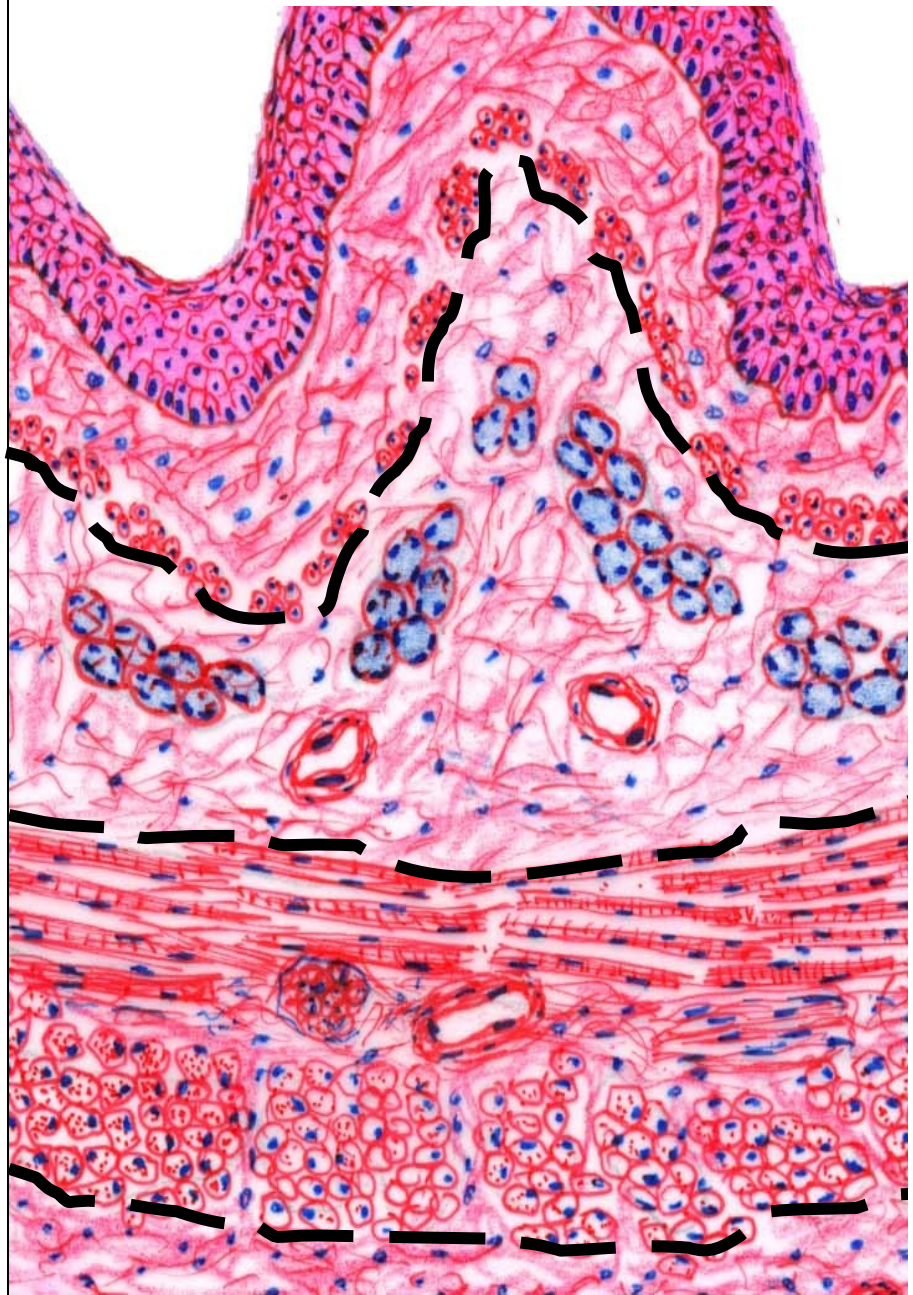
DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY
FACULTY OF MEDICINE - MASARYK UNIVERSITY

Digestive system 1

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

Common structure of the wall of GIT tube

hollow organs



- **The mucosa**
  - epithelium
  - lamina propria
    /loose connect. tissue/
  - lamina muscularis mucosae
- **The submucosa**
  /loose connect. tissue + Meissner´s nerve plexus/
- **The muscularis**
  - circular
    - myenteric nerve plexus
  - longitudinal smooth muscle
- **The serose or adventitia**
  /loose connect. tissue - /+mesothelium/

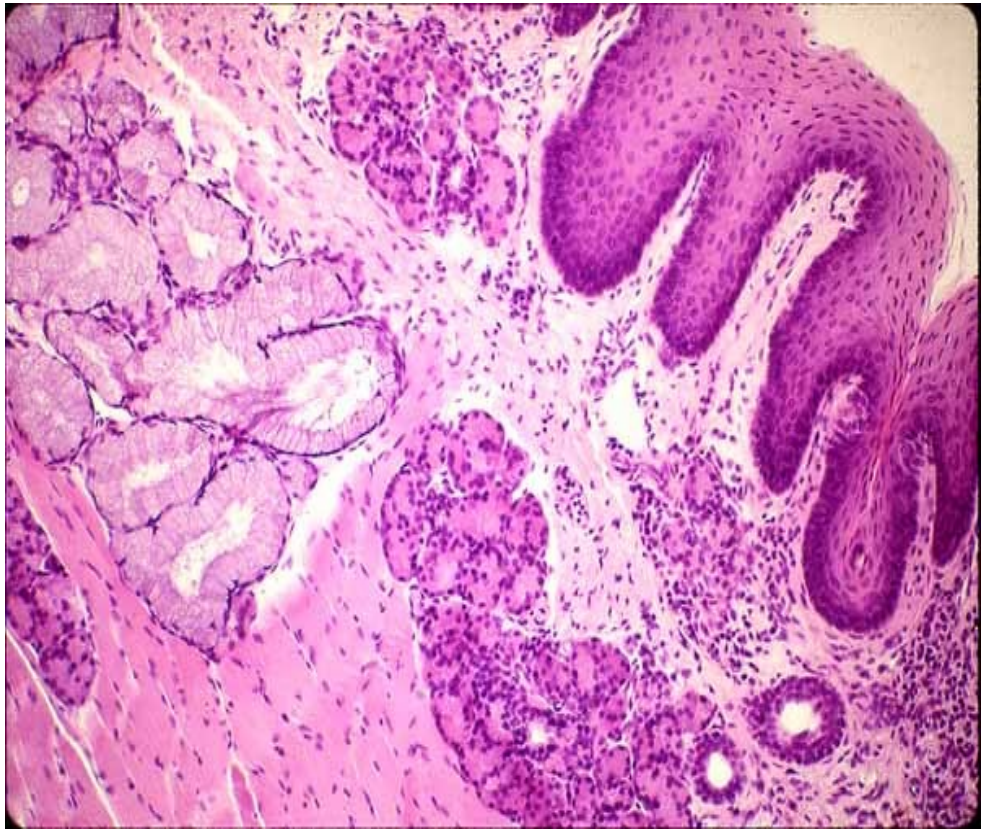
The oral cavity

(the mucosa)

the epithelium
nonkeratinized
stratified squamous ep.

lamina propria
loose connective tissue

the muscularis mucosae
is not present!!!

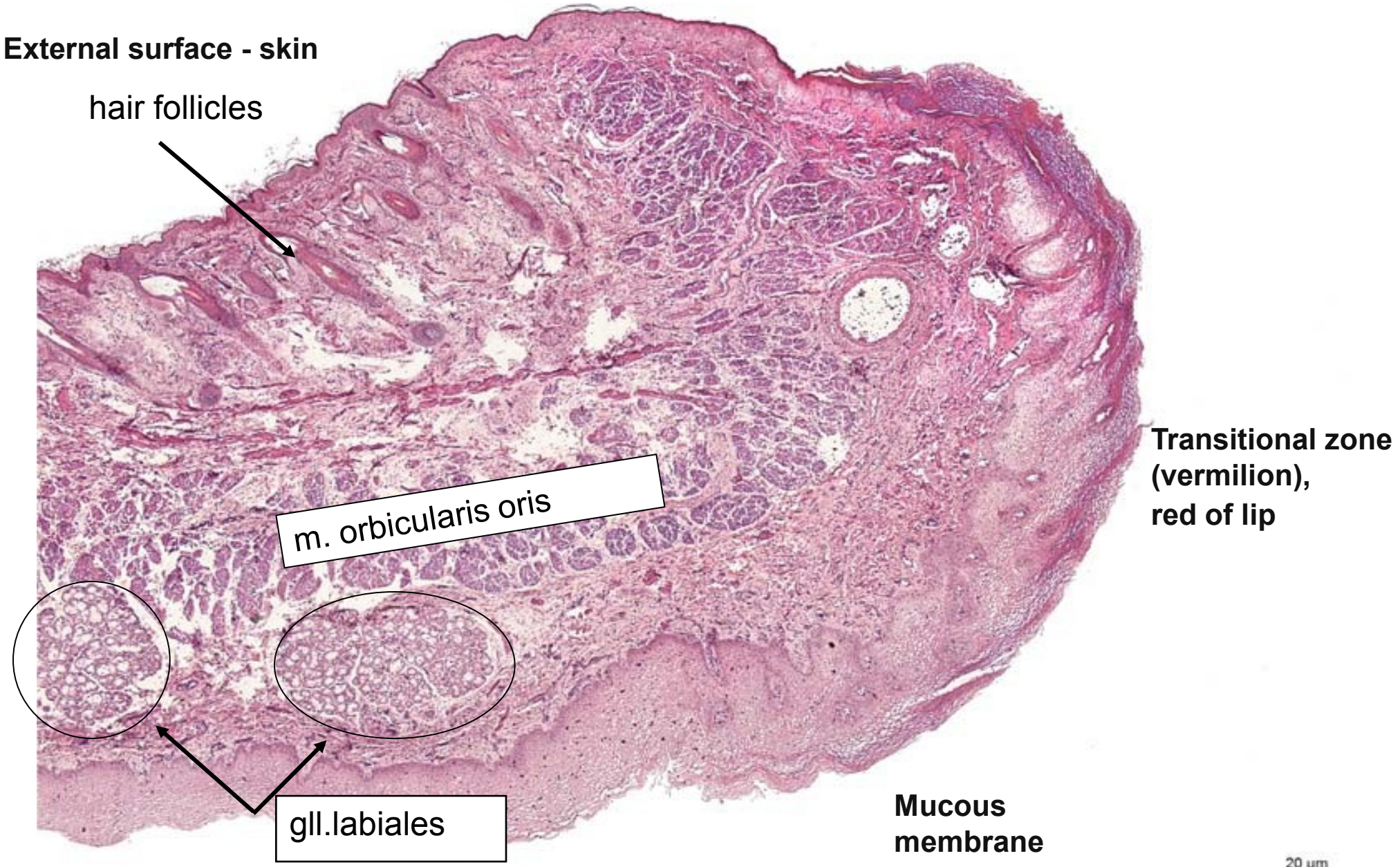


Lam. propria → the submucosa (loose connect. tissue)

