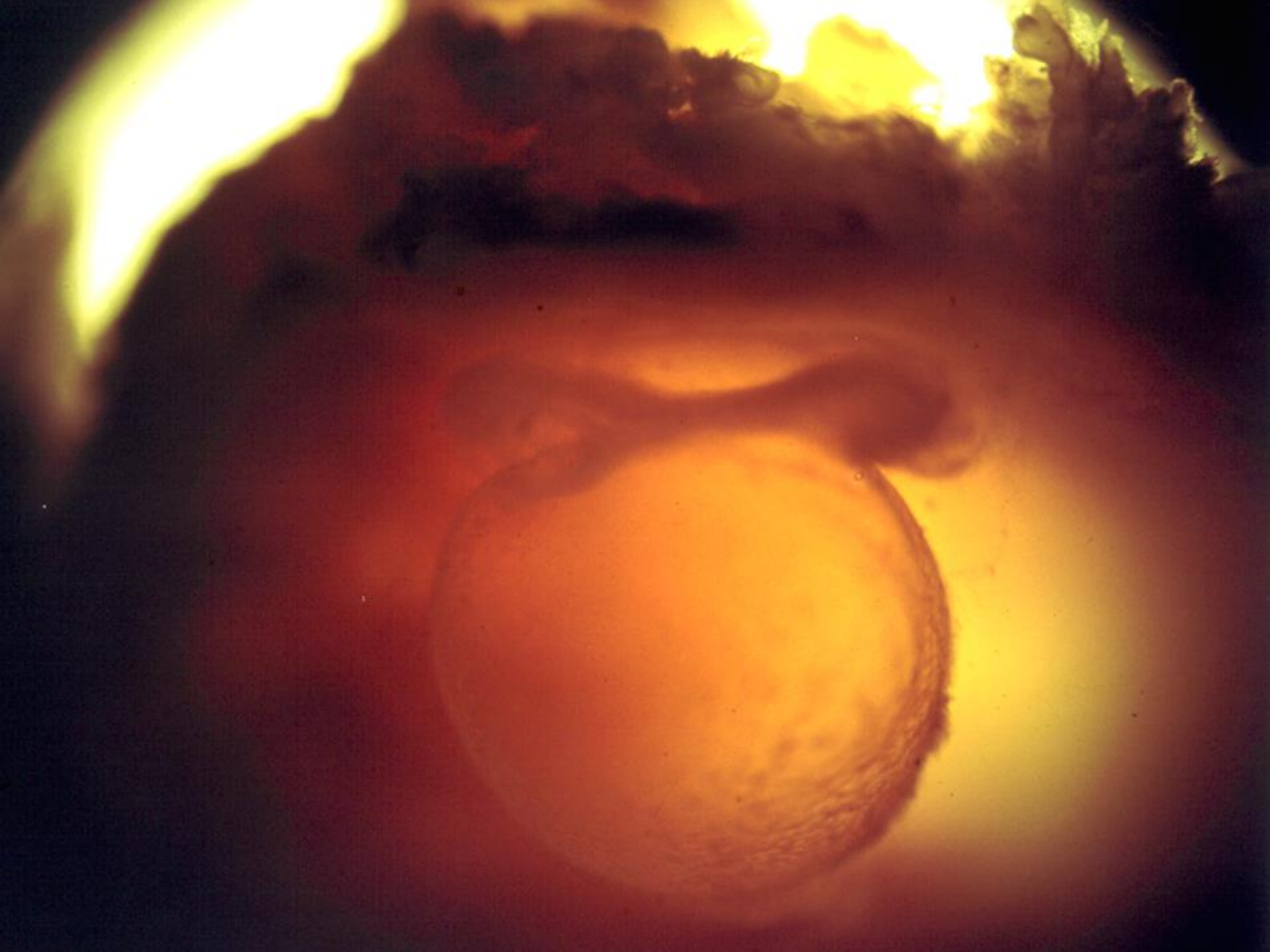
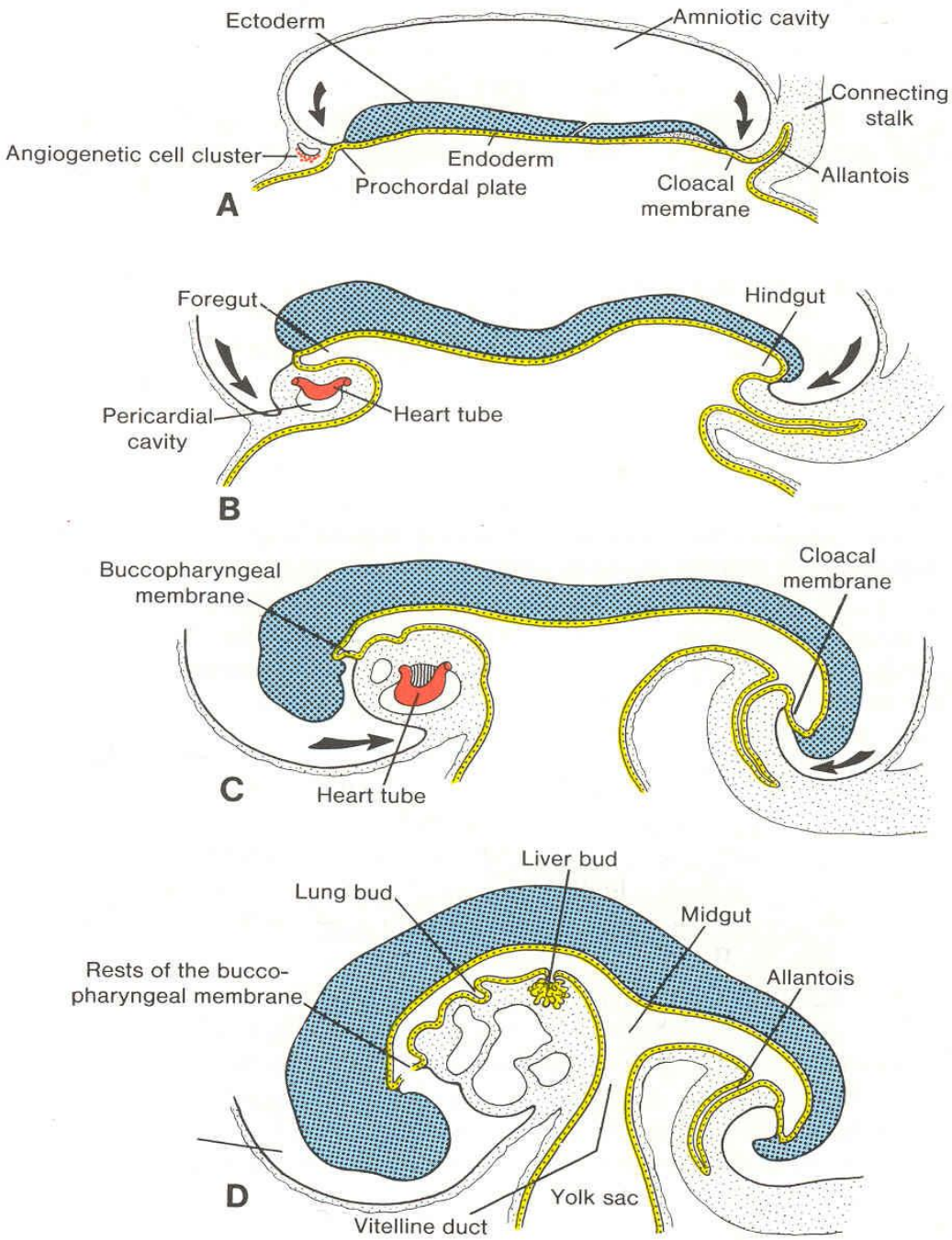
