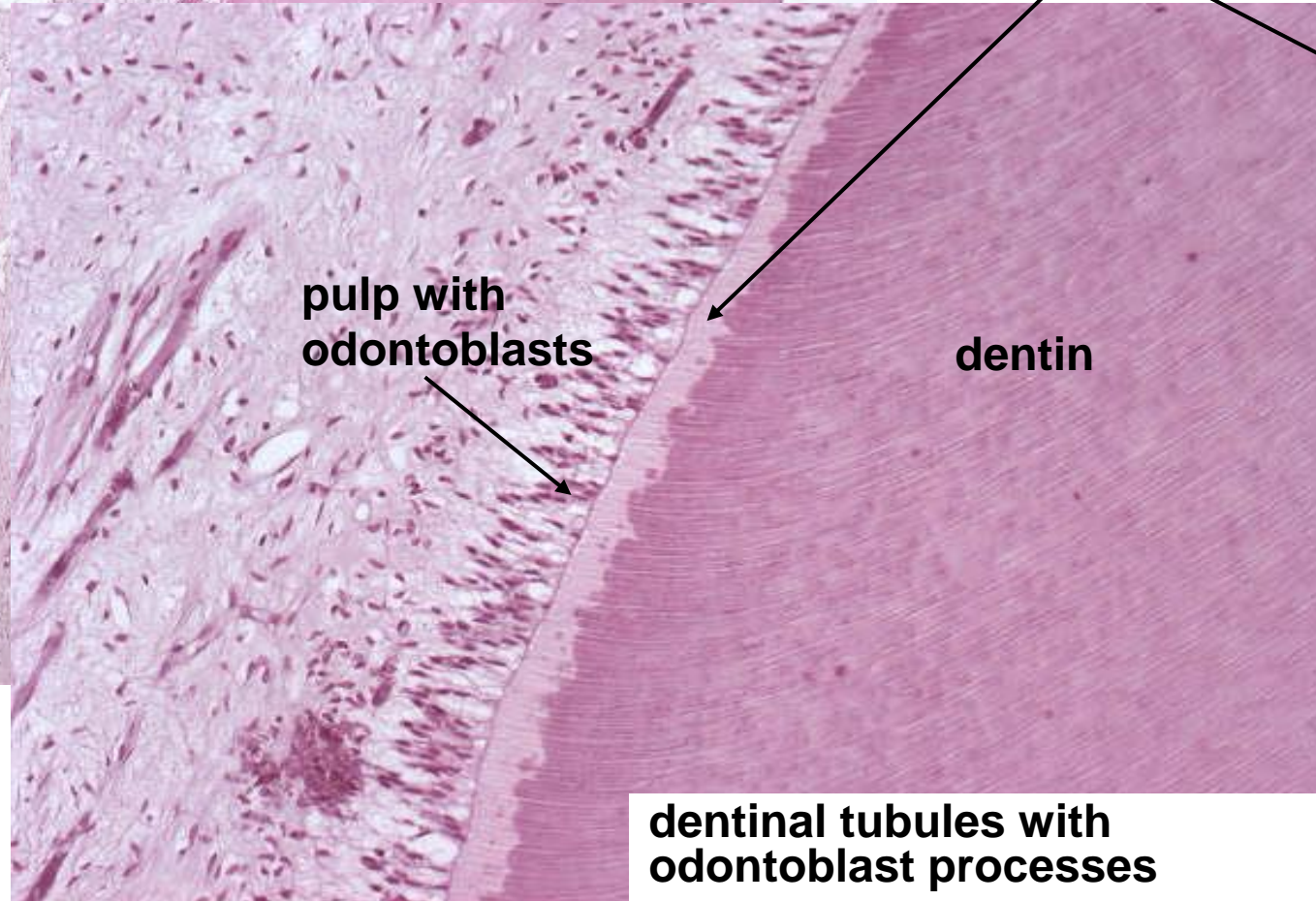


Decalcified tooth - enamel is missing



dentin

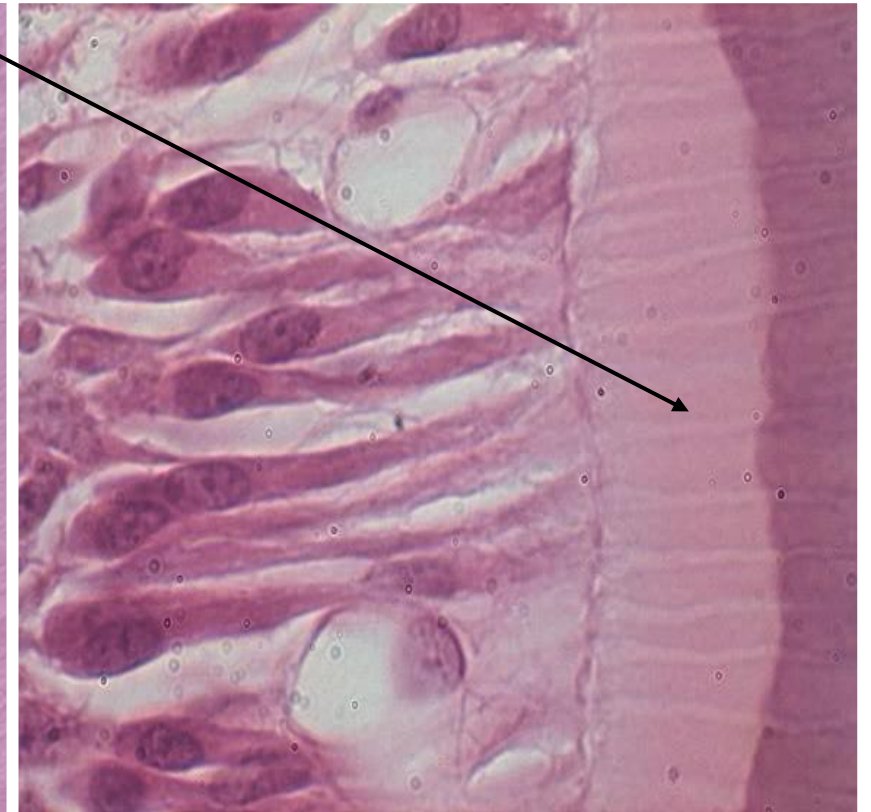
predentin – unmineralized dentin
with nerve fibers