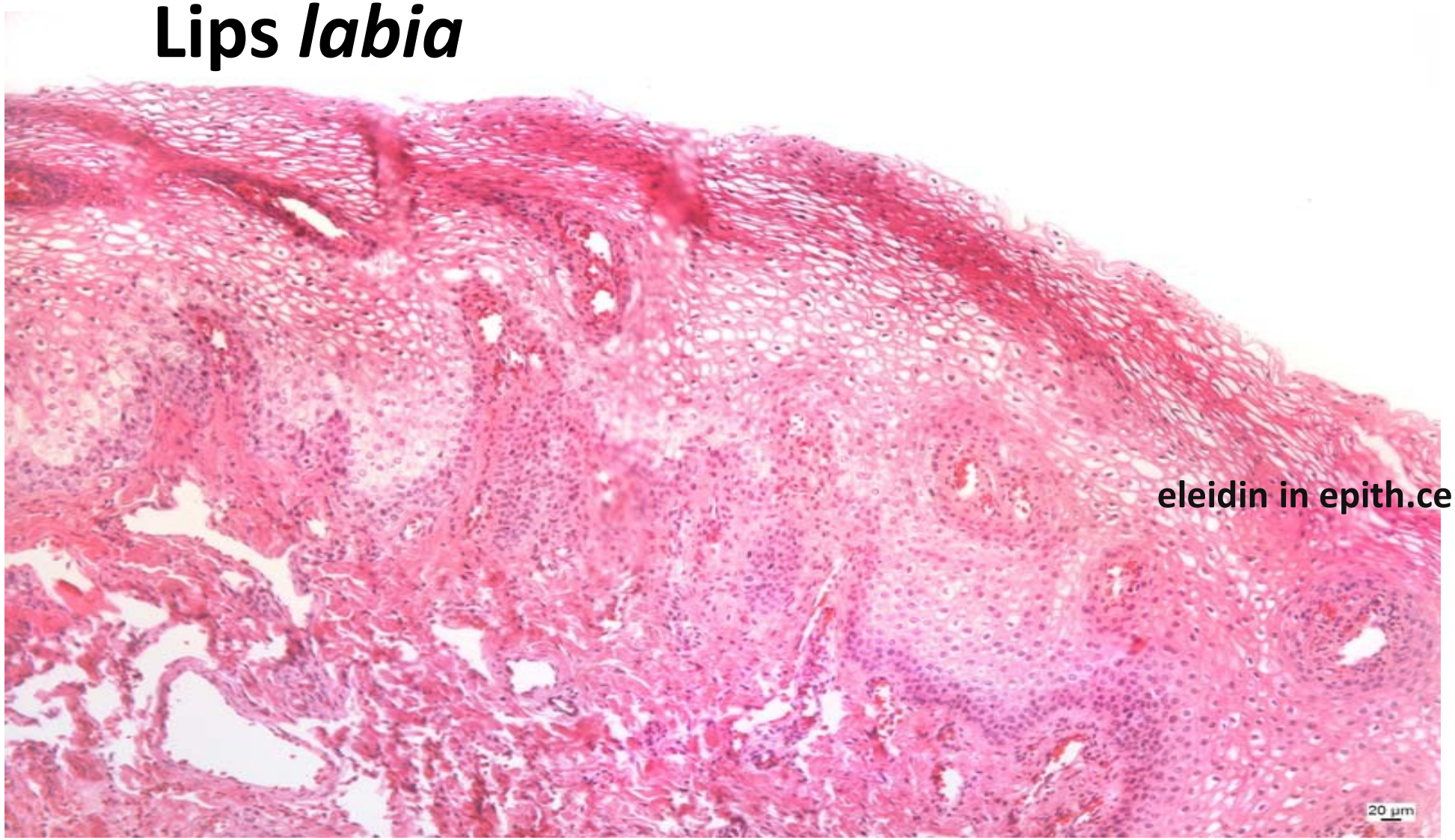
→ periosteum or muscle

(it is functionally masticatory mucosa

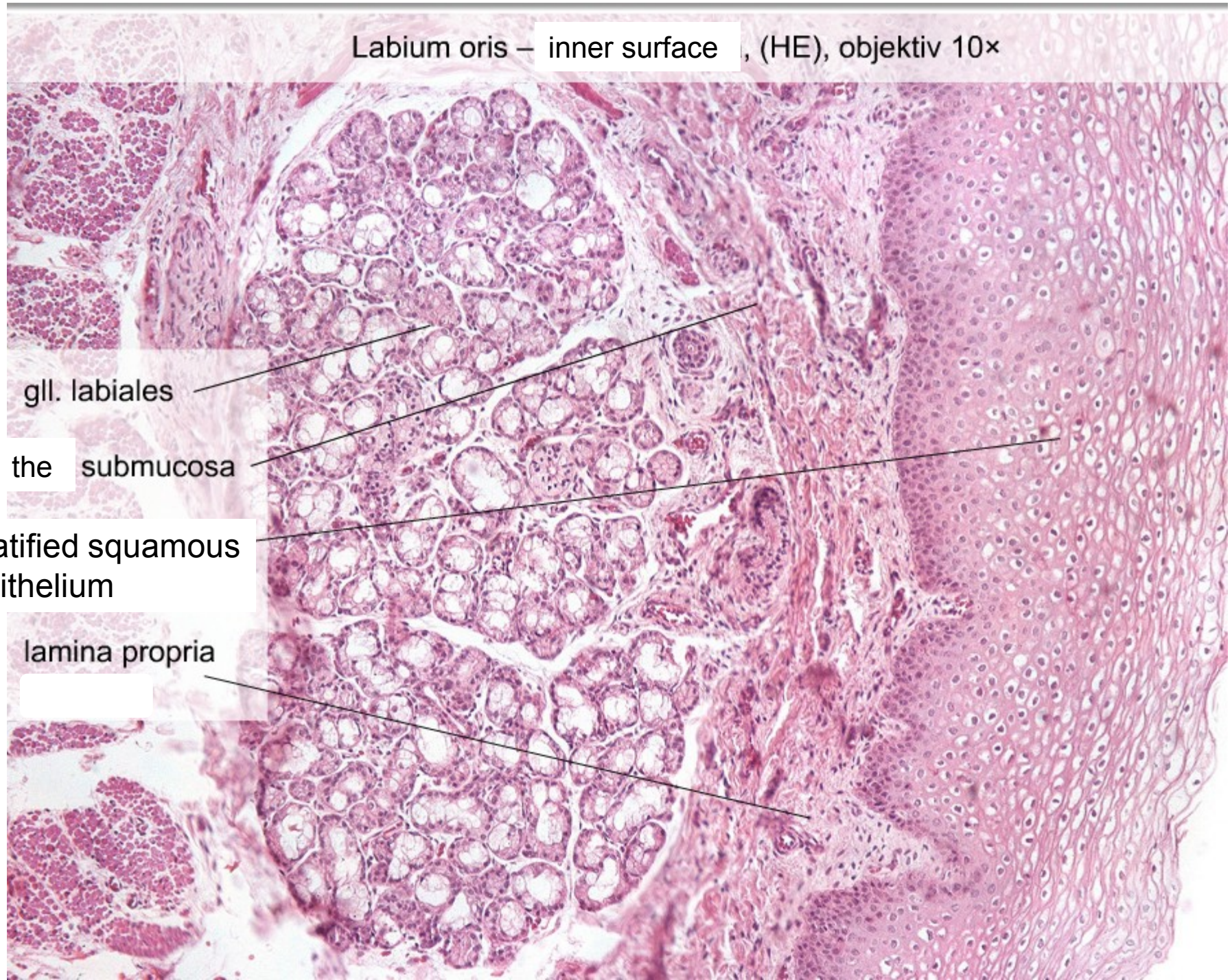
Labium oris


External surface - skin
hair follicles
m. orbicularis oris
gll.labiales
Transitional zone (vermilion), red of lip
Mucous membrane
20 µm

Lips *labia*



The epithelium is somewhat thicker than in other parts of the facial skin. C.t. papillae extend deep into the epithelium and are heavily vascularized. It is the proximity of these vessels to the surface of the epithelium which gives this lip region it's red appearance.


Labium oris – inner surface , (HE), objektiv 10×
gll. labiales
the submucosa
stratified squamous epithelium
lamina propria

Tongue

- **dorsal surface**

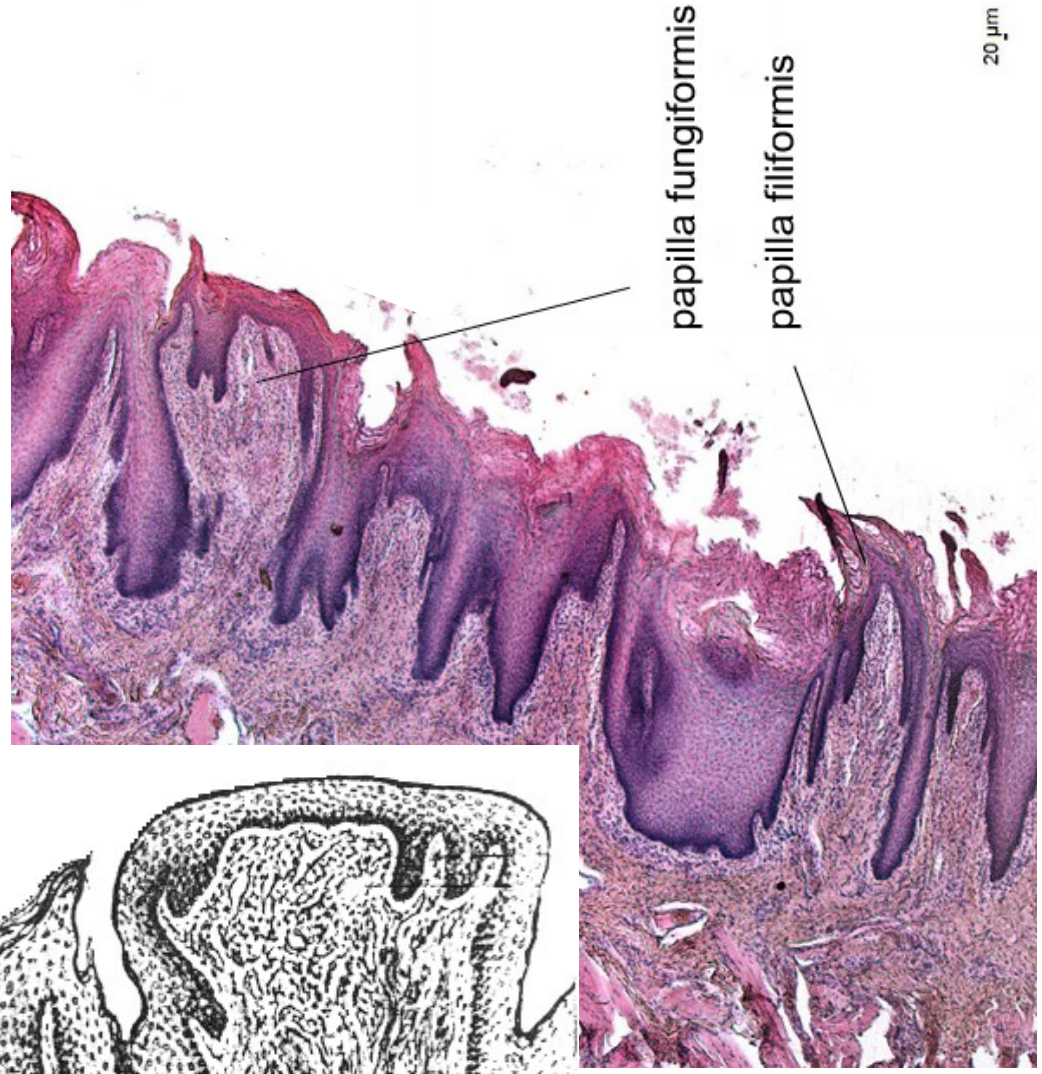
  The mucosa – filiform, fungiform, circumvallatae, foliatae pap.
  (the submucosa is missing! **)**
  aponeurosis linguae

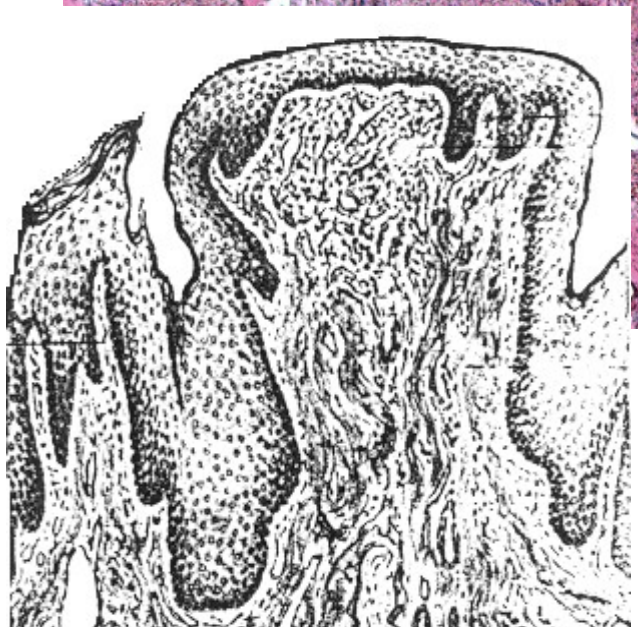
- **inferior surface (facies mylohyoidea)**

  The mucosa – without papillae
  the submucosa!

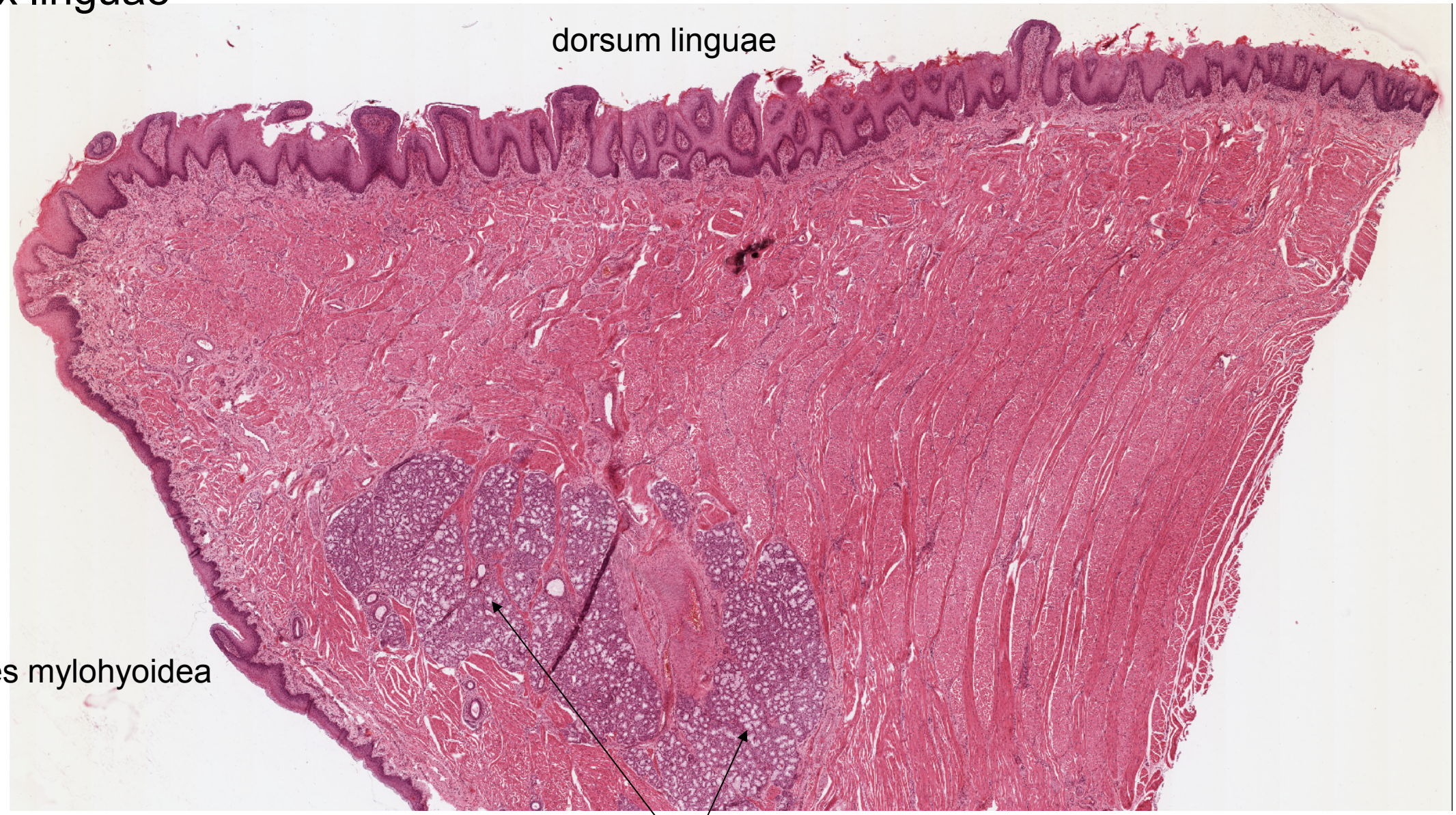
→

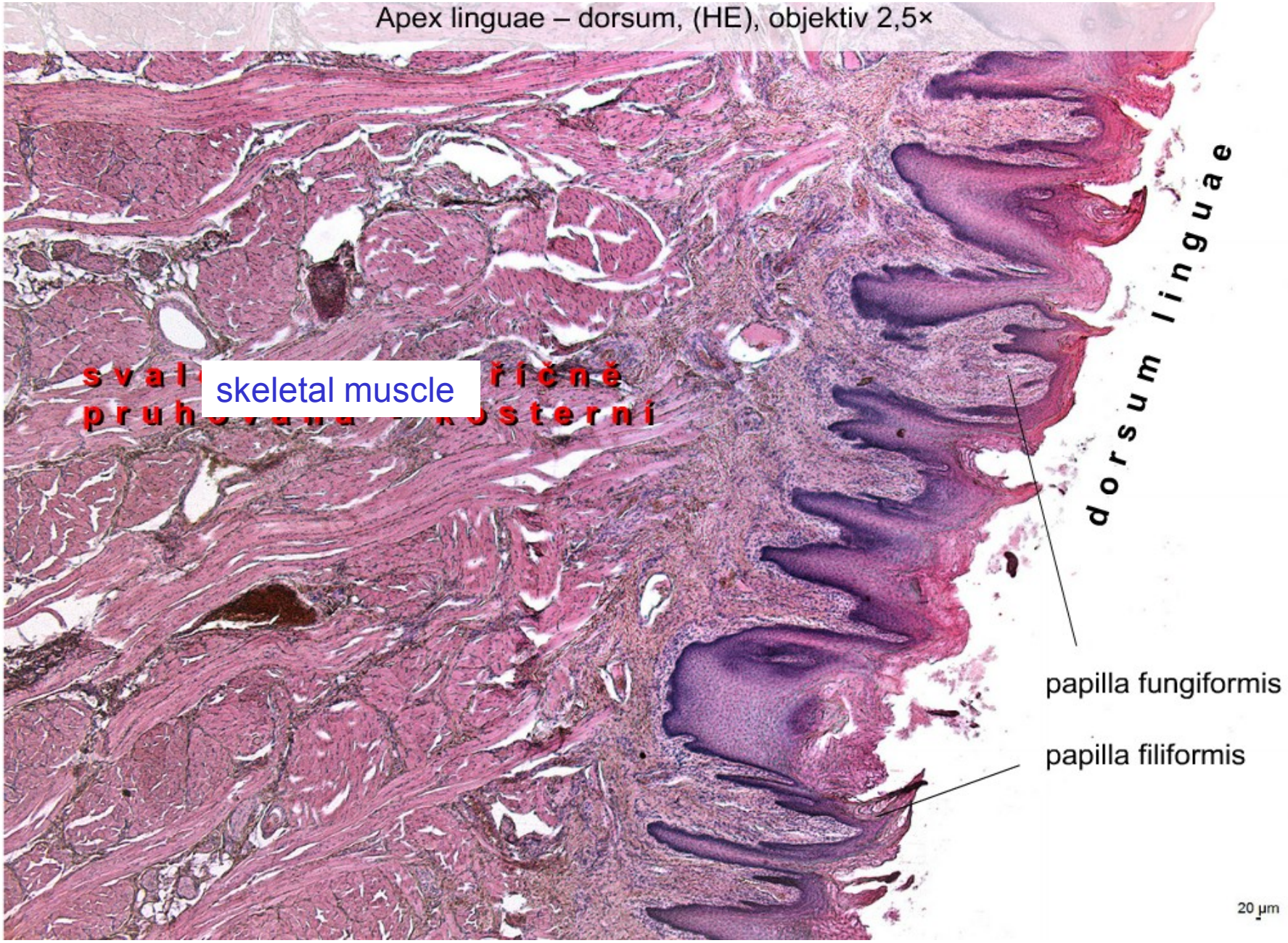
-**papillae = elevations of the oral epithelium and lamina propria**