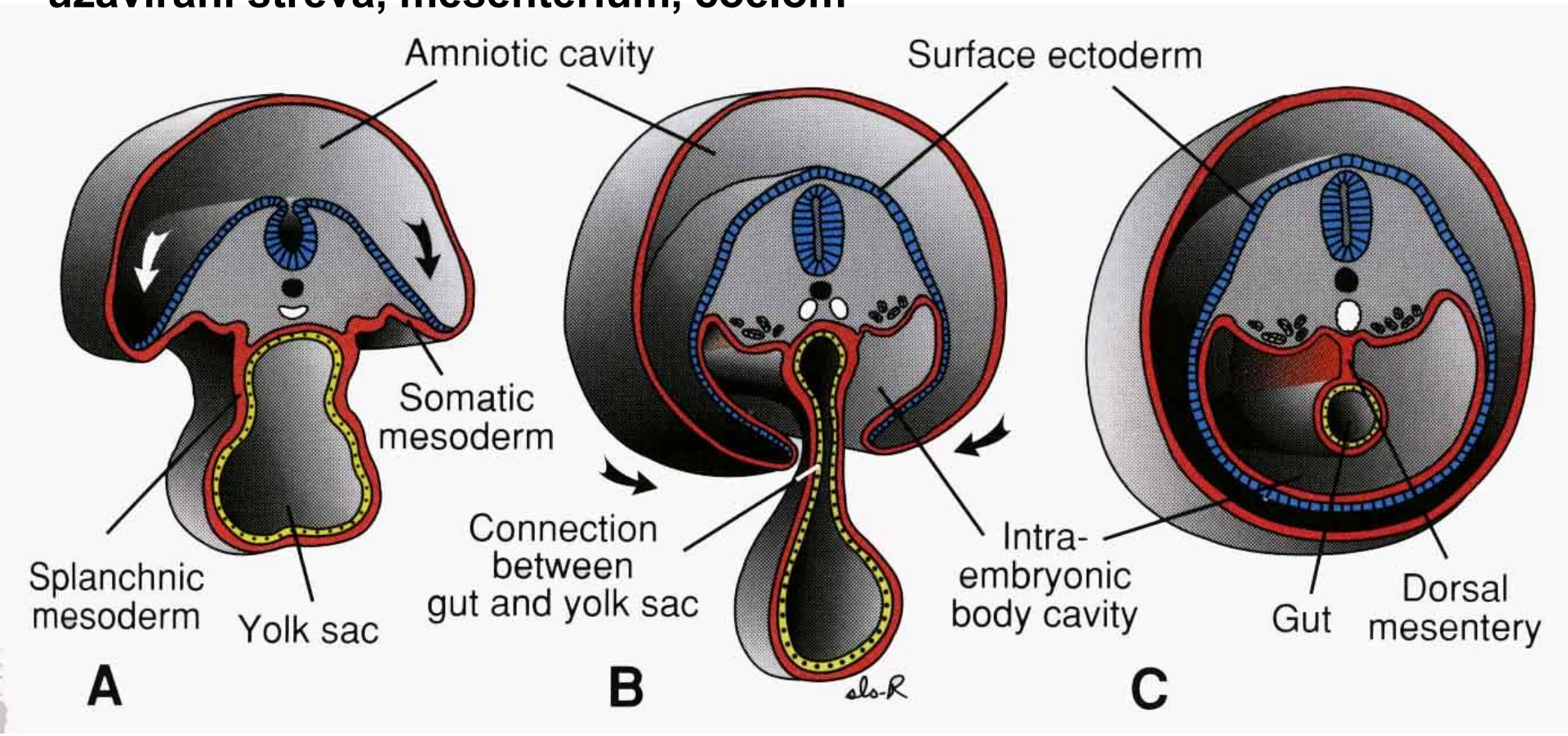
VÝVOJ HLAVY A KRKU



