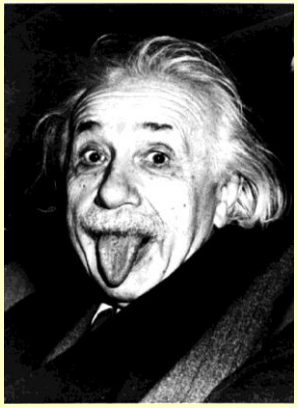
THE GASTROINTESTINAL TRACT



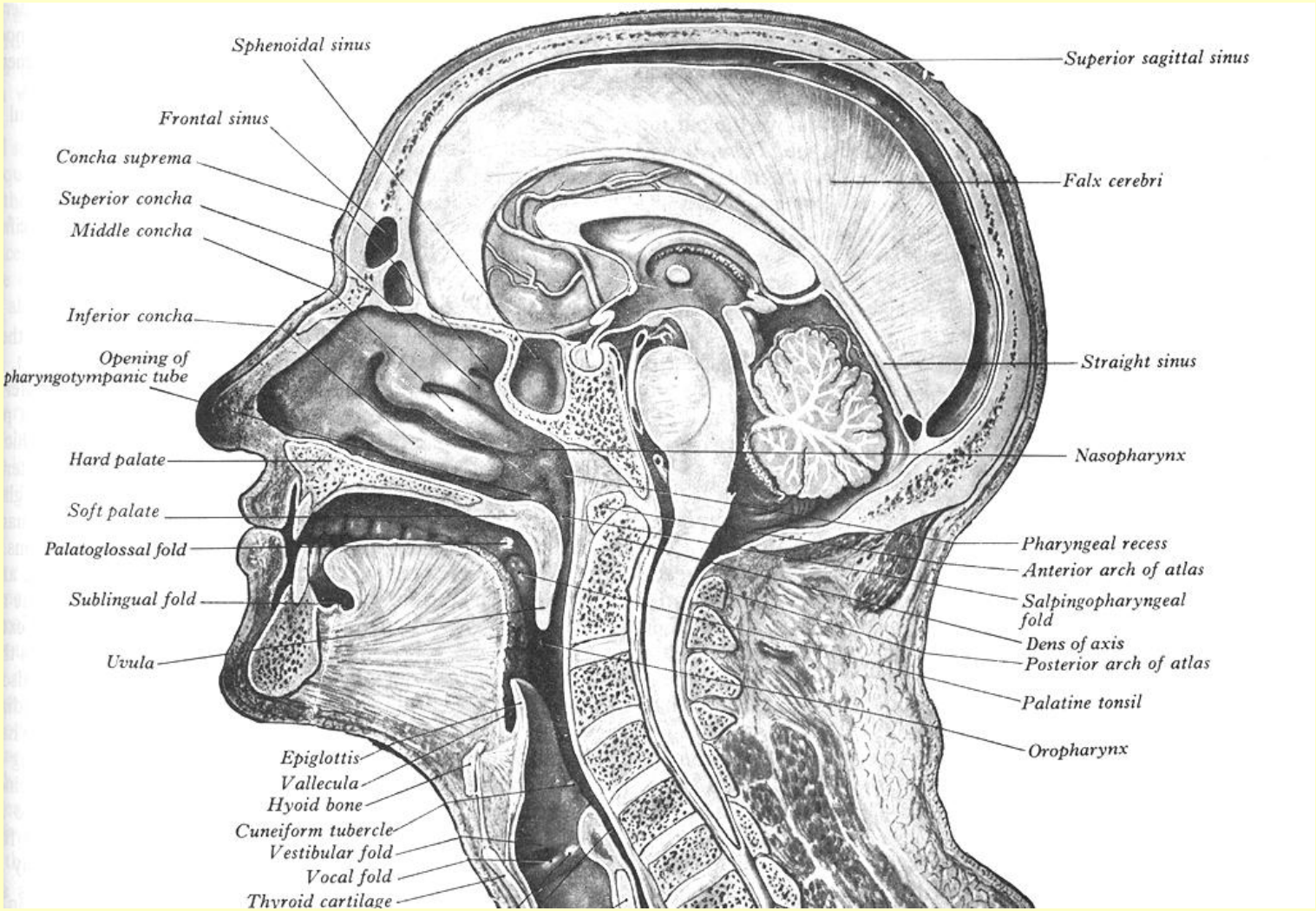
Tongue and Salivary Glands

Dr. Andrea D. Székely

Semmelweis University

Department of Anatomy,
Histology and Embryology
Budapest

ORAL CAVITY
ANATOMICAL RELATIONS

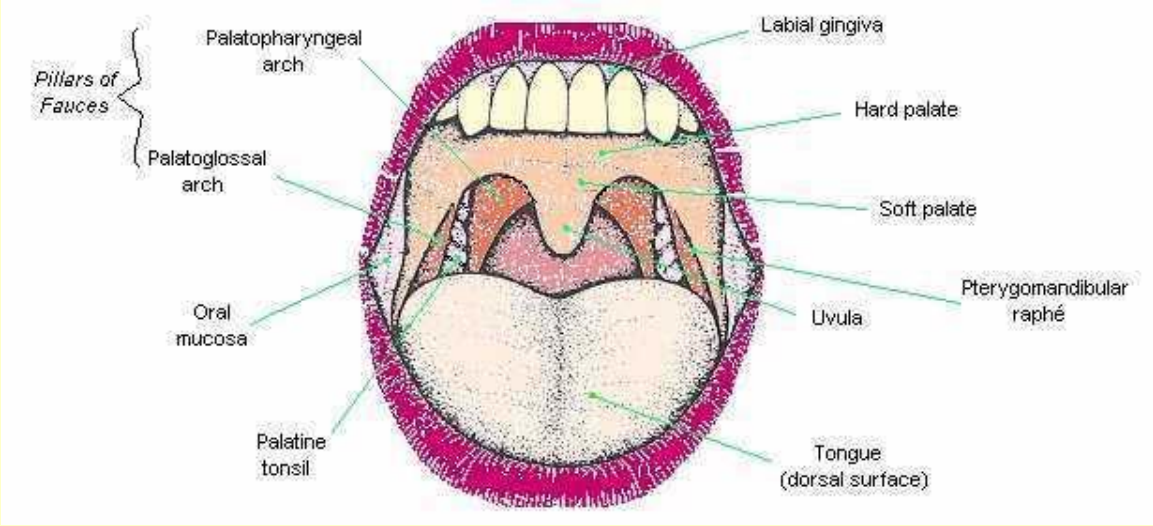


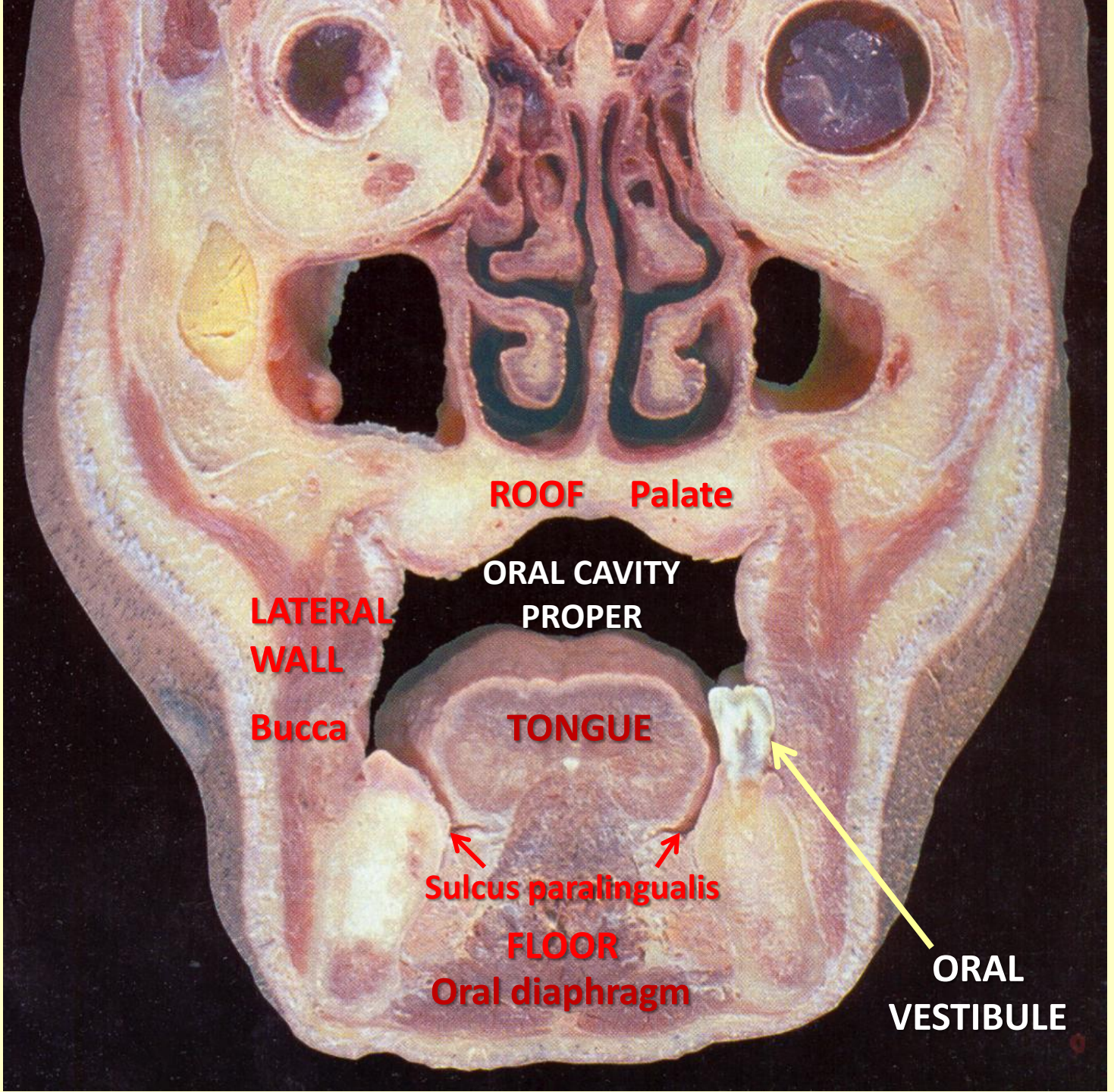
ORAL CAVITY

*Designed for **articulation in speech** and **mastication of food**, the oral cavity also functions as an **alternate airway**.*

BOUNDARIES

Anterior	*- lips*
Posterior	*- the anterior tonsillar pillars*
Roof	*- hard and soft palate*
Floor	*- mucosa overlying sublingual and submandibular glands + tongue.*
Walls	*- buccal mucosa*

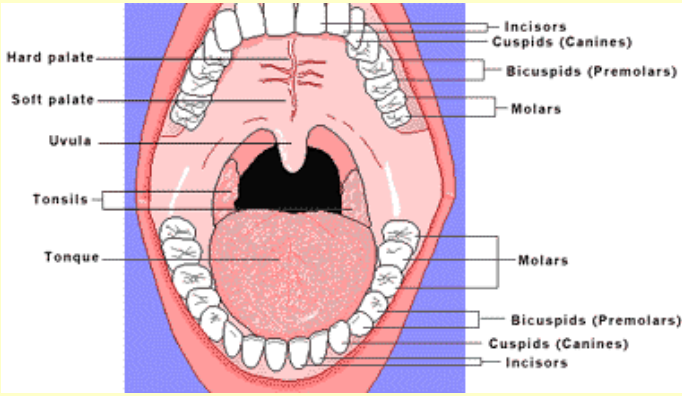



ROOF
Palate
ORAL CAVITY
PROPER
LATERAL
WALL
Bucca
TONGUE
Sulcus paralingualis
FLOOR
Oral diaphragm
ORAL
VESTIBULE