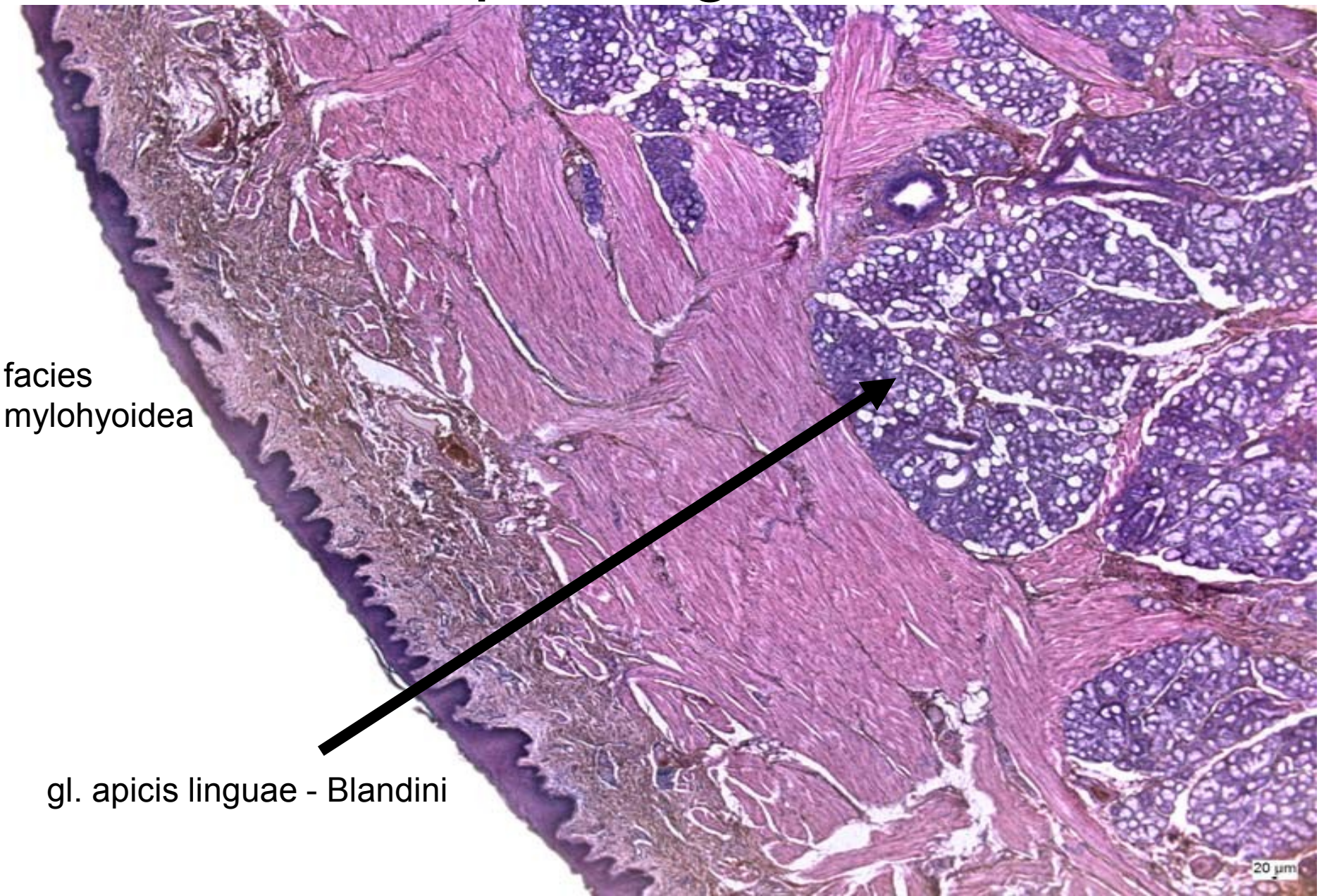


Apex linguae




Apex linguae – dorsum, (HE), objektiv 2,5×
skeletal muscle
dorsum linguae
papilla fungiformis
papilla filiformis
20 µm

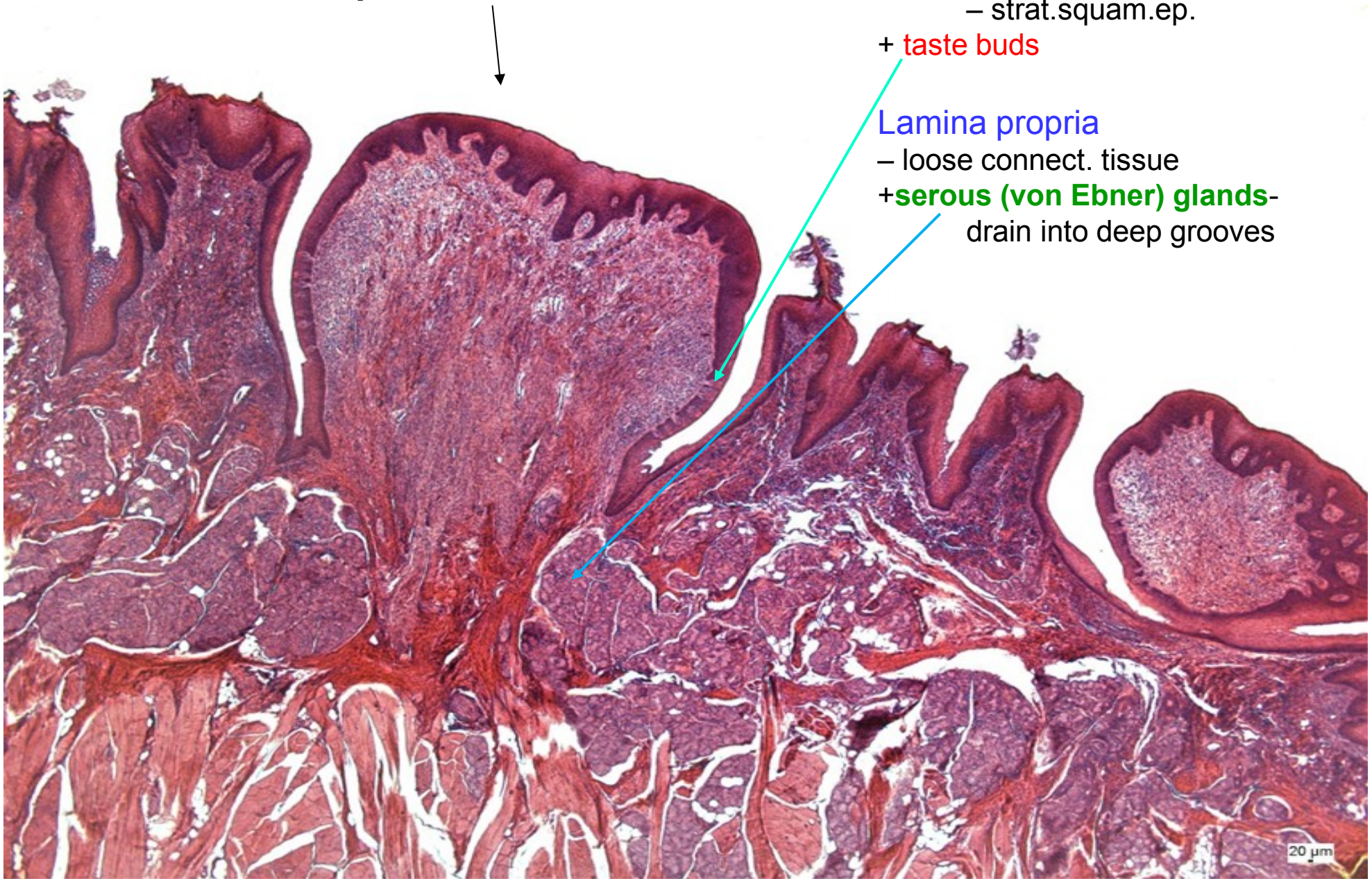
Apex linguae



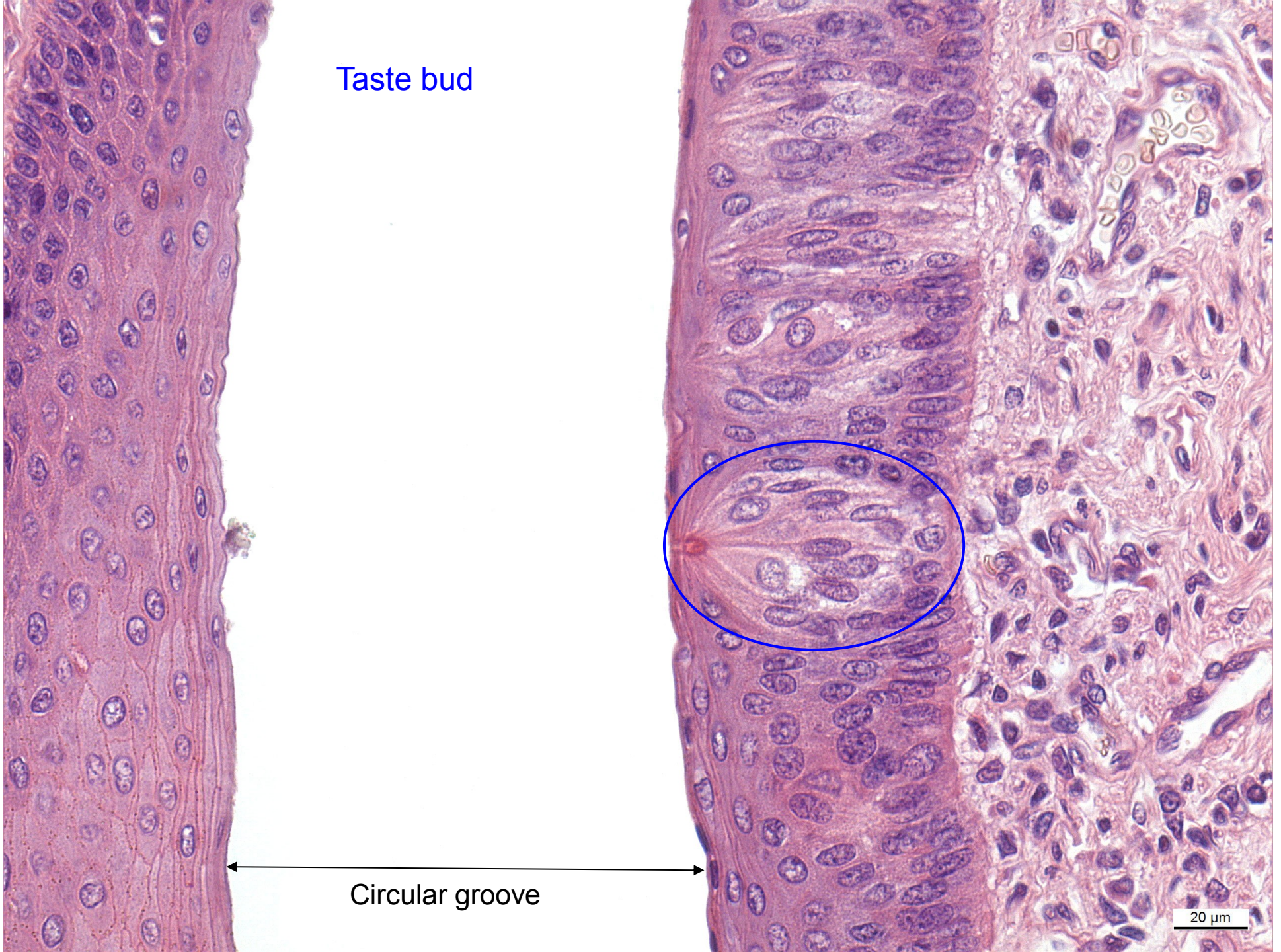
Circumvallatea Papillae

The epithelial linning
– strat.squam.ep.
+ taste buds

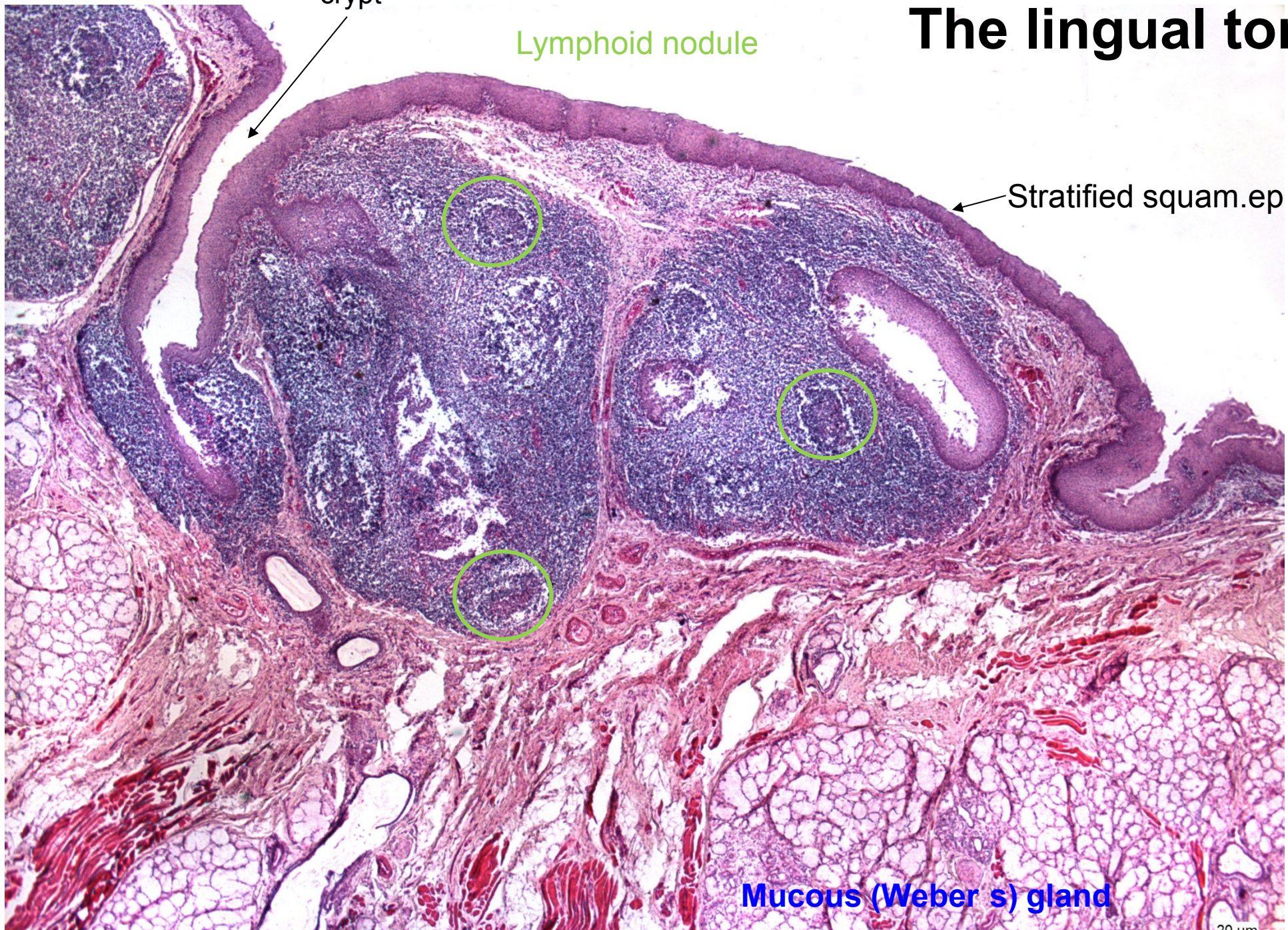
Lamina propria
– loose connect. tissue
+**serous (von Ebner) glands**-
drain into deep grooves