vznik ohraničujících rýh
vytvoří z trilaminárního zárodečného terčíku
trojrozměrnou trubici

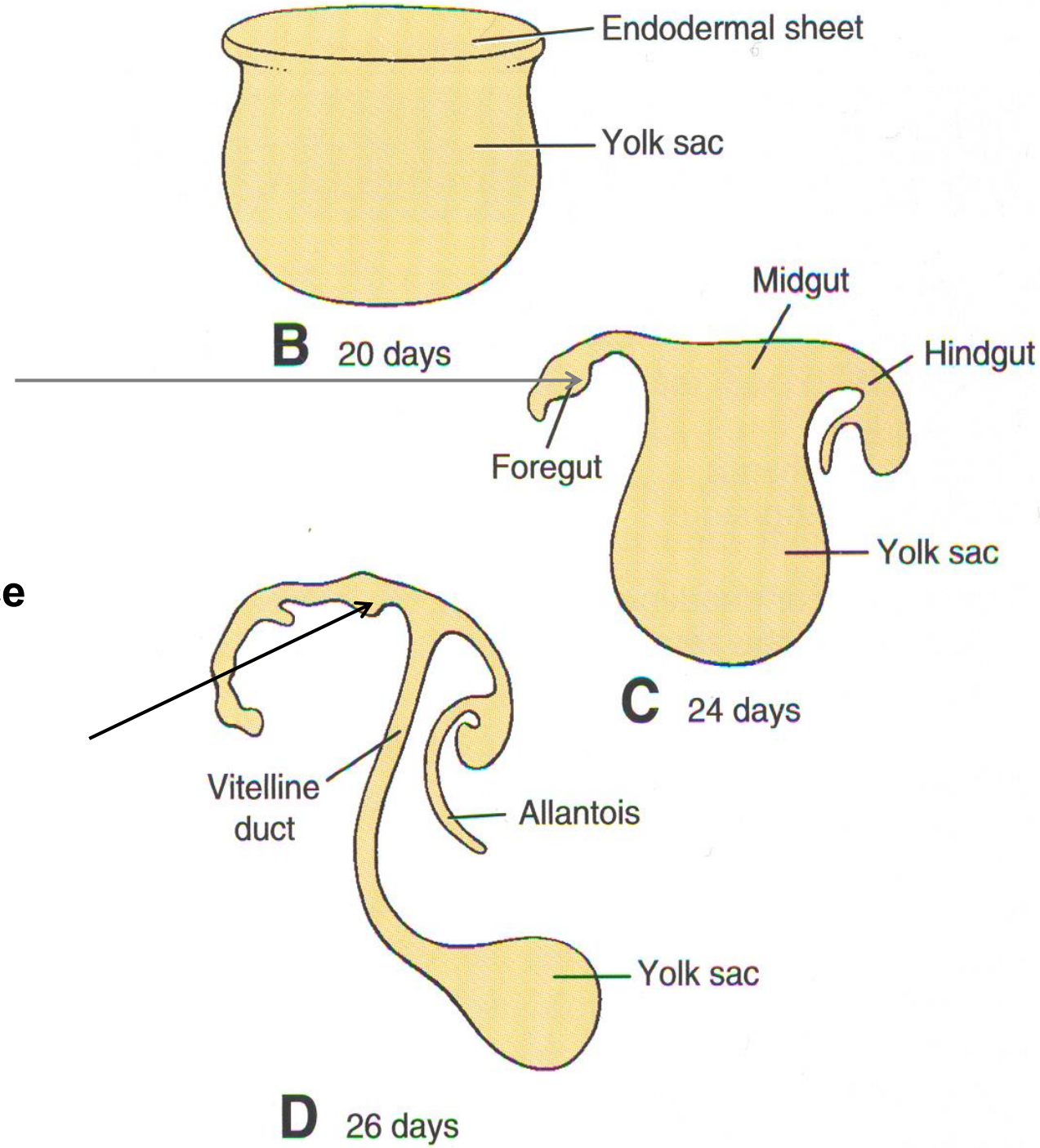


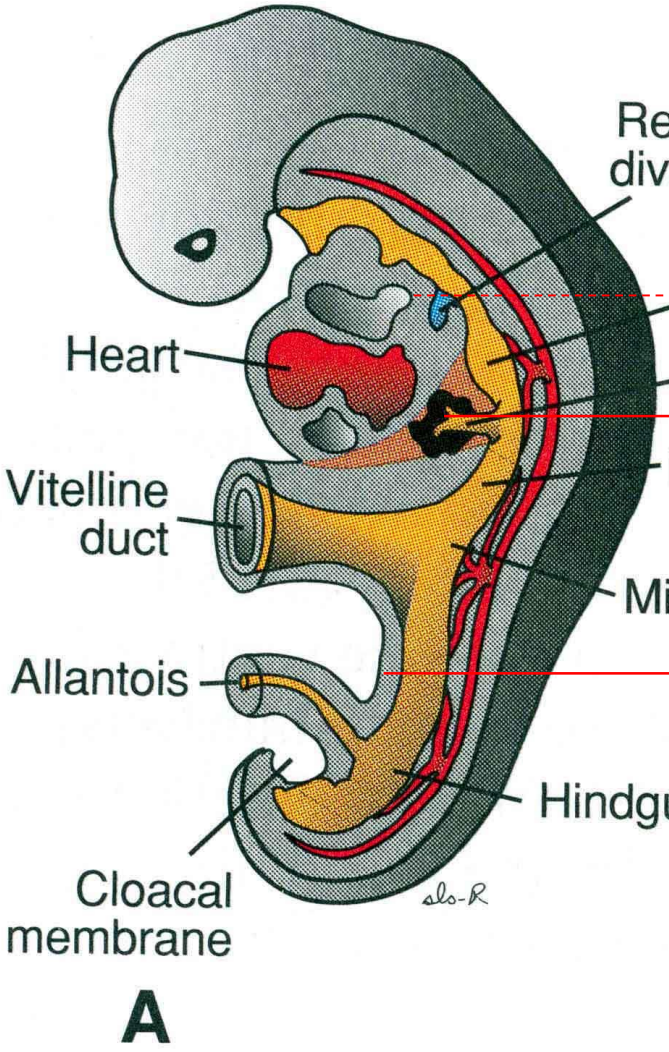
žloutkový váček, vytváření trávicí trubice
ductus omphaloentericus
uzavírání střeva, mesenterium, coelom



vývoj trávicí trubice
vliv ohraničujících rýh

formování trávicí trubice





faryngové střevo (primitivní farynx)