ORAL CAVITY

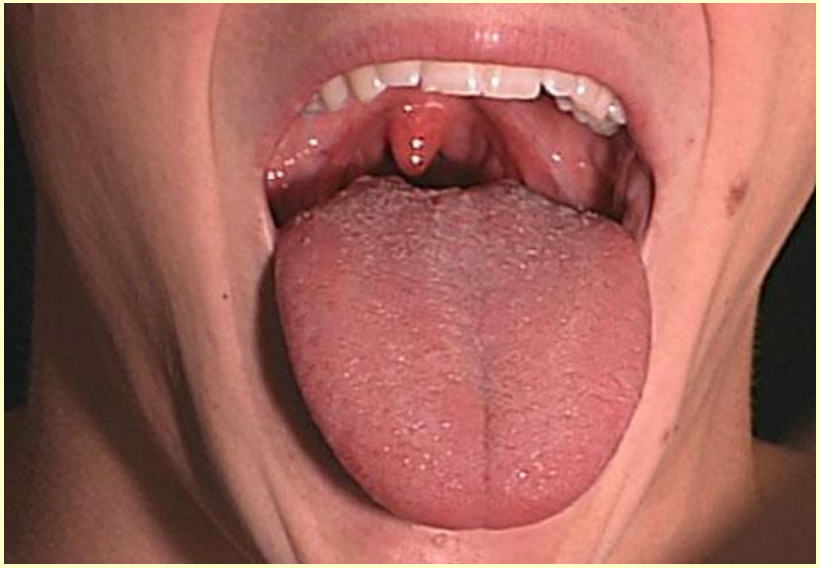
PARTS

Vestibule vs o.c. proper



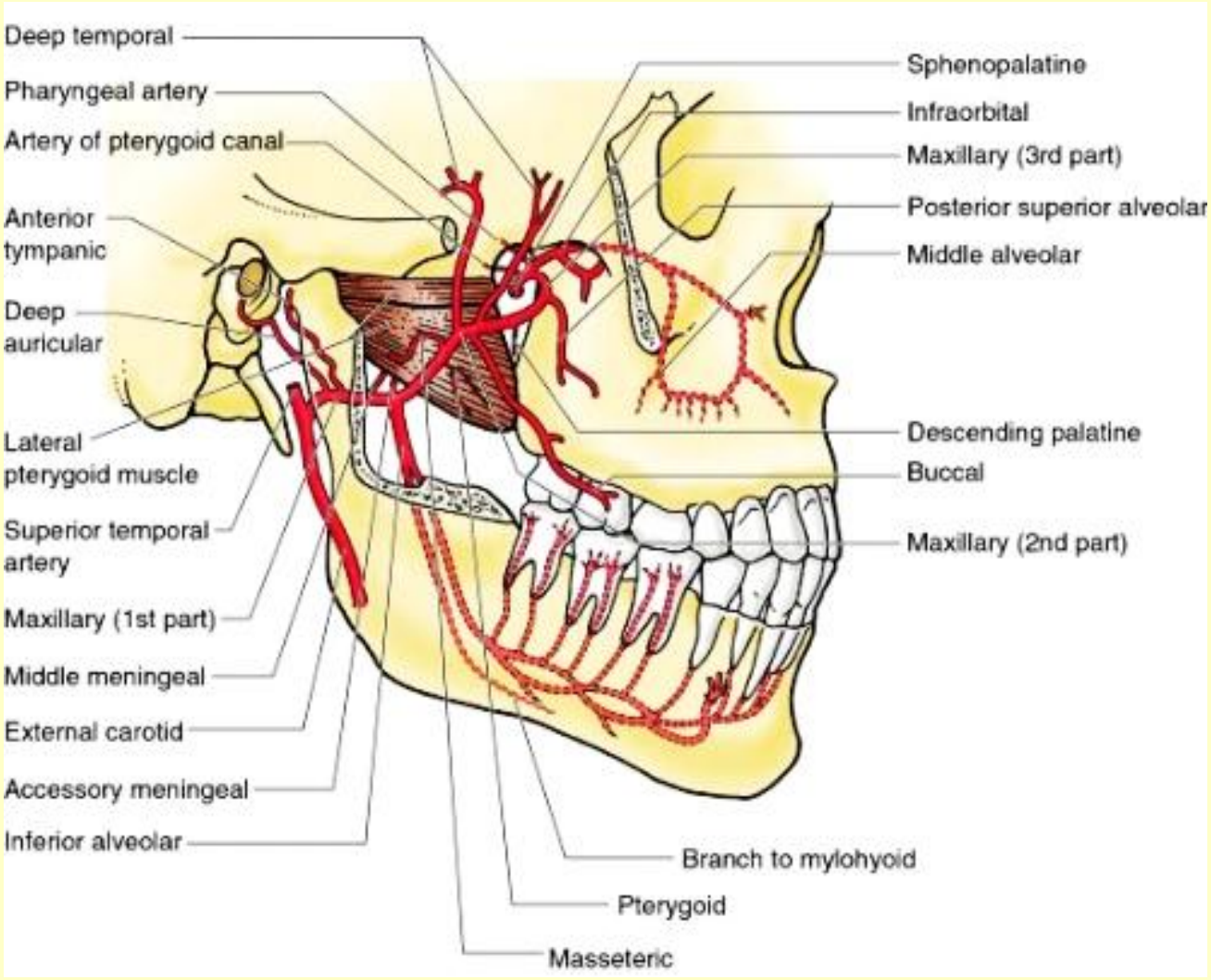
CONTENT

- *Alveolar processes and teeth*
- *Anterior part of tongue to circumvallate papillae*
- *Orifice of parotid duct (Stenon's duct) in buccal mucosa opposite upper second molars*
- *Orifice of submandibular duct (Wharton's duct) in anterior floor of mouth*
- *Orifices of sublingual glands*



BLOOD SUPPLY TO THE ORAL CAVITY

nasopalatine a.
asc. palatine a.
desc. palatine a.
lingual a.
buccal a.
sup. / inf. labial a.
infraorbital a.
inf. alveolar a.



CONTENTS OF THE ORAL CAVITY

MUCOSA (mucous membrane)

TONGUE

Teeth

SALIVARY GLANDS

Small mixed glands
(immediately under the mucosal layer)

&

LARGE, paired salivary glands
Lying EXTERNAL to the oral cavity
Parotid, submandibular, sublingual glands

PARTS OF THE TONGUE

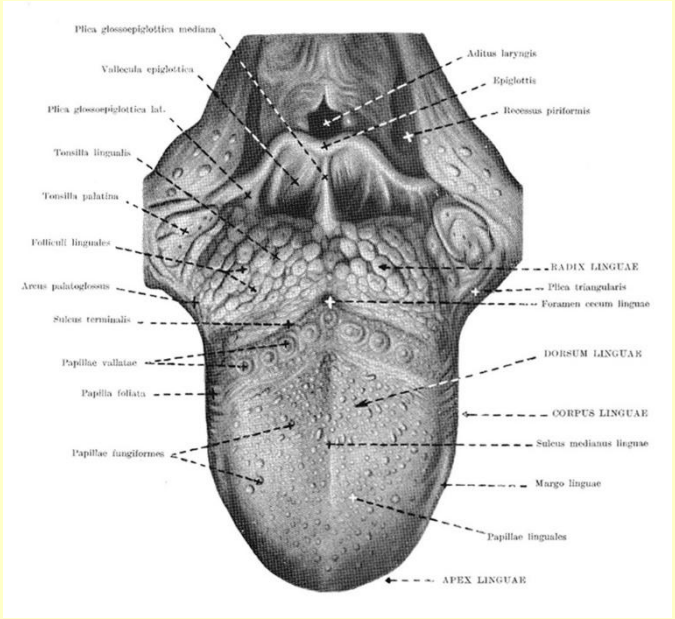
Radix linguae

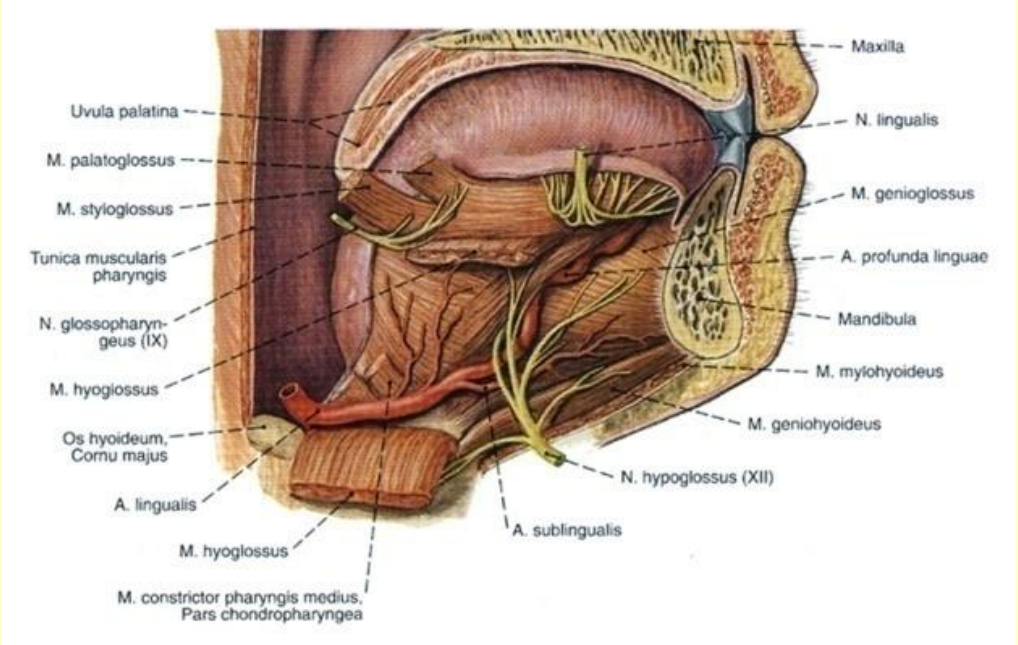
Corpus linguae

Dorsum linguae

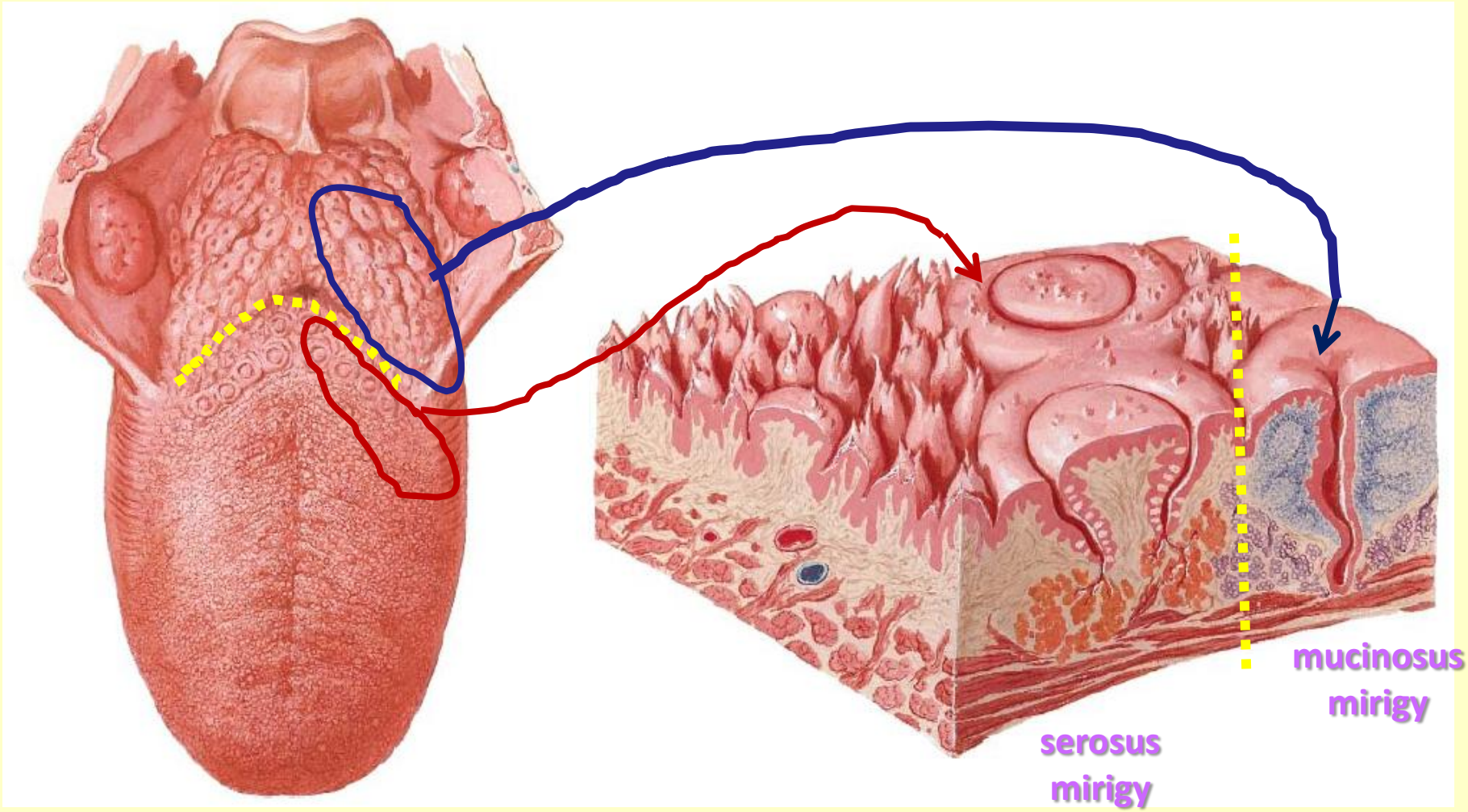
- **PARS FOLLICULARIS**
- *Sulcus terminalis*
- **PARS PAPILLARIS**

Apex linguae





FEATURES ON THE TWO SIDES OF THE SULCUS TERMINALIS



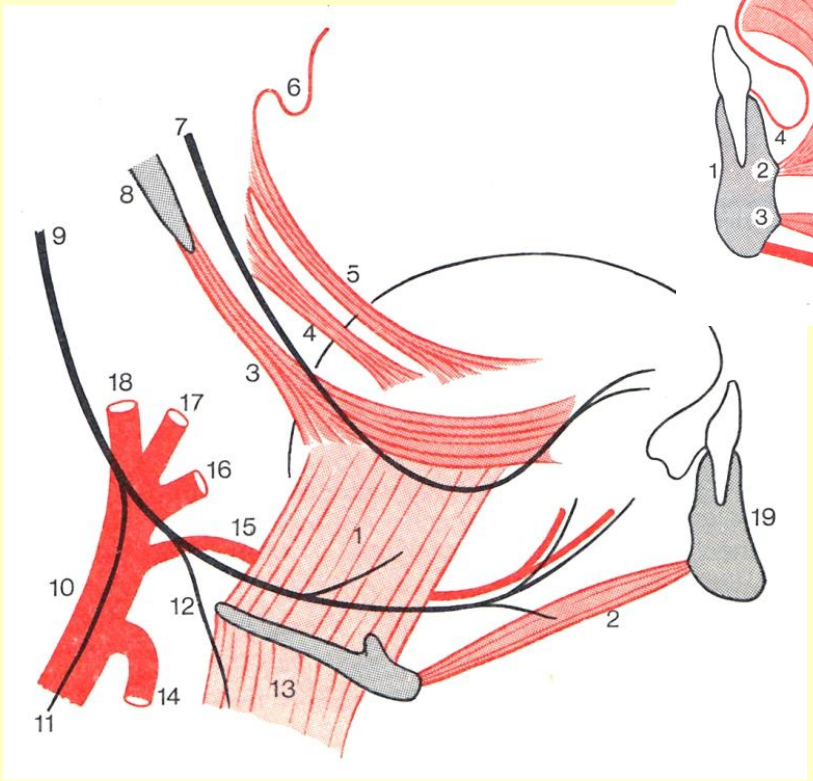
LINGUAL MUSCLES

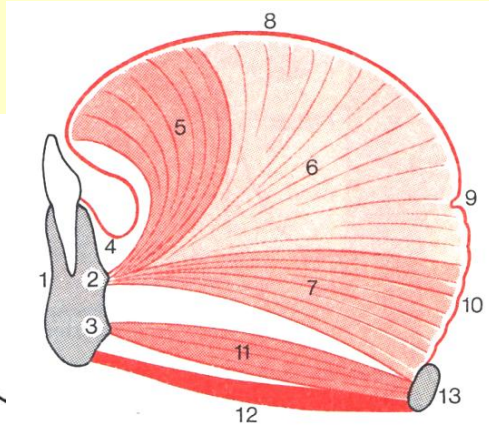
EXTRINSIC

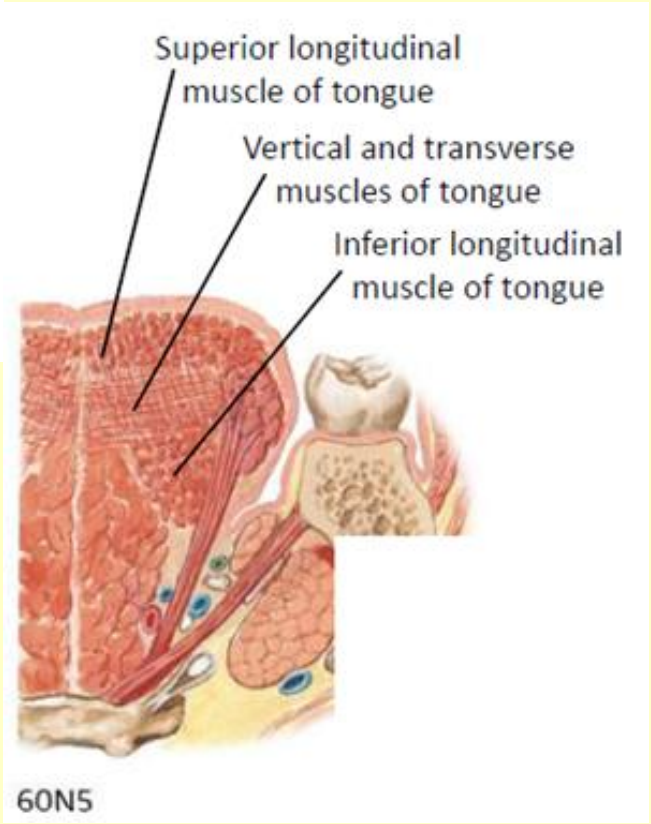
- palatoglossus
- styloglossus
- hyoglossus
- genioglossus

INTRINSIC

- verticalis
- tranversus
- longitudinalis sup
- longitudinalis inf.







THE INTERNAL AND EXTERNAL MUSCLES OF THE TONGUE

NAME	SHAPE	ORIGIN	POSITION	FUNCTION	INNERVATION
EXTRINSIC					
palatoglossus	bundle	palatal aponeur.	connects the soft palate to the side of the tongue	elevates the root of the tongue	pharyngeal plexus (from glossopharyngeus and vagus)
genioglossus	fan shaped	mental spine of the mandible	radiates towards the root and dorsum close to the midline	pulls the tongue forward	hypoglossal nerve (XII.)
hyoglossus	flat and square	body and greater horn of the hyoid bone	radiates in to the lateral edges	flattens the tongue	XII.
stylohyoideus	spindle shaped	styloid process of the temporal bone	reaches the lateral portions	pulls the tongue up and back	XII.
INTRINSIC					
longitudinalis - sup. - inf.	flat bundles	internal to the tongue	both stretch between the apex and the root - under the dorsum, along the midline; - deep, lateral to the genioglossi	shorten the tongue - lifts the apex - turns the apex down	XII.
transversus	solid mass	lingual septum	radiates slighty superior and inferior	thins and thickens the tongue	XII.
verticalis	separated, rudimentary portions of genioglossus and hyoglossus	hyoid bone, mandible	perpendicular bundles	flattens and thereby passively widens the tongue	XII.

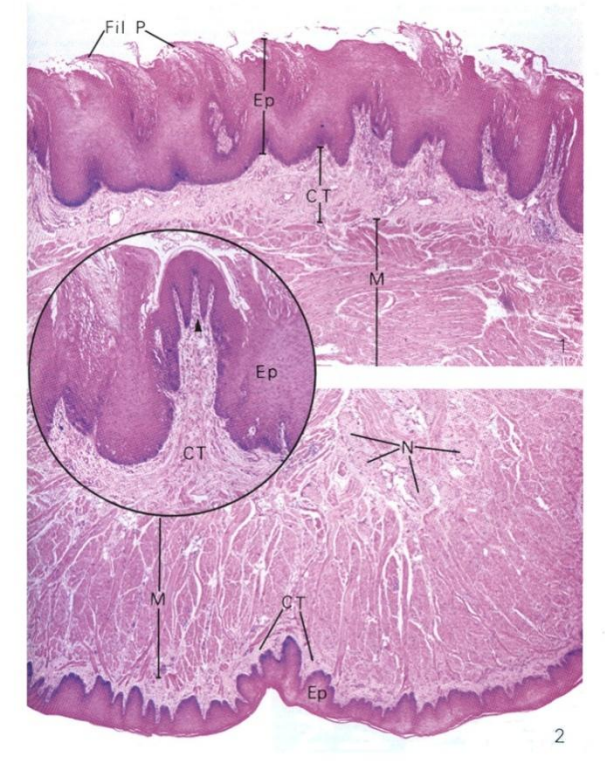
LINGUAL PAPILLAE

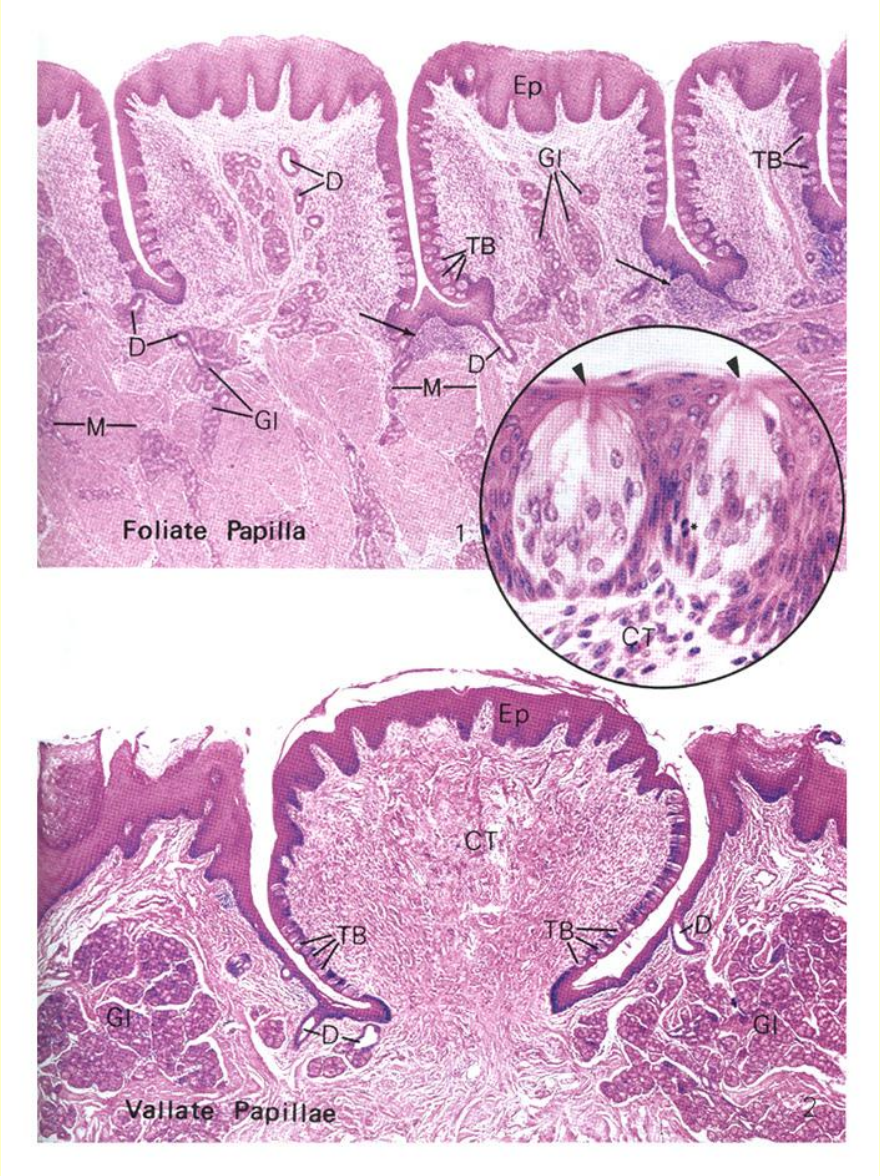
FILIFORM

FUNGIFORM (LENTIFORM)

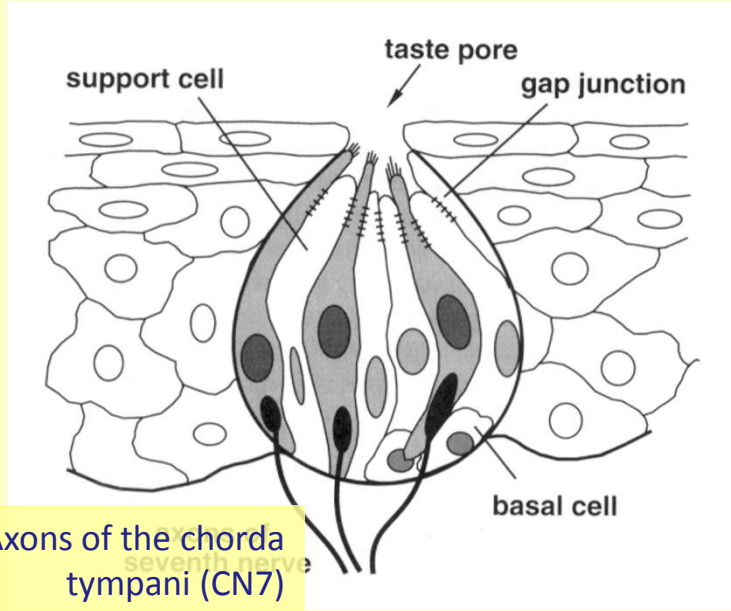
FOLIATE

CIRCUMVALLATE



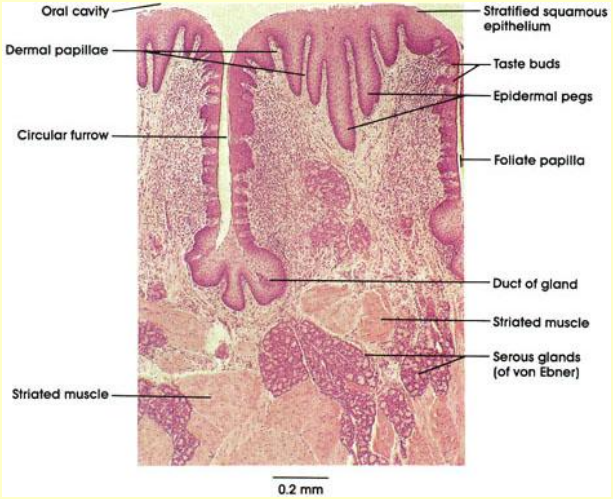


THE ORGAN OF TASTE

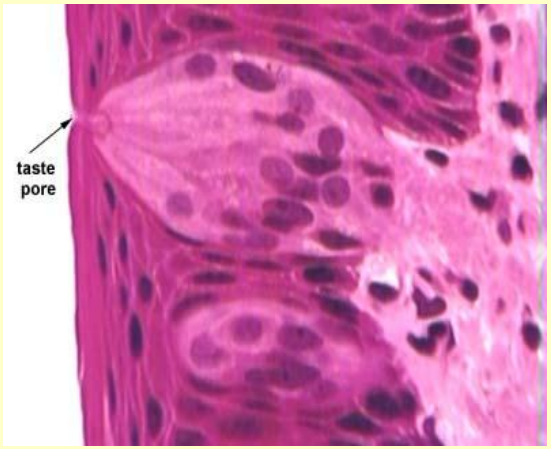


Axons of the chorda tympani (CN7)

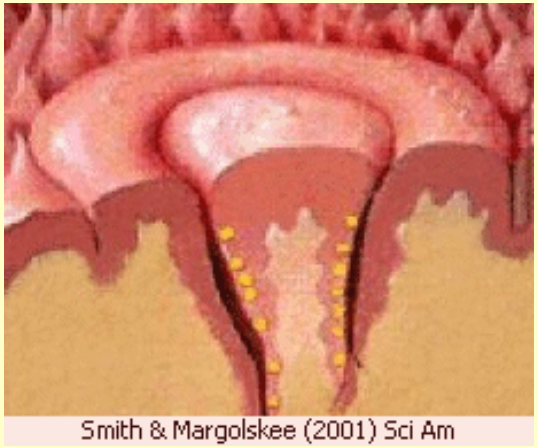
FOLIATE PAPILLA

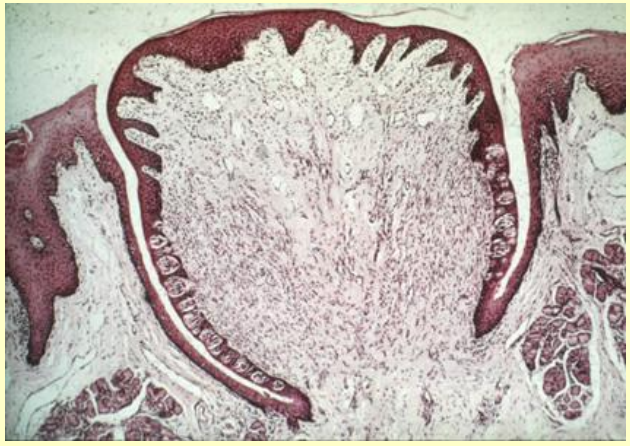


GEMMA GUSTATORIA



CIRCUMVALLATE PAPILLA





TASTE MAP OF THE TONGUE (??)