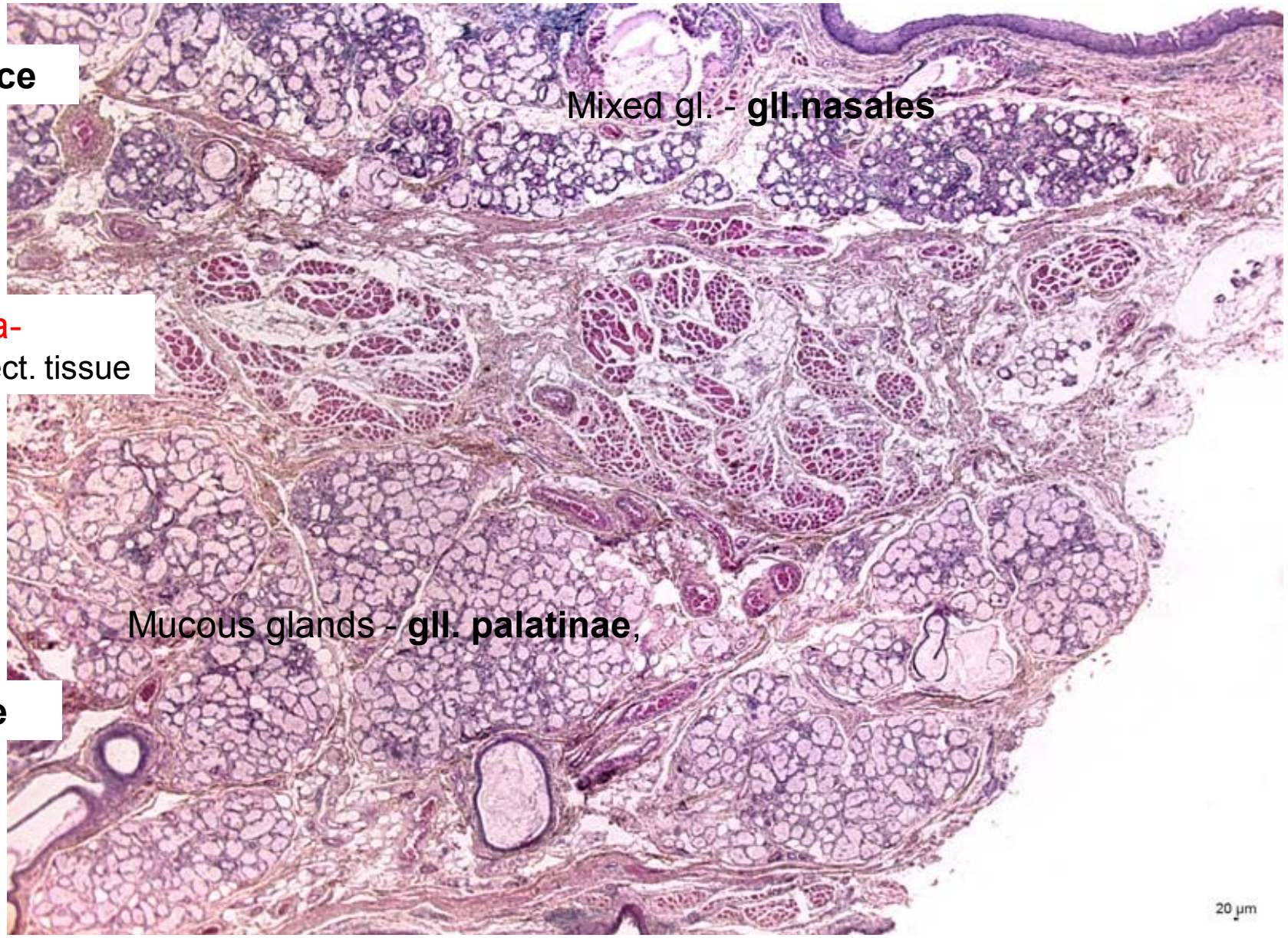
Circumvallate papilla (HE)


Taste bud
Circular groove
20 µm

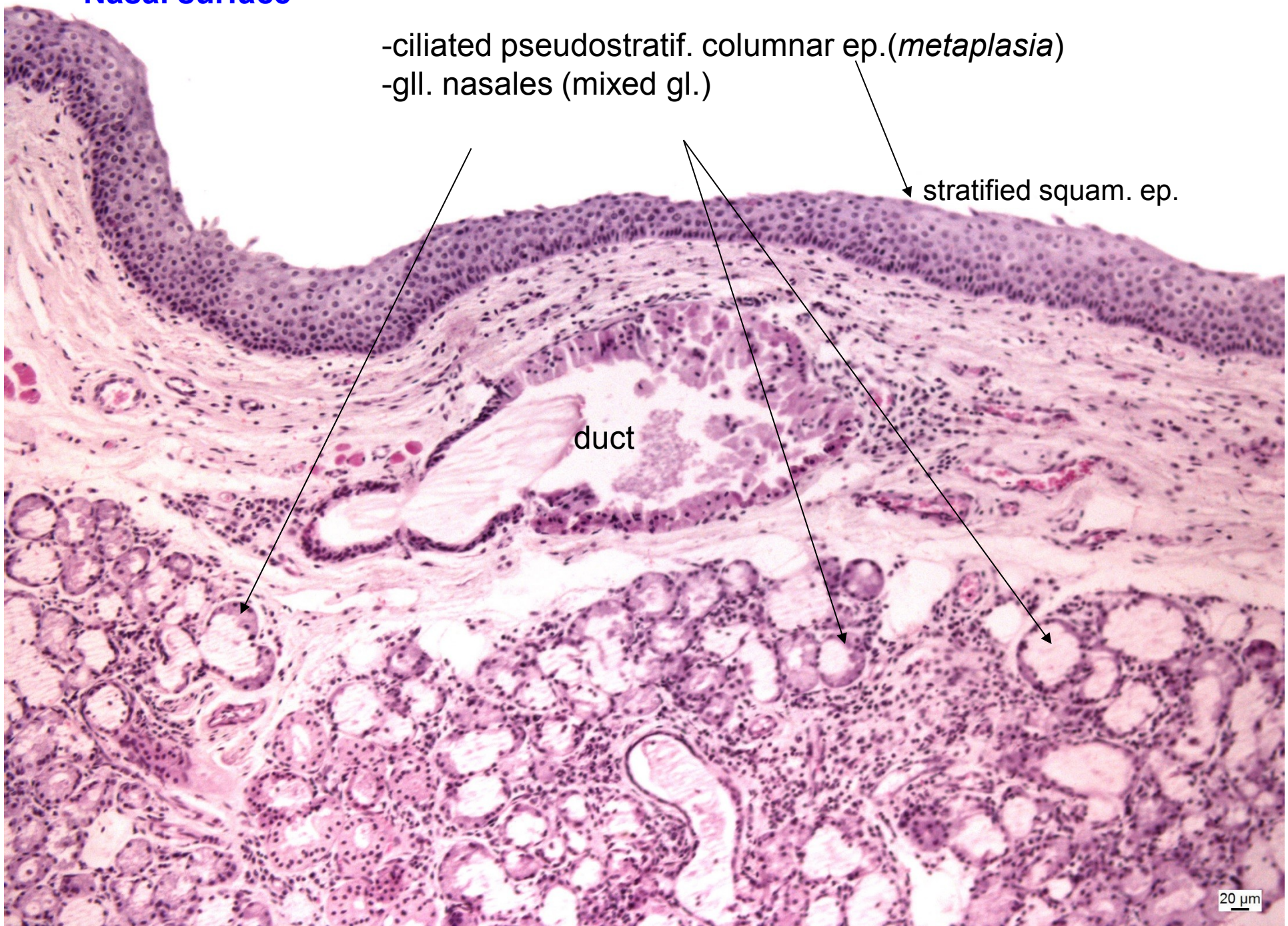
The lingual tonsil



Soft palate


Nasal surface
Mixed gl. - gll.nasales
aponeurosis palatina-
skeletal muscle+connect. tissue
Mucous glands - gll. palatinae,
Oral surface
20 µm

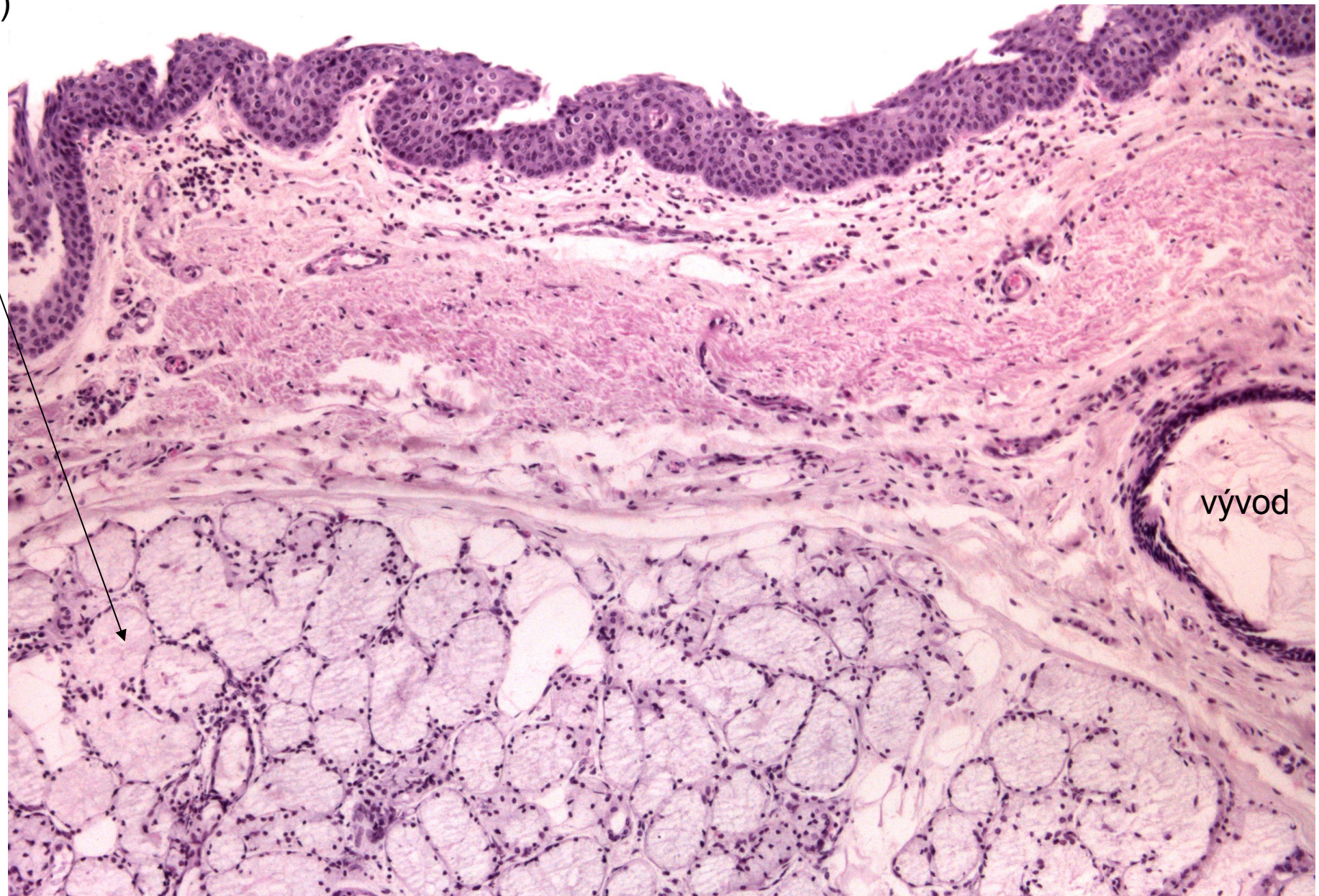
Nasal surface



Oral surface

-stratified squamous epithelium

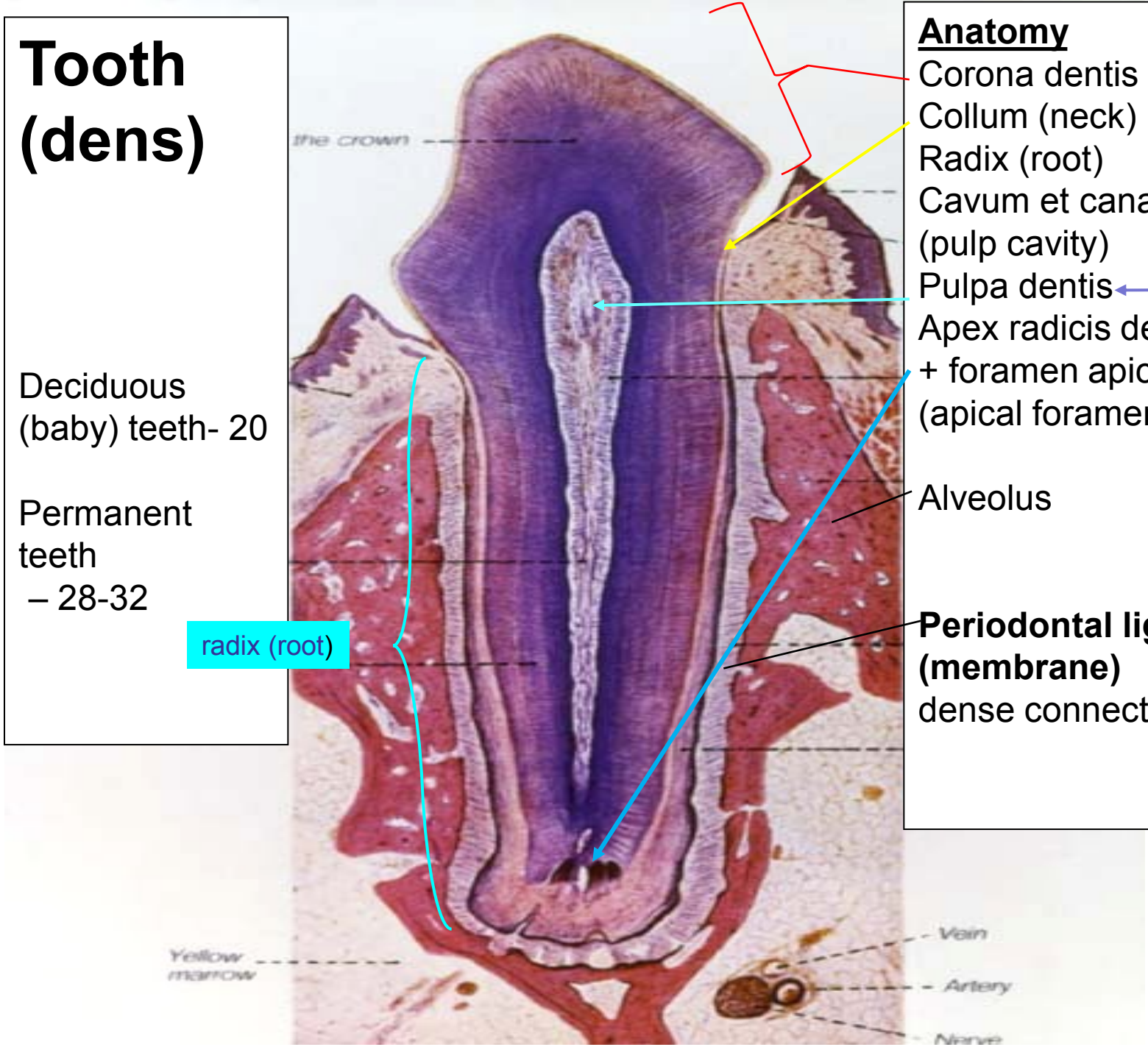
-gll. palatinae (MUCOUS gl.))