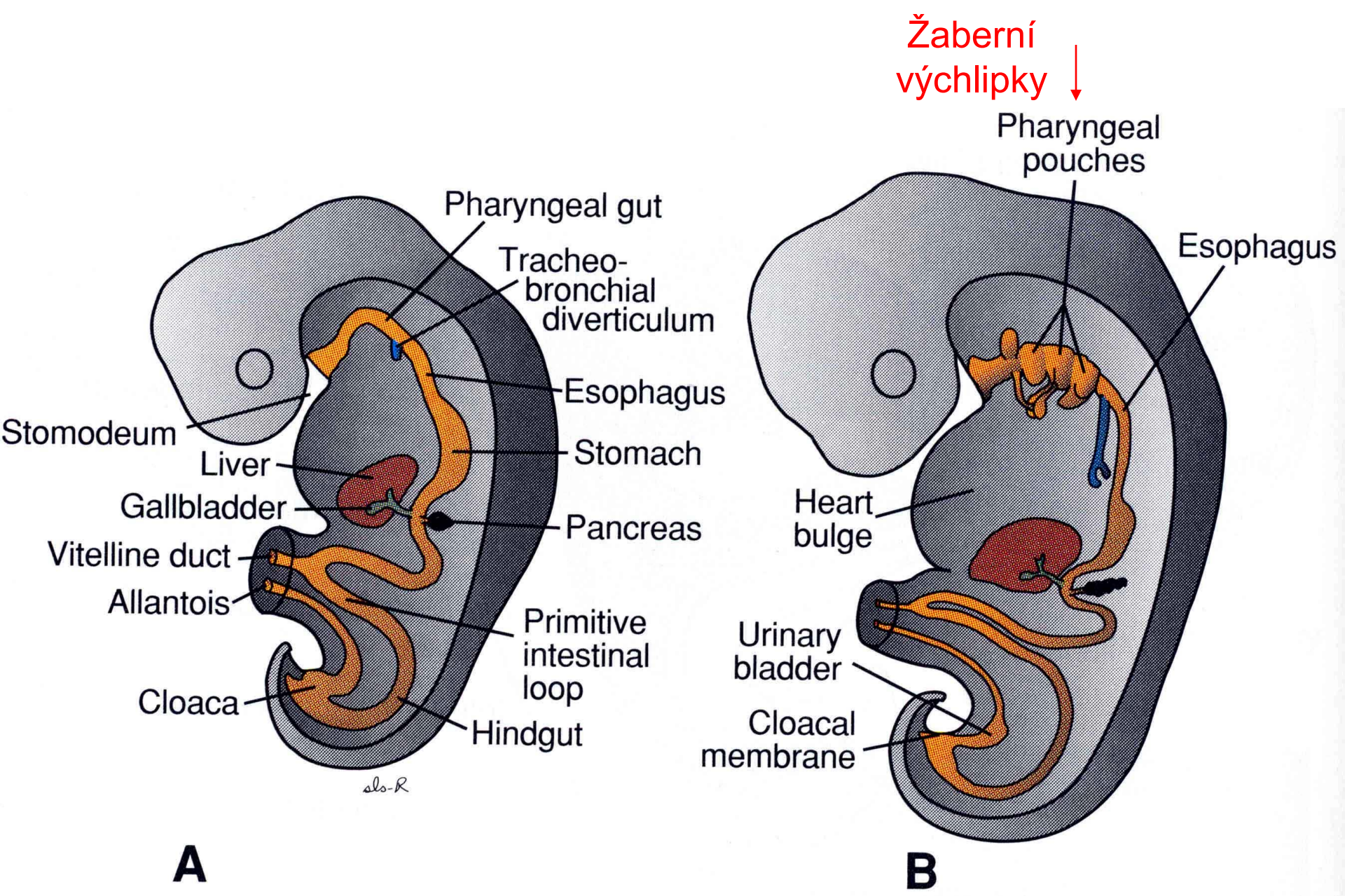
Přední střevo

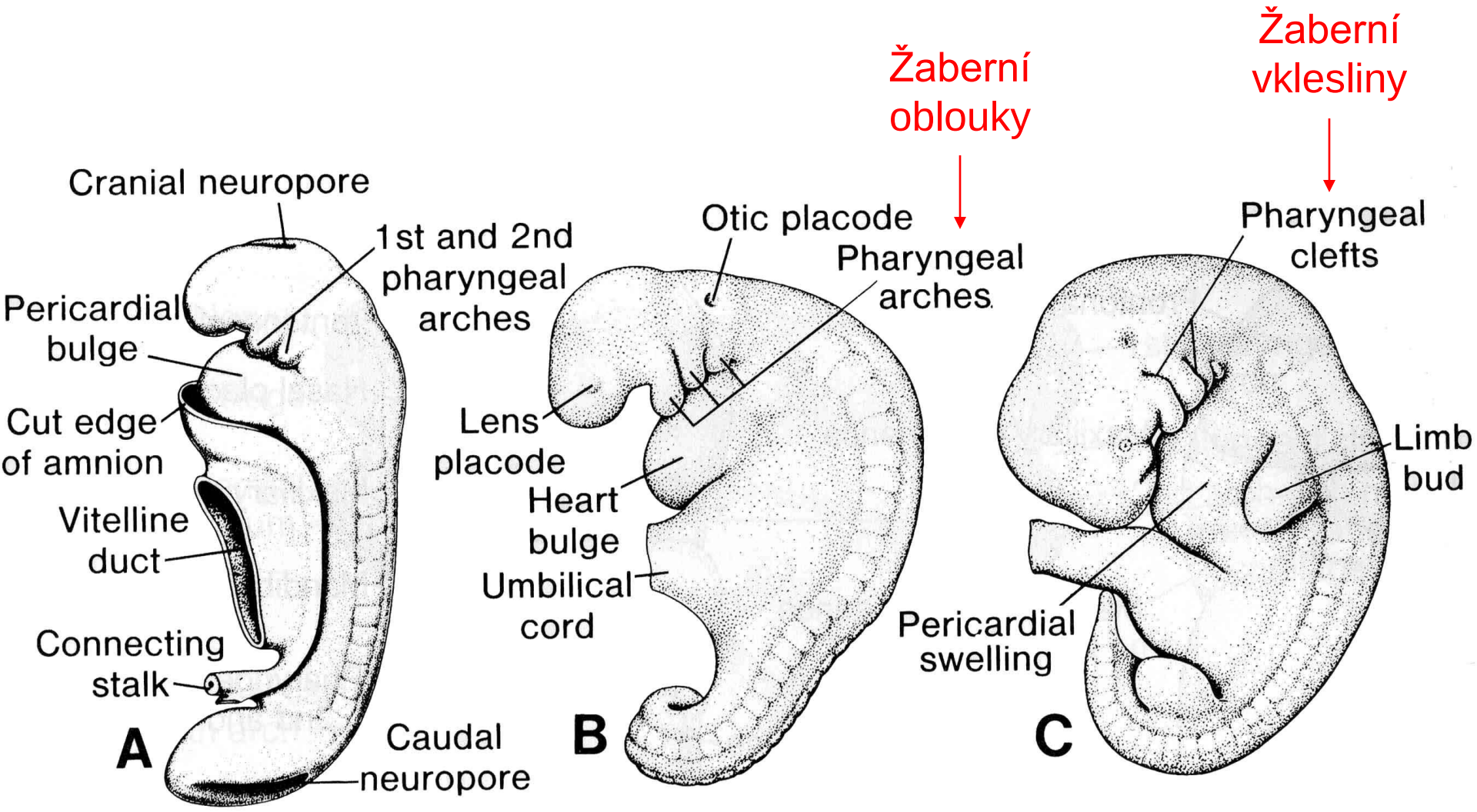
kaudální část předního střeva

Střední střevo

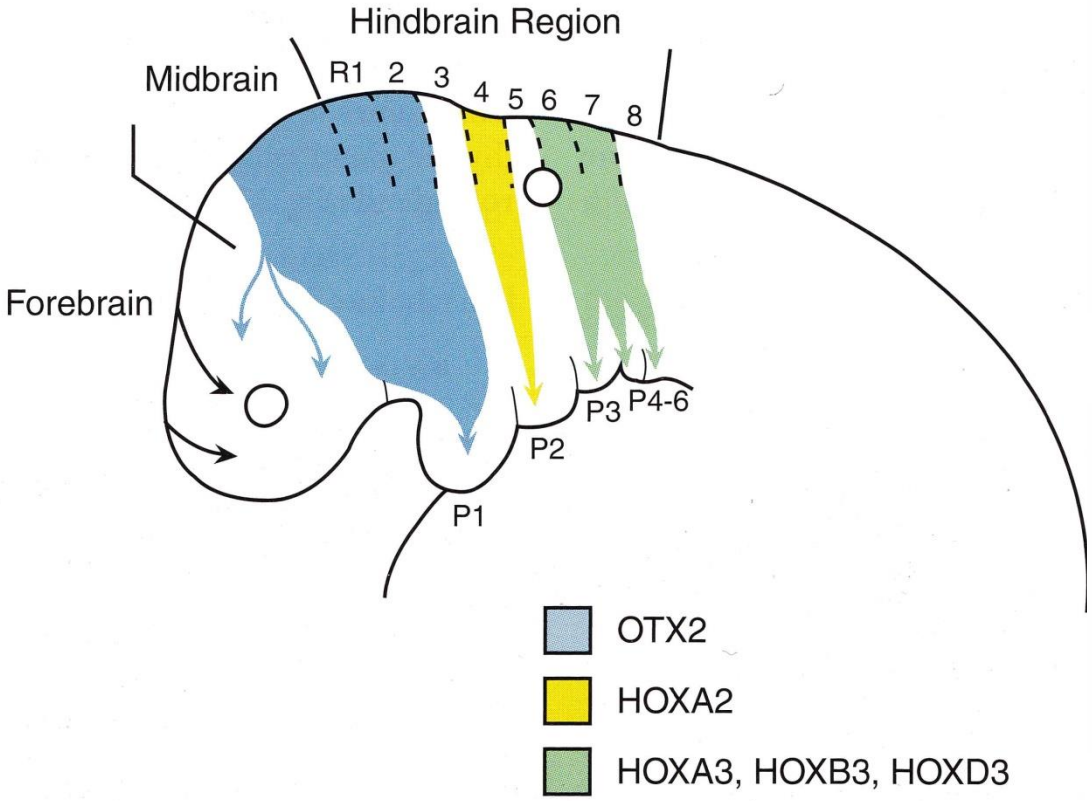
Zadní střevo

DIFERENCIACE PRIMITIVNÍHO FARYNGU (FARYNGOVÉHO STŘEVA), ŽABERNÍ VÝCHLIPKY, VKLESLINY A OBLOUKY