**pulp with
odontoblasts**

dentin

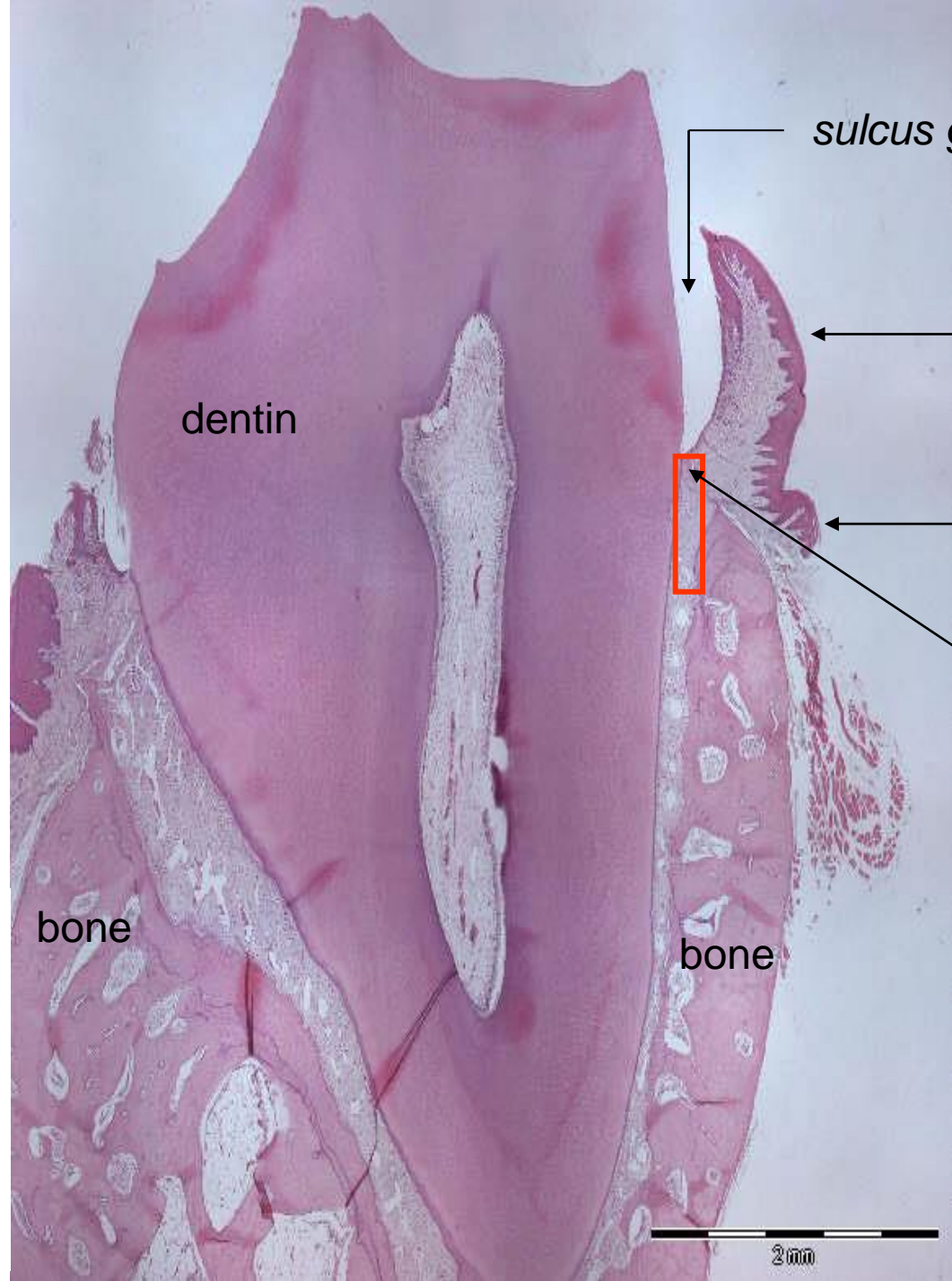
**dentinal tubules with
odontoblast processes**



odontoblasts



Periodontal ligament –
dense connective tissue
Cementum
Alveolar bone – woven bone



sulcus gingivalis

gingiva libera

gingiva affixa

epithelial attachment of Gottlieb
(junctional epithelium)
= epithelium of gingiva is bound
to the tooth enamel

dentin

bone

bone

2mm

Gingiva

- stratified squamous epithelium
- connective tissue papillae – dense collagen c.t.
- (no *tela submucosa*)

Digestive system – I



Slides :

1. Labium oris (HE)
2. Apex linguae (HE)
3. Papilla circumvallata (HE)
5. Palatum molle (HE)
7. Tooth (HE)
11. Oesophagus (HE, HES)
97. Tooth – development (Azan)

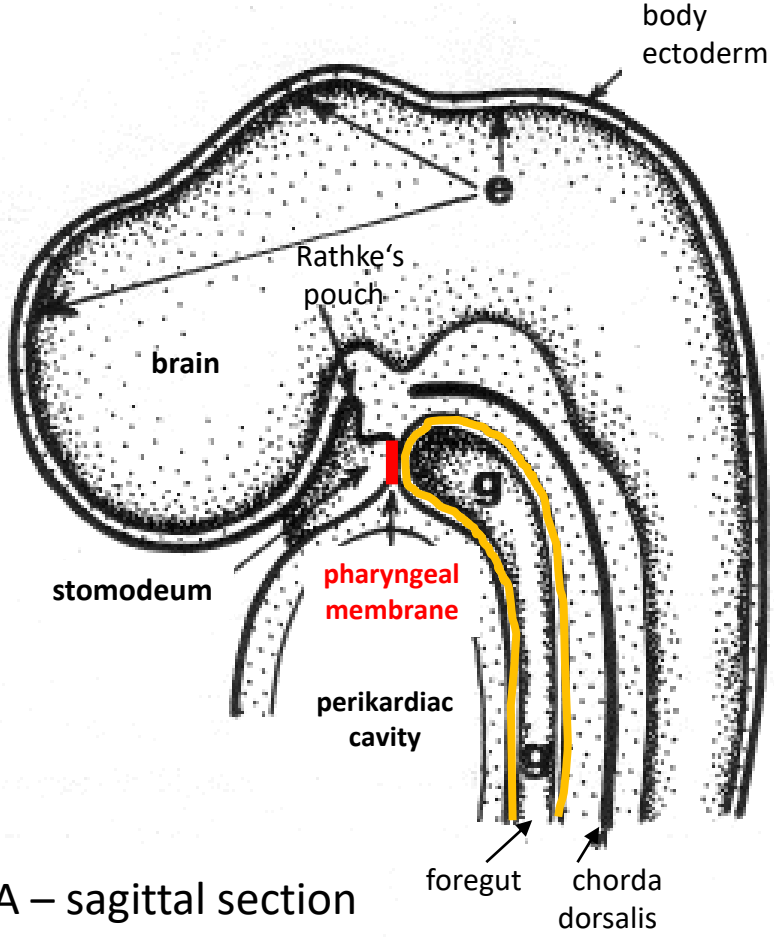
Atlas:

