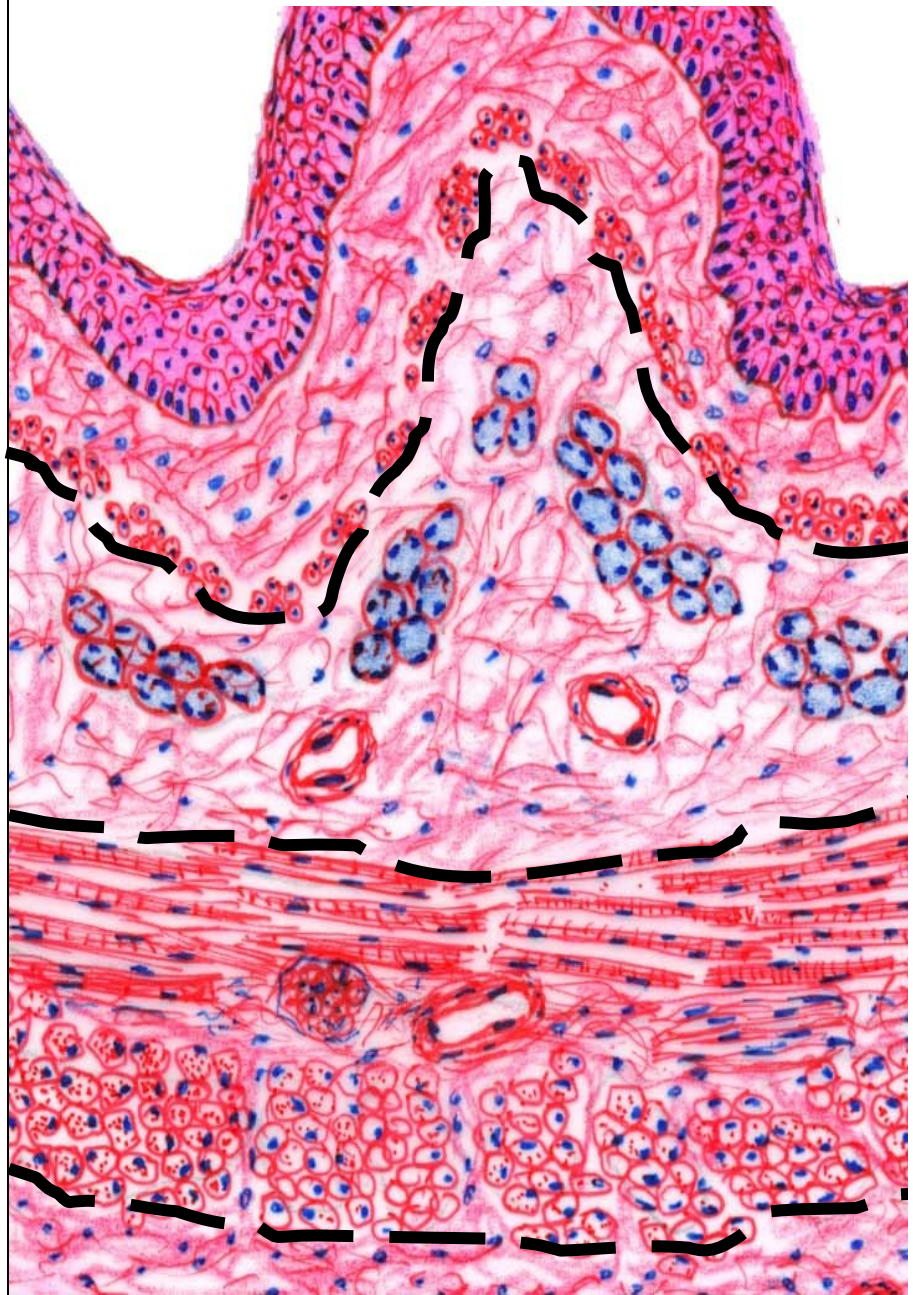
DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY
FACULTY OF MEDICINE - MASARYK UNIVERSITY

# Digestive system 1

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

# Common structure of the wall of GIT tube



- **The mucosa**
  - epithelial linning
  - lamina propria
    /loose connect. tissue/
  - the 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 -

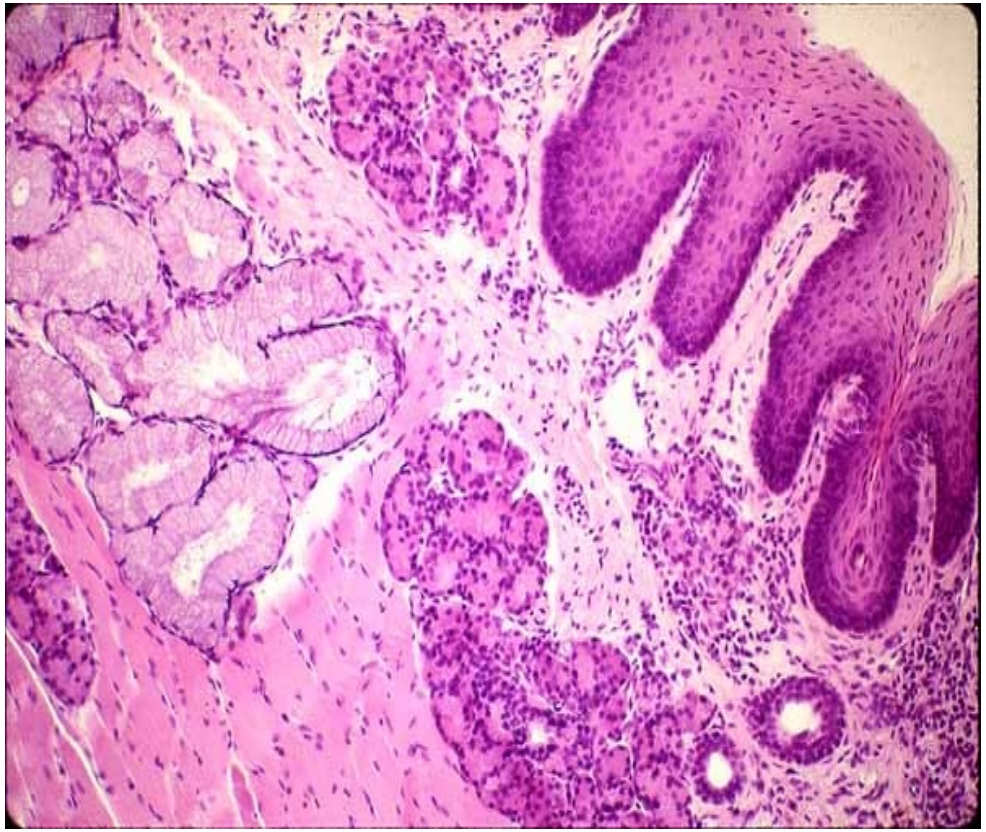
# The oral cavity

(the mucosa)

The epithelium
Nonkeratinized
stratified squamous ep.

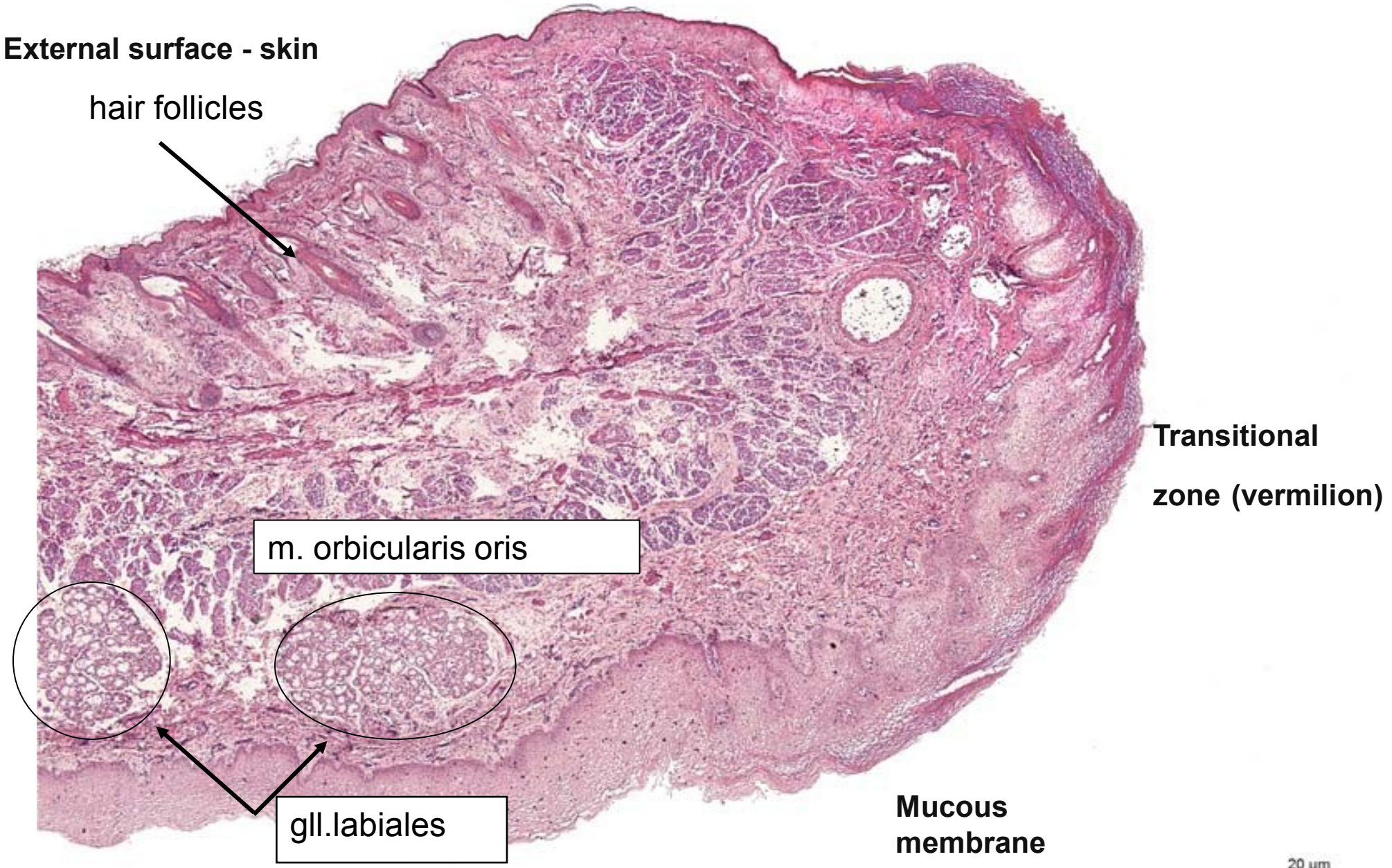
Lamina propria
loose connective tissue

The muscularis mucosae
is missing!!!