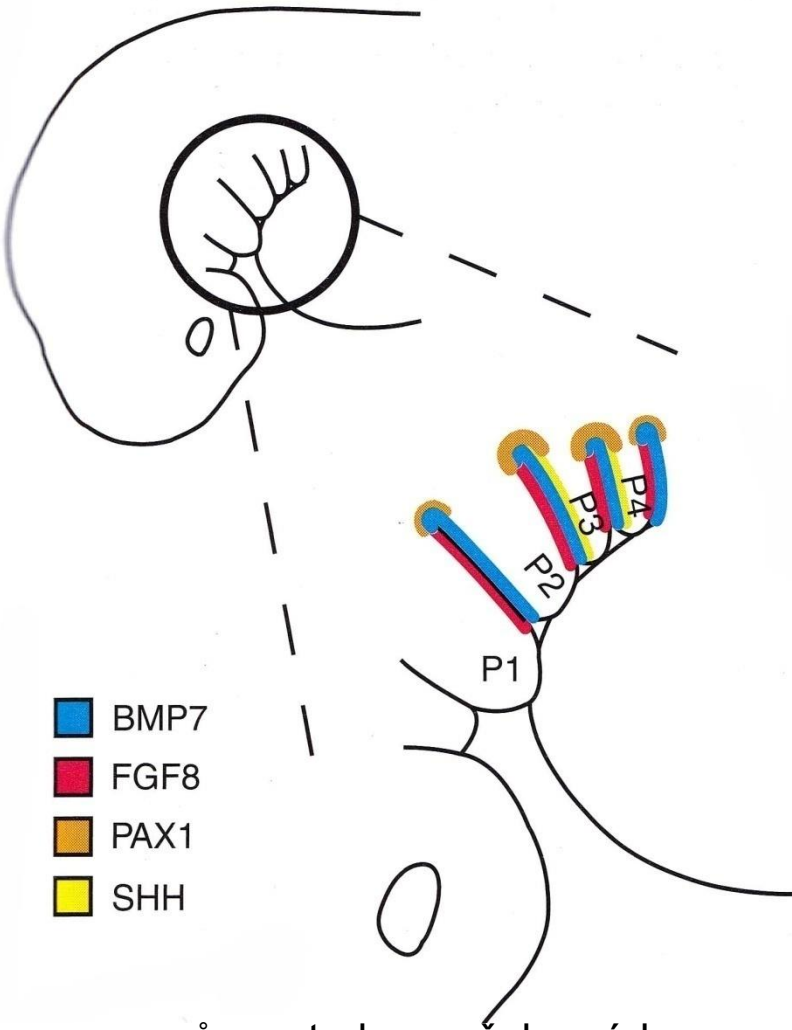

Žaberní
výchlipky
Pharyngeal gut
Tracheo-
bronchial
diverticulum
Esophagus
Stomodeum
Liver
Stomach
Gallbladder
Pancreas
Vitelline duct
Allantois
Primitive
intestinal
loop
Cloaca
Hindgut
A
Pharyngeal
pouches
Esophagus
Heart
bulge
Urinary
bladder
Cloacal
membrane
B


Žaberní oblouky
Žaberní vklesliny
Cranial neuropore
1st and 2nd pharyngeal arches
Pericardial bulge
Cut edge of amnion
Vitelline duct
Connecting stalk
Caudal neuropore
A
Otic placode
Pharyngeal arches
Lens placode
Heart bulge
Umbilical cord
B
Pharyngeal clefts
Limb bud
Pericardial swelling
C