Tooth (dens)

Deciduous (baby) teeth- 20

Permanent teeth – 28-32



Anatomy

Corona dentis (crown)

Collum (neck)

Radix (root)

Cavum et canalis radicis dentis (pulp cavity)

Pulpa dentis

Apex radicis dentis

+ foramen apicis radicis dentis (apical foramen)

Alveolus

Periodontal ligament (membrane)

dense connective tissue fibers

Tooth

ROOT ----------CROWN

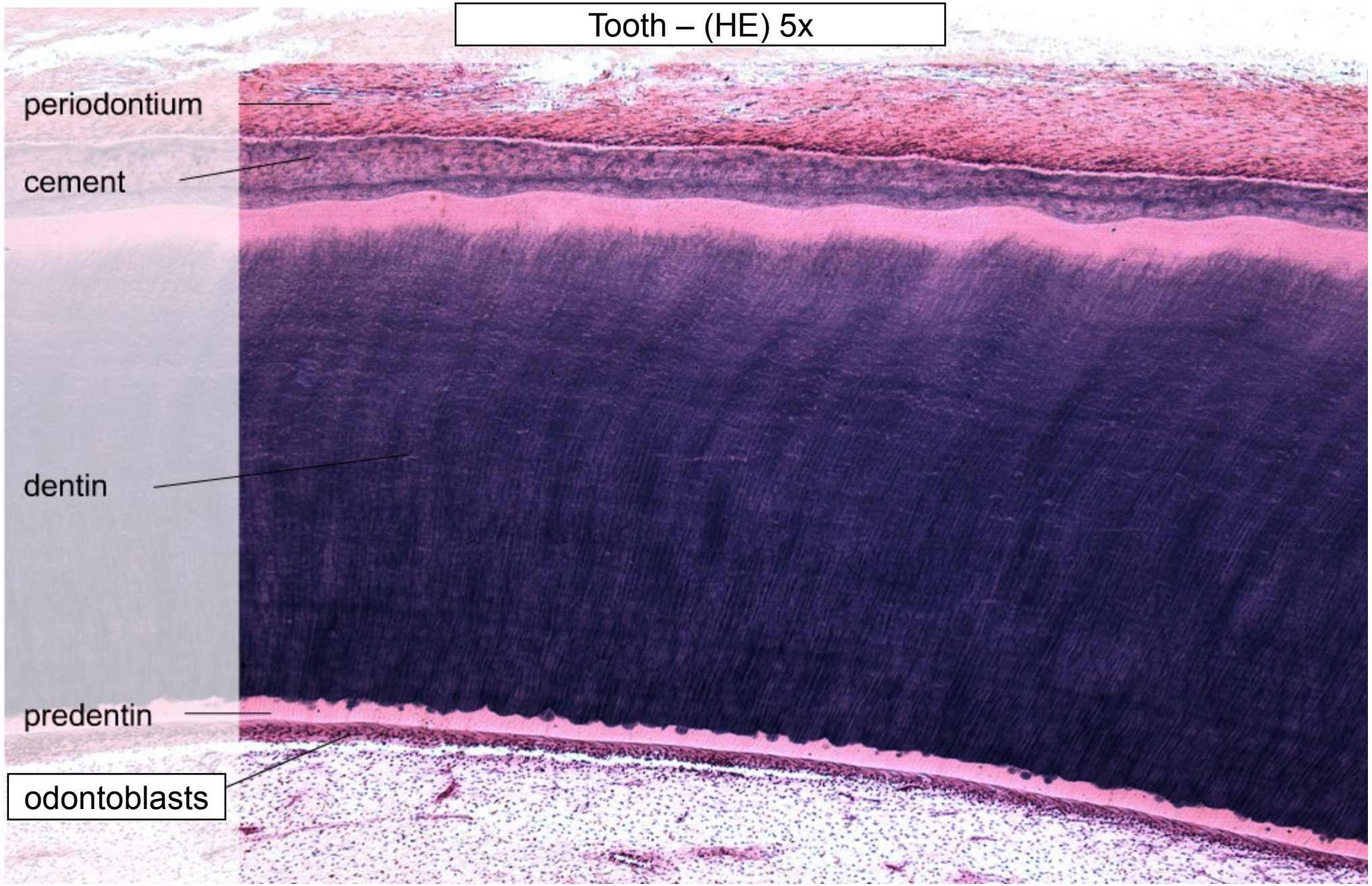
cementum

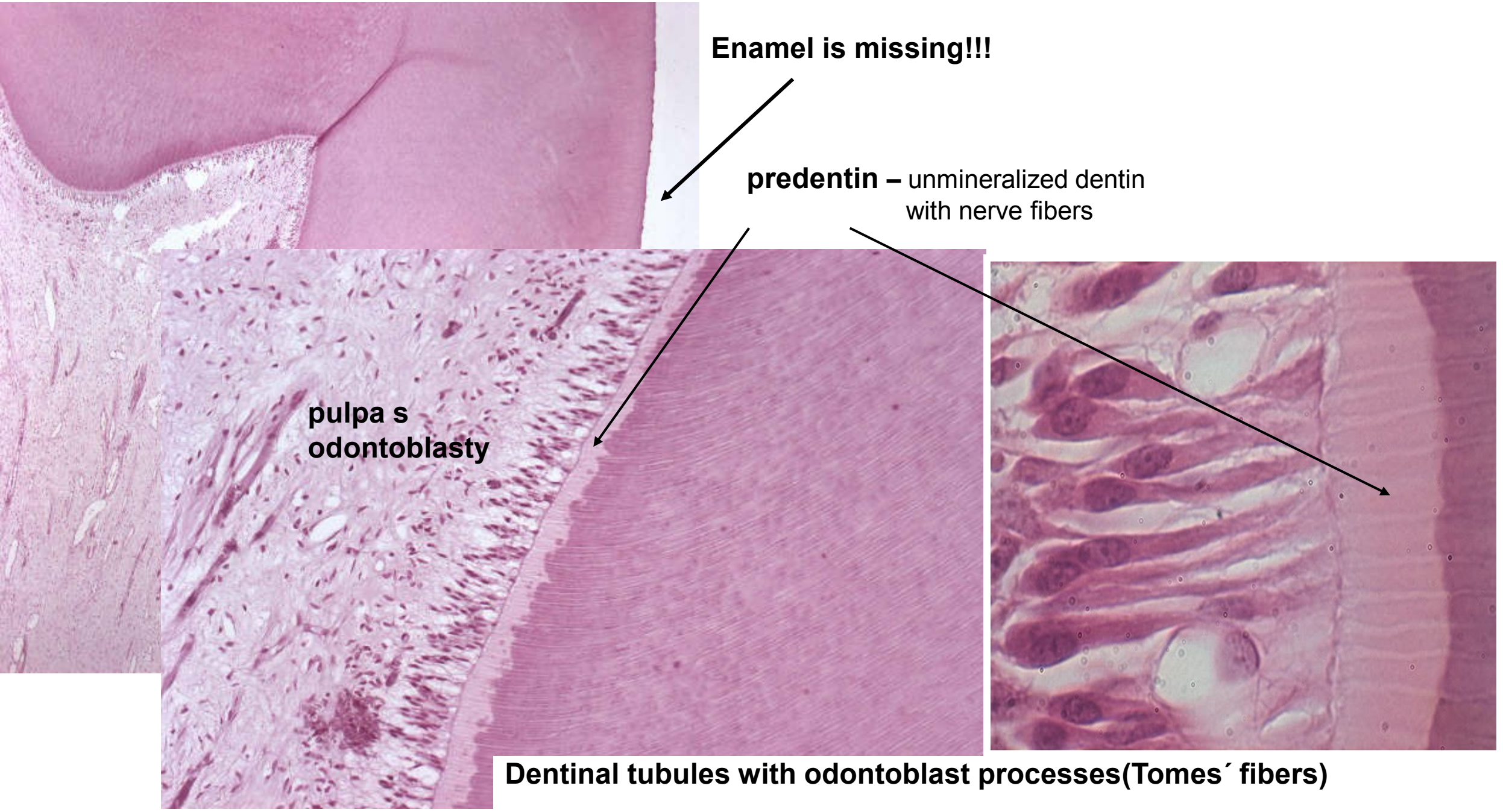
enamel!!!!

dentin

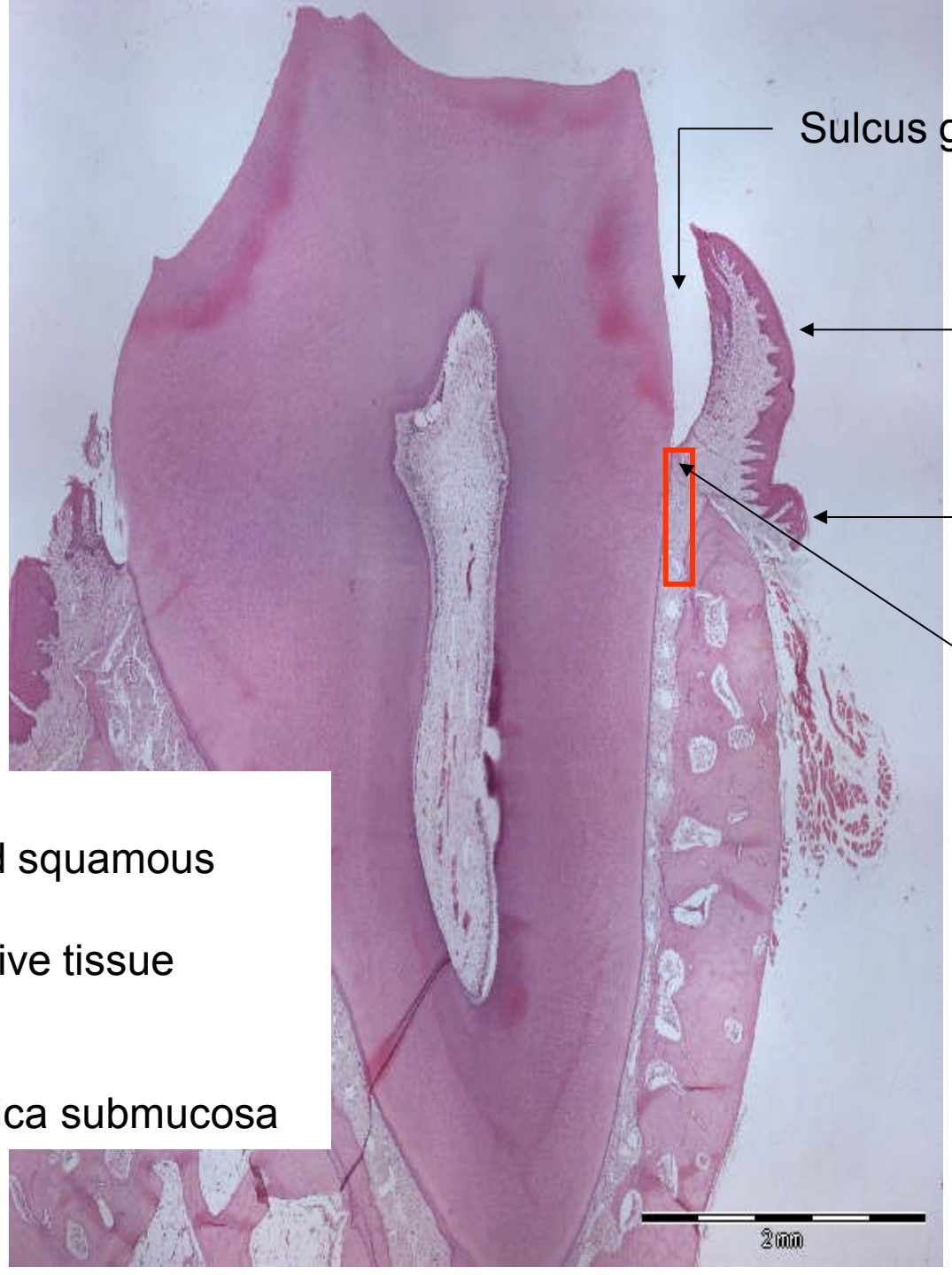
dentinal tubules with odontoblast processes(Tomes´fibers)

Tooth – (HE) 5x




Enamel is missing!!!
predentin – unmineralized dentin with nerve fibers
pulpa s odontoblasty
Dentinal tubules with odontoblast processes(Tomes´ fibers)

Periodontal ligament
– dense connective tissue
Alevolar bone – woven bone



GINGIVA

- Stratified squamous epith.
- Connective tissue papillae

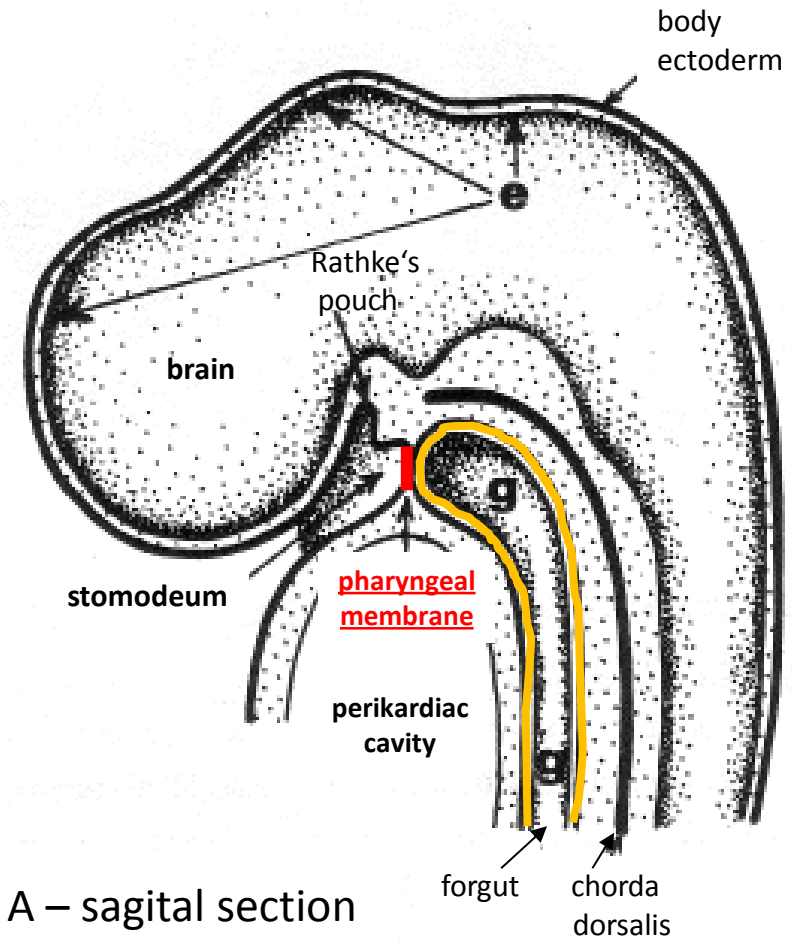
NO!!! Tunica submucosa

1.
Digestive system – I

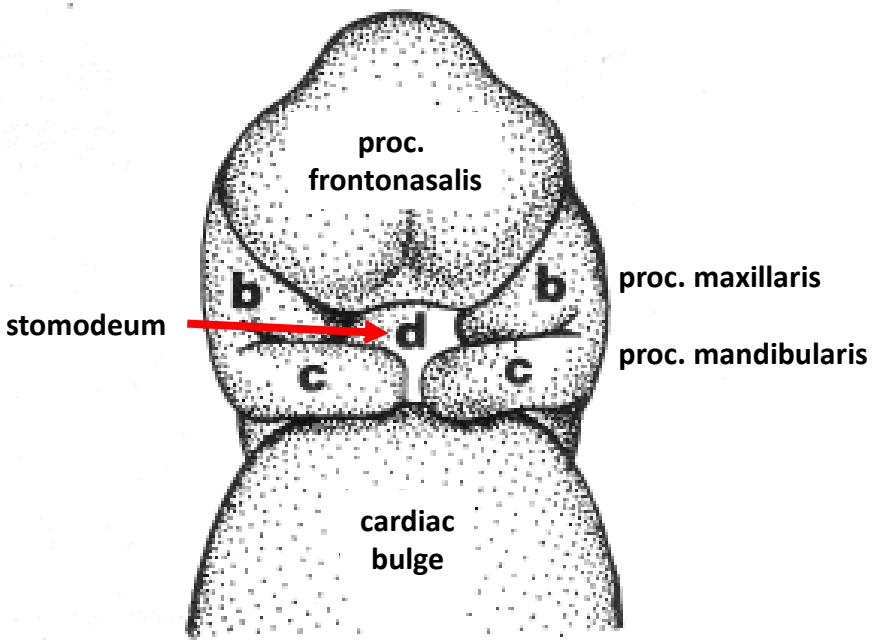
Slides :