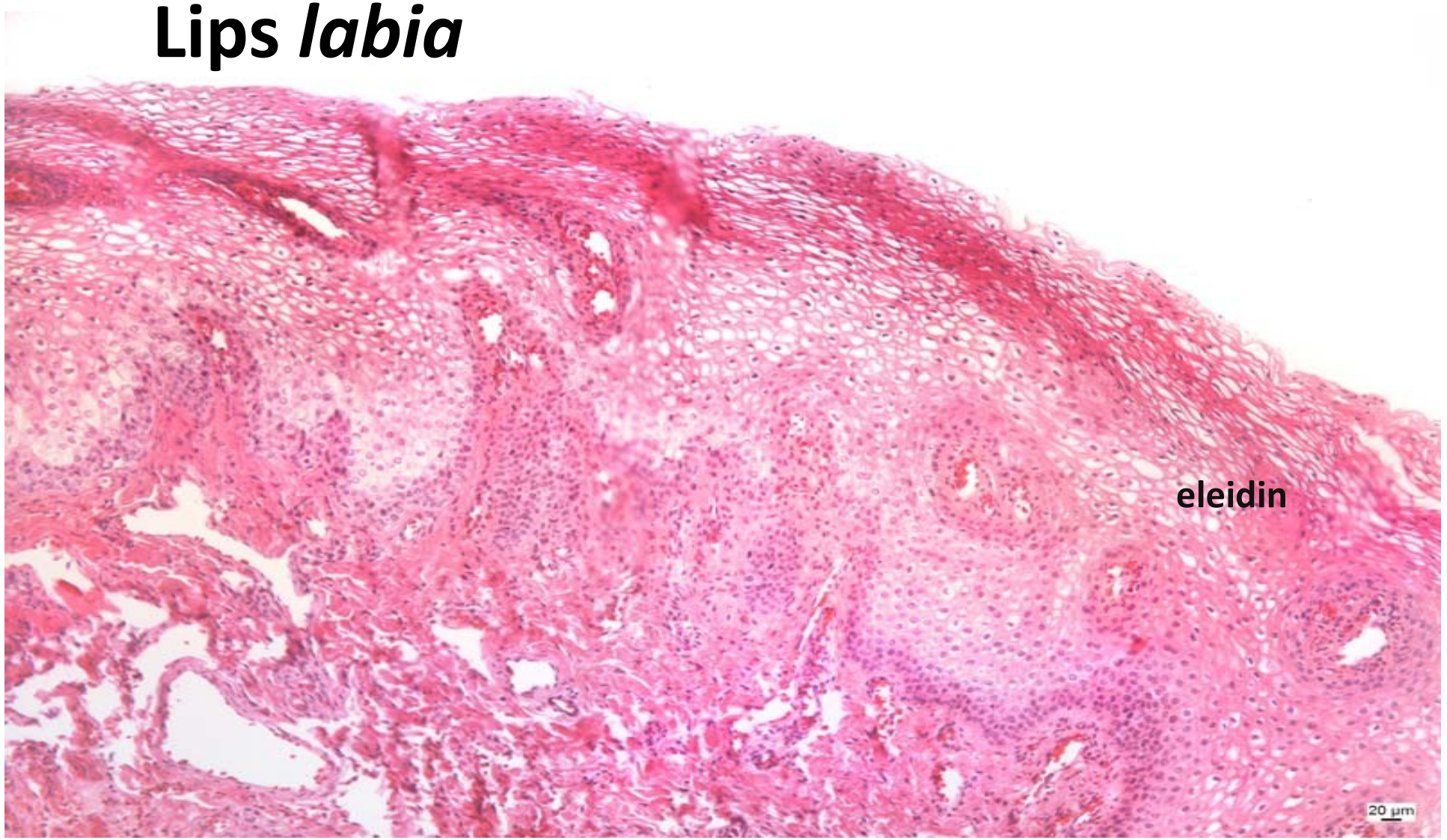


Lam. propria → the submucosa (loose connect. tissue) / periost / muscle

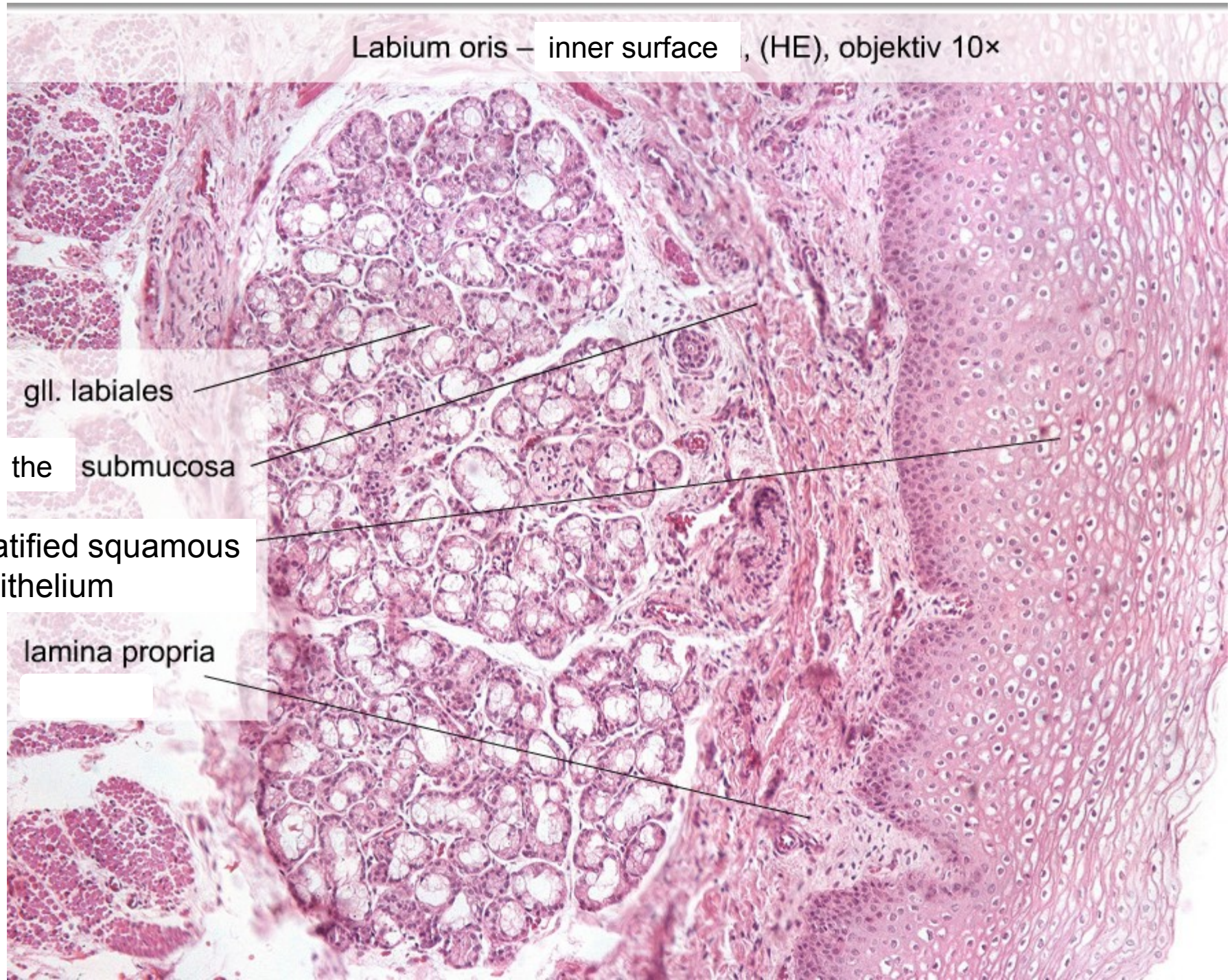
# Labium oris


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

# Lips *labia*




- 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.


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

# Tongue

- **dorsal surface**

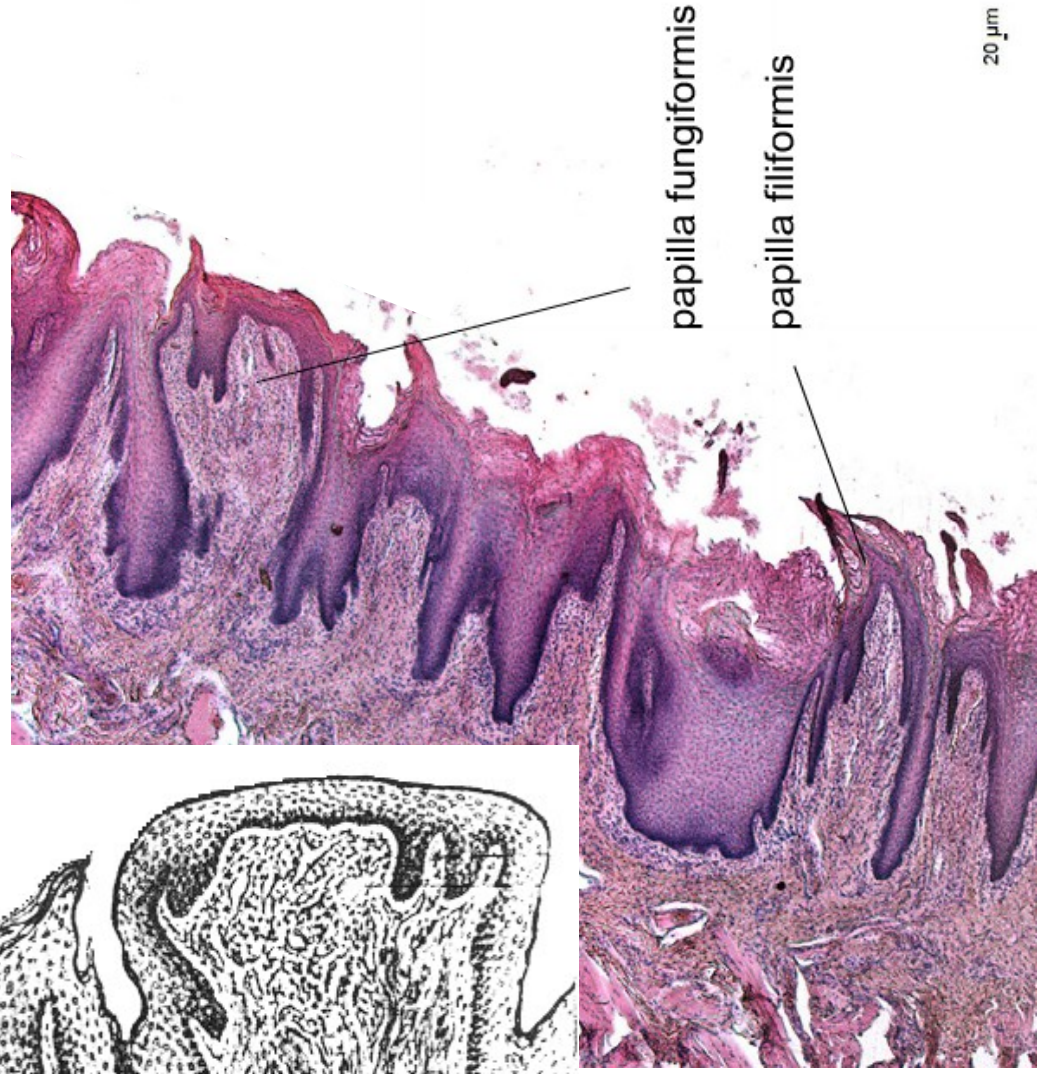
  **The mucosa –** filiform, fungiform, circumvallatae, foliatae pap.
  **(**the submucosa is missing! **)**
  **aponeurosis linguae**

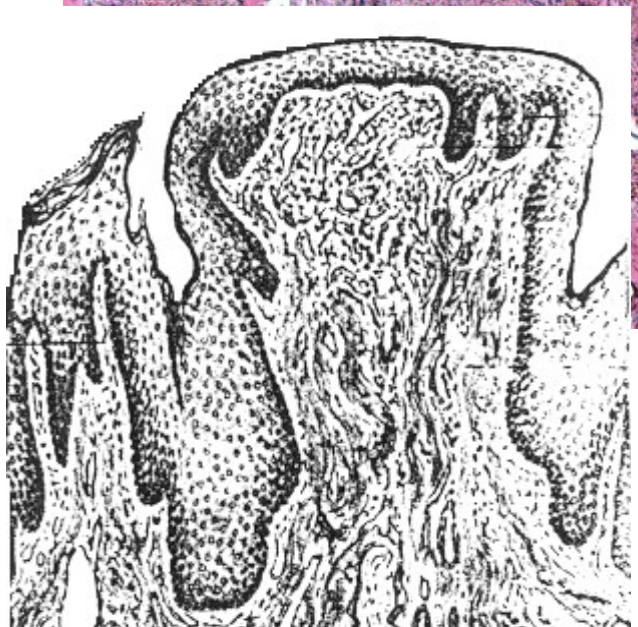
- **inferior surface (mylohyoidea)**

  **The mucosa –** without papillae
  **the submucosa**!

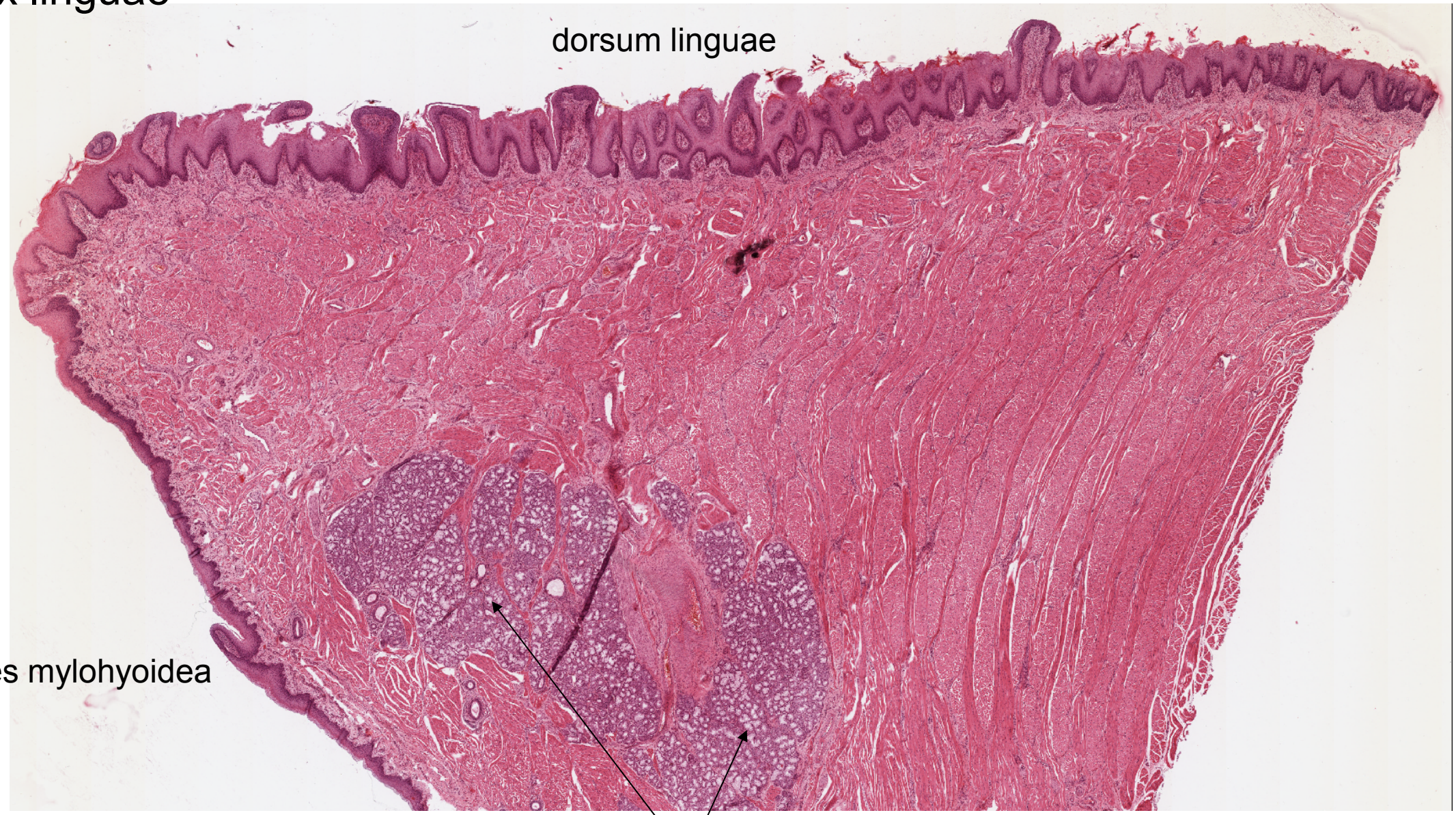
→

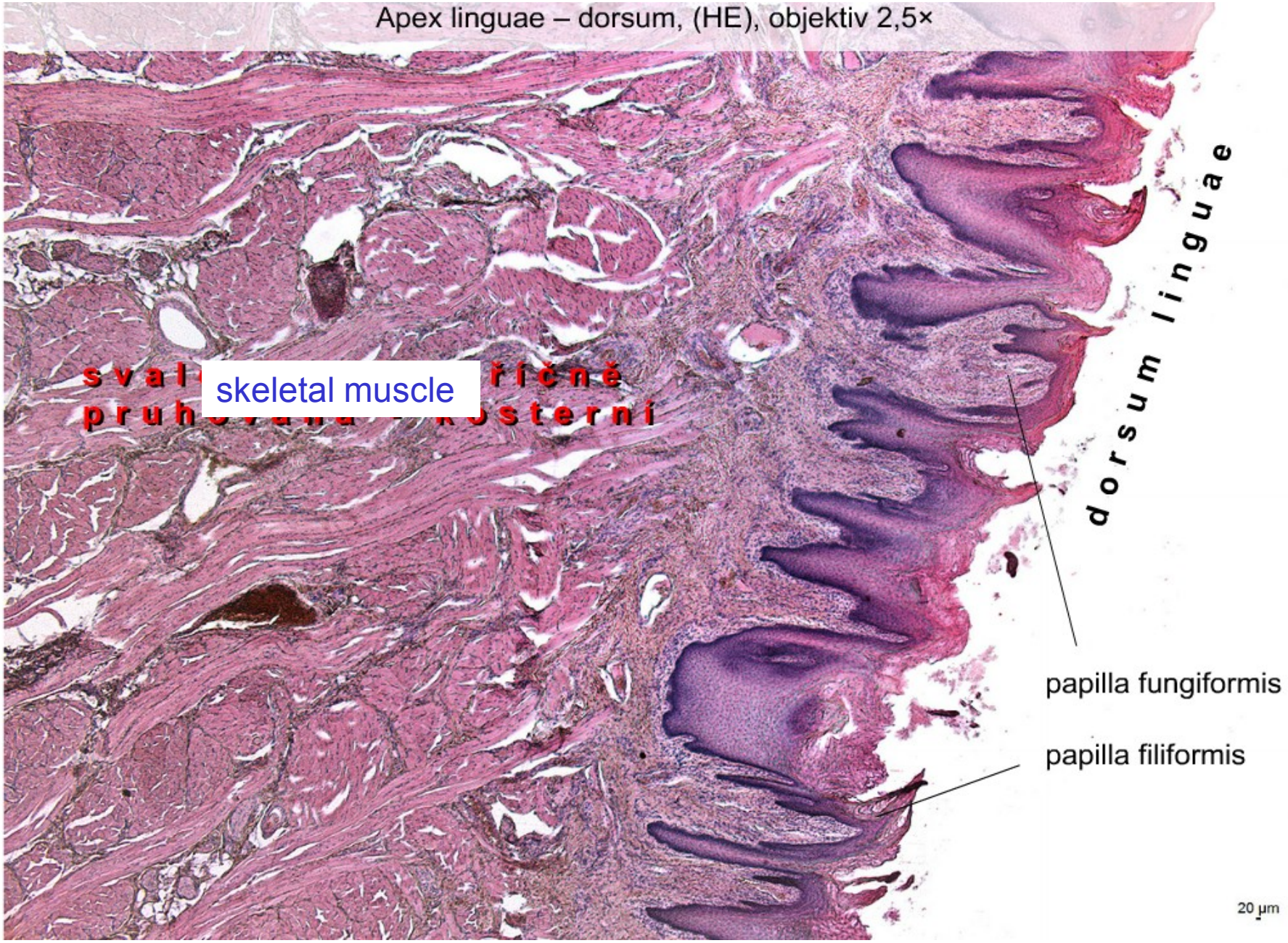
-**papillae = elevations of the oral epithelium and lamina propria**