Development of face (87)

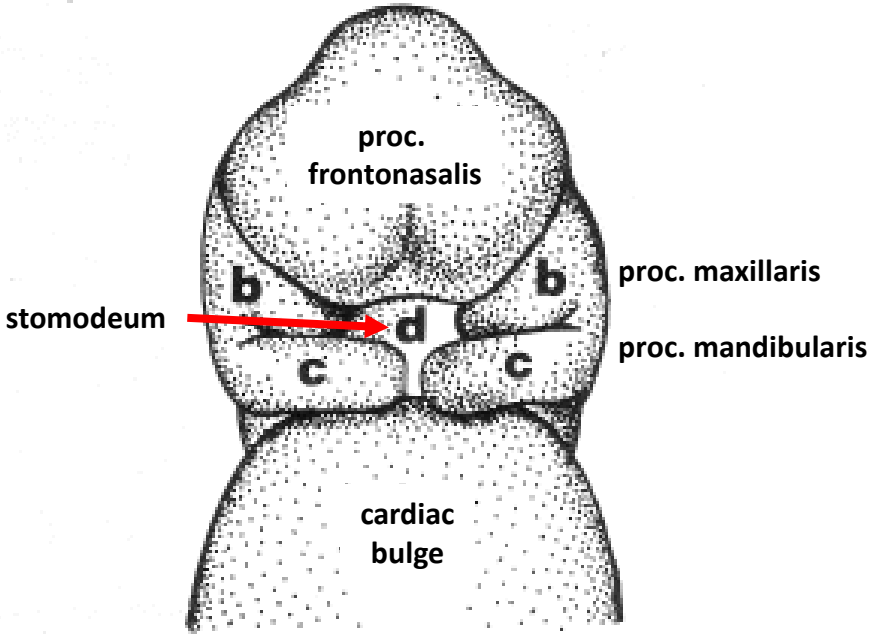
Pharyngeal (branchial) apparatus. Development of tongue (88)

Tooth – development (99-100)