Misconception

Based on a publication from 1901

By Hänig, David

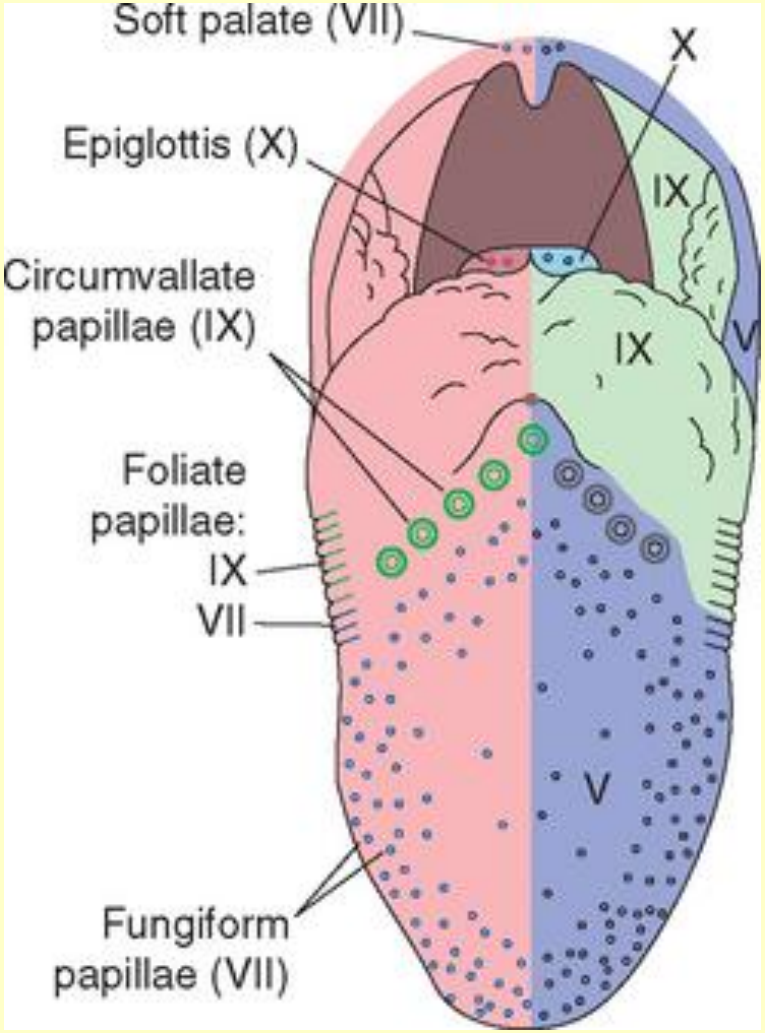
*. „Zur Psychophysik des Geschmackssinnes". Philosophische Studien. **17**: 576–623*

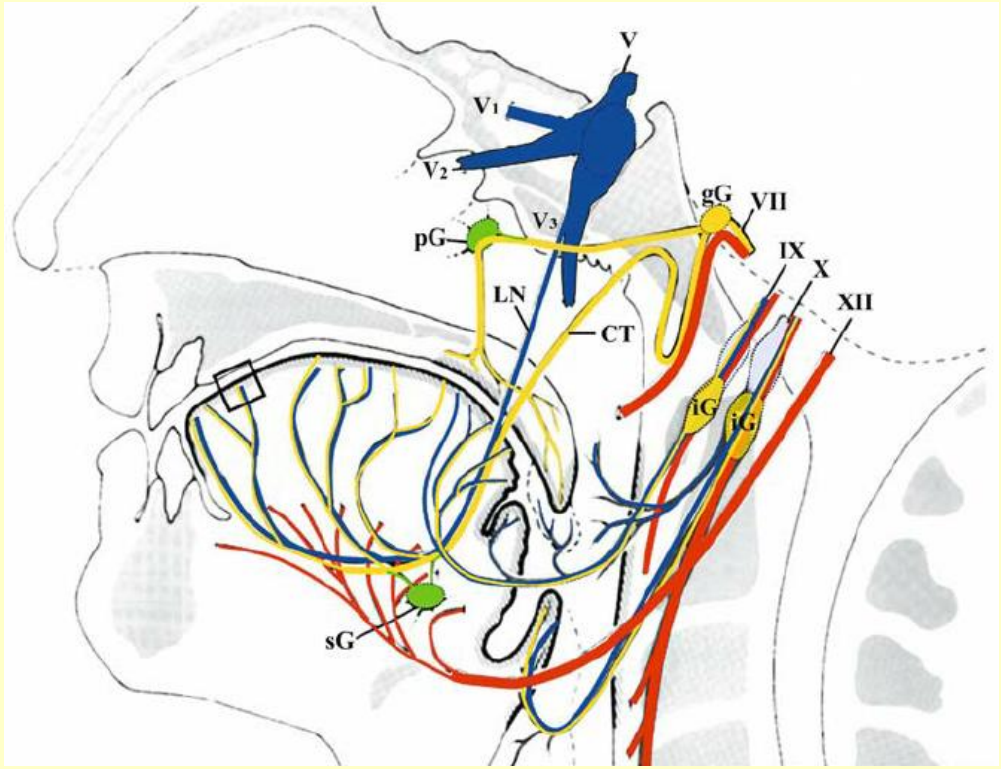
NEVER PROVED TO BE TRUE

„…all taste sensations come from all regions of the tongue, although different parts are more sensitive to certain tastes…”

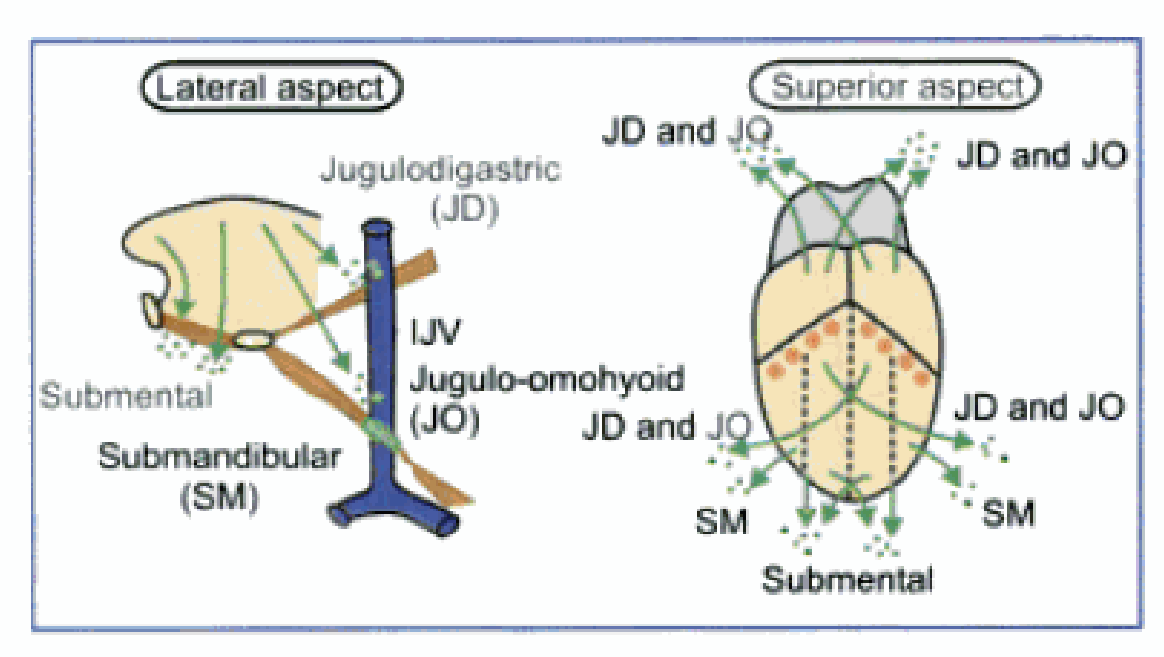
Collings, V. B. (1974). "Human Taste Response as a Function of Locus of Stimulation on the Tongue and Soft Palate". Perception & Psychophysics. 16: 169–174

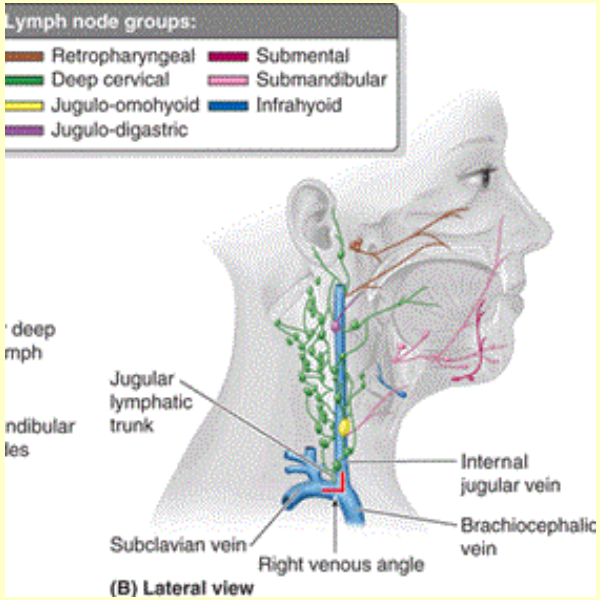
INNERVATION OF THE TONGUE

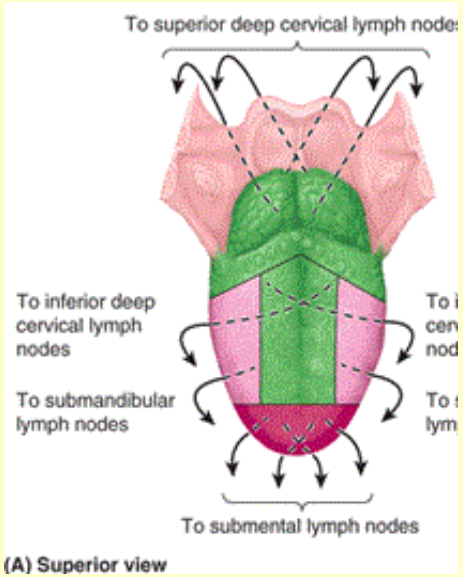




LYMPHATIC DRAINAGE



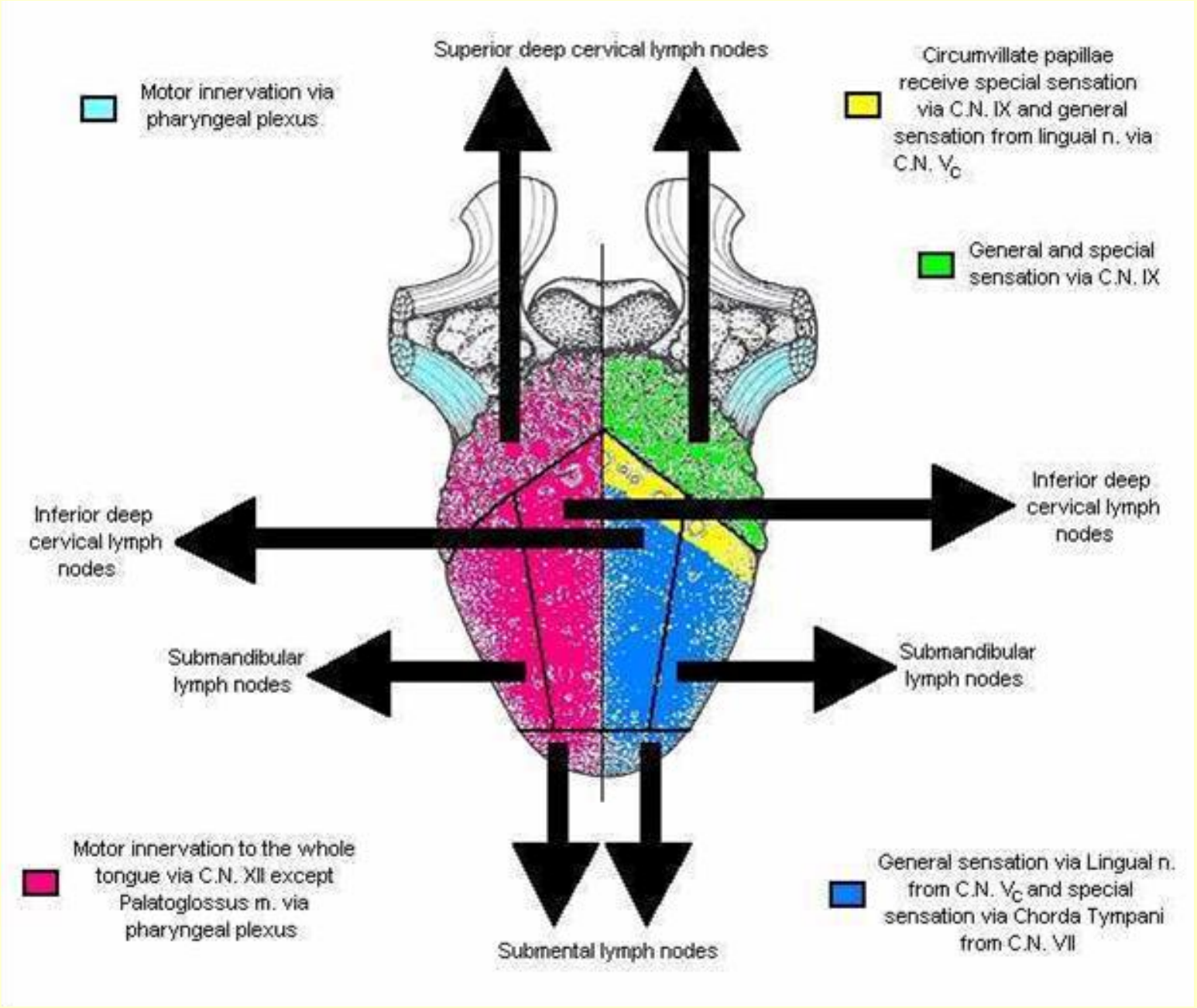




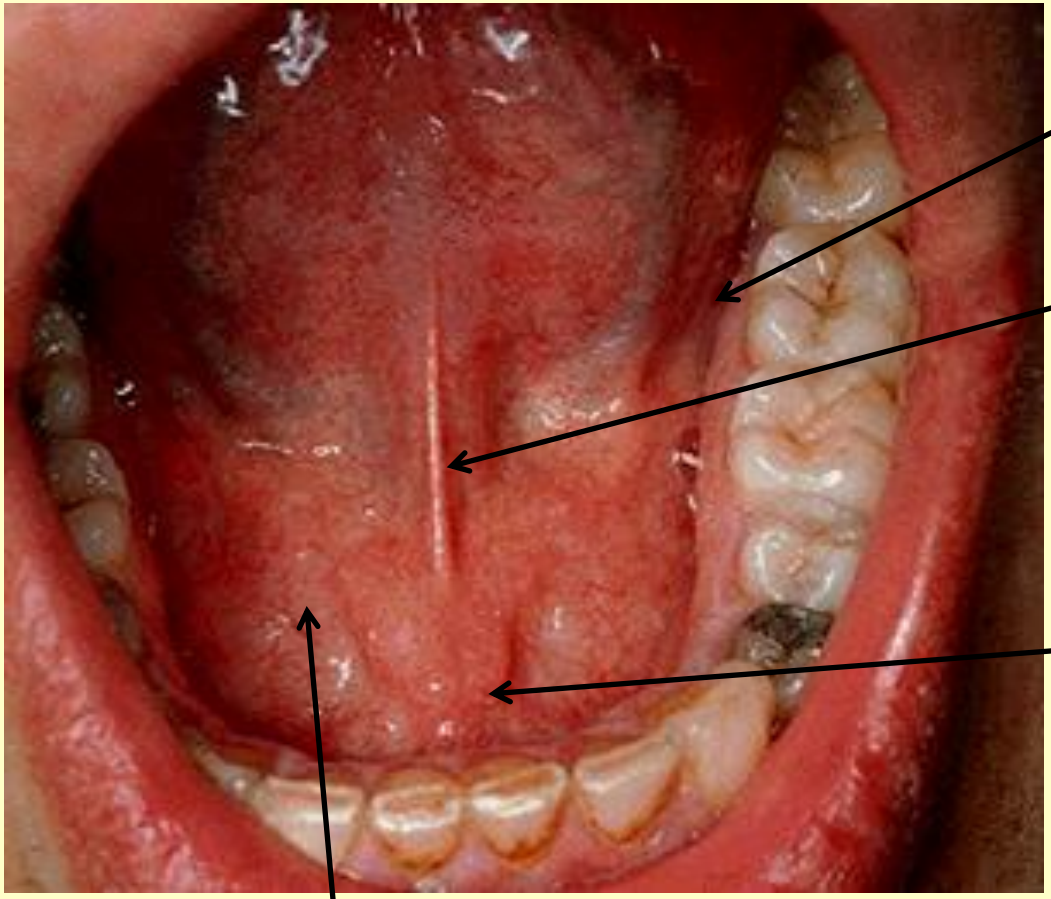
APEX	**Submental ly. Nn.**
DORSUM (med)	**inferior cervical (JO) ly. nn. bilat**
DORSUM (lat)	**submandibular ly. nn. unilat**
PARS TONSILLARIS	**superior cervical (JO & JD) ly. nn.**
EPIGLOTTIS **	**superior cervical ly. nn.**

There are less and less lymph vessels towards the larynx to prevent obliteration (laryngeal edema)

INNERVATION AND LYMPH DRAINAGE



SUBLINGUAL REGION

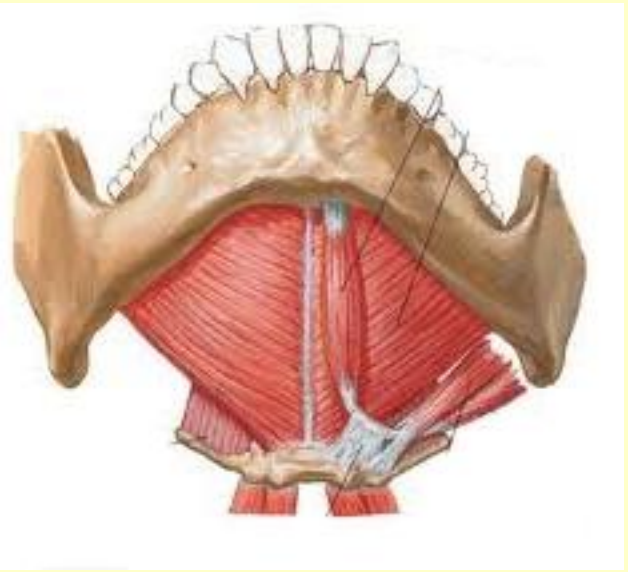


paralingual sulcus

lingual frenulum

Submandibular duct opens on the **sublingual caruncula** *together with the major sublingual duct*

sublingual gland – lies under the sublingual fold
the *minor sublingual ducts* open here along the fold

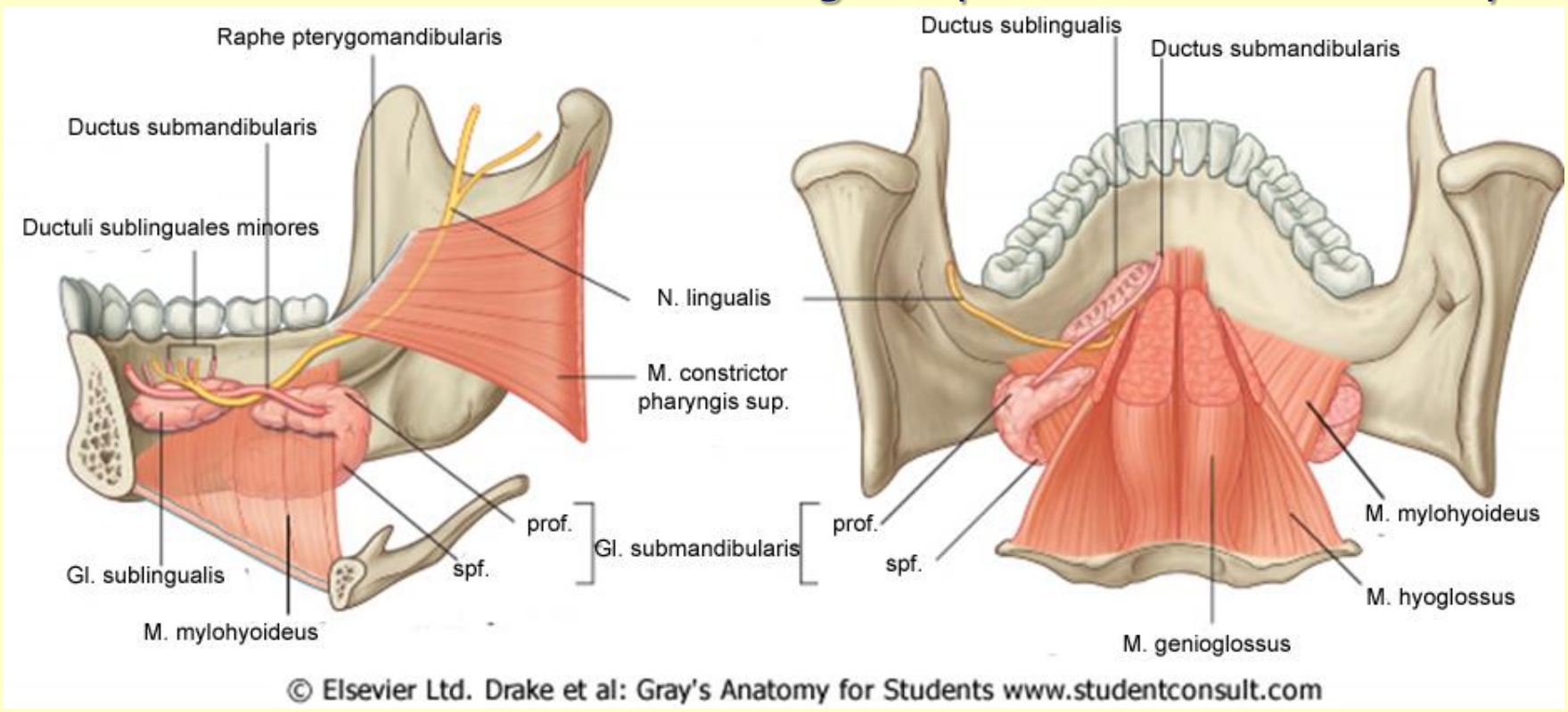


ORAL DIAPHRAGM

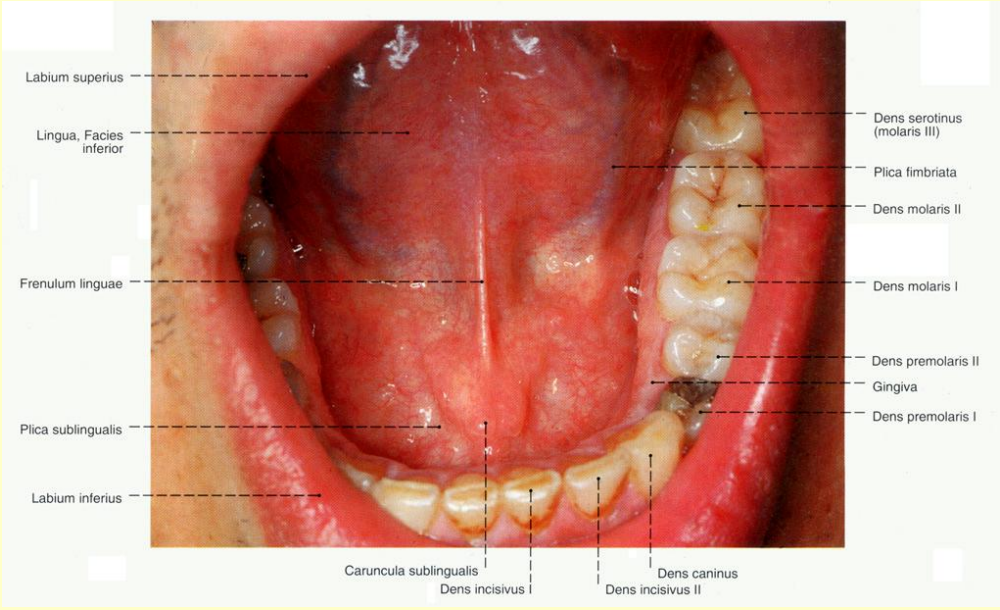
Mylohyoid + fasciae STRENGTHENED BY:
Geniohyoid (inside),
anterior belly of digastric (outside)

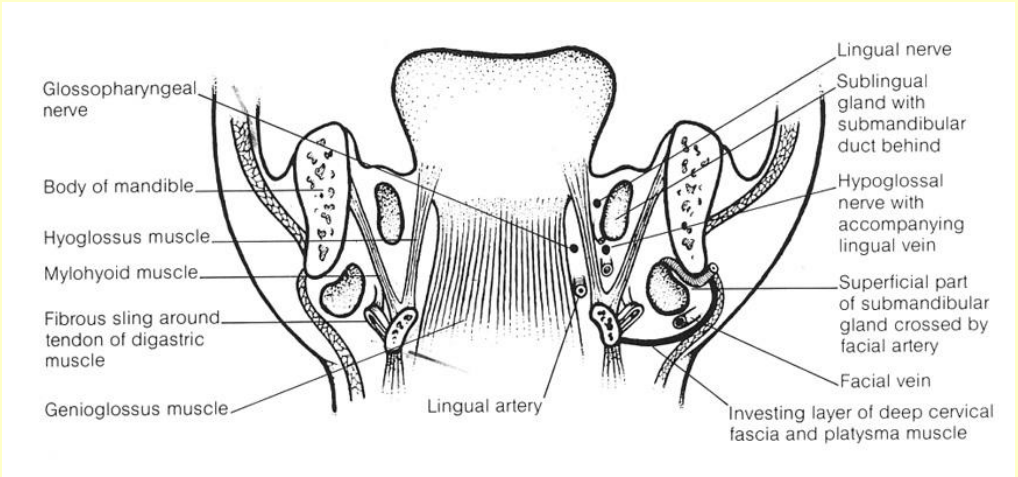
Action: opening odf the mouth,
Elevation of larynx, swallowing

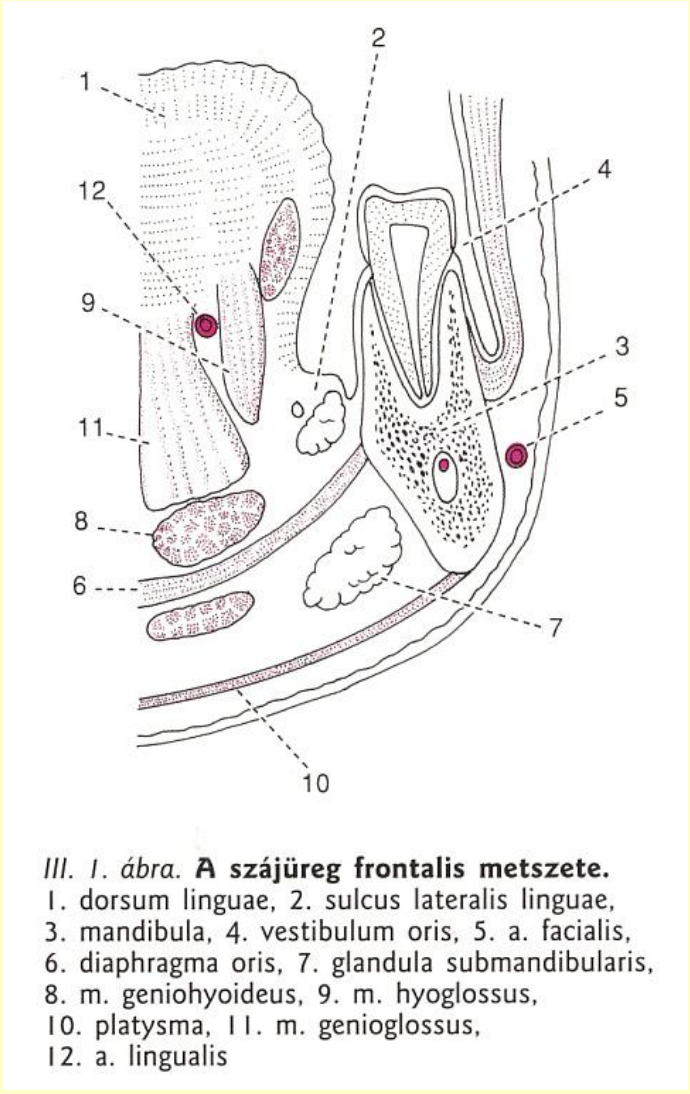
Increases the negative pressure of the oral cavity



FLOOR OF THE ORAL CAVITY







III. 1. ábra. **A szájüreg frontalis metszete.**
1. dorsum linguae, 2. sulcus lateralis linguae,
3. mandibula, 4. vestibulum oris, 5. a. facialis,
6. diaphragma oris, 7. glandula submandibularis,
8. m. geniohyoideus, 9. m. hyoglossus,
10. platysma, 11. m. genioglossus,
12. a. lingualis

CONTENTS OF THE ORAL CAVITY

MUCOSA (mucous membrane)

TONGUE

Teeth

What makes the MUCOSA mucous?

SALIVARY GLANDS

Small mixed glands
(immediately under the mucosal layer)

&

LARGE, paired salivary glands
Lying EXTERNAL to the oral cavity
Parotid, submandibular, sublingual glands

WHERE DO WE HAVE SMALL SALIVARY GLANDS?

SMALL GLANDS ARE FOUND IN THE BUCCAL/LABIAL MUCOSA

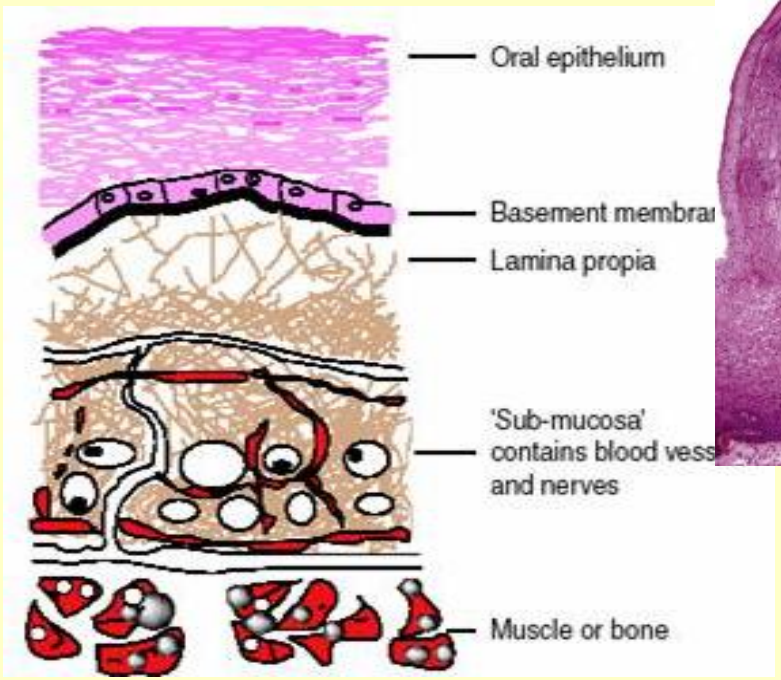
mucous membrane

lamina propria /submucosa (buccal glands and aperture of the parotid duct)

Buccinator

Bichat fat pad

skin



SALIVARY GLANDS IN GENERAL

PARENCHYMAL ORGANS
LOBULAR STRUCTURE

COMPOUND GLANDS

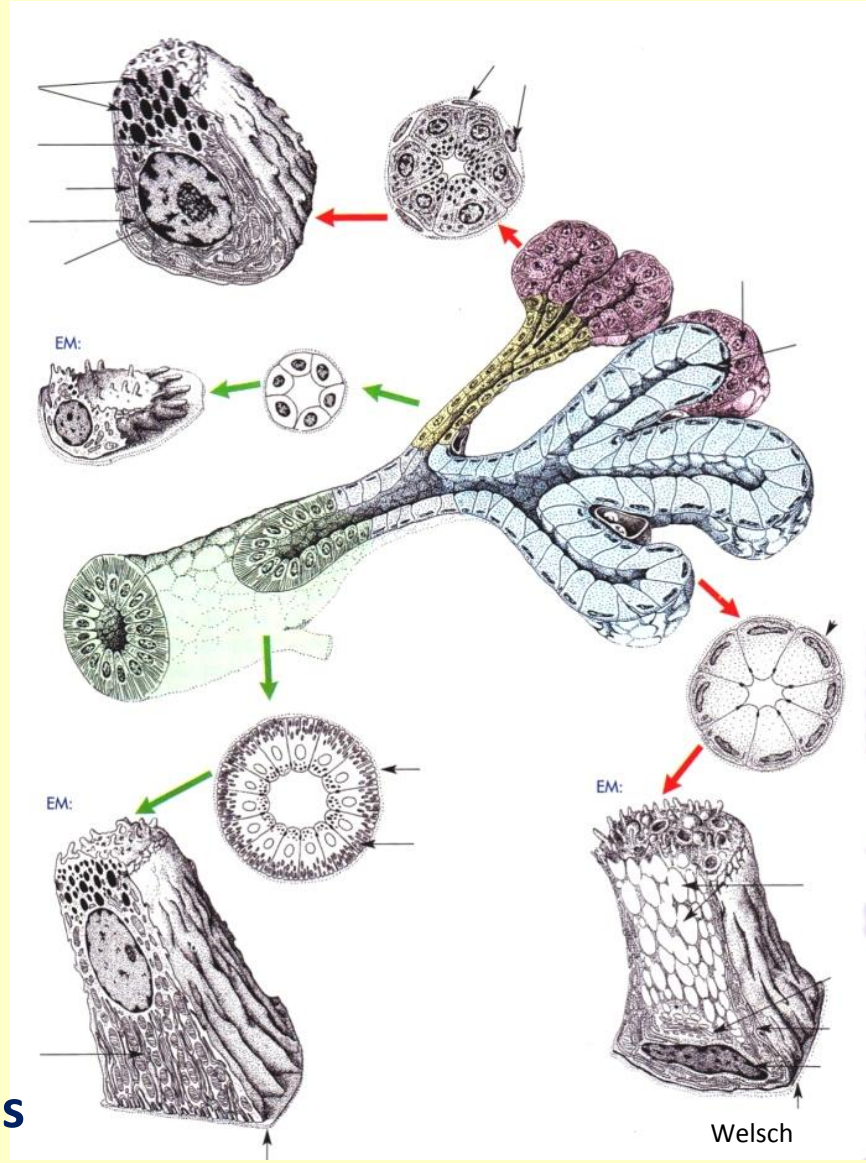
TUBULOALVEOLAR *morphology*

ACINUS & EXCRETORY DUCT

MEROCRINE SECRETION

MIXED SECRETORY PRODUCT
serous
mucous
Gianuzzi's demilune

Myoepithelial cells surround the acinus



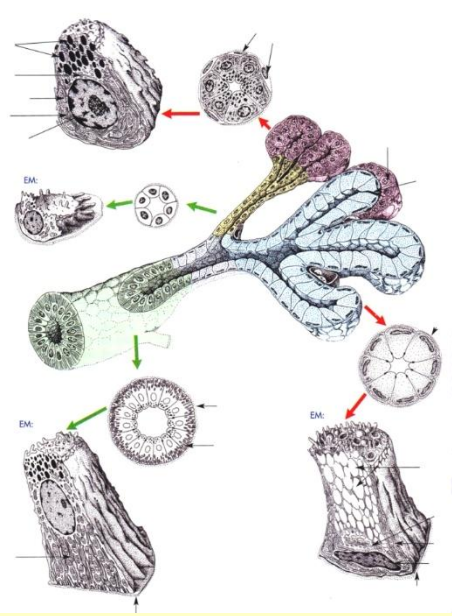
EXCRETORY DUCTS

- intercalated duct (flat cuboidal)
- salivary or *striated* – high cuboidal)

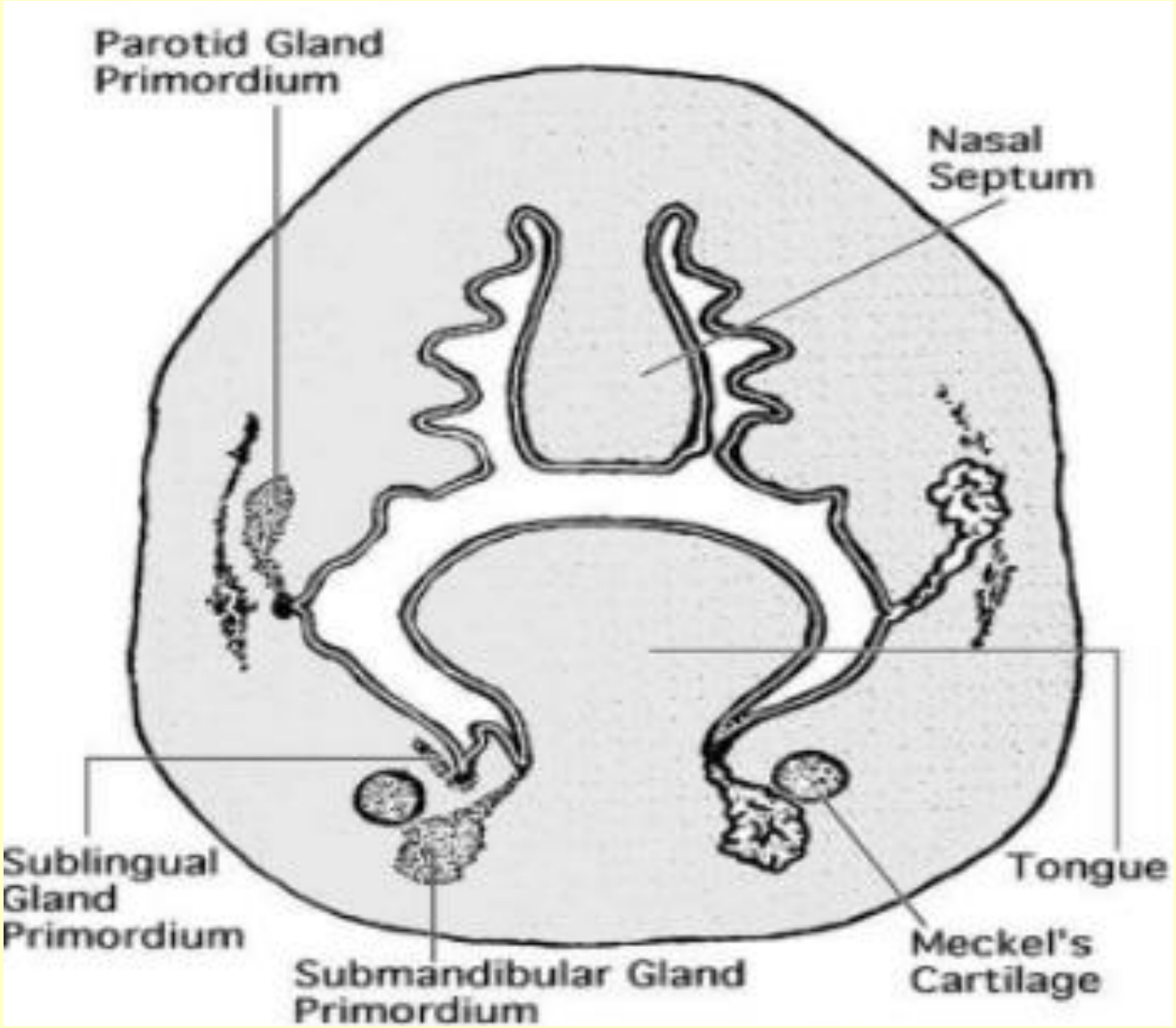
Intralobar excretory duct (simple columnar)

Interlobar excretory duct (two layered columnar)

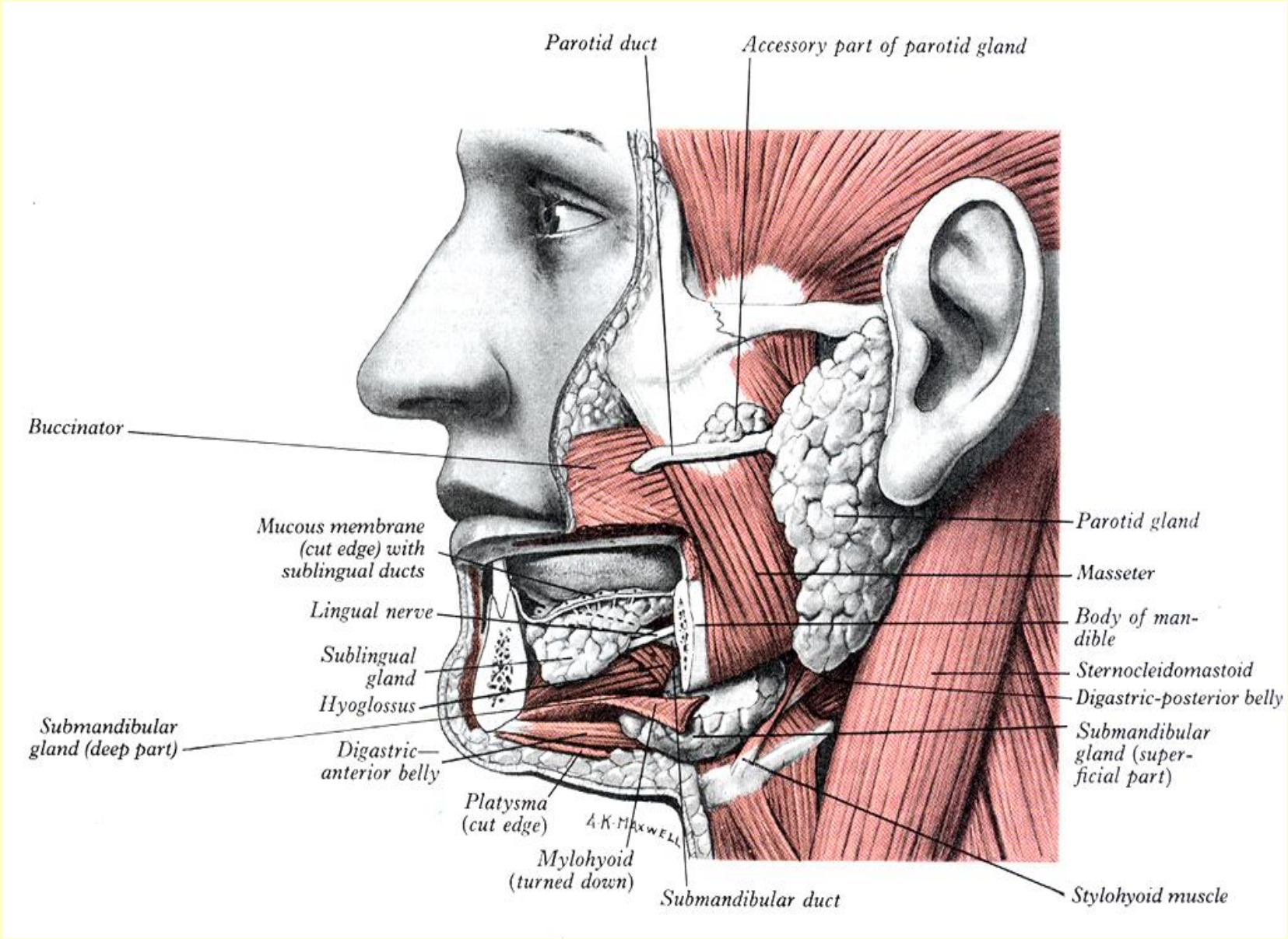
Large excretory duct (oral epithelium)



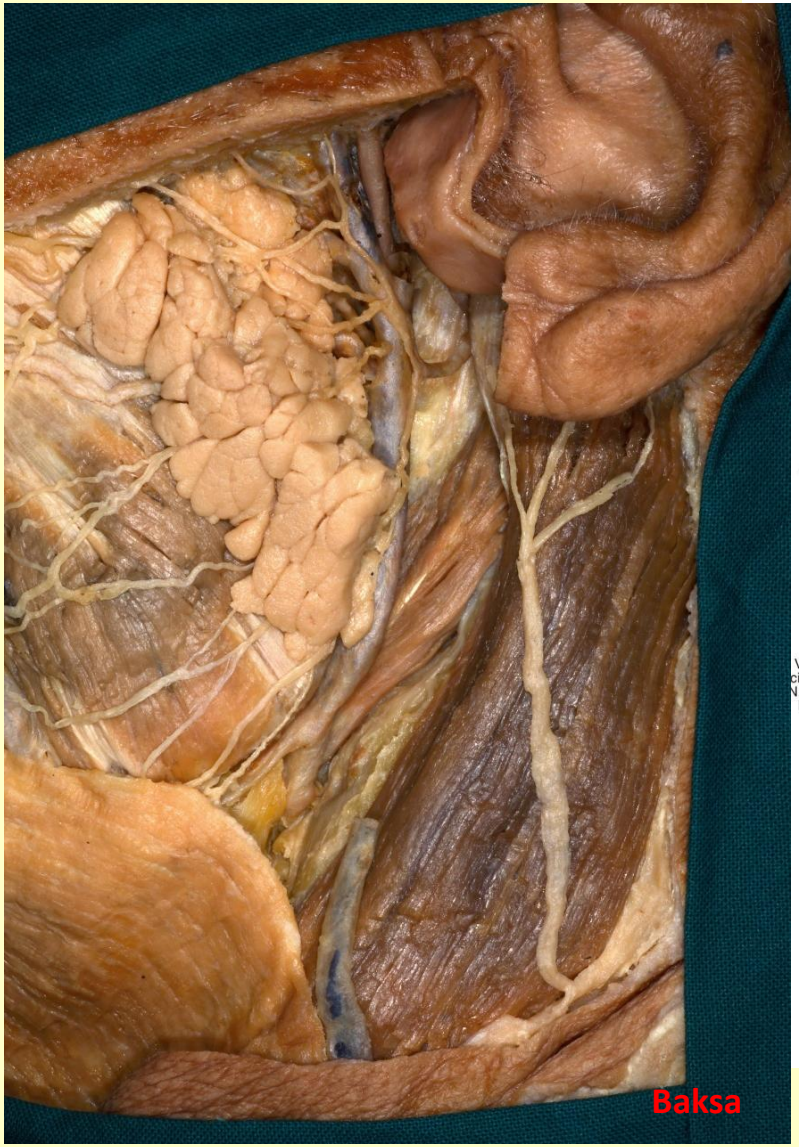
DEVELOPMENT OF LARGE SALIVARY GLANDS



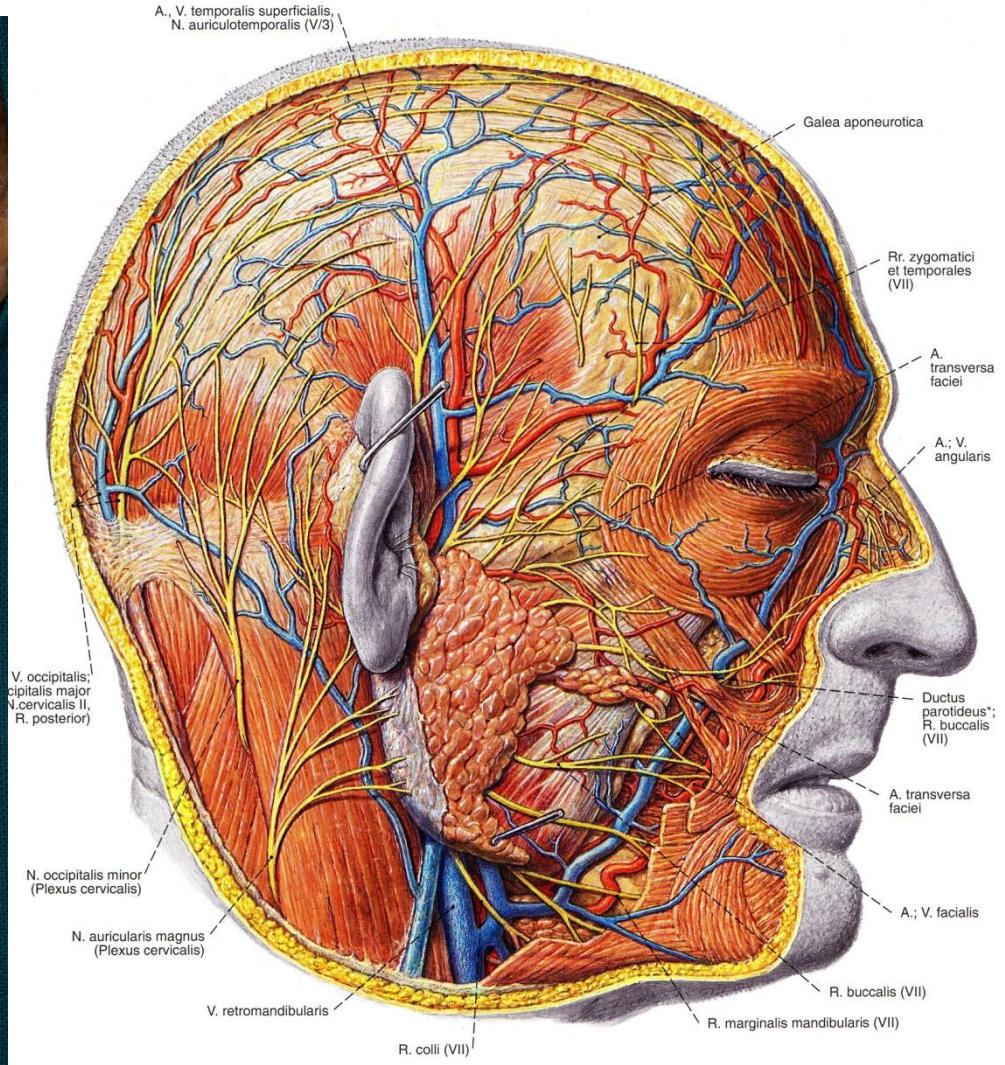
POSITION OF SALIVARY GLANDS



PAROTID GLAND

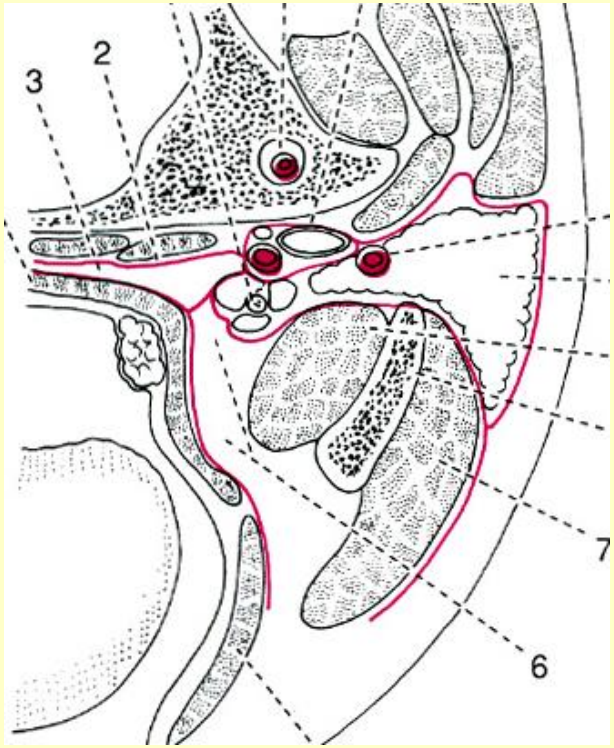


Baksa



Sobotta

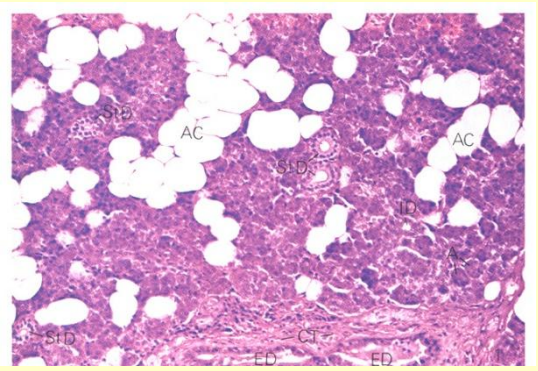
PAROTID GLAND



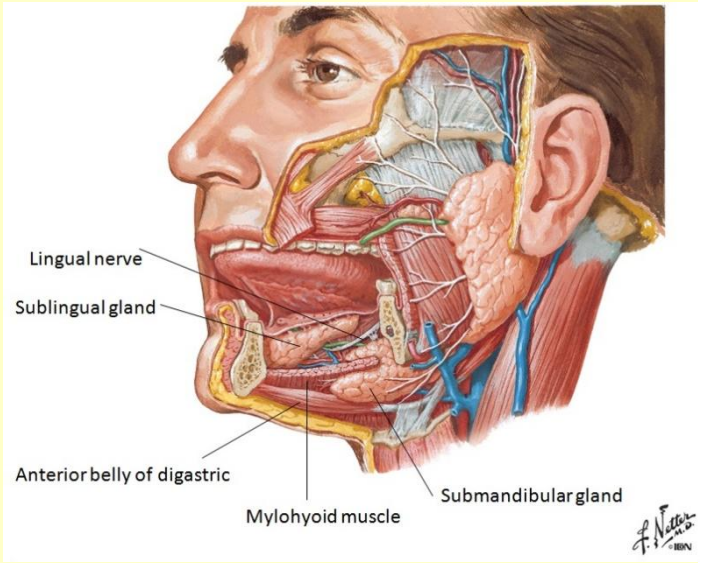
Parotideomasseteric fascia
Parotid duct (*Stenon*) + accessory lobe
Auriculotemporal n.
Facial n.
Superficial temporal artery and vein

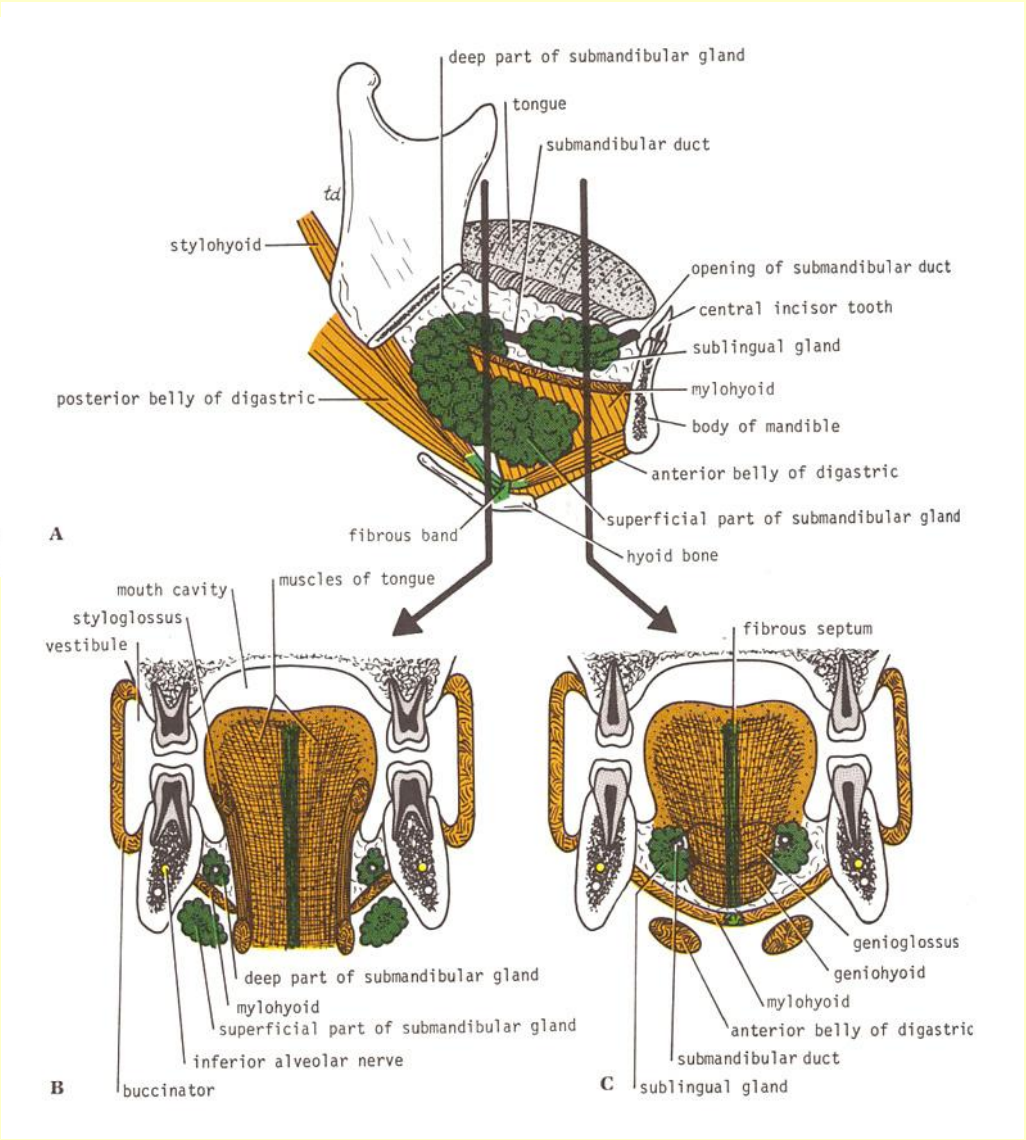
PAROTID NEST
anterior: masseter
mandibular ramus
med. pterygoideus med.
Posterior m.sternocleidomastoid
m. digastricus
medial: m. stylohyoideus
m. stylopharyngeus
m. styloglossus

lobular structure
tubuloalveolar acini
serous secretion

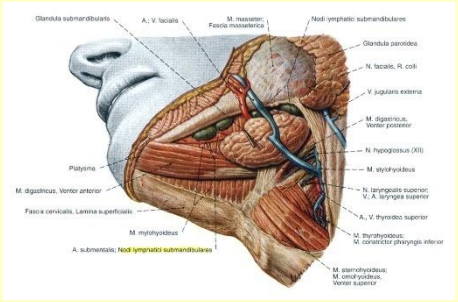


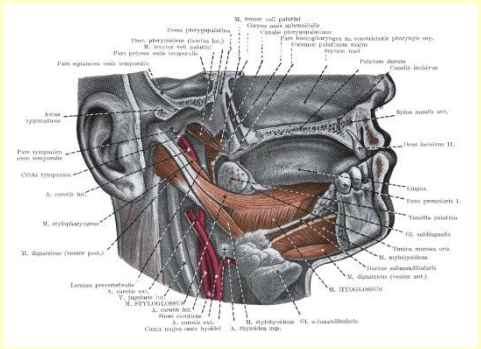
POSITION OF THE SUBMANDIBULAR AND SUBLINGUAL GLANDS

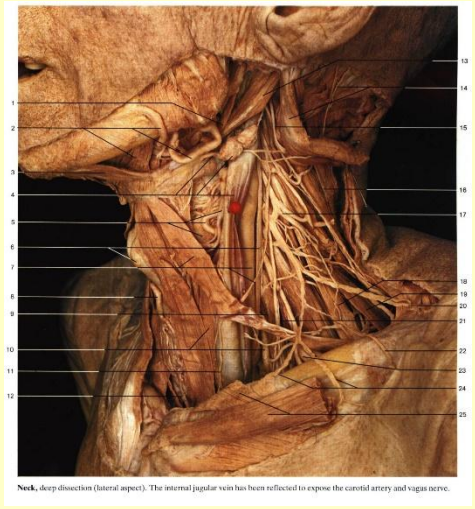




SUBMANDIBULAR GLAND






Neck, deep dissection (lateral aspect). The internal jugular vein has been reflected to expose the carotid artery and vagus nerve.

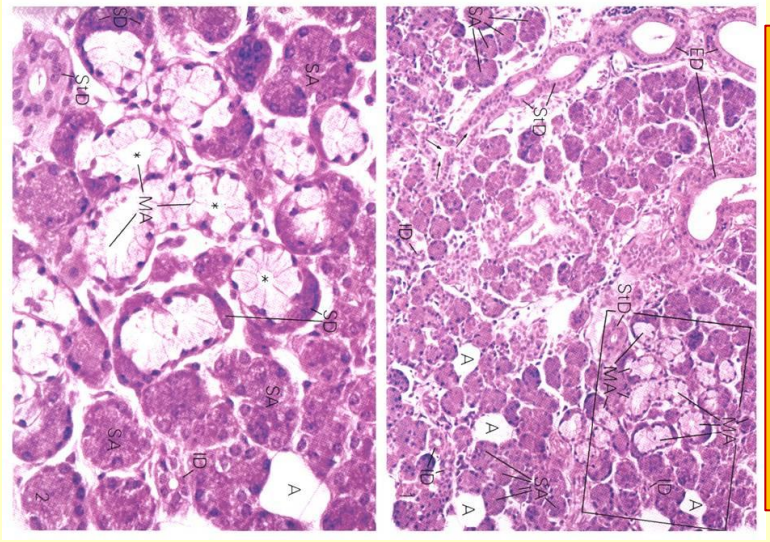
Divided into (smaller) superficial and deep lobes separated by the mylohyoid muscle

Submandibular duct (*Wharton*) in the sulc. lat. linguae

Opens through the sublingual caruncula together with the major sublingual duct (*Bartholin*)

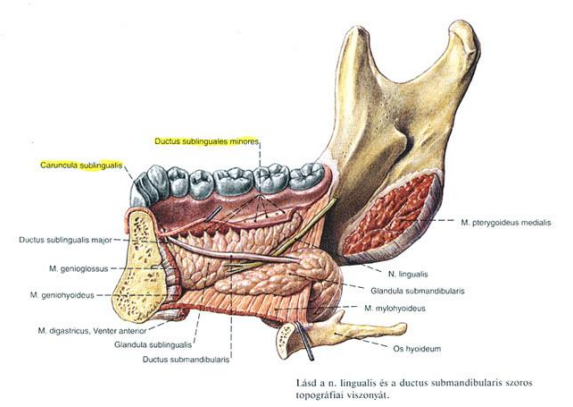
Facial artery and vein

Submandibular trigone

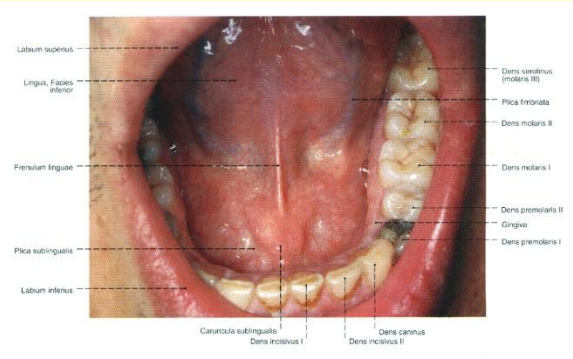


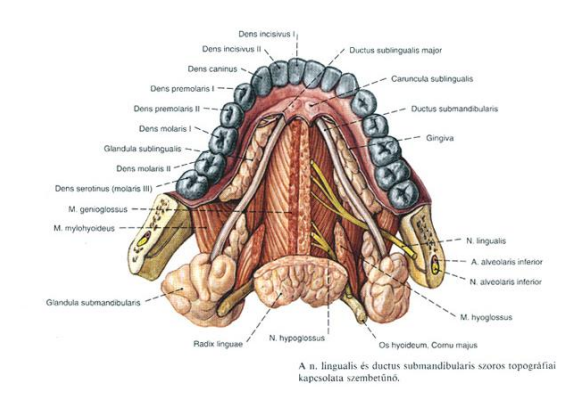
lobular structure
tubuloalveolar acini
2/3 serous
1/3 mucous
produces the largest amount of saliva

SUBLINGUAL GLAND



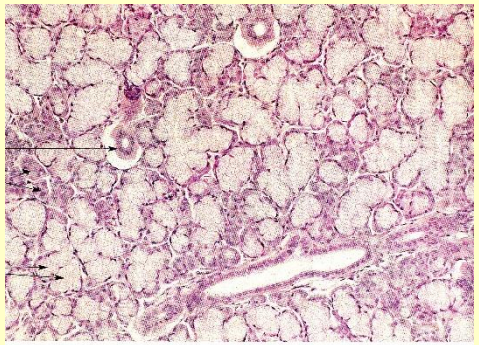
Lásd a n. lingualis és a ductus submandibularis szoros topográfiai viszonyát.

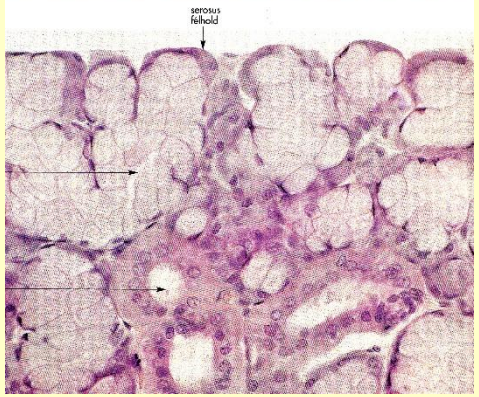




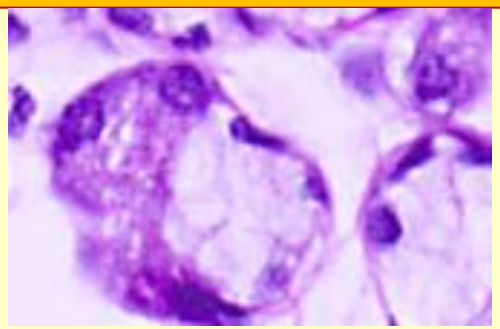
A n. lingualis és ductus submandibularis szoros topográfiai kapcsolata szembetűnő.

anterior to the submandibular gland
Lies on the floor of the mouth (under the mucosa).
8-20 minor excretory ducts of *Rivinus*.
major sublingual duct (of *Bartholin*)
joins the submandibular duct
opens on the sublingual caruncula





lobular structure
tubuloalveolar acini
1/3 serous
2/3 mucous
Gianuzzi demilunes

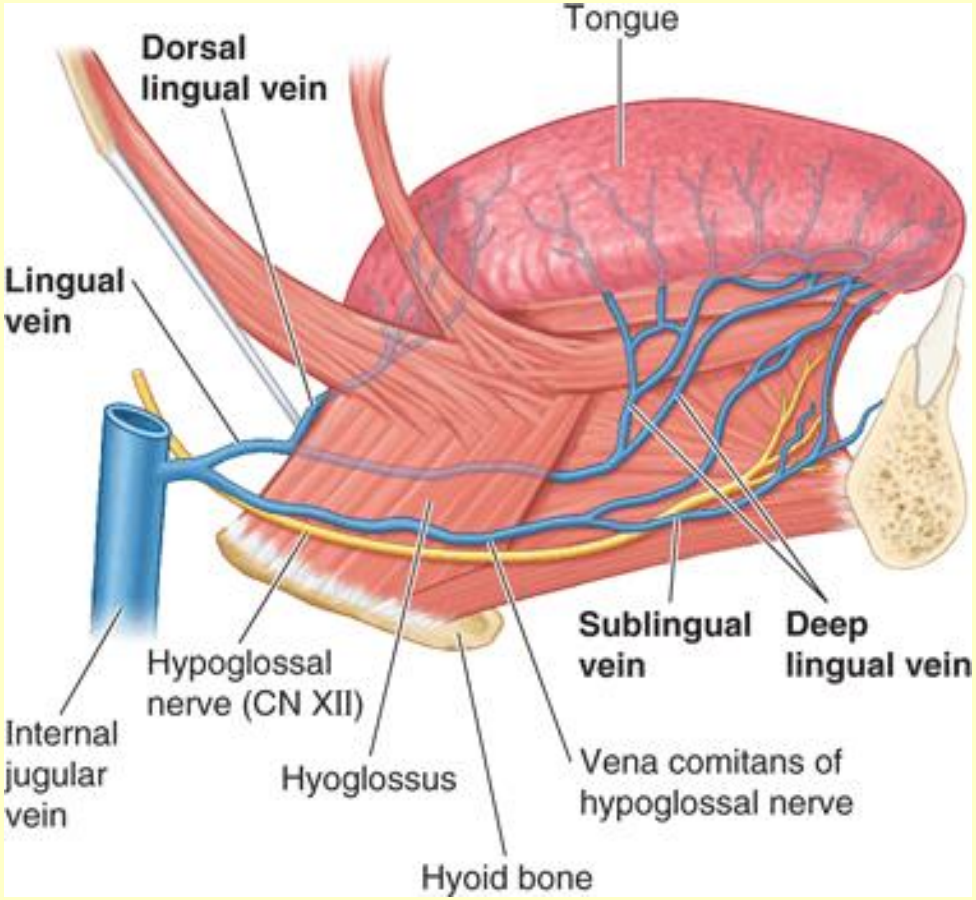


LATERAL LINGUAL SULCUS

BORDERS:

med: hyoglossus
lat: mylohyoid
sup: sublingual mucosa

CONTENT: lingual n.
submandibular d.
hypoglossal n.
+ accompanying vein (*sublingual*)



LATERAL LINGUAL SULCUS

BORDERS:

med: hyoglossus
lat: mylohyoid
sup: sublingual mucosa

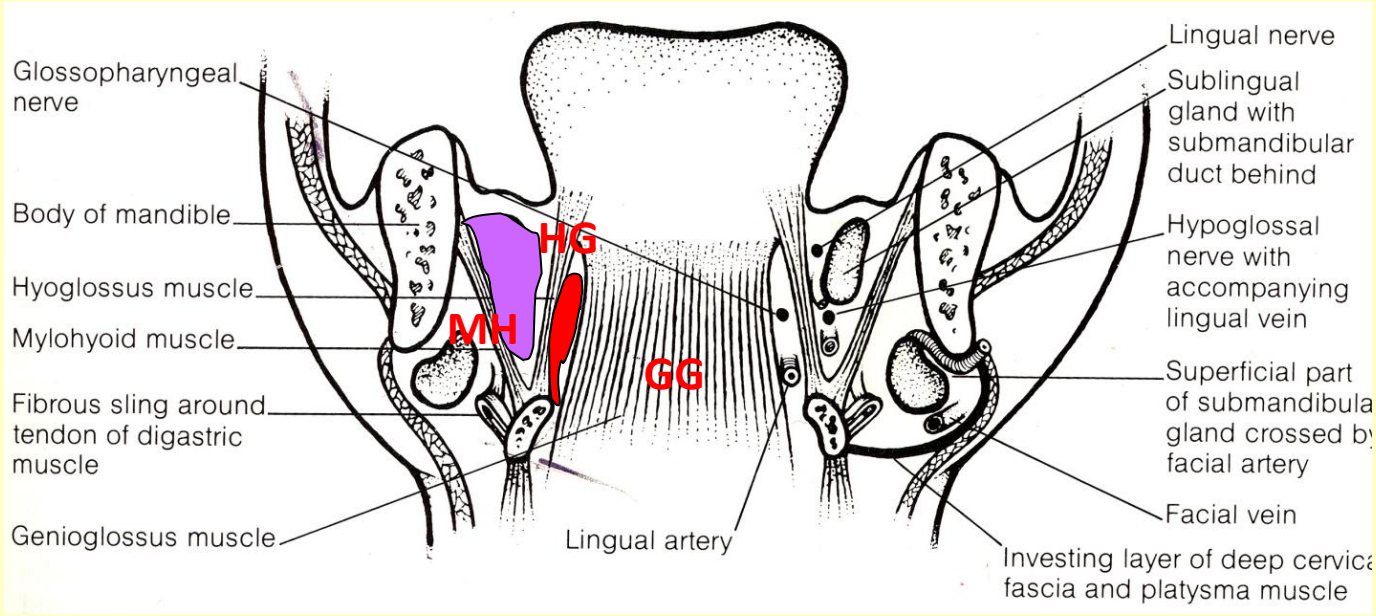
CONTENT: *lingual n.*
submandibular d.
hypoglossal n.
+ accompanying vein (sublingual)

MEDIAL LINGUAL SULCUS

BORDERS:

med: genioglossus
lat: hyoglossus

CONTENT: lingual a.
glossopharyngeal n.



THANK YOU VERY MUCH FOR YOUR ATTENTION!