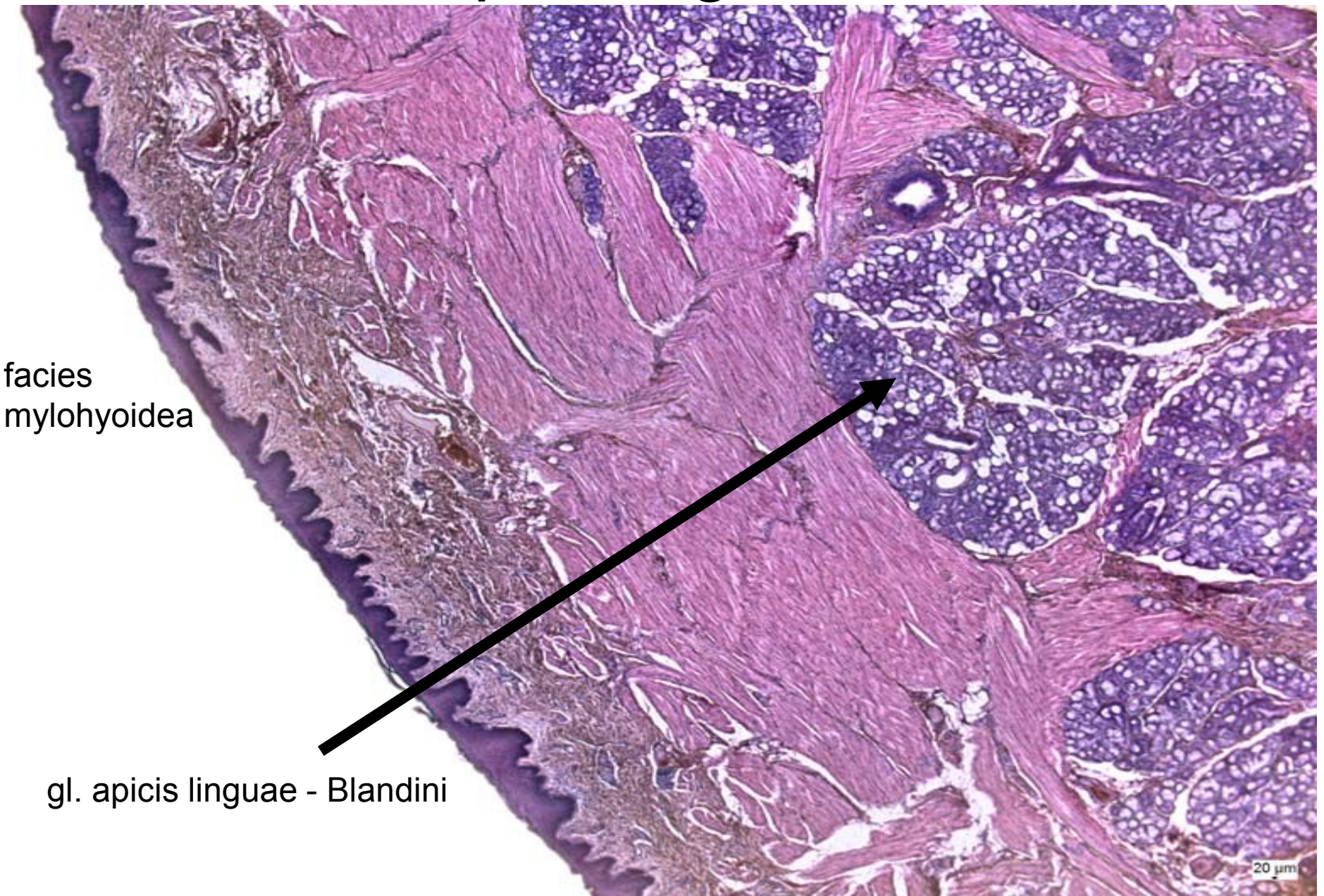



# Apex linguae

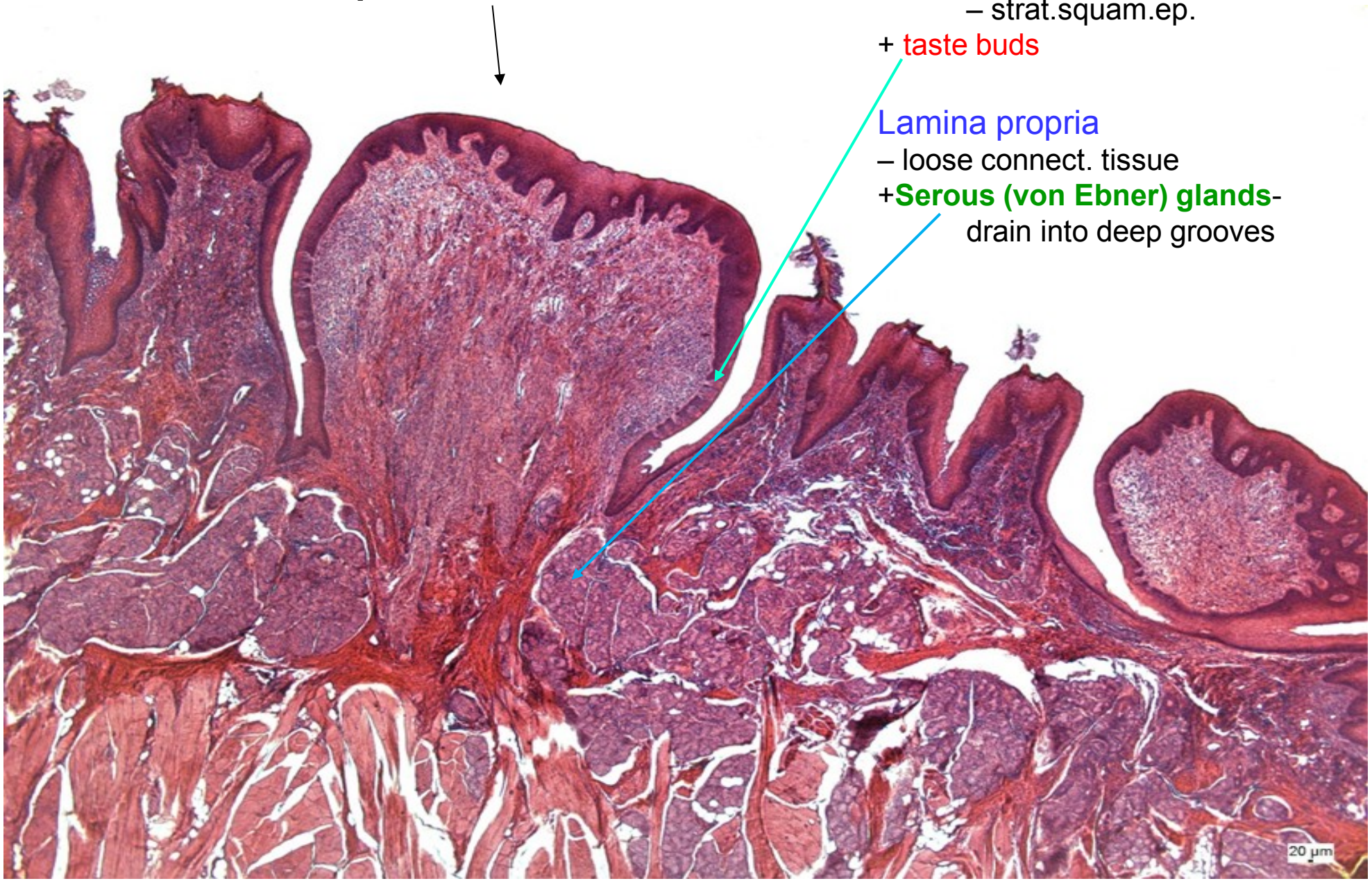



Apex linguae – dorsum, (HE), objektiv 2,5×
skeletal muscle
dorsum linguae
papilla fungiformis
papilla filiformis
20 µm