Development of the face, stomodeum and cervical region – embryo, day 24

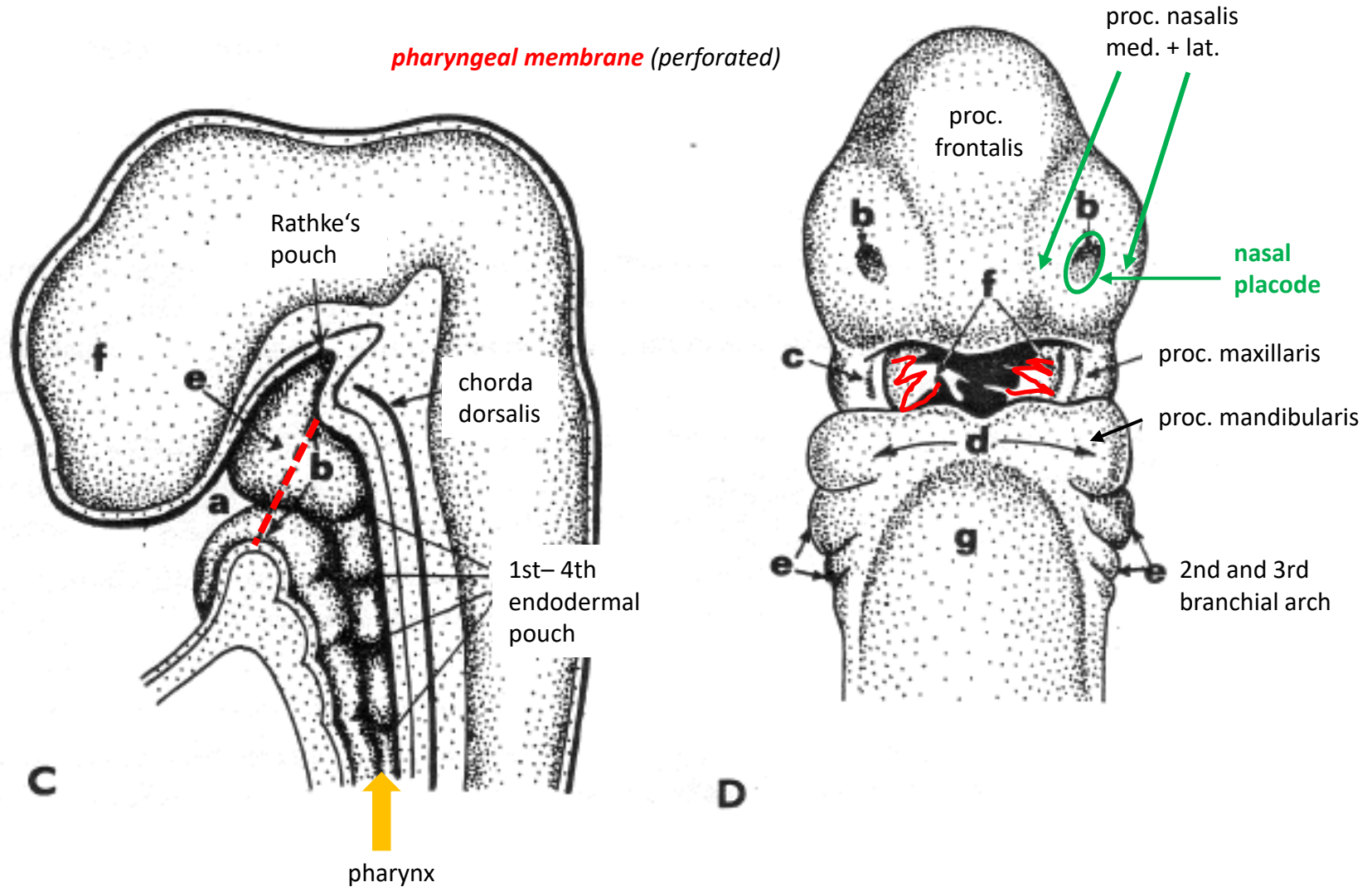


A – sagittal section

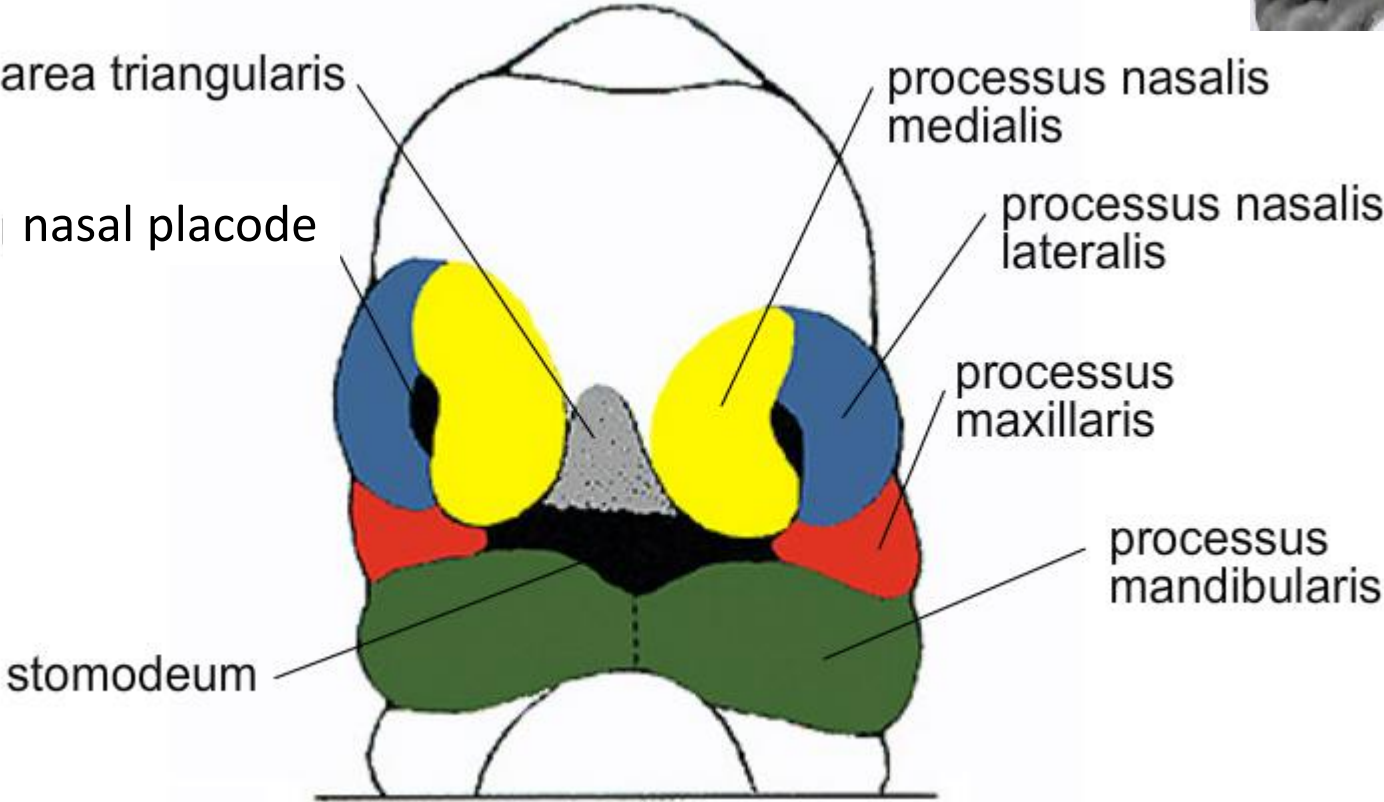
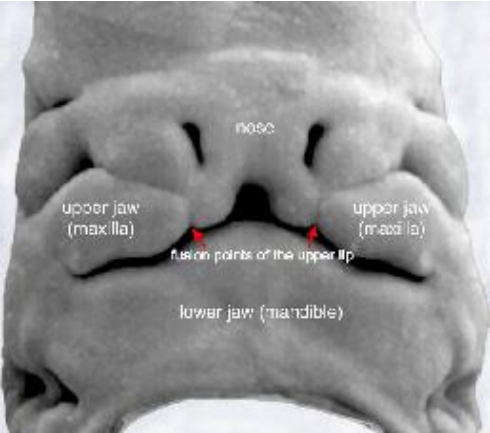


B – frontal view

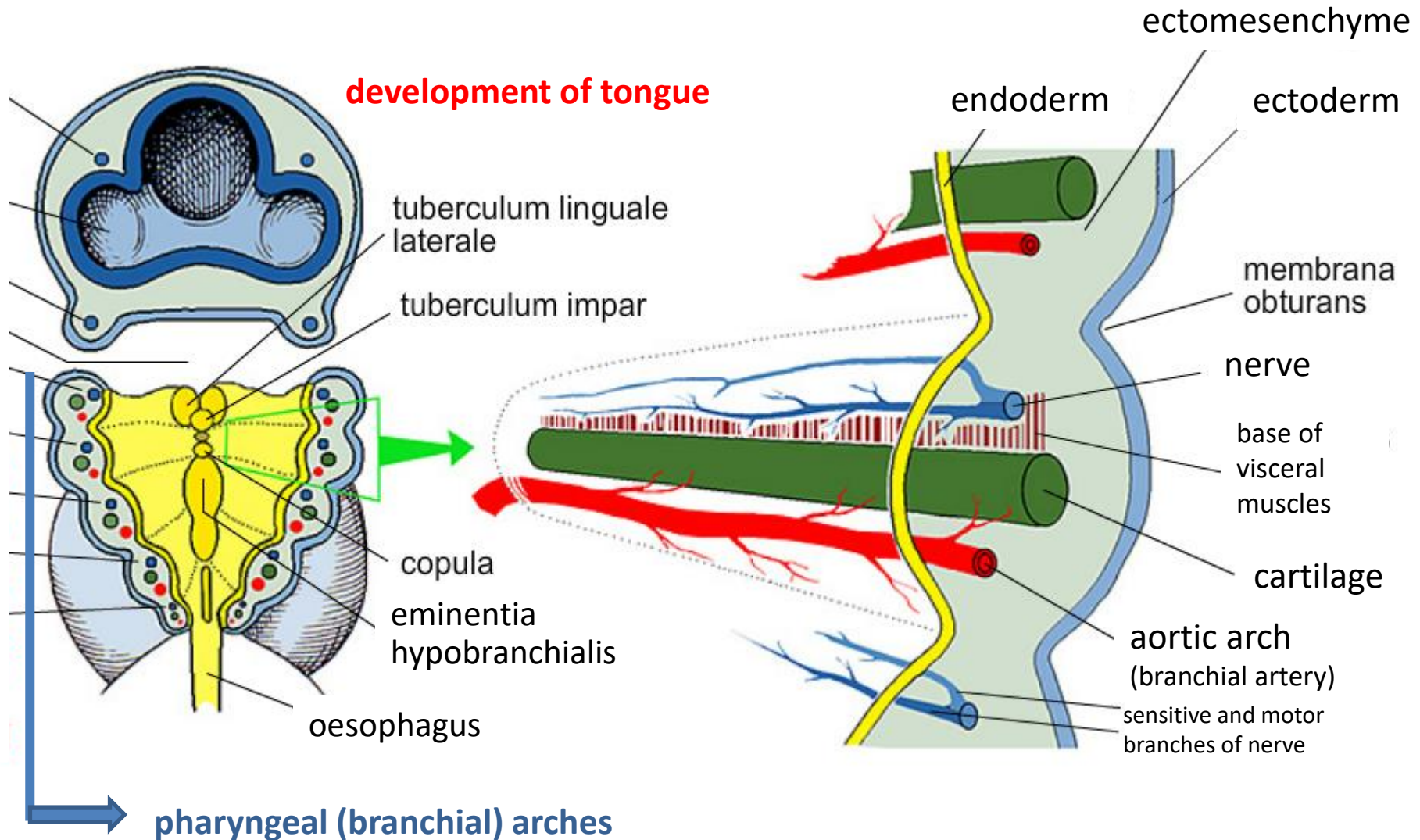
Development of the face, stomodeum and cervical region – embryo, day 28