1. Labium oris (HE)
2. Apex linguae (HE)
3. Papilla circumvallata(HE)
4. Tonsilla lingualis (HE)
5. Palatum molle(HE)
7. Tooth (HE)

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

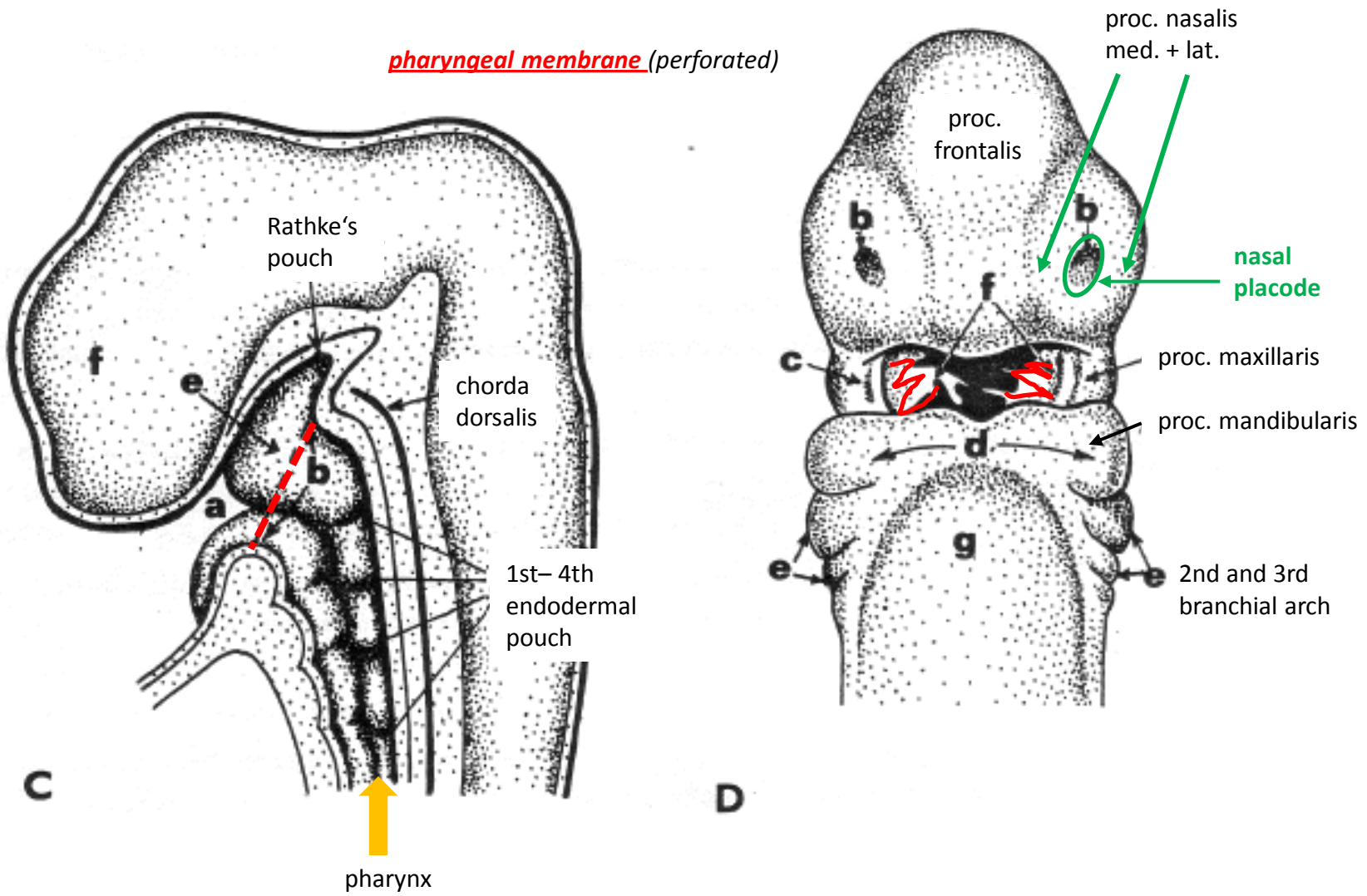


A – sagital section

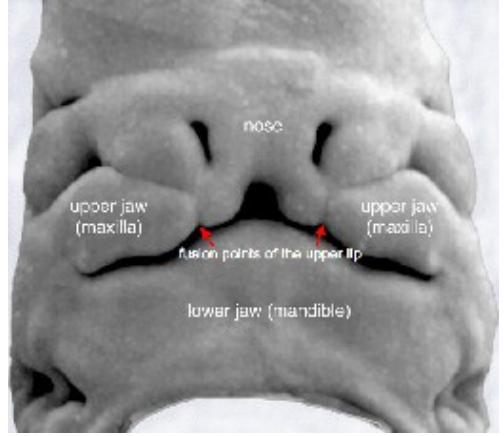


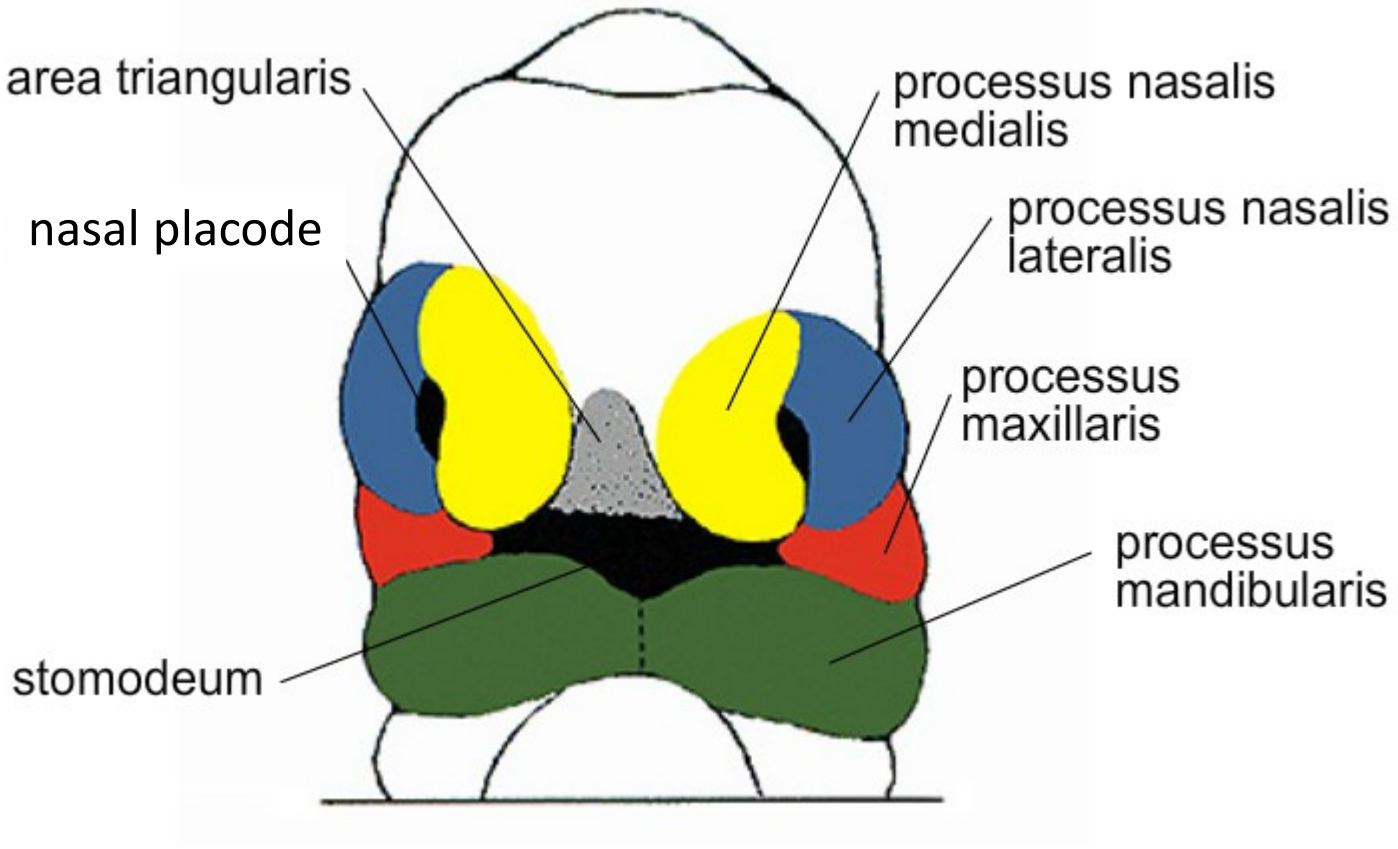
B – frontal view

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

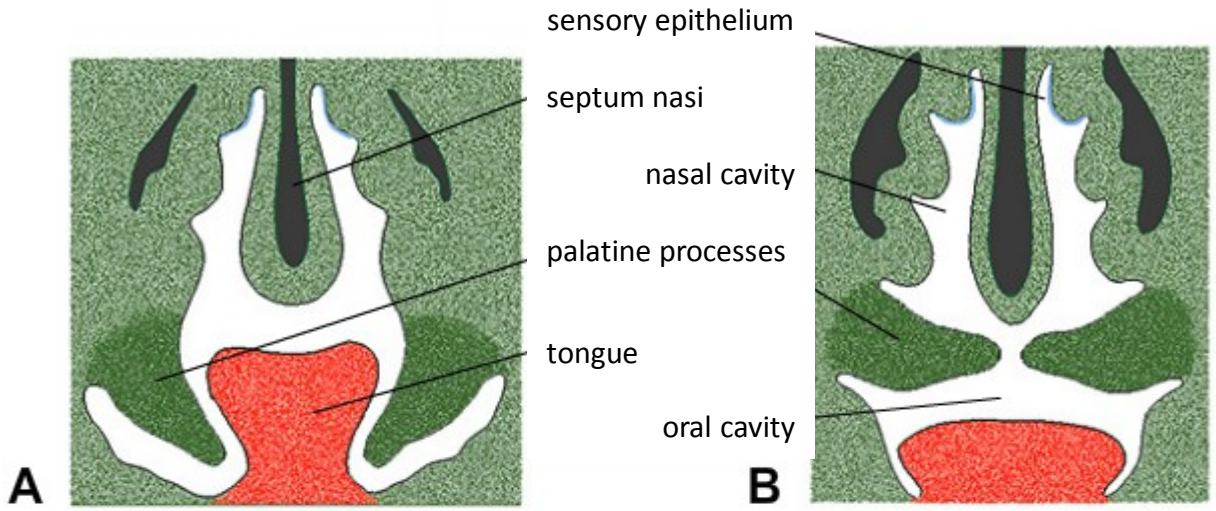


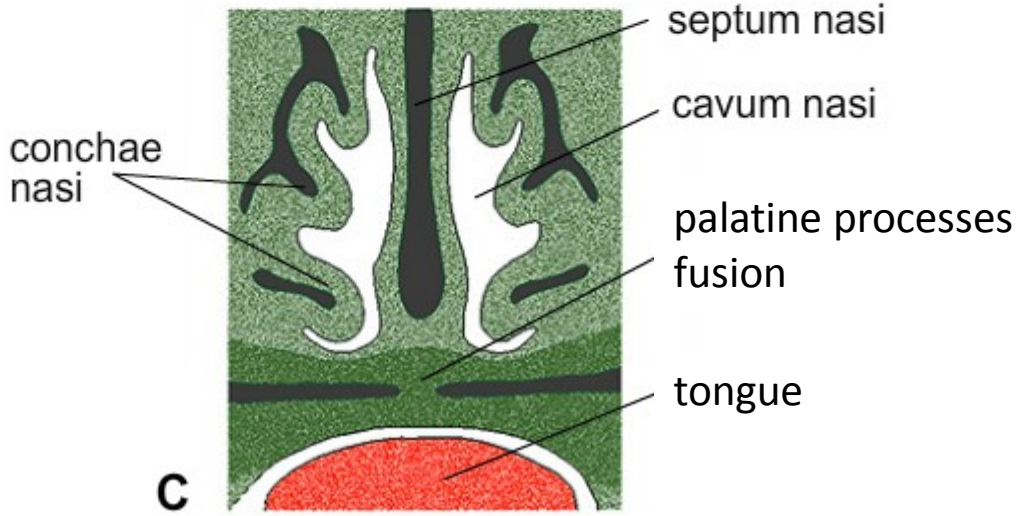
Development of the face – embryo , end of week 5