# Apex linguae



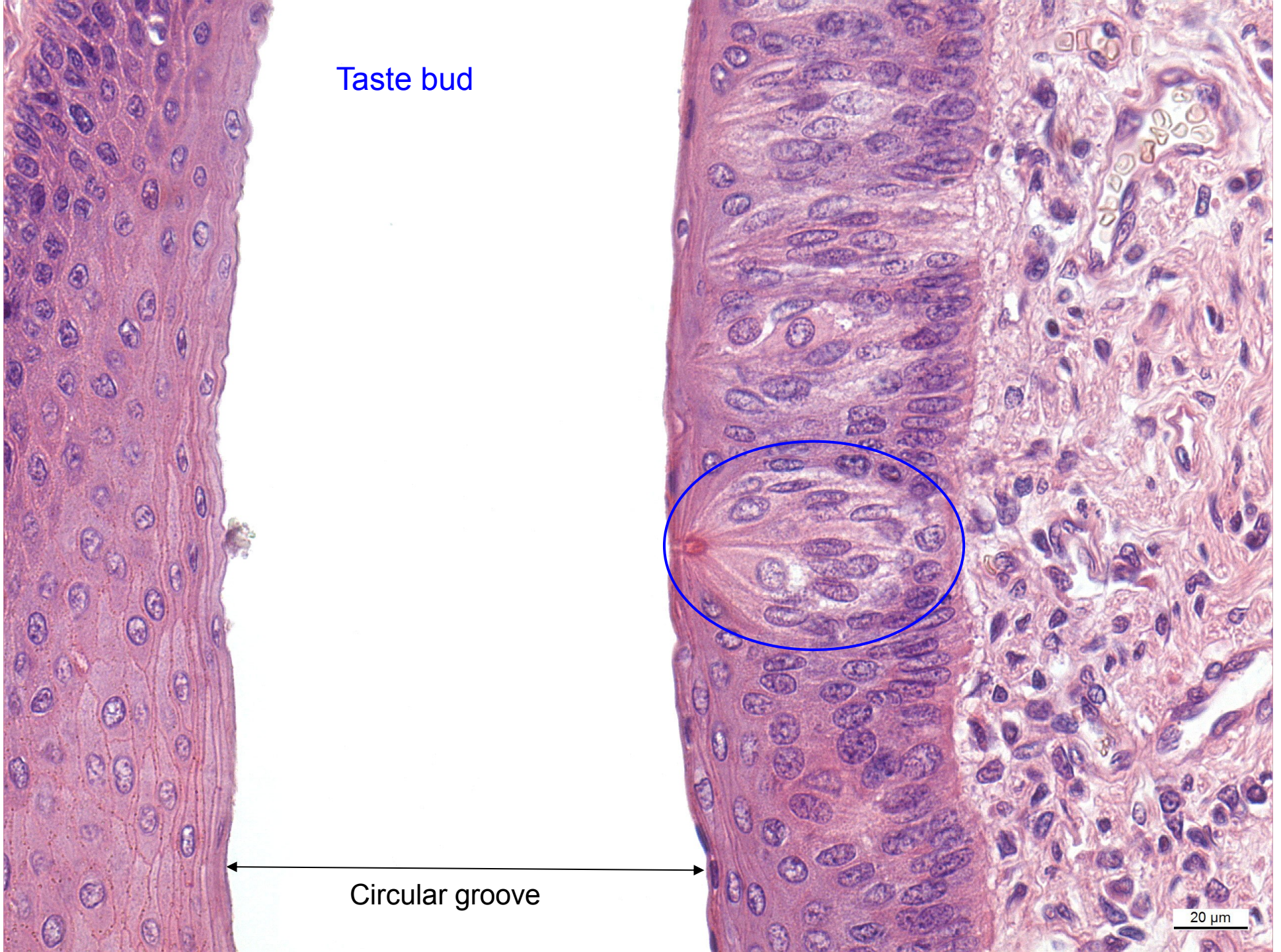
# Circumvallatea Papillae



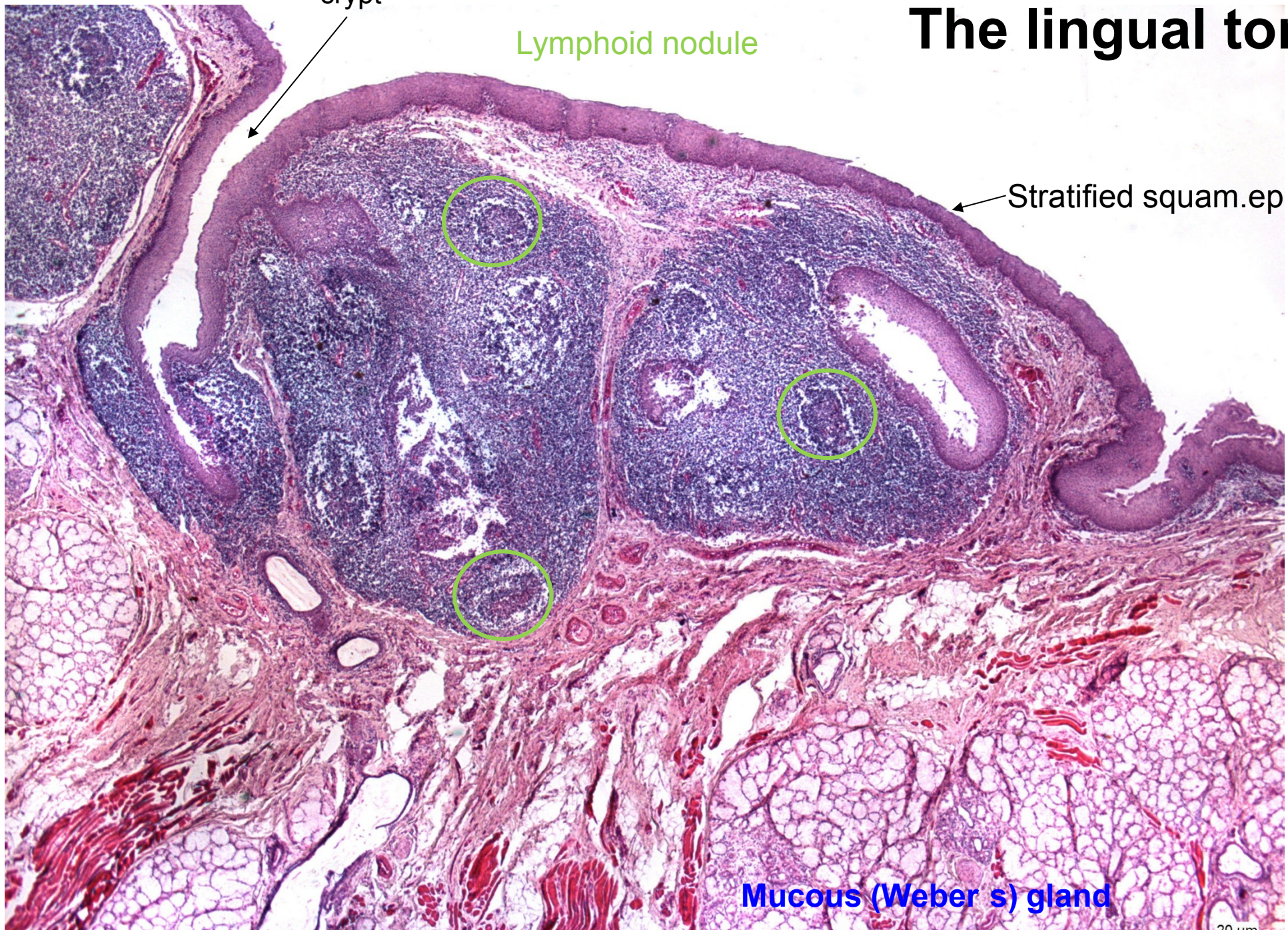

The epithelial linning
– strat.squam.ep.
+ taste buds

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

# Circumvallate papilla (HE)

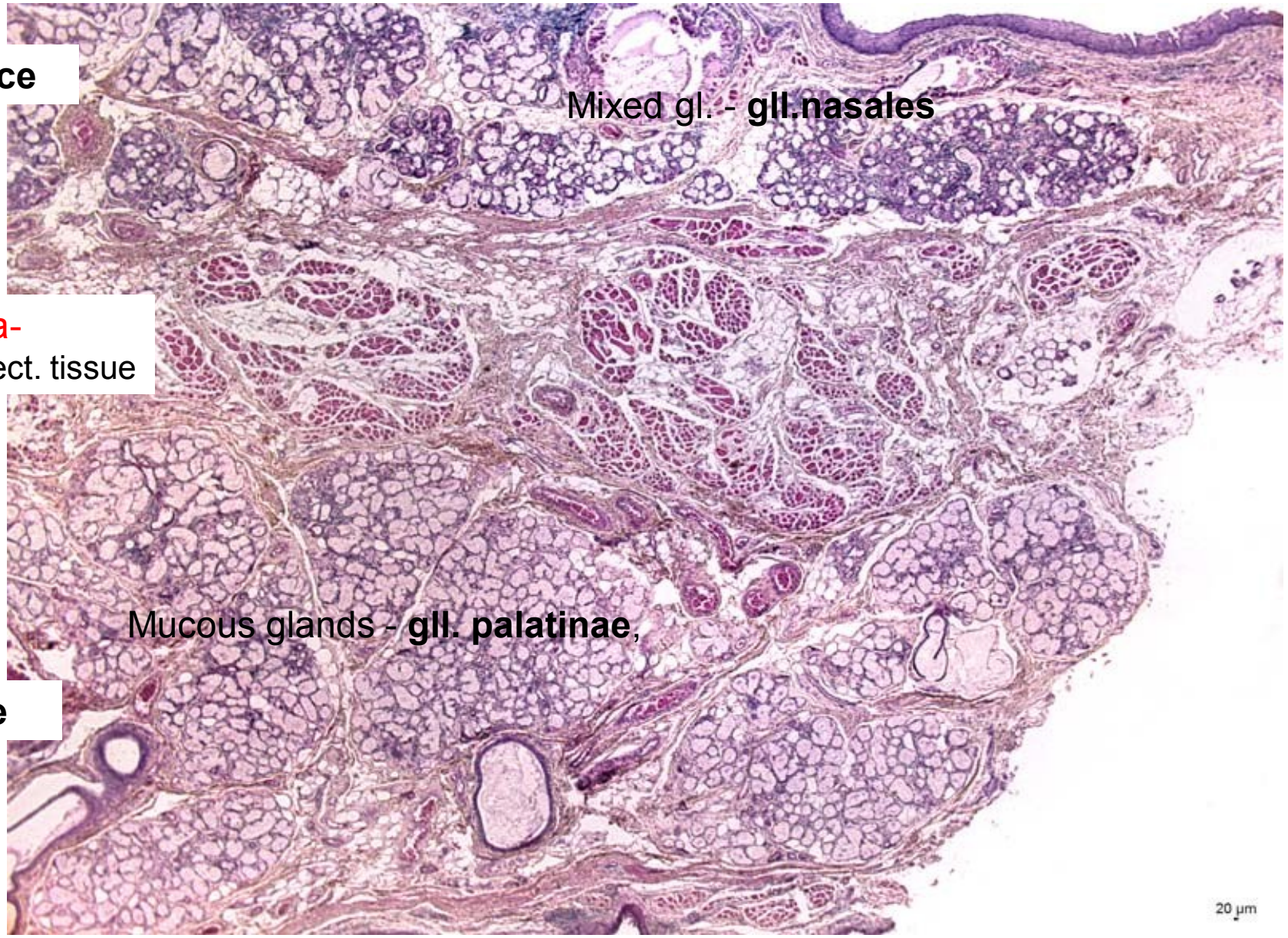

Taste bud
Circular groove
20 µm

# The lingual tonsil



# Soft palate

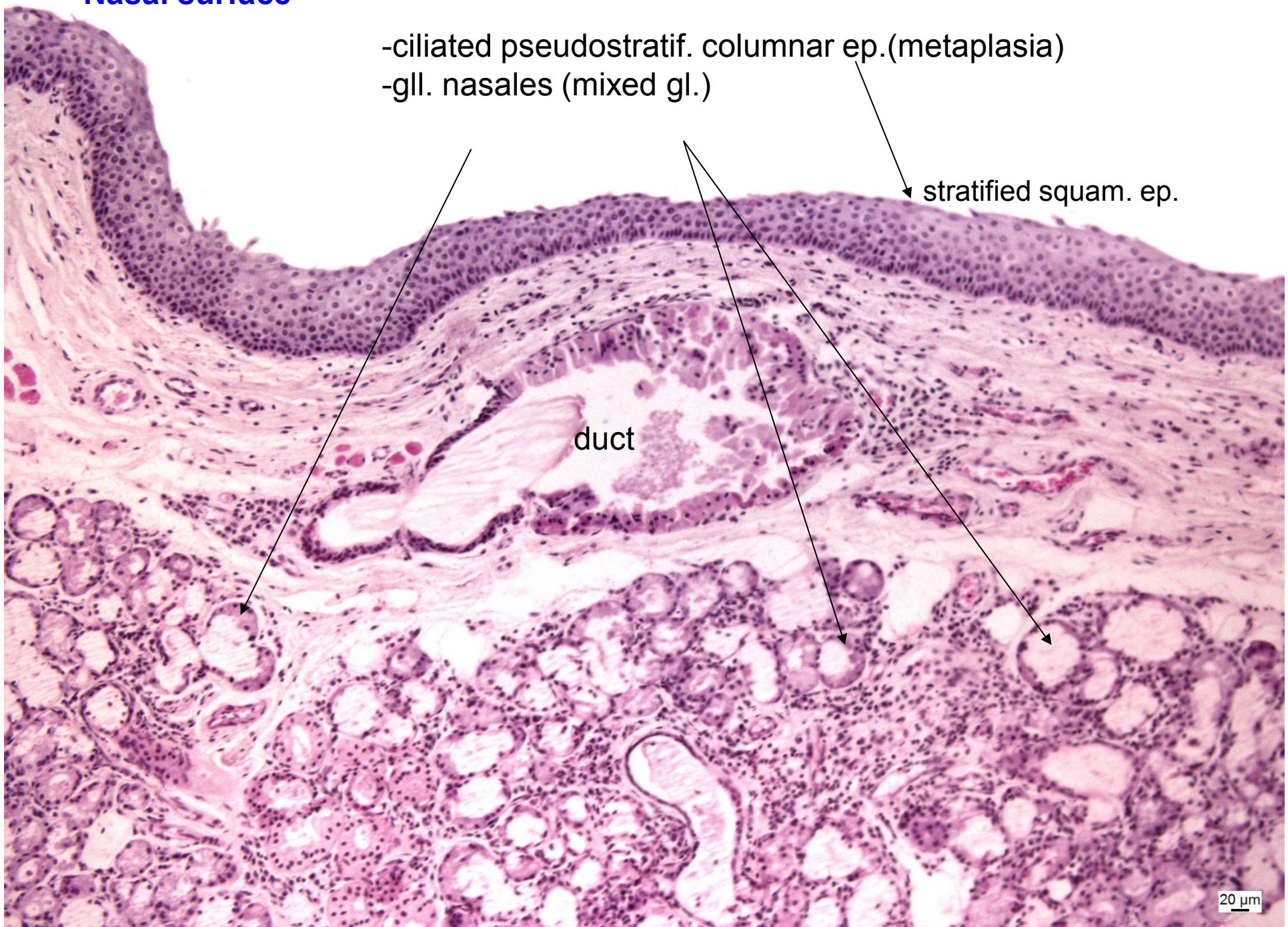
**Nasal surface**




aponeurosis palatina-
Skeletal muscle+connect. tissue

**Oral surface**

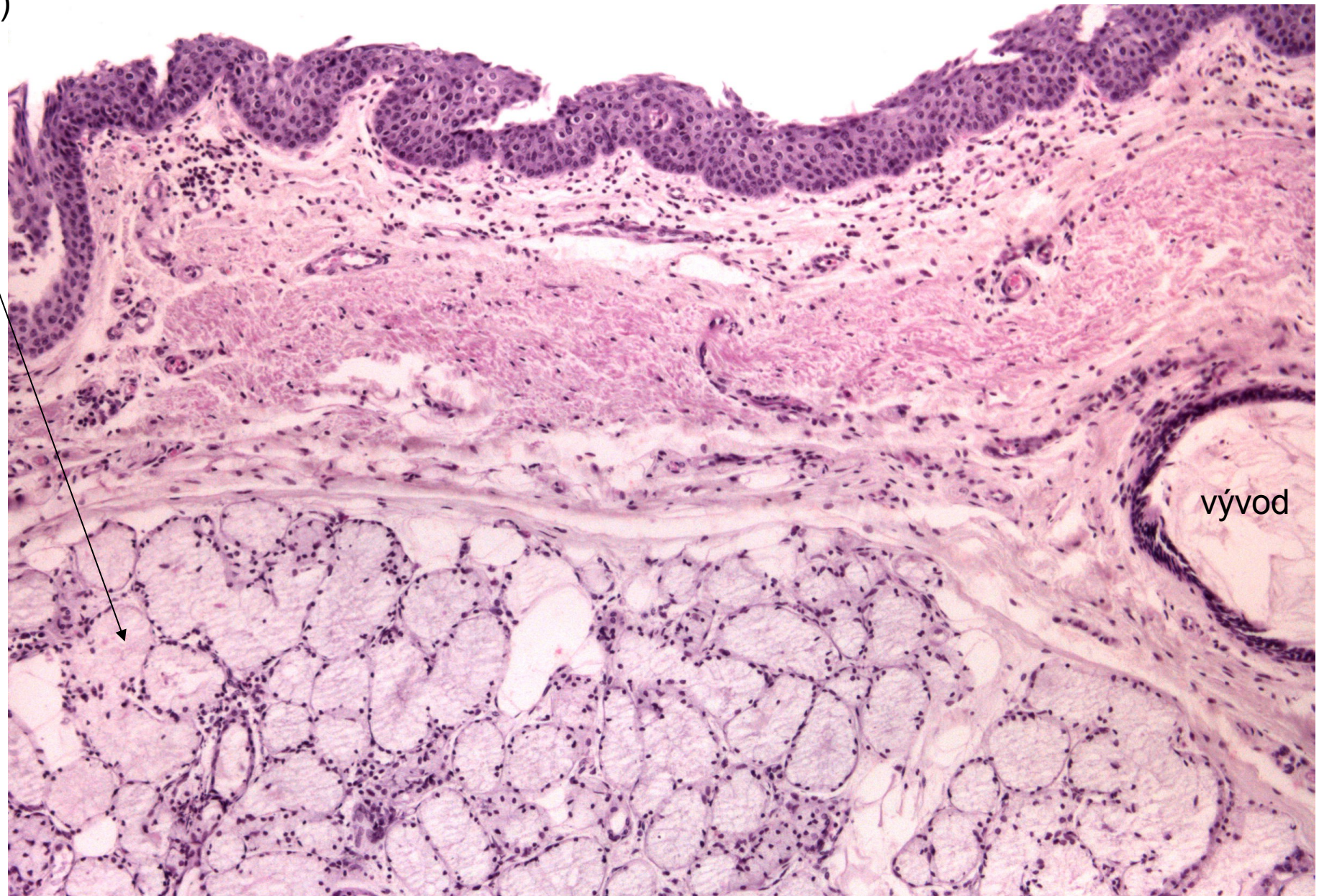
## Nasal surface



## Oral surface

-stratified squamous epithelium

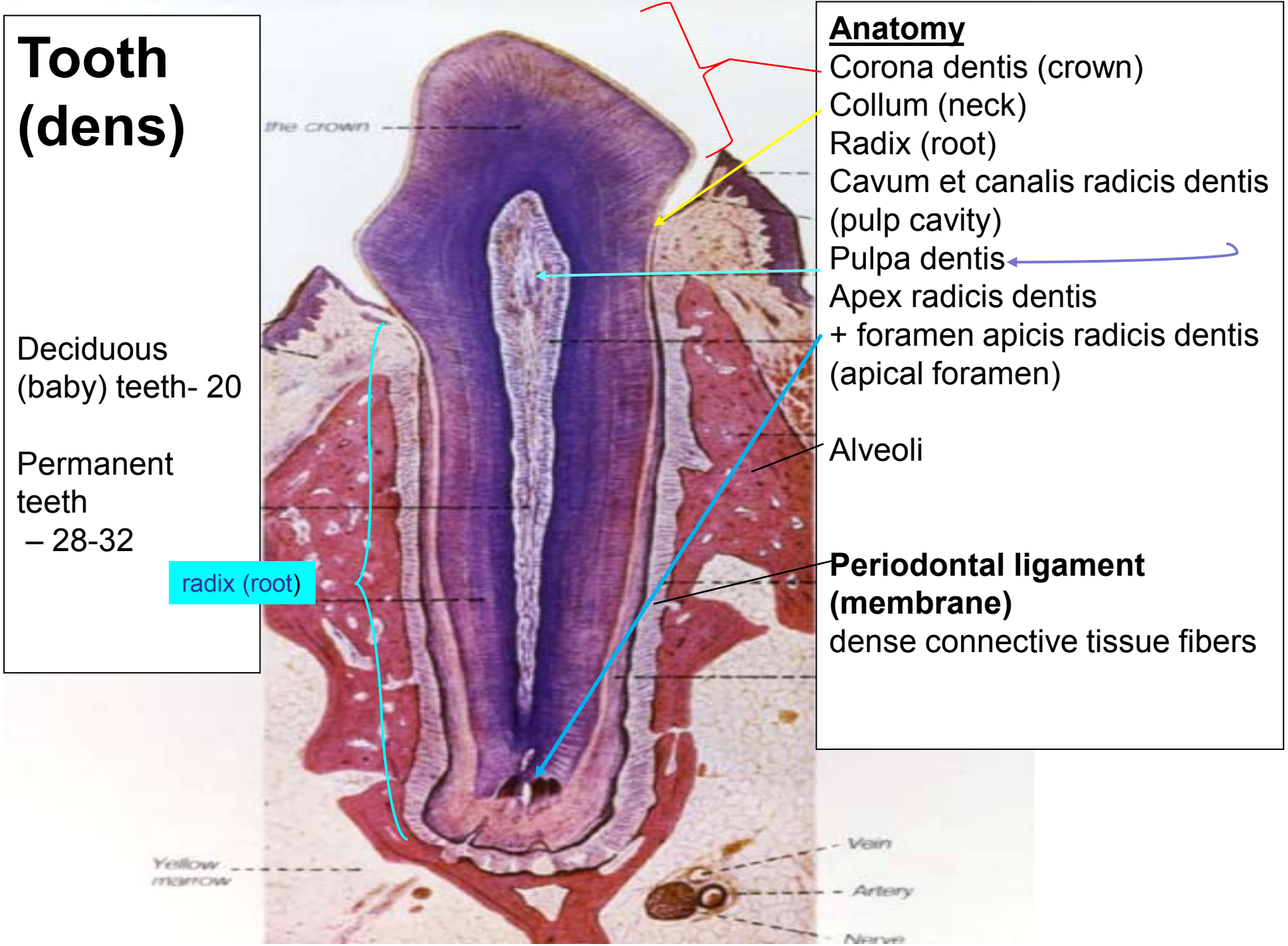
-gll. palatinae (MUCOUS gl.))