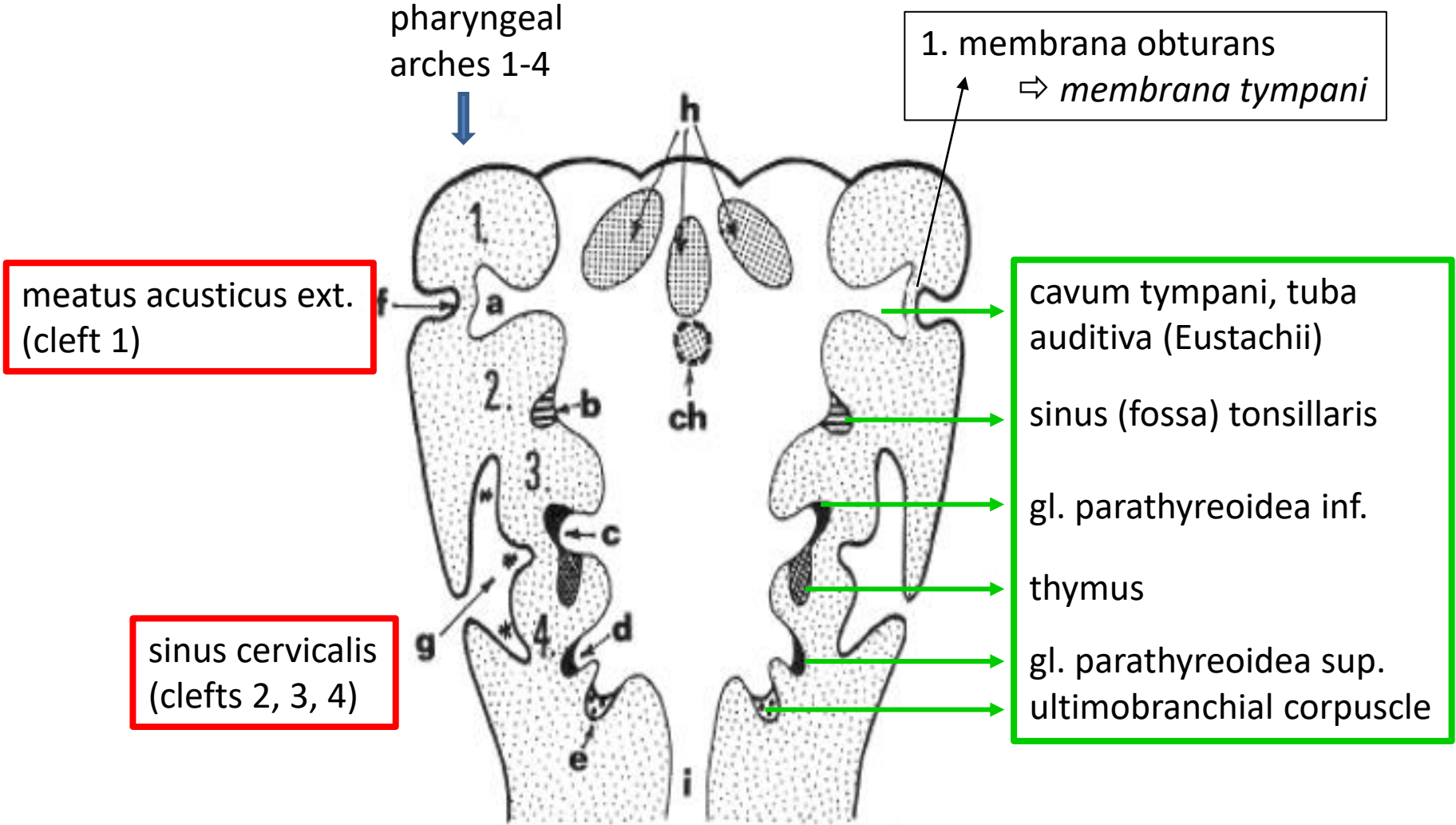
Development of the face – embryo, end of week 5