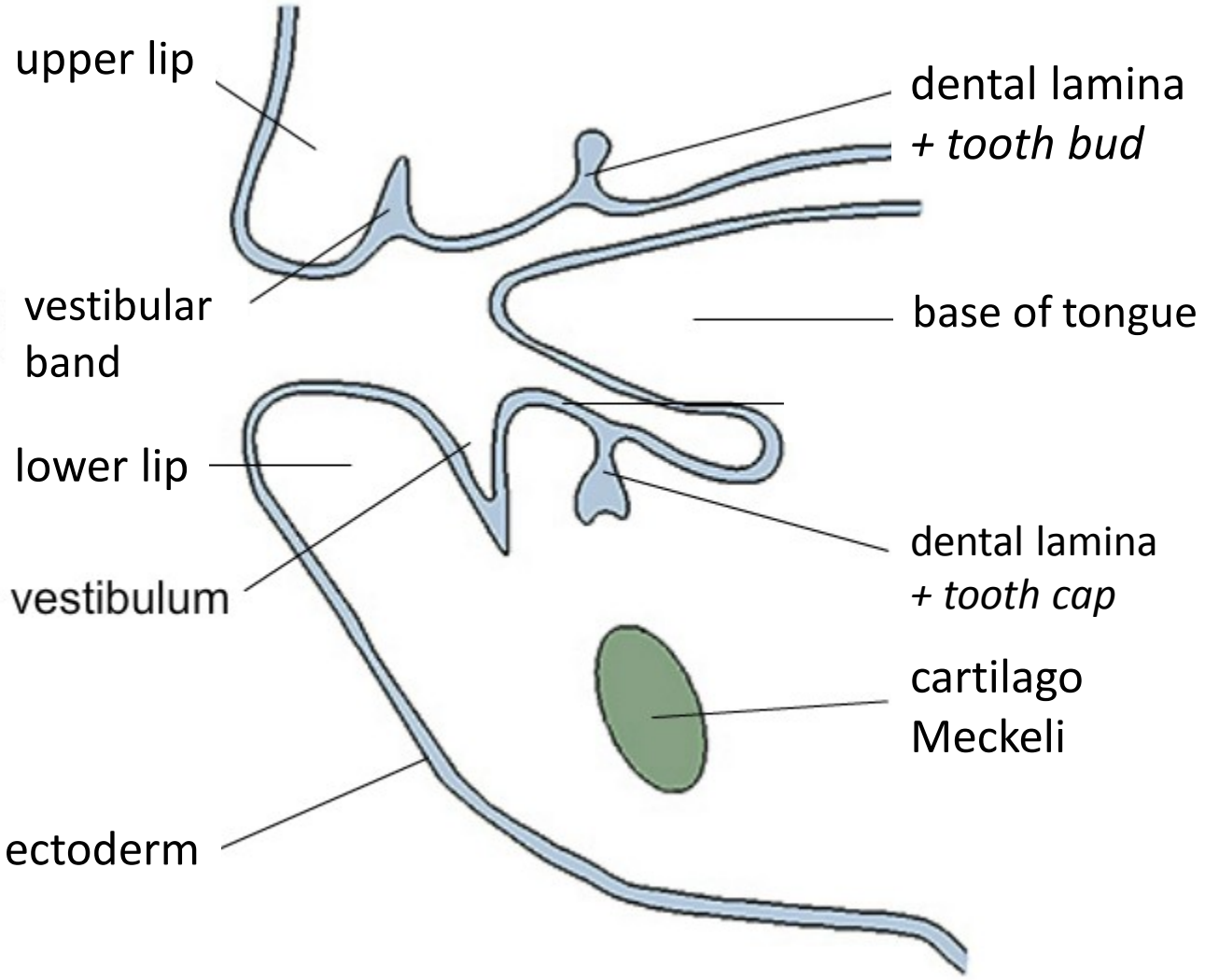


Development of palate – embryo, A – week 7, B – week 8, C – week 10

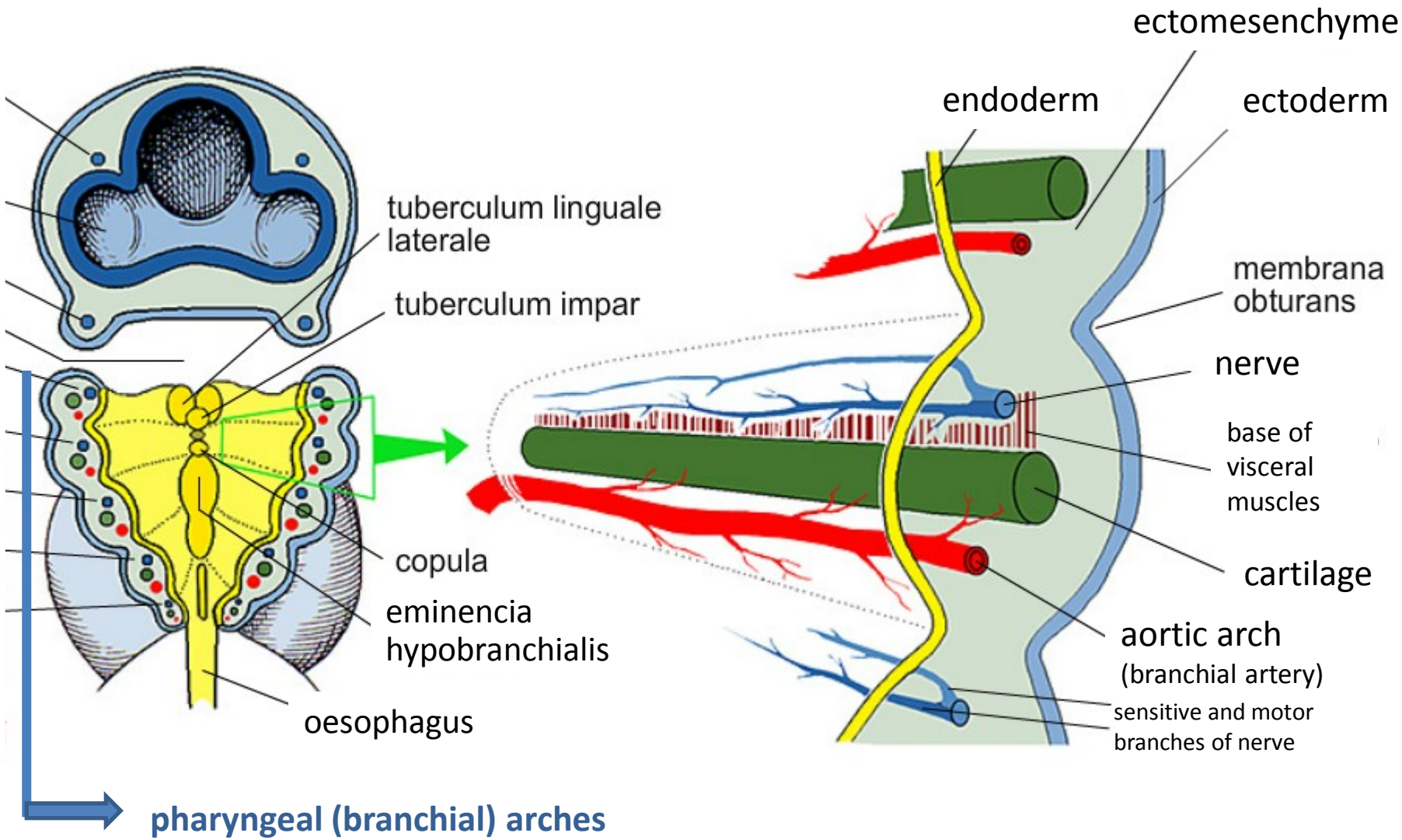




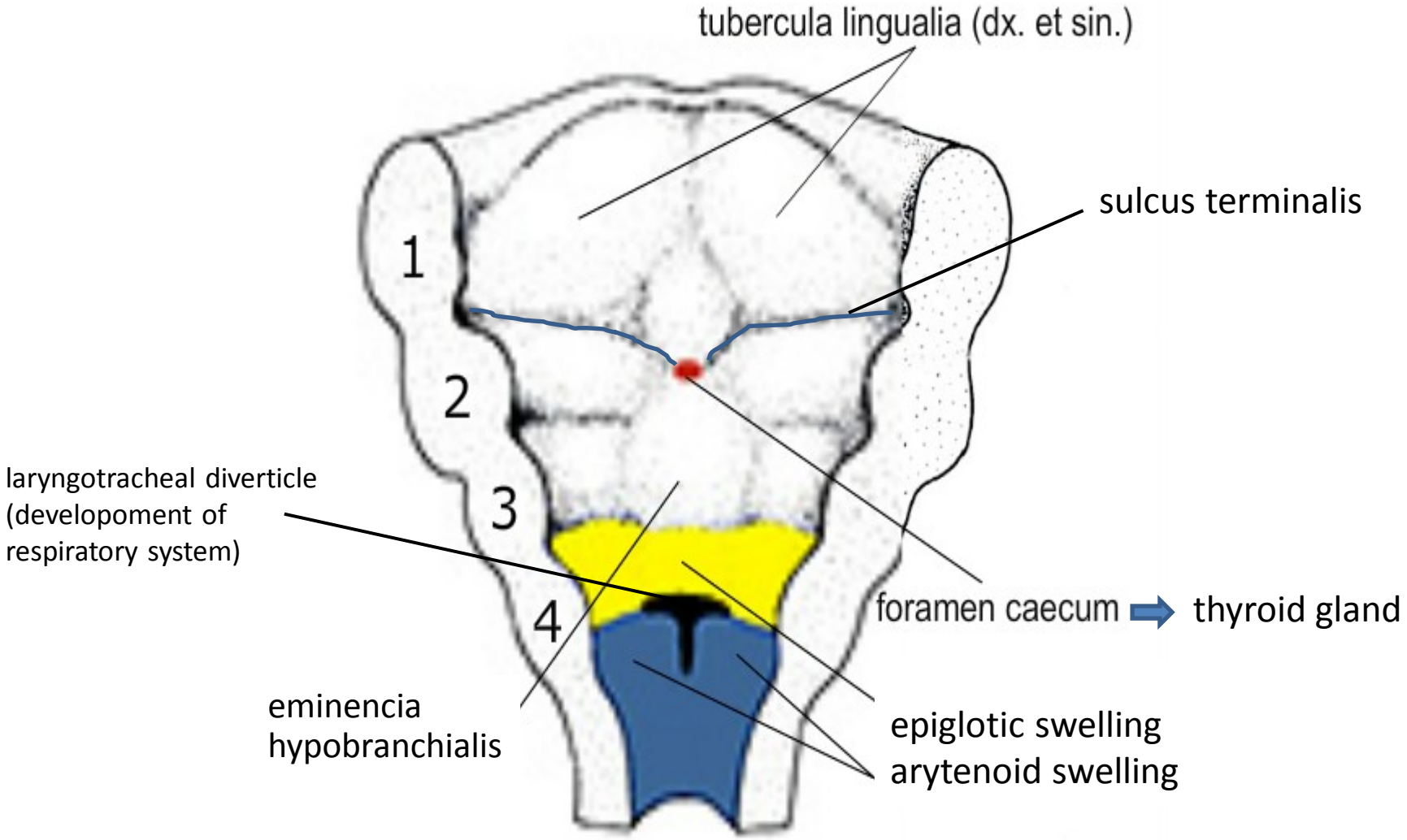
Development of the oral cavity – embryo, week 6



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

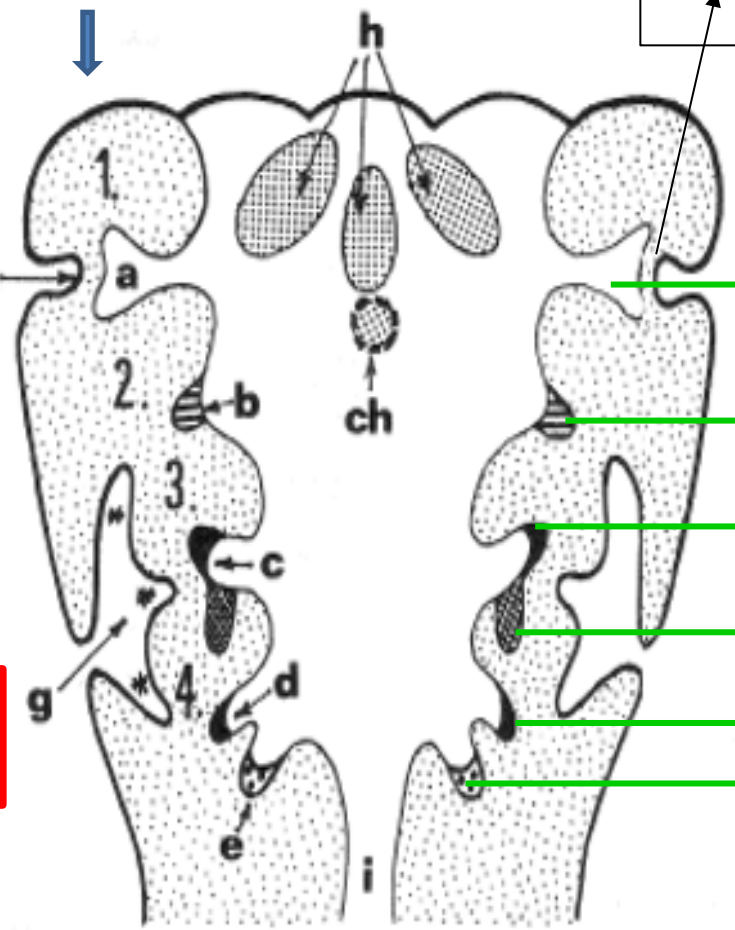


Development of tongue



ECTODERMAL CLEFTS and ENDODERMAL POUCHES – embryo, week 5

pharyngeal arches 1-4



1. membrana obturans
⇨ *membrana tympani*

meatus acusticus ext. (cleft 1)

sinus cervicalis (clefts 2, 3, 4)

cavum tympani, tuba auditiva (Eustachii)

sinus (fossa) tonsillaris

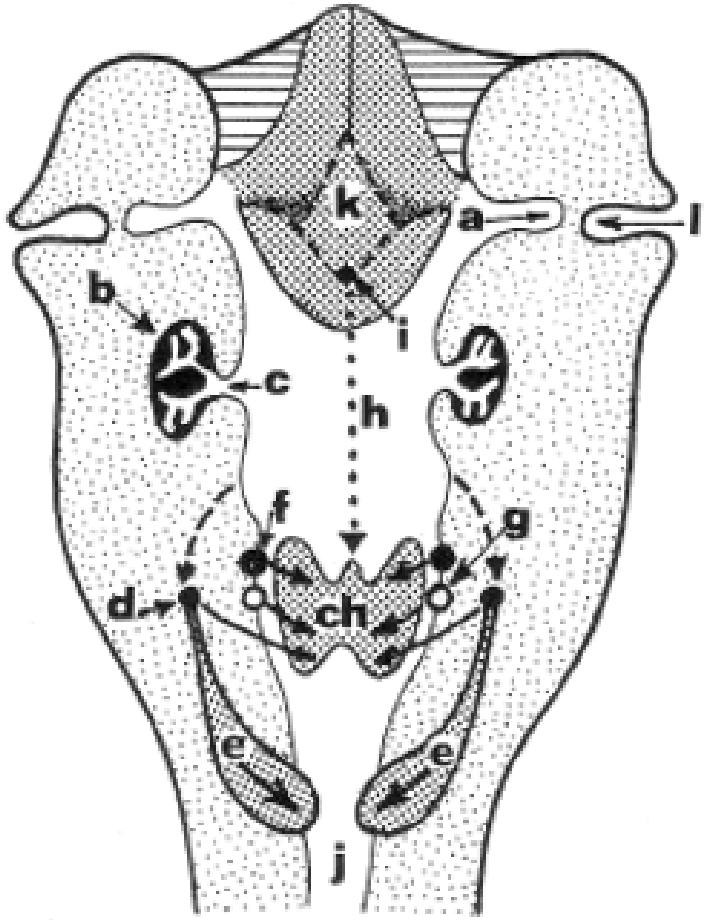
gl. parathyreoidea inf.

thymus

gl. parathyreoidea sup.

ultimobranchial corpuscle

Descensus of thyroid gland and thymus with gll. parathyreoideae inf. – embryo, week 6