# 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)

Alveoli

**Periodontal ligament (membrane)**

dense connective tissue fibers

# Tooth

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

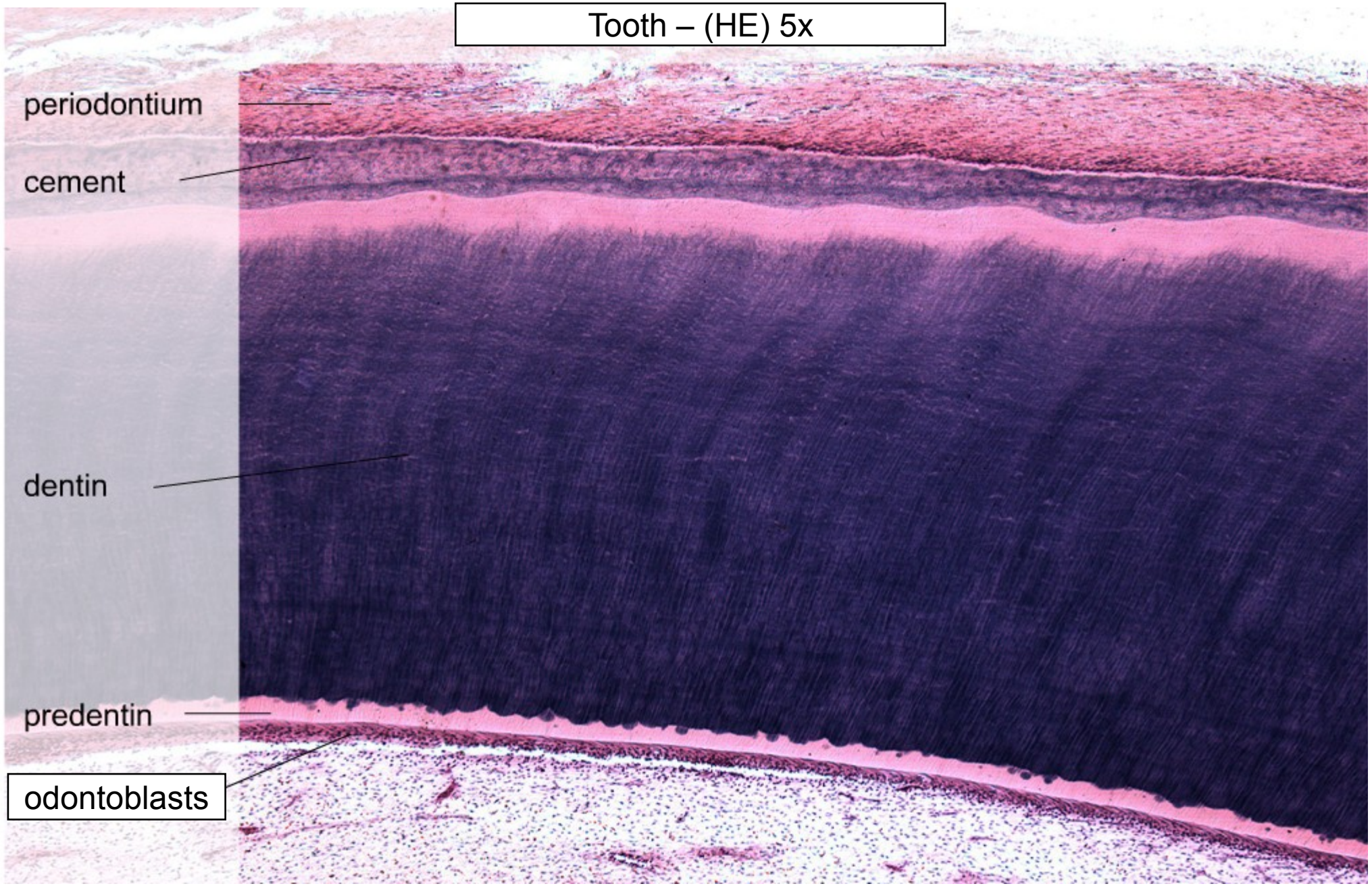
cementum

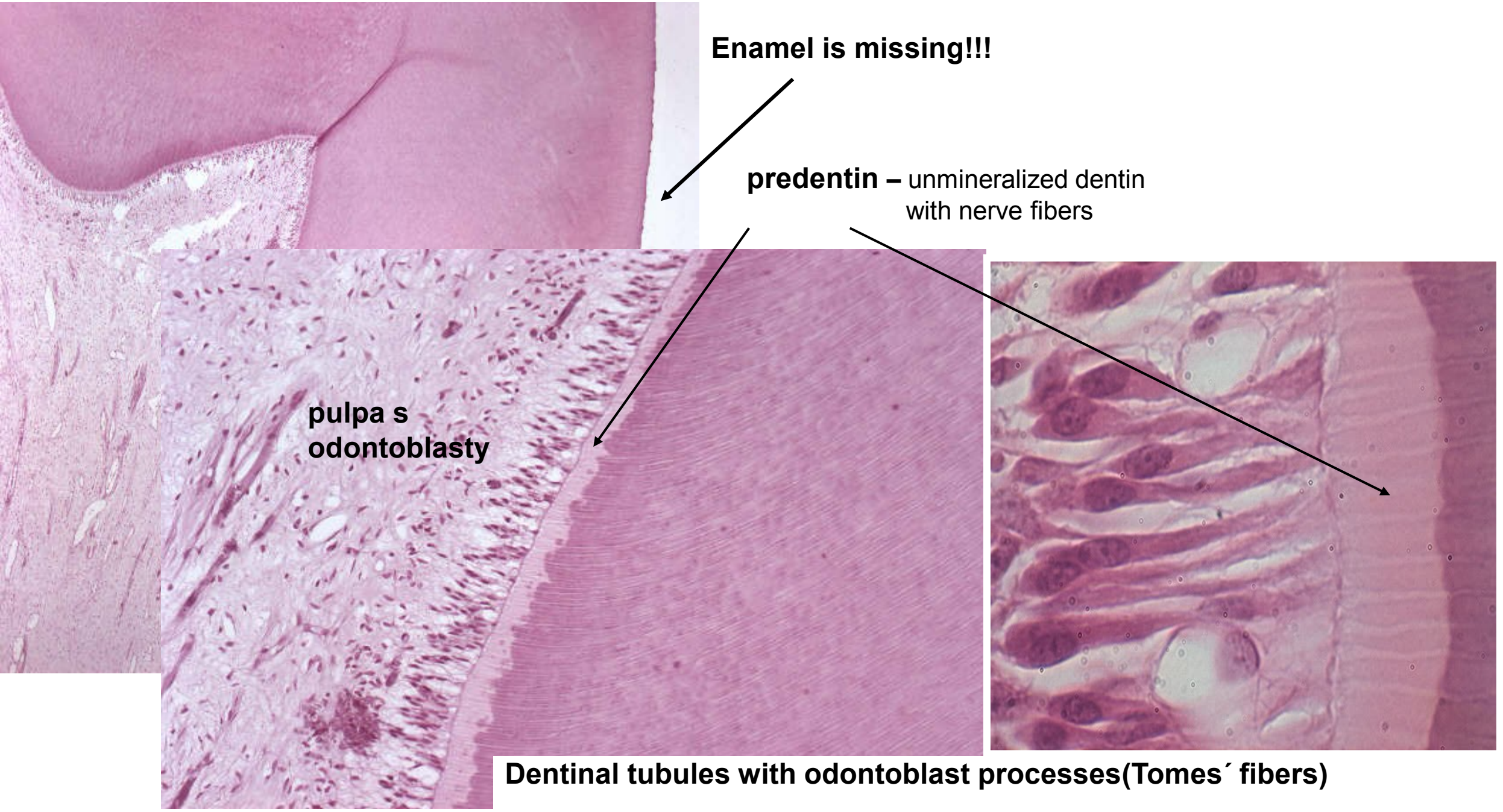
**enamel!!!!**

dentin

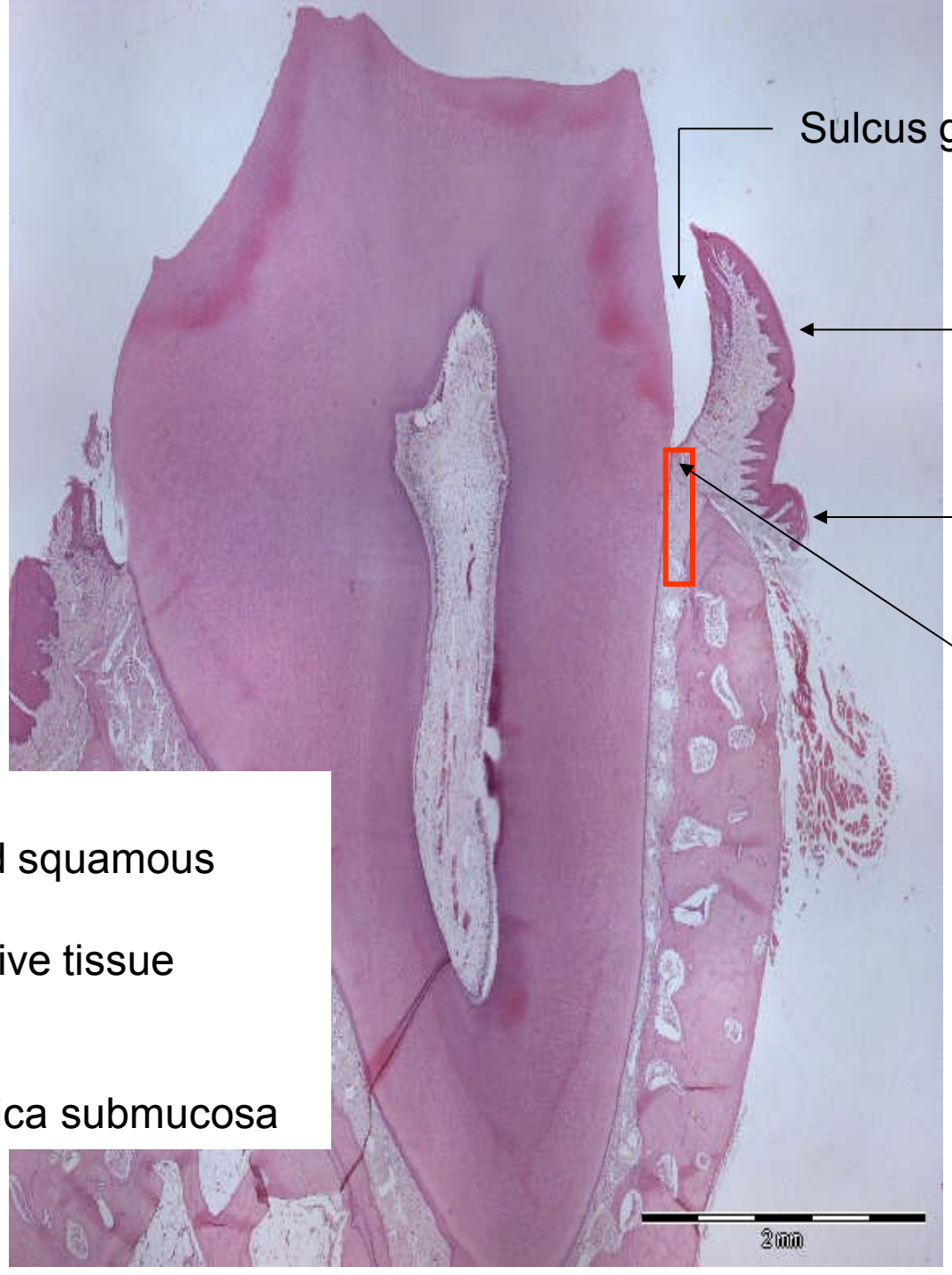
**dentinal tubules with odontoblast processes(Tomes´fibers)**

# 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** connective tissue papillae+stratif.squamous ep.
**Epithelial attachment of Gottlieb**