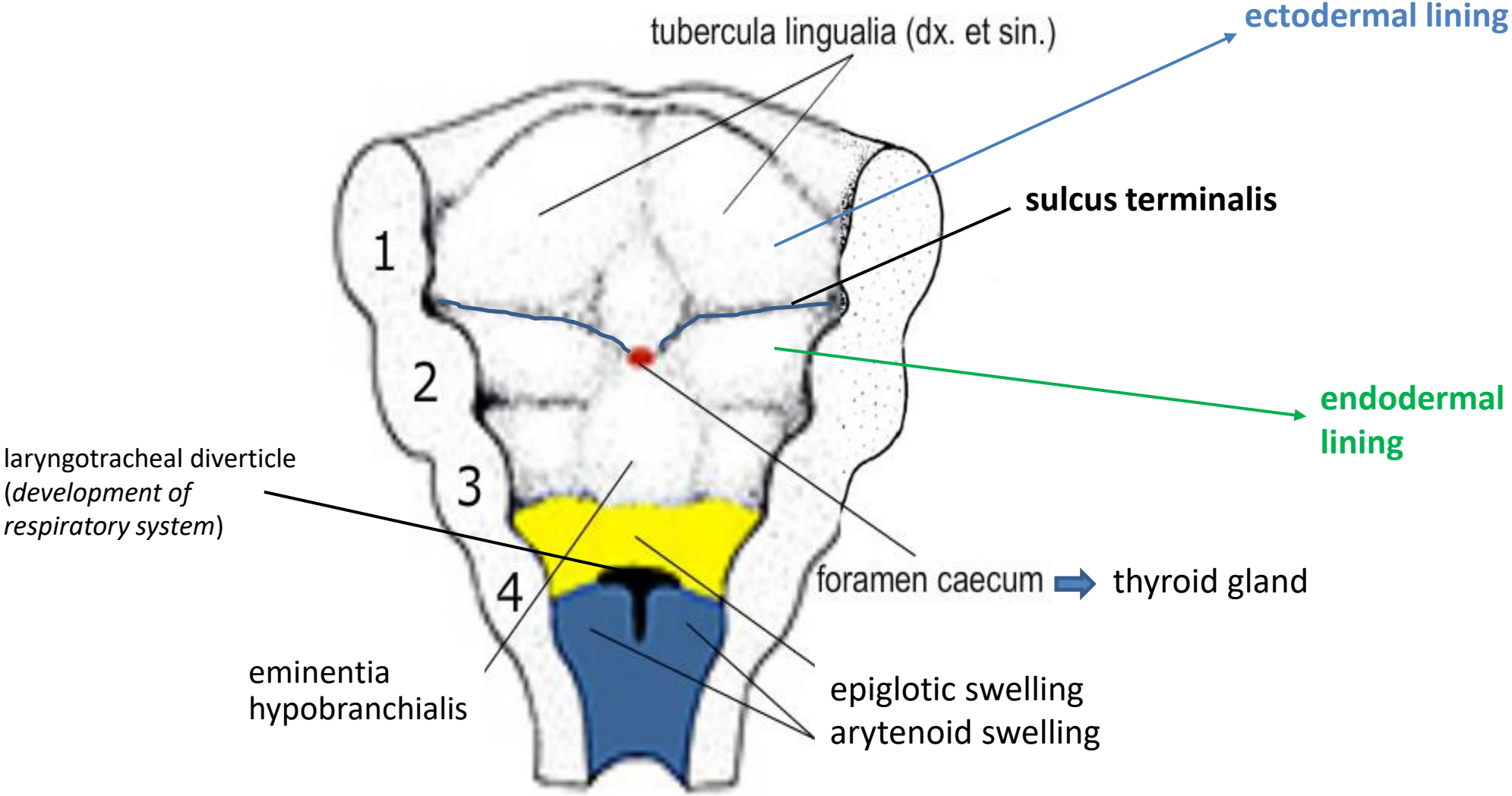
Development of pharyngeal (branchial) apparatus – embryo, week 6



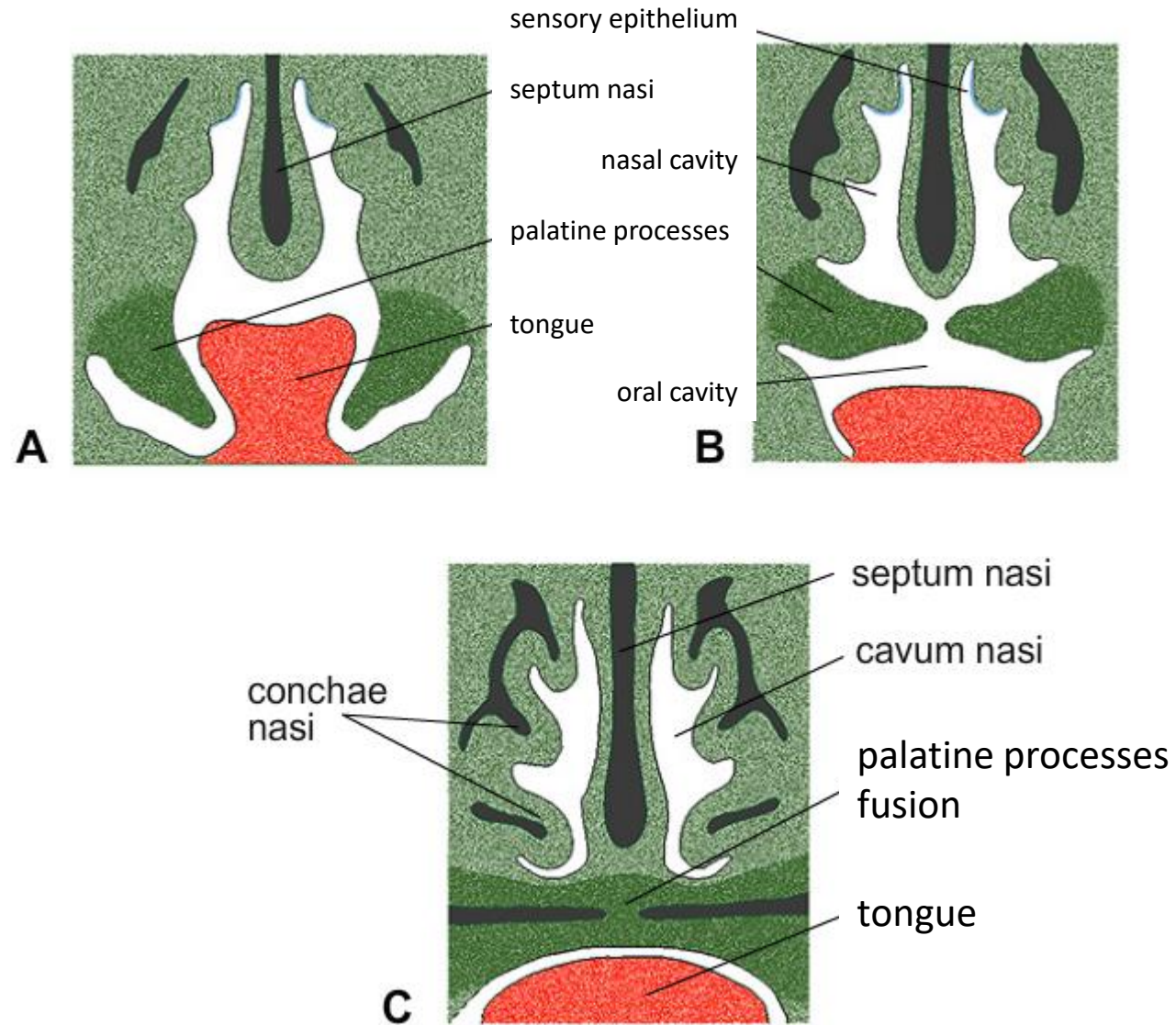
ECTODERMAL CLEFTS and ENDODERMAL POUCHES – embryo, week 5