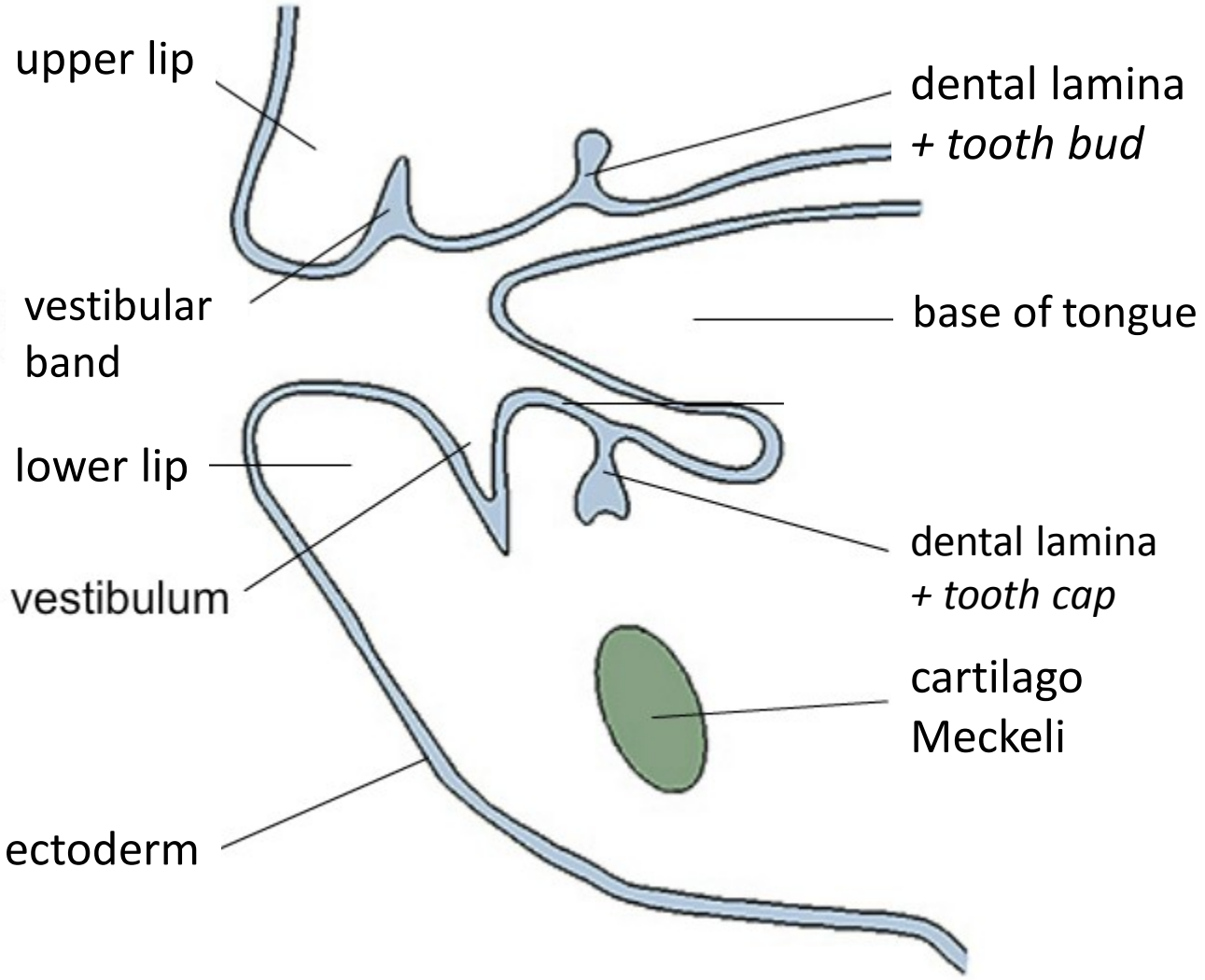


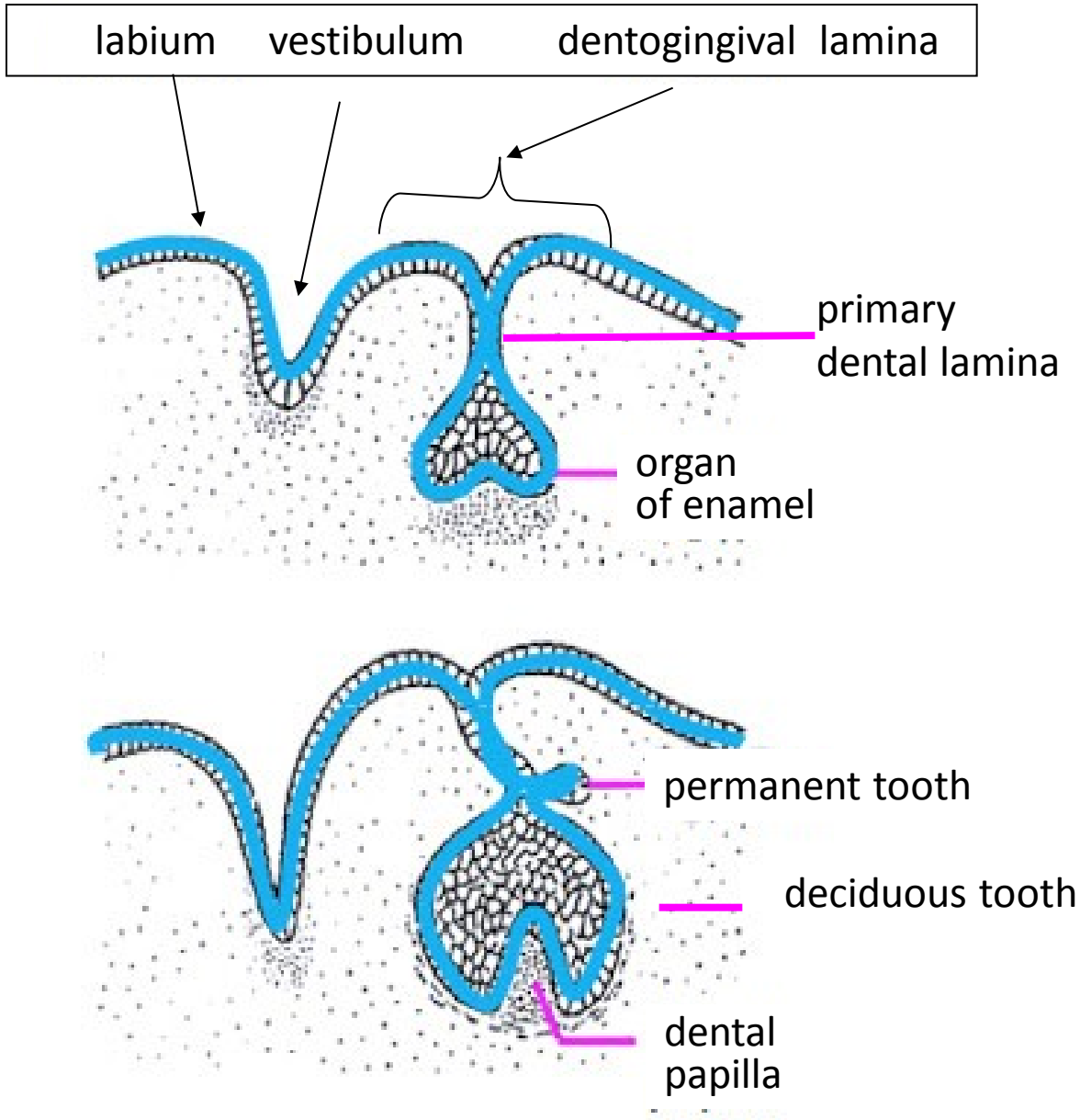
tongue (k),
foramen caecum (i),
ductus thyreoglossus (h),
gl. thyreoidea(ch),
thymus (e),
gll. parathyreoideae inf. (d),
gll. parathyreoideae sup.(f),
ultimobranchial corpuscle (g)

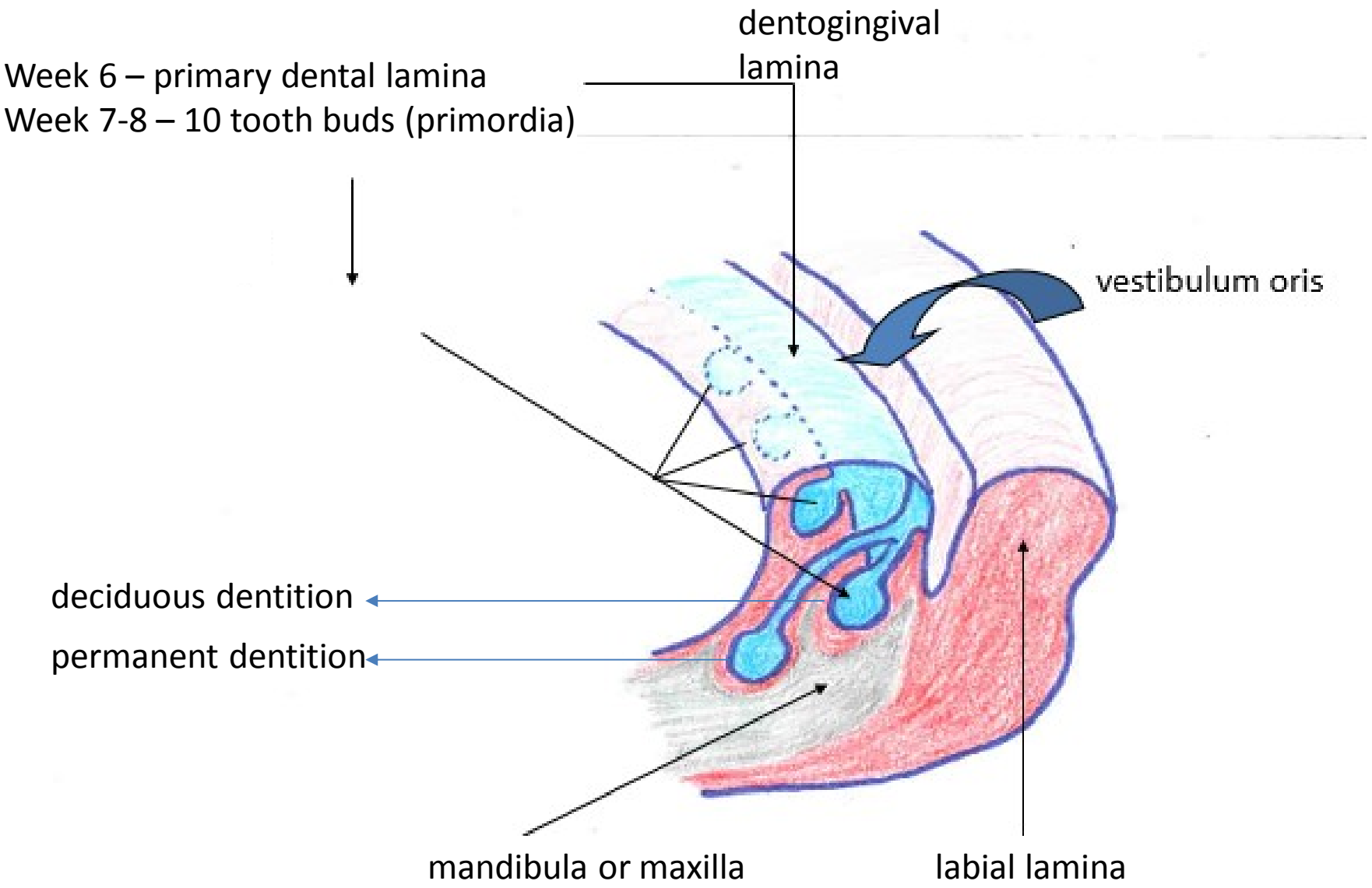
Embryology

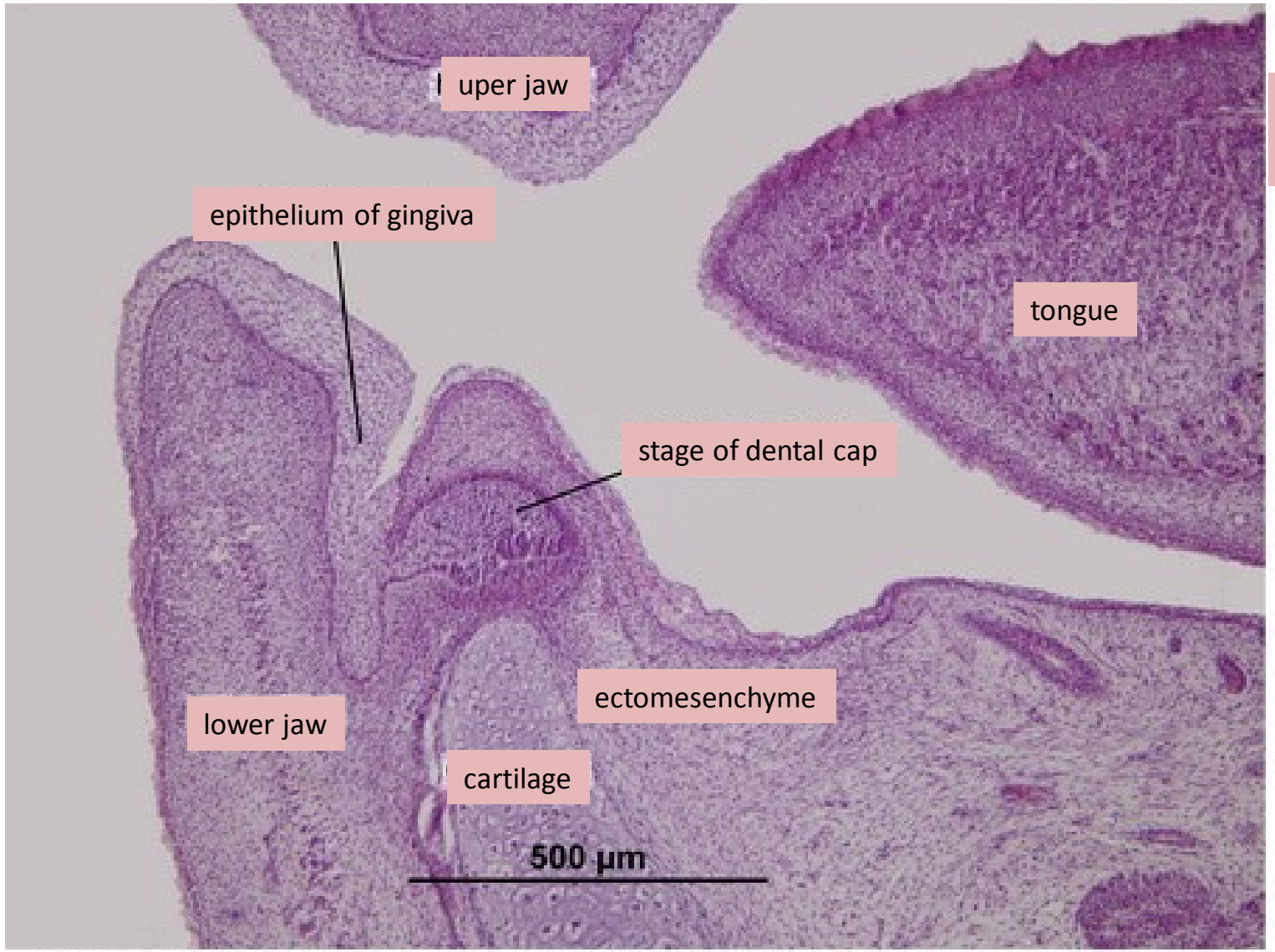
Development of the tooth

Development of the oral cavity – embryo, week 6




labium
vestibulum
dentogingival lamina
primary
dental lamina
organ
of enamel
permanent tooth
deciduous tooth
dental
papilla


Week 6 – primary dental lamina
Week 7-8 – 10 tooth buds (primordia)
dentogingival lamina
vestibulum oris
deciduous dentition
permanent dentition
mandibula or maxilla
labial lamina



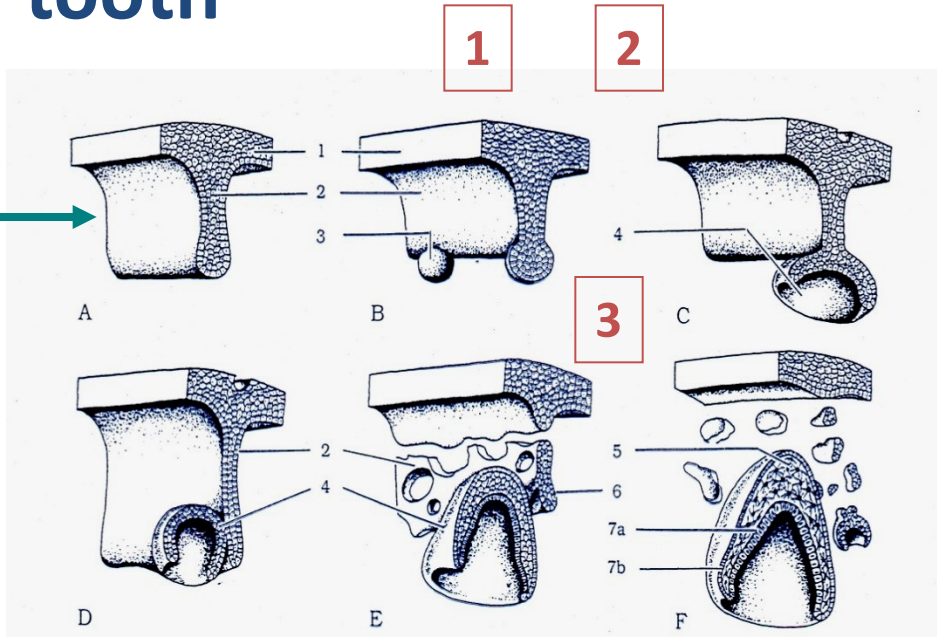
base of tooth in mandible

Development of the tooth, HE

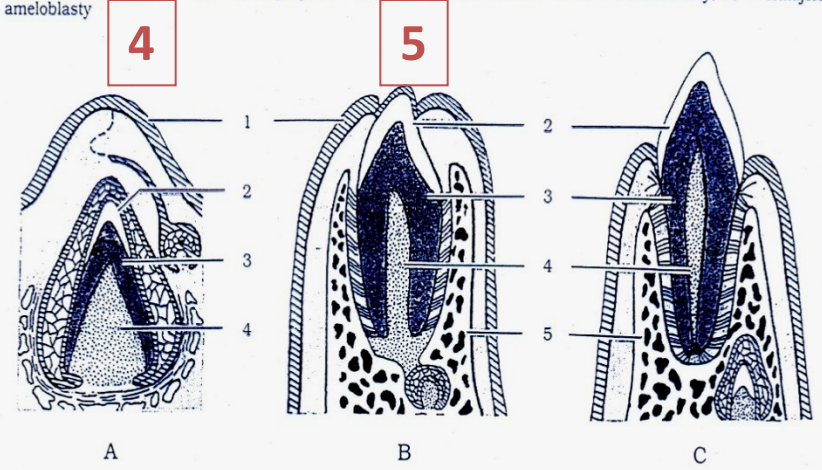
Developmental stages of tooth

primary dental lamina

1. stage of dental bud (primordium)
2. stage of dental cap
3. stage of dental bell
4. stage of apposition
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)