**GINGIVA**

- Stratified squamous epith.
- Connective tissue papillae

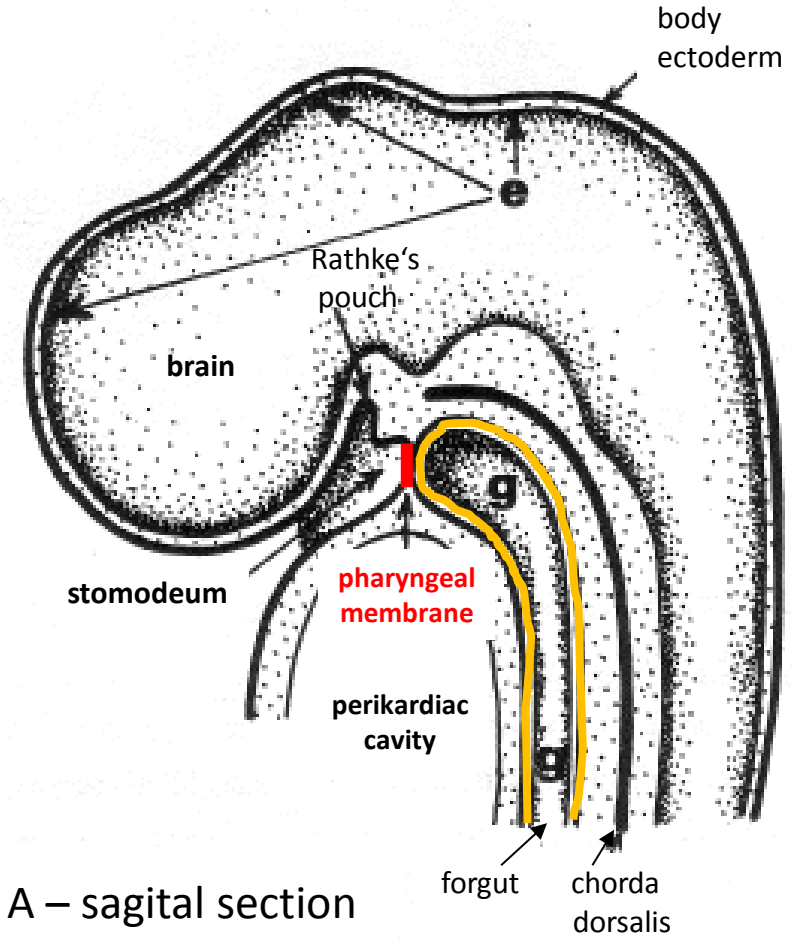
NO!!! Tunica submucosa

# 1.
# Digestive system – I

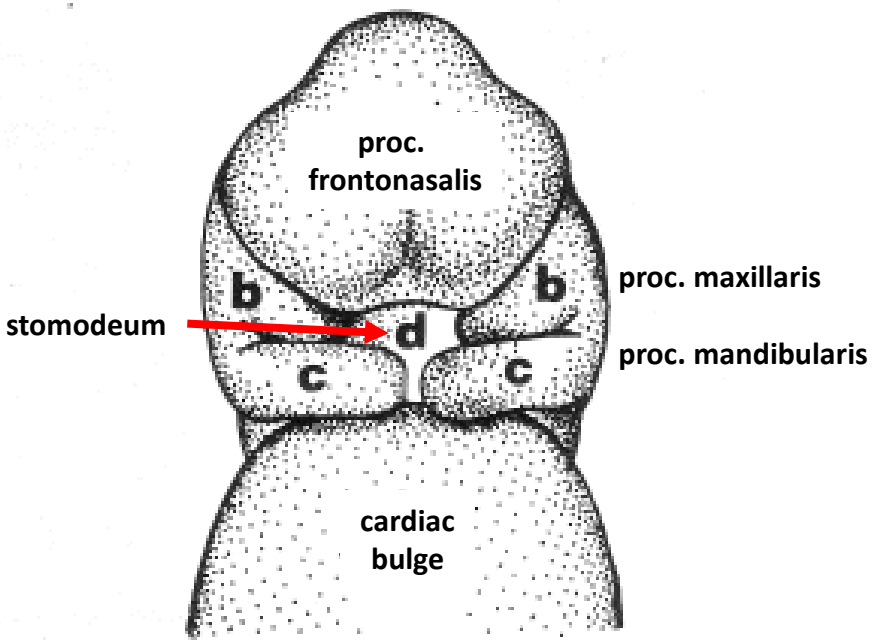
**Slides :**

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

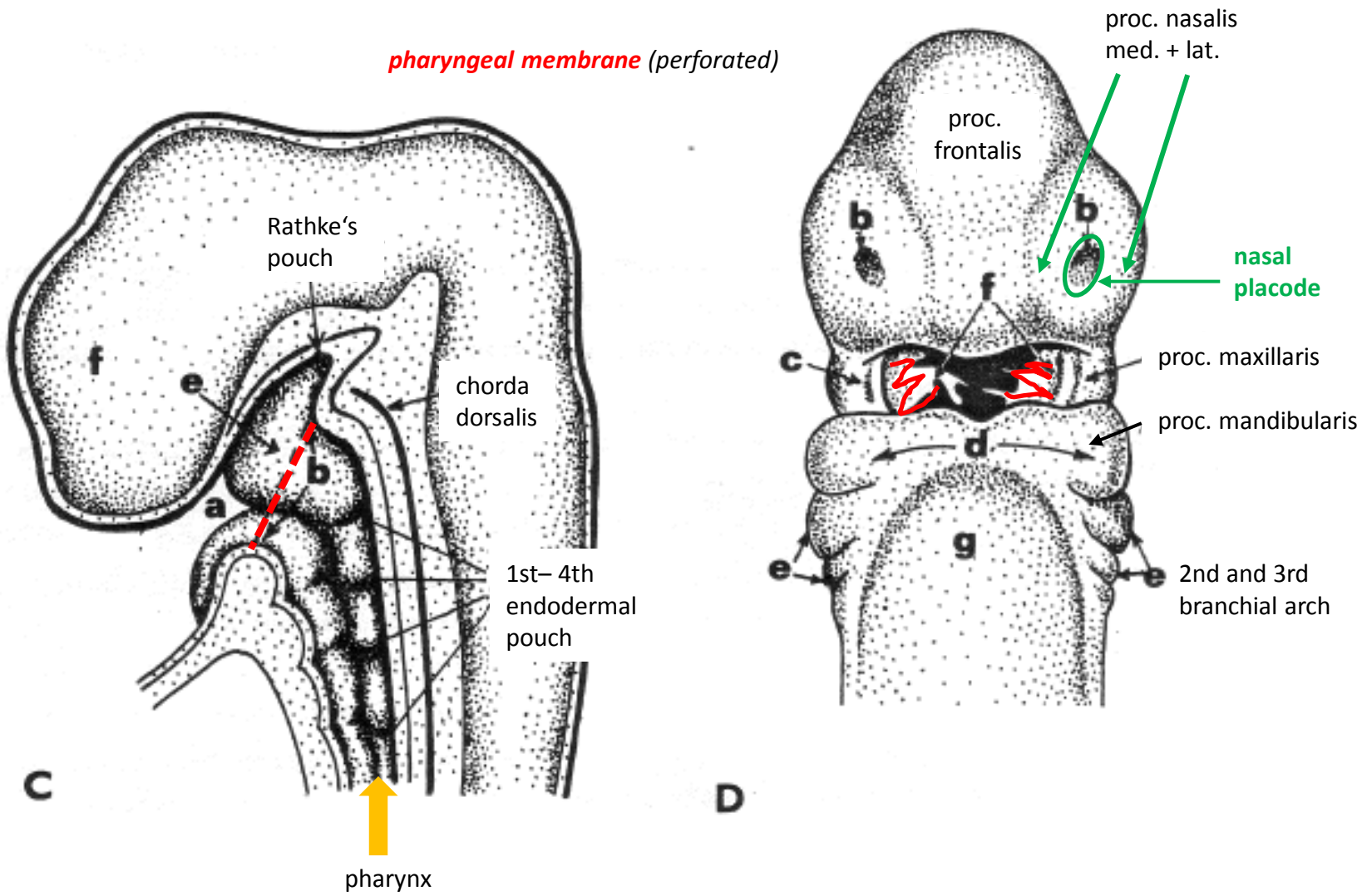



A – sagital section

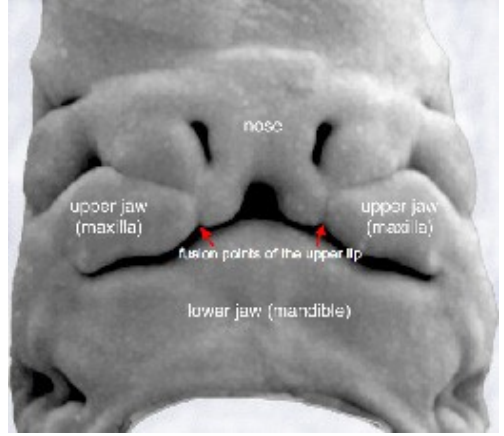


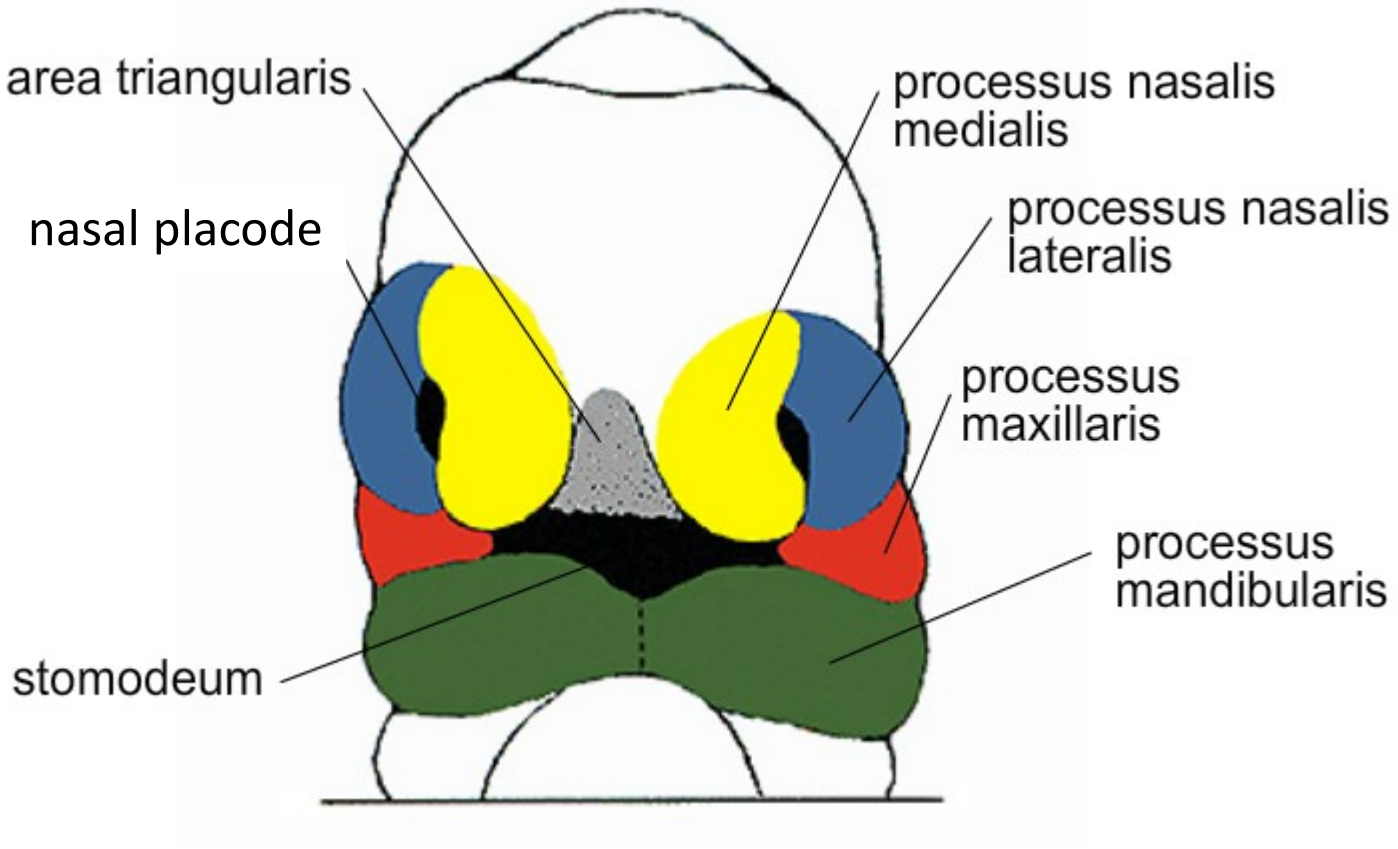

B – frontal view

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

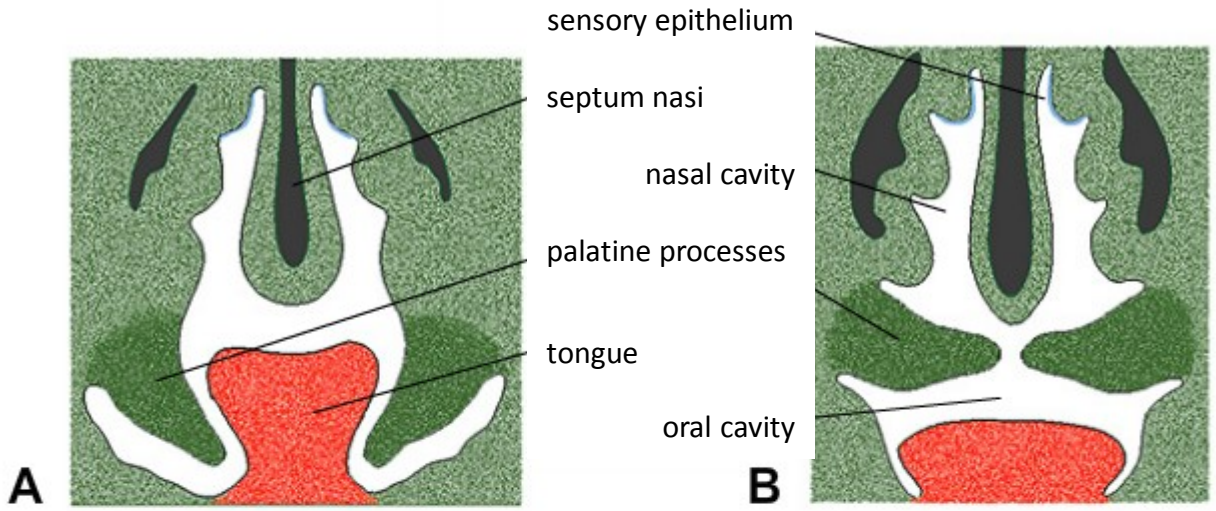


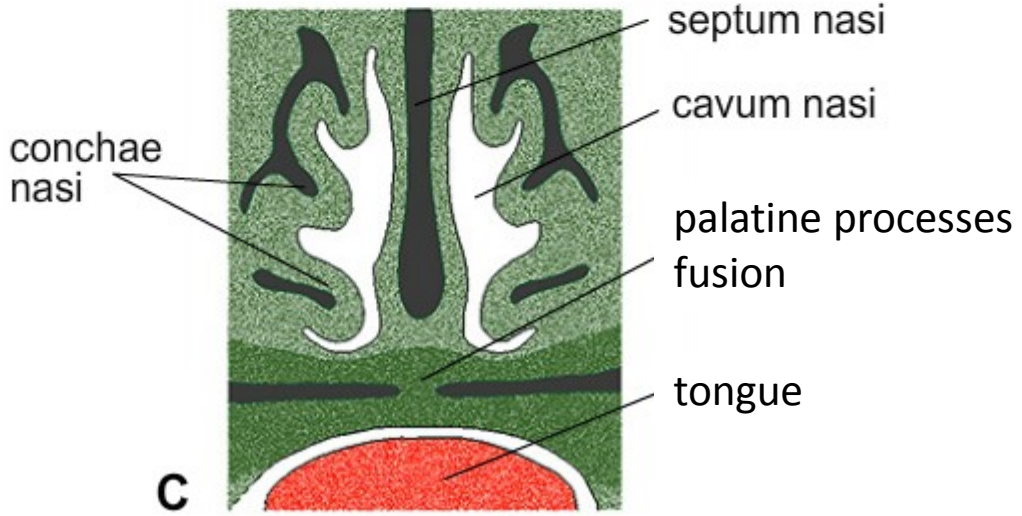
**Development of the face – embryo , end of week 5**