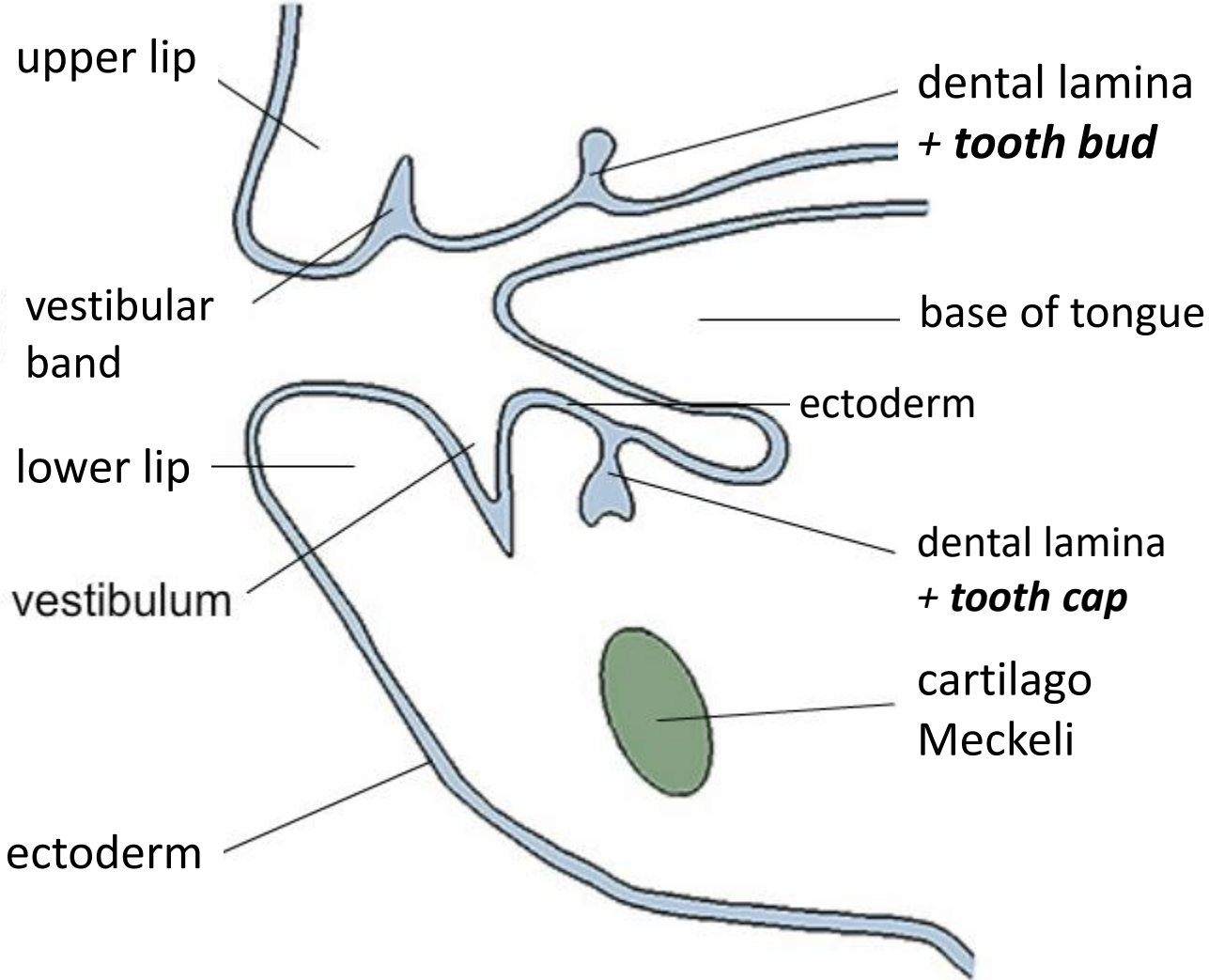
Development of tongue



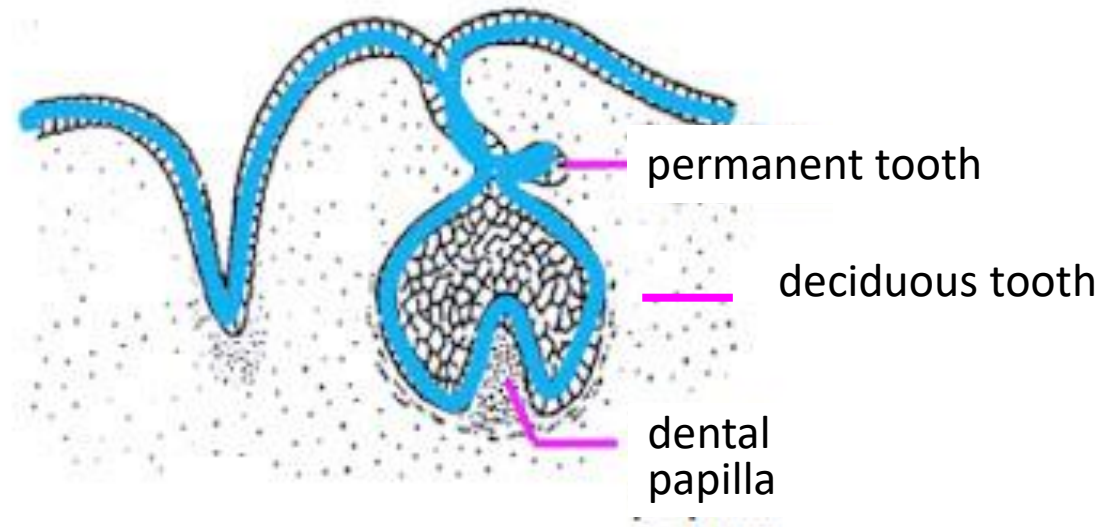
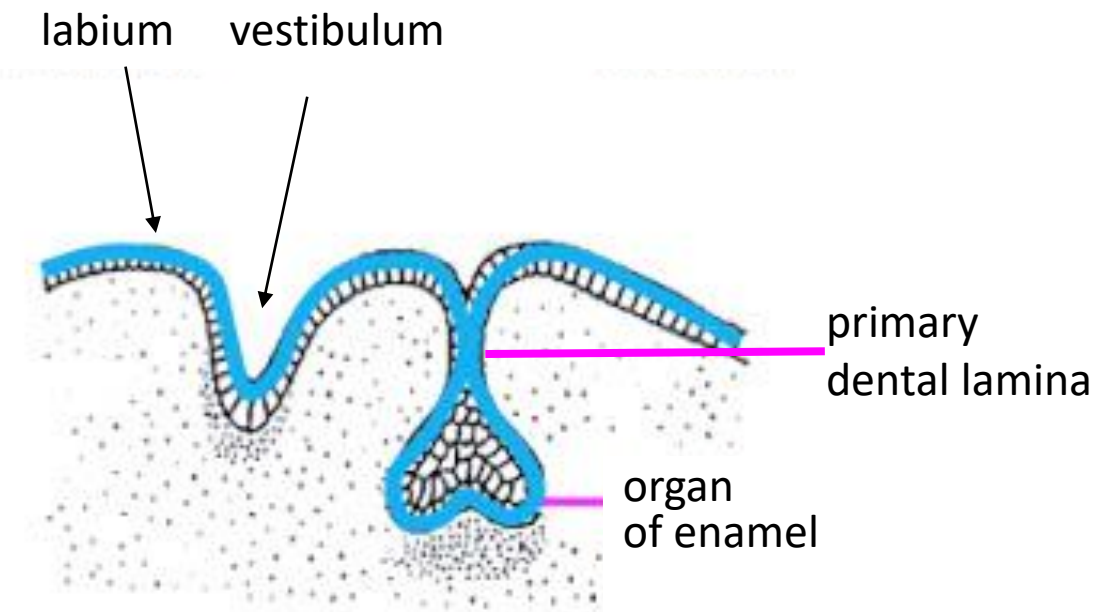
Development of palate – embryo, A – week 7, B – week 8, C – week 10



Development of the oral cavity and teeth – embryo, week 6



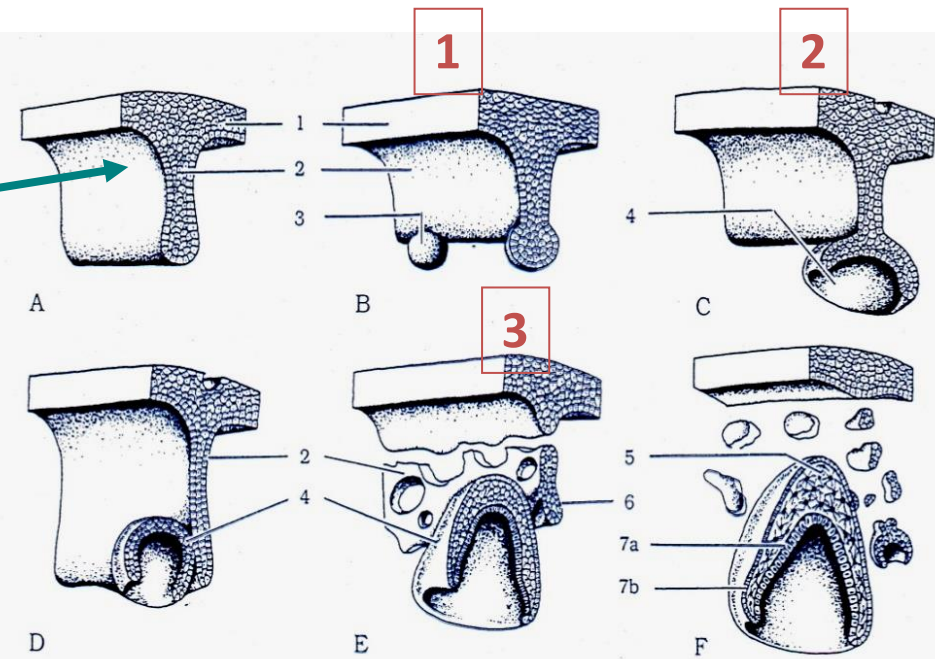
Development of the teeth – embryo, week 6



Developmental stages of tooth

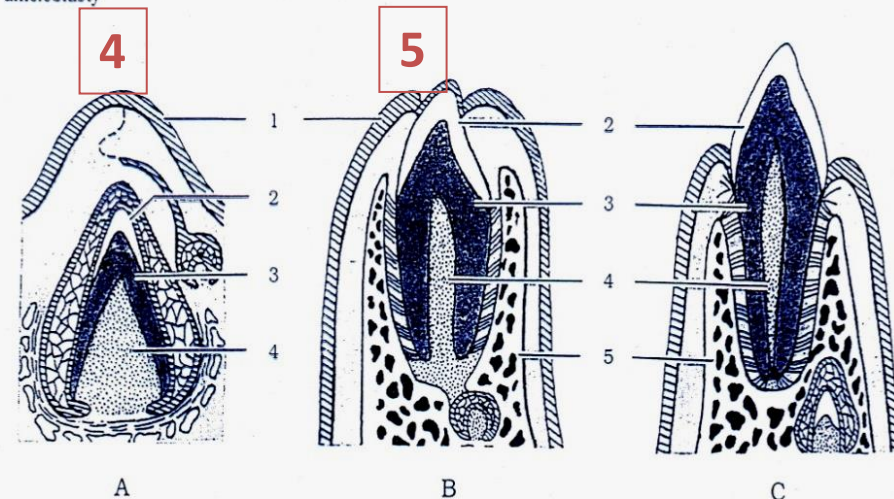
primary dental lamina

1. stage of dental **bud**
2. stage of dental **cap**
3. stage of dental **bell**
4. stage of apposition
(dentinogenesis and amelogenesis)
5. stage of **eruption**



Obr. 13.12 Vývoj sklovinových orgánov zo zubnej lišty

Schematicky sú znázornené iba deriváty ektodermy: A - 6. týždeň, B - 7. týždeň, C - 8. týždeň, D - 10. týždeň, E - 14. týždeň, F - 18. týždeň vývoja; 1 - ektodermálny epitel ústnej dutiny, 2 - zubná lišta, 3 - epitelový uzlík, 4 - sklovinový orgán, 5 - sklovinová pulpa, 6 - základ trvalého zuba, 7a - vnútorné ameloblasty, 7b - vonkajšie ameloblasty



Obr. 13.13 Schematické znázornenie vývoja zuba (podľa Moorea, 1980)

A - 28. týždeň vývoja, B - asi 6. mesiac po narodení, C - prerezanie zuba po 6. mesiaci veku dieťaťa; 1 - epitel ústnej dutiny, 2 - email (biela), 3 - dentín (tmavosivá), 4 - zubná papila (pulpa), 5 - kosť zubnej alveoly (bielo-čierna)

Tooth – bell stage