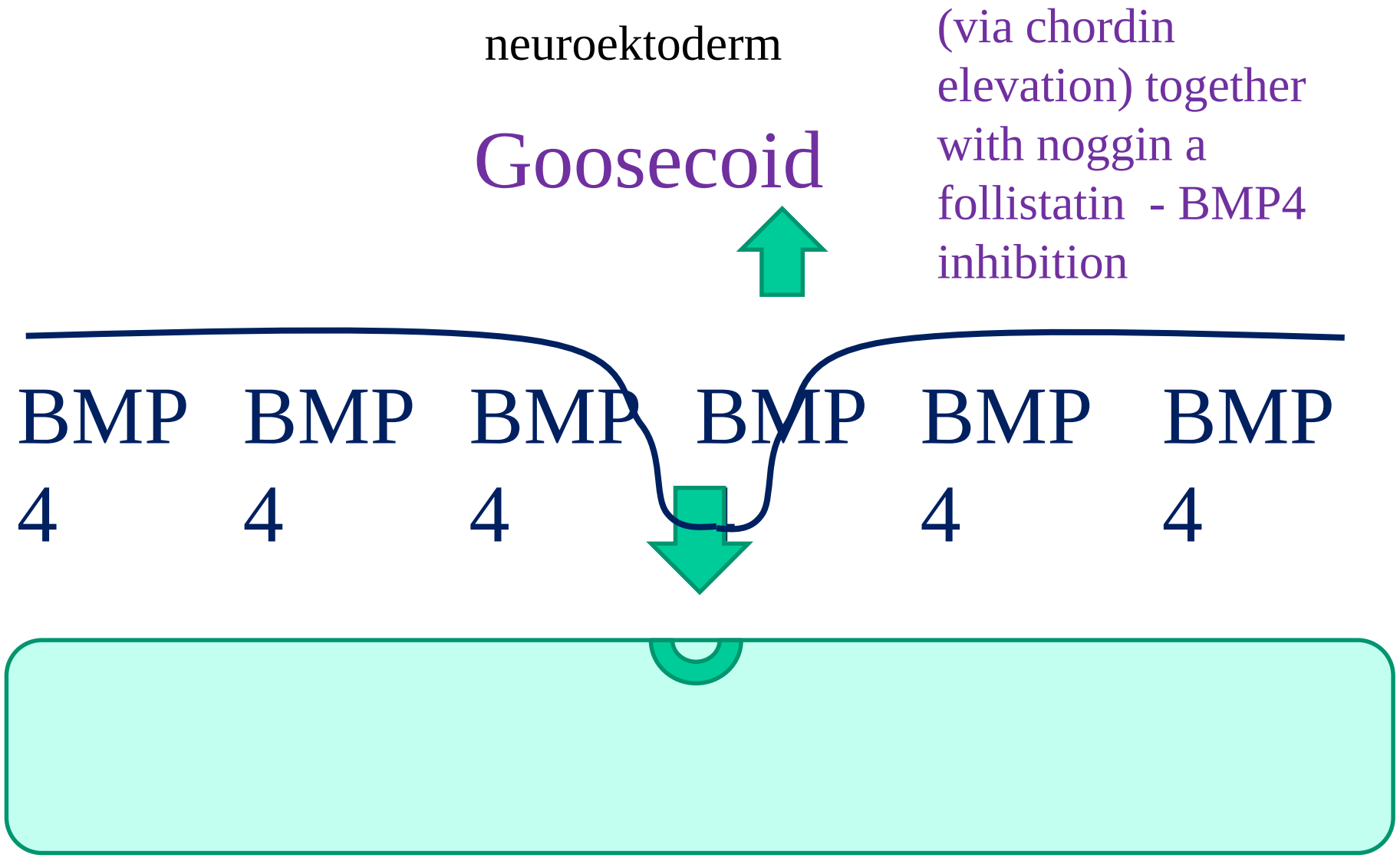
Molekulární řízení vzniku žaberních oblouků

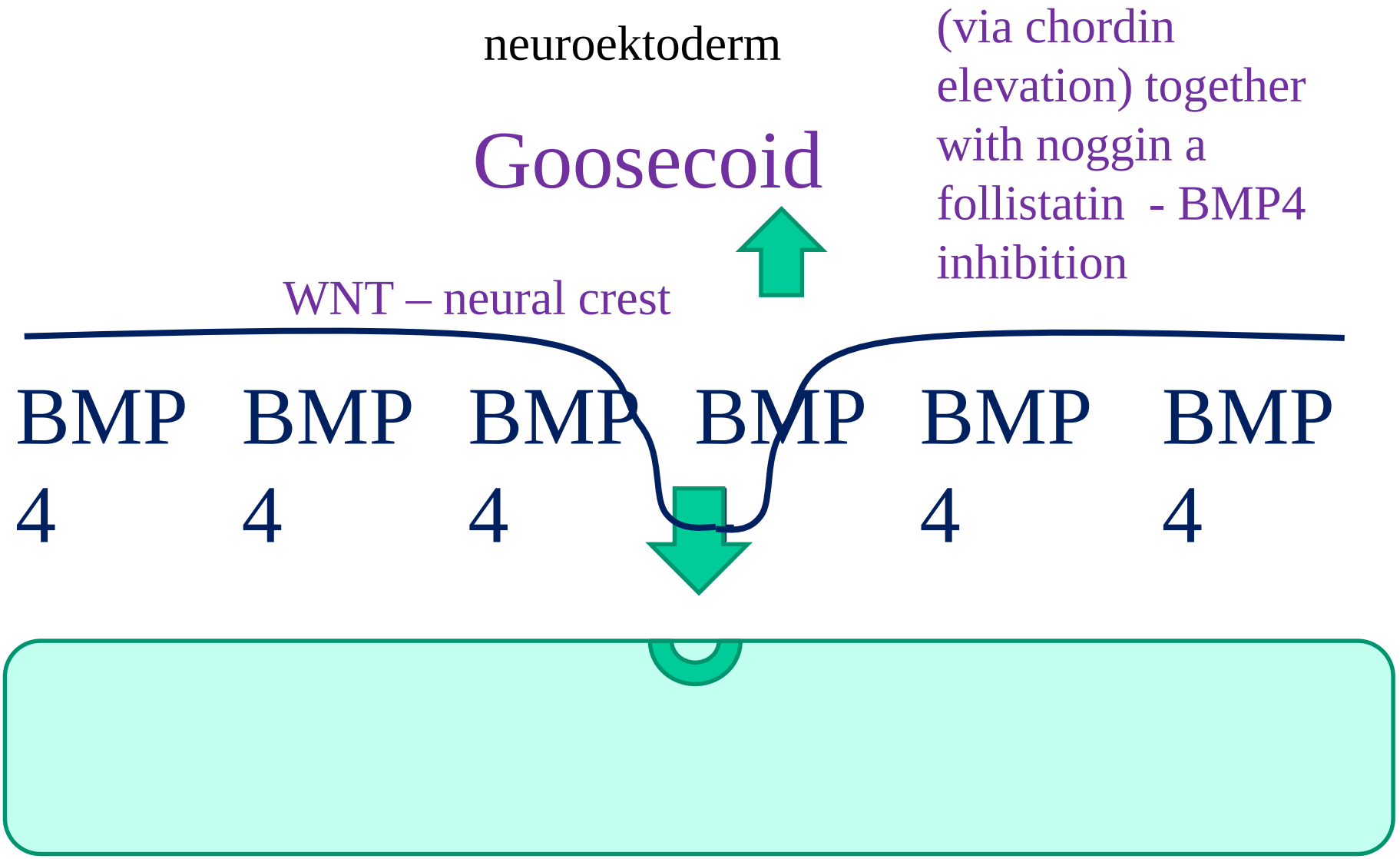


exprese genů v migračních proudech buněk neurální lišty

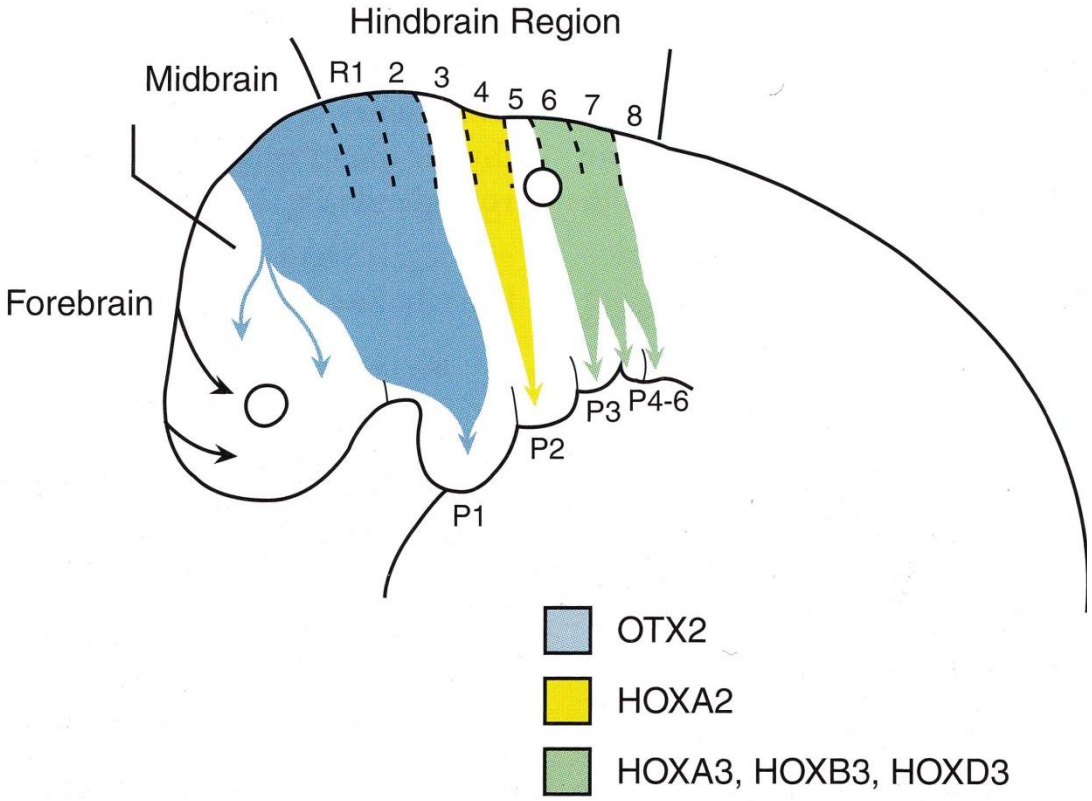


exprese genů v entodermu žaberních výchlipek