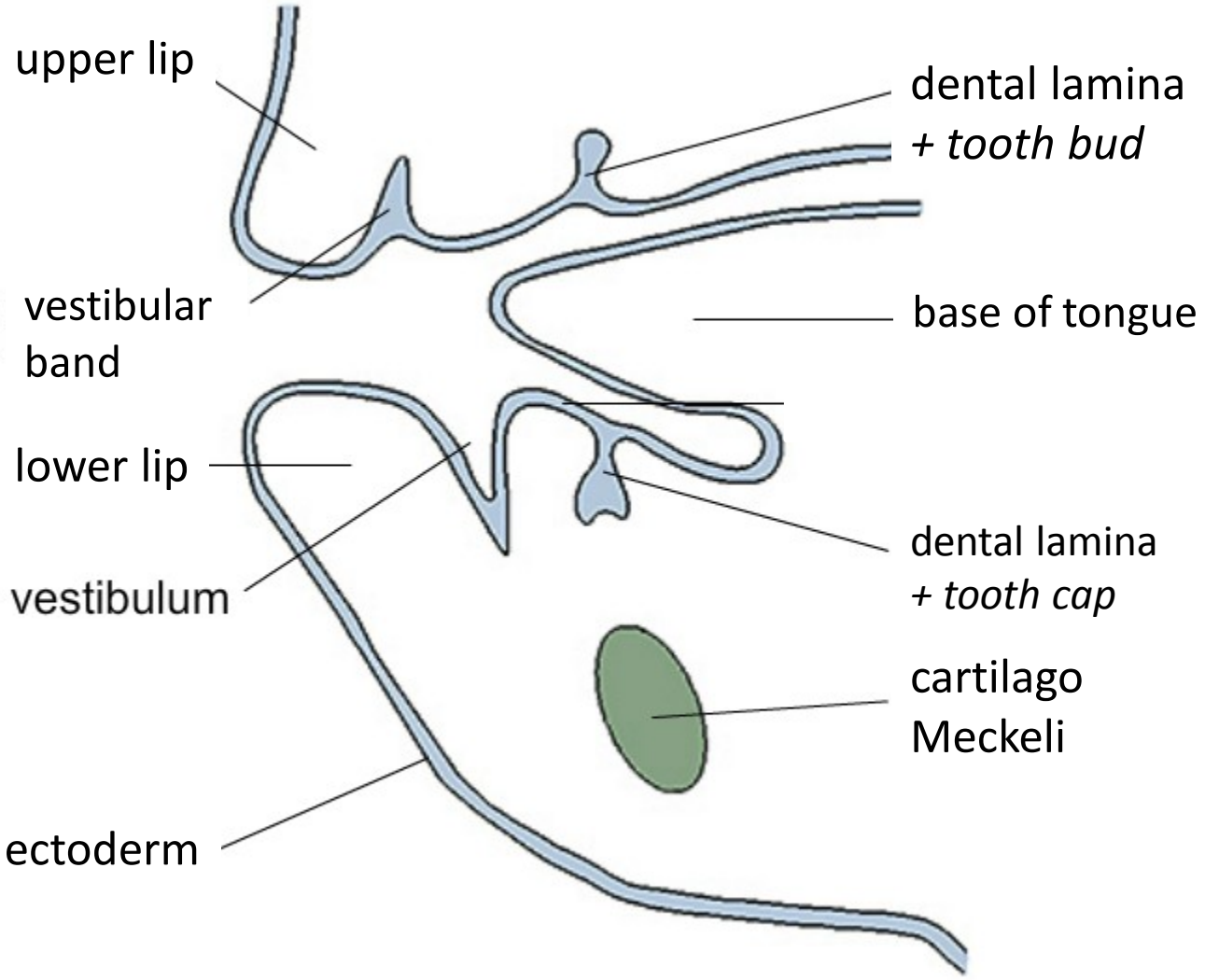



# Development of palate – embryo, A – week 7, B – week 8, C – week 10

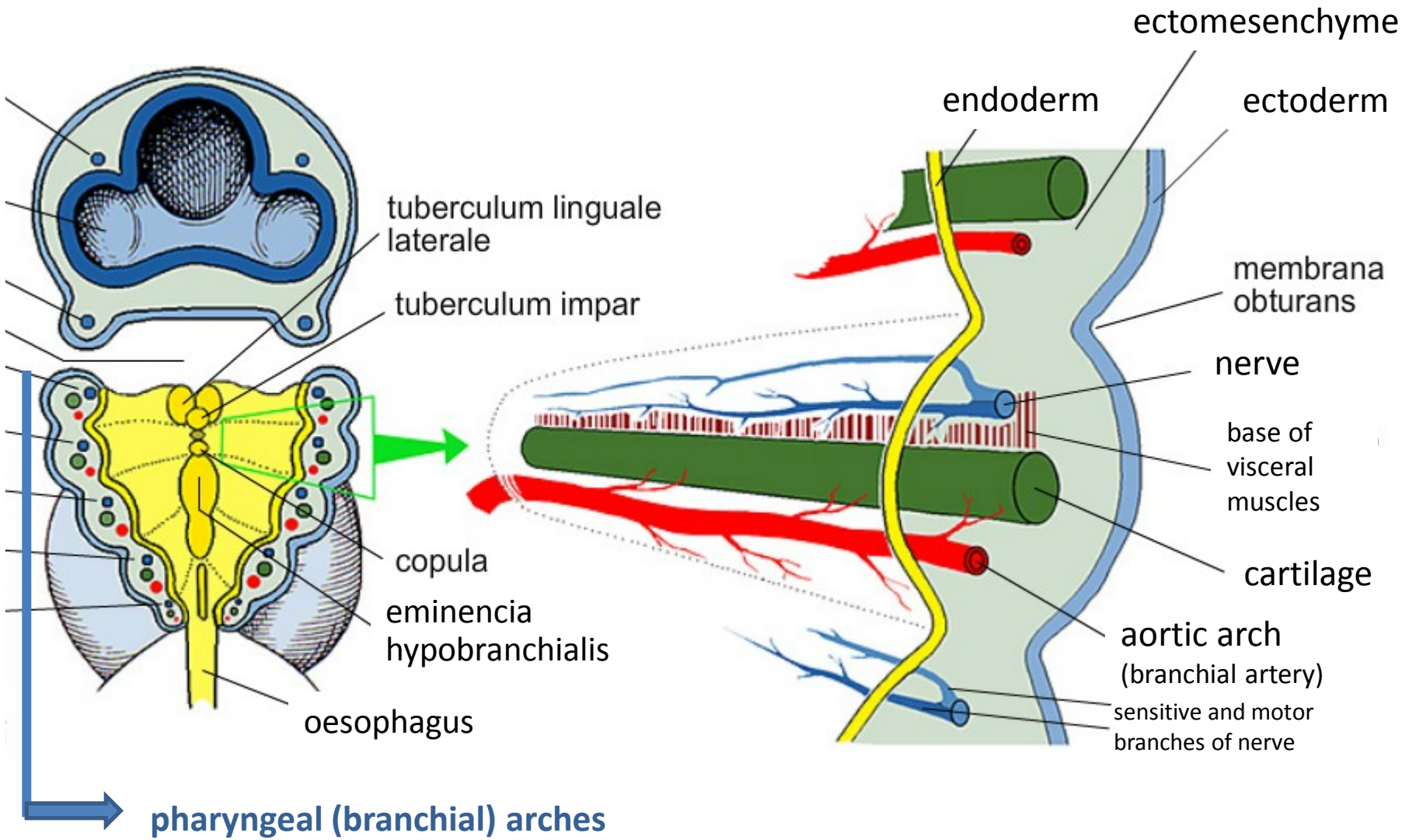


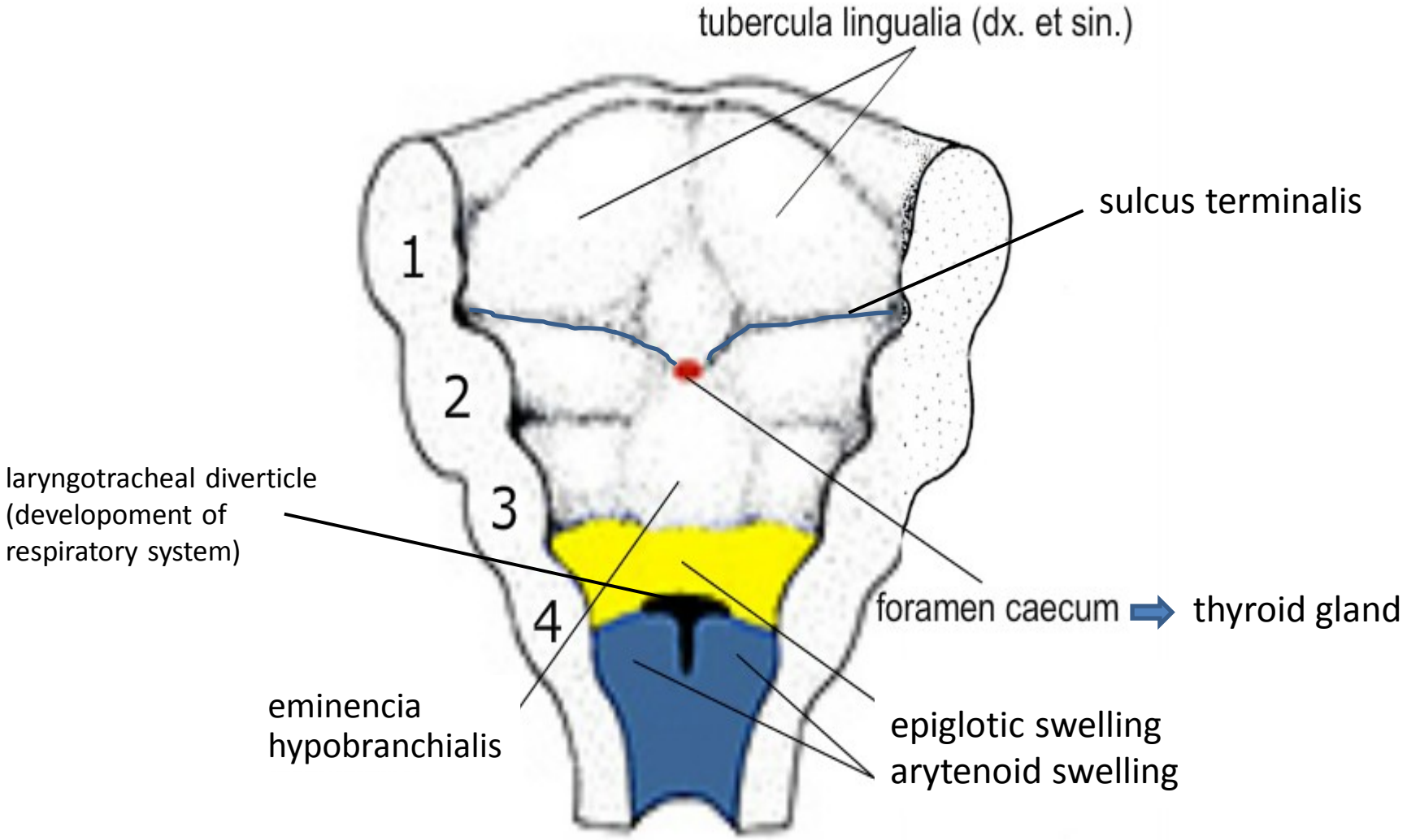
**Development of the oral cavity – embryo, week 6**



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

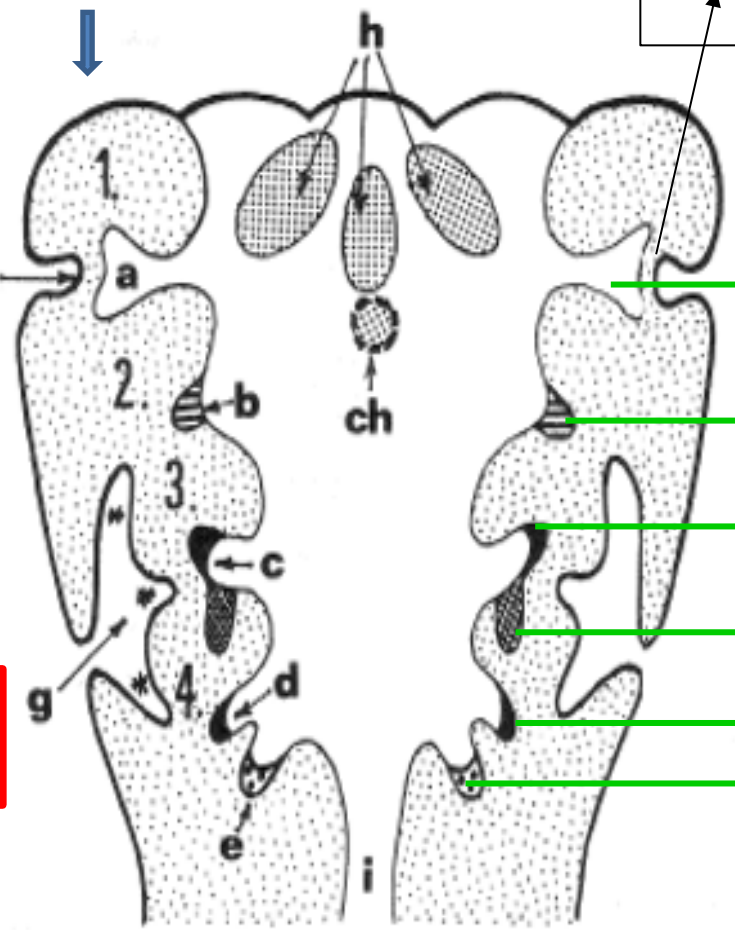


# Development of tongue



# 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

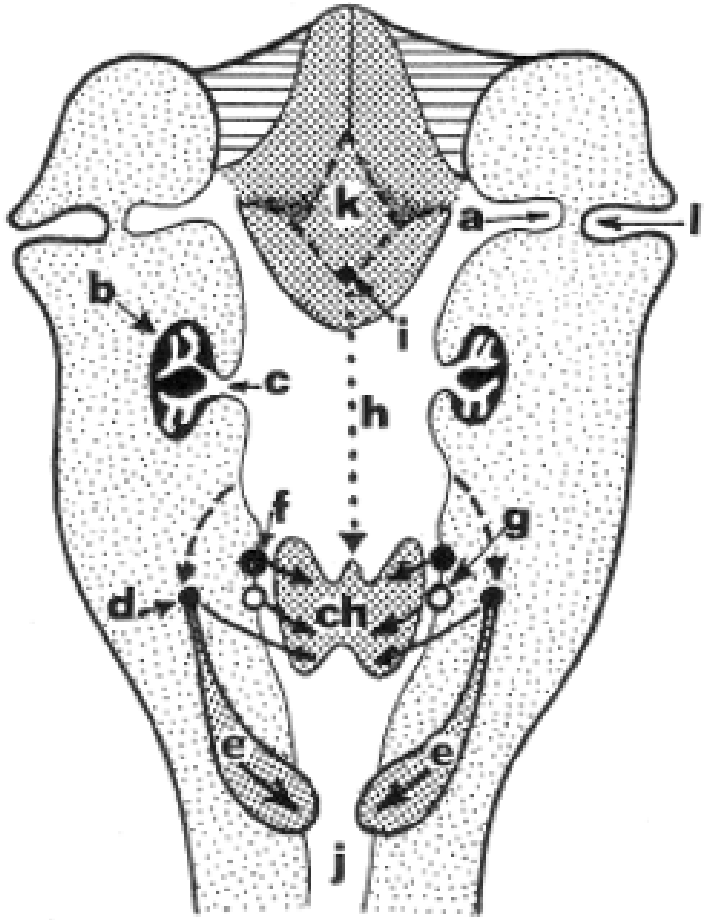
gl. parathyreoidea inf.

thymus

gl. parathyreoidea sup.

ultimobranchial corpuscle

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

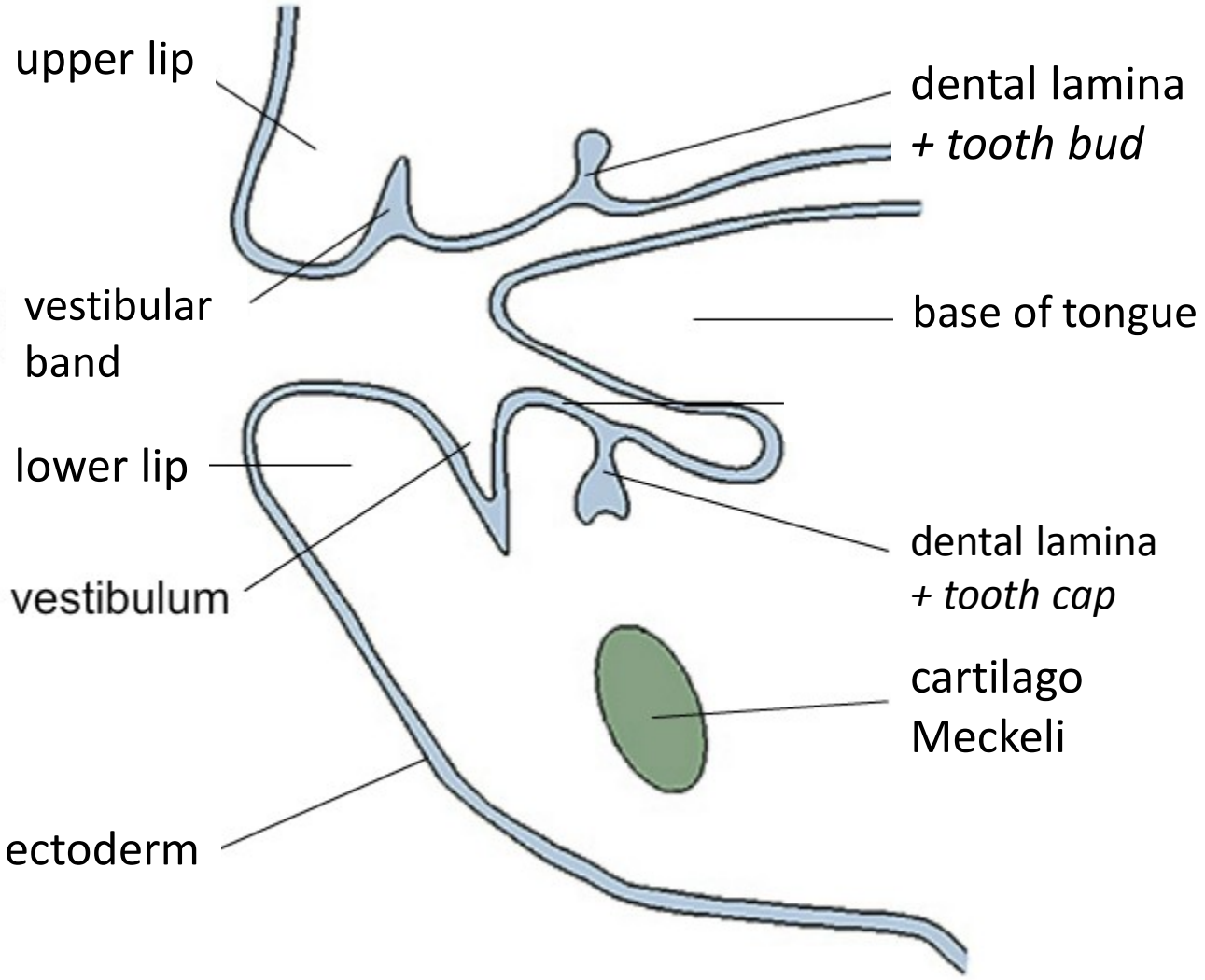


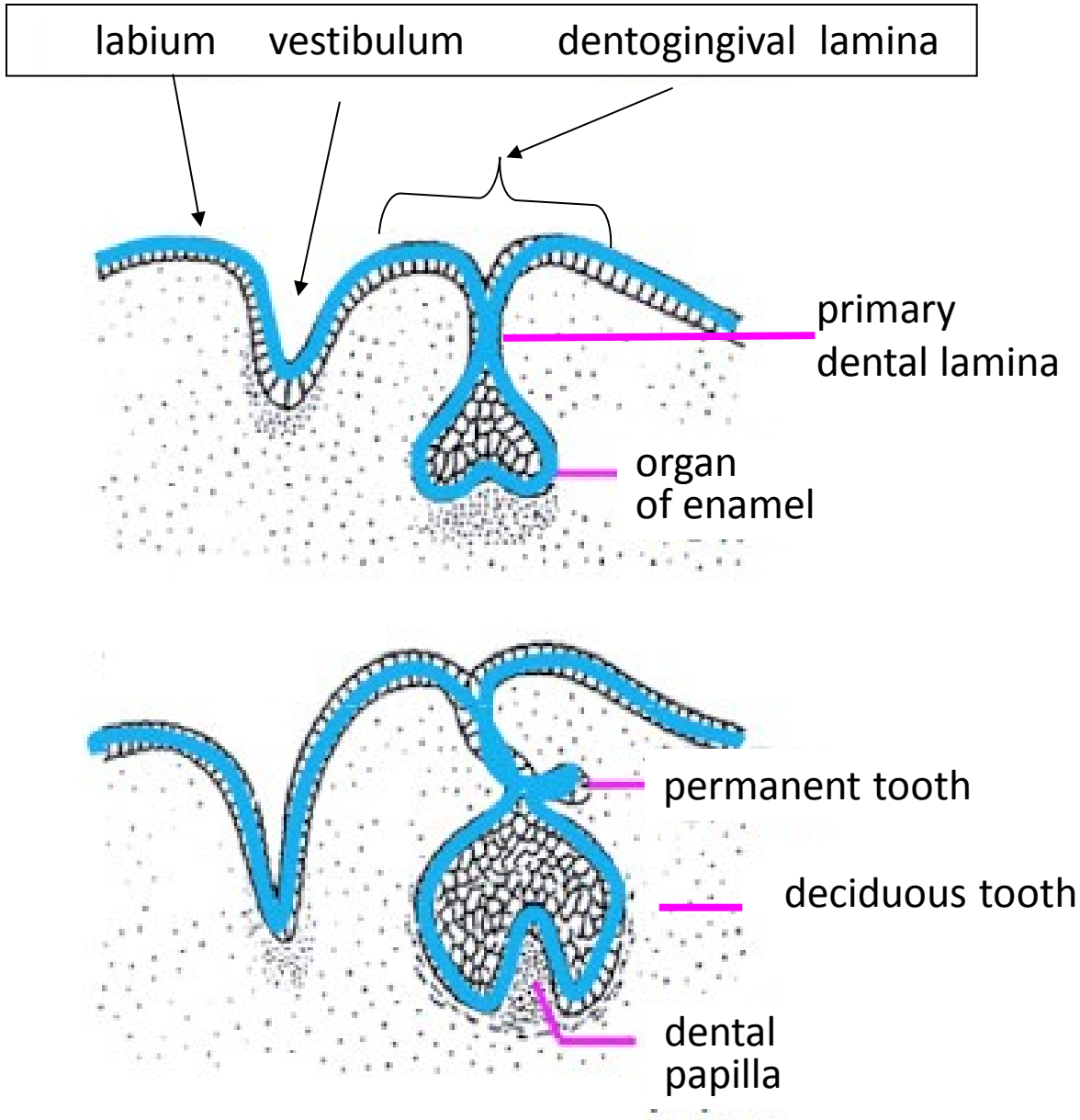

tongue (k),
foramen caecum (i),
ductus thyreoglossus (h),
gl. thyreoidea(ch),
thymus (e),
gll. parathyreoideae inf. (d),
gll. parathyreoideae sup.(f),
ultimobranchial corpuscle (g)

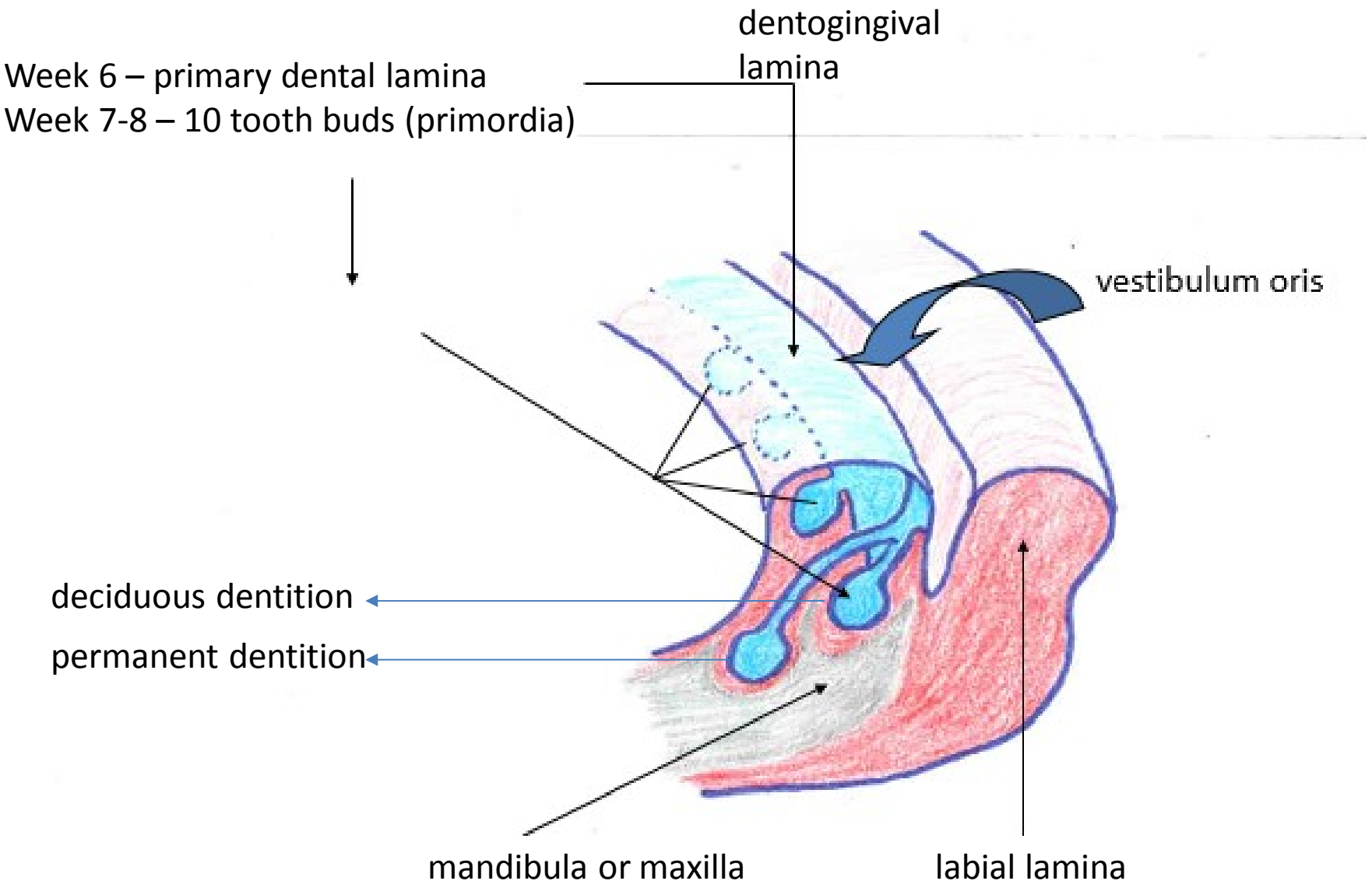
# Embryology

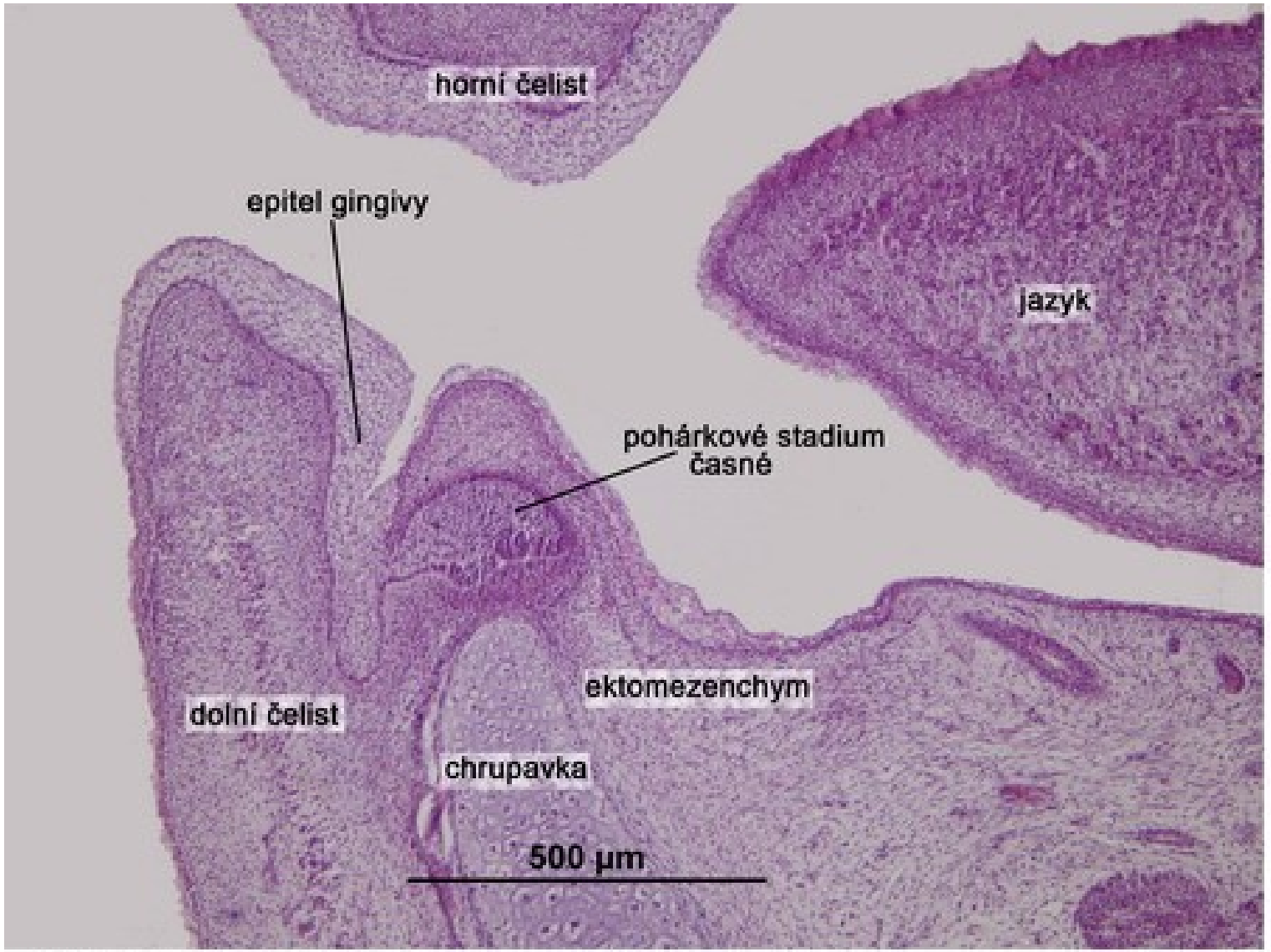
Development of the tooth

**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



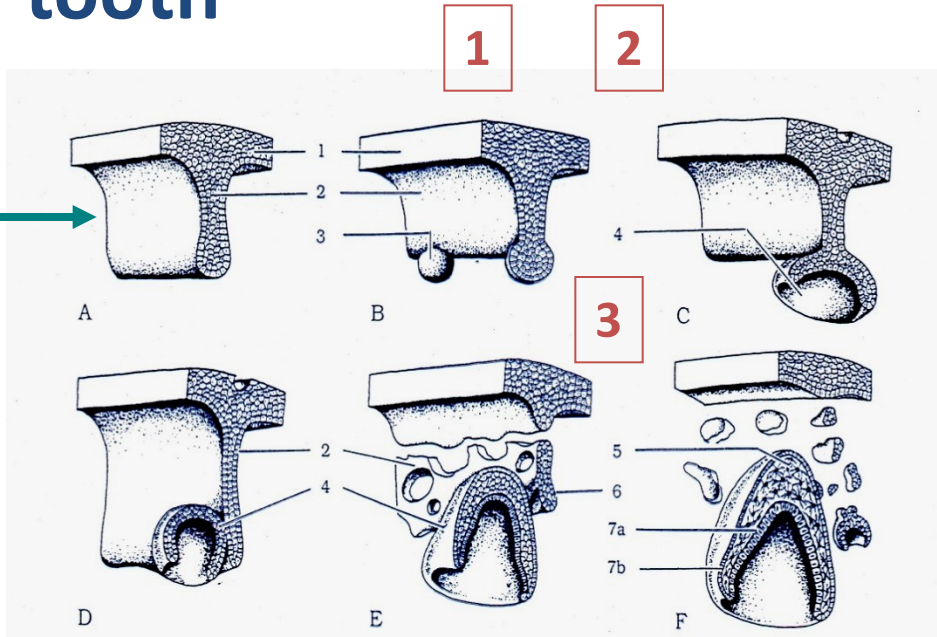

základ zubu
v mandibule

VÝVOJ ZUBU, barveno HE

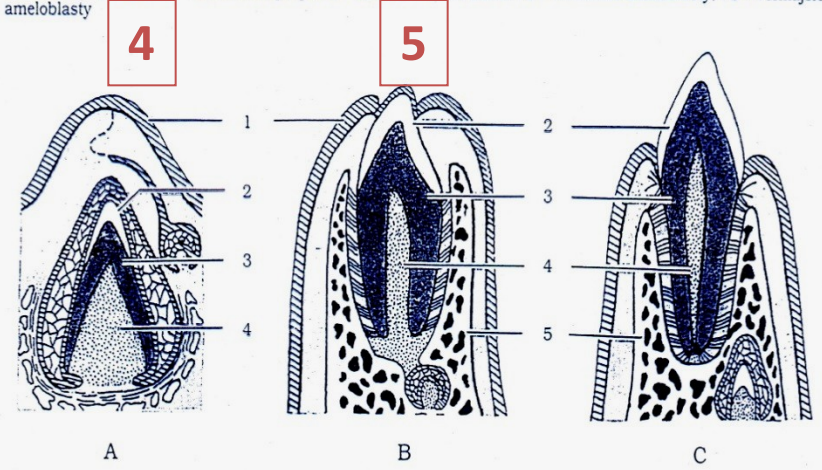
# Developmental stages of tooth

## 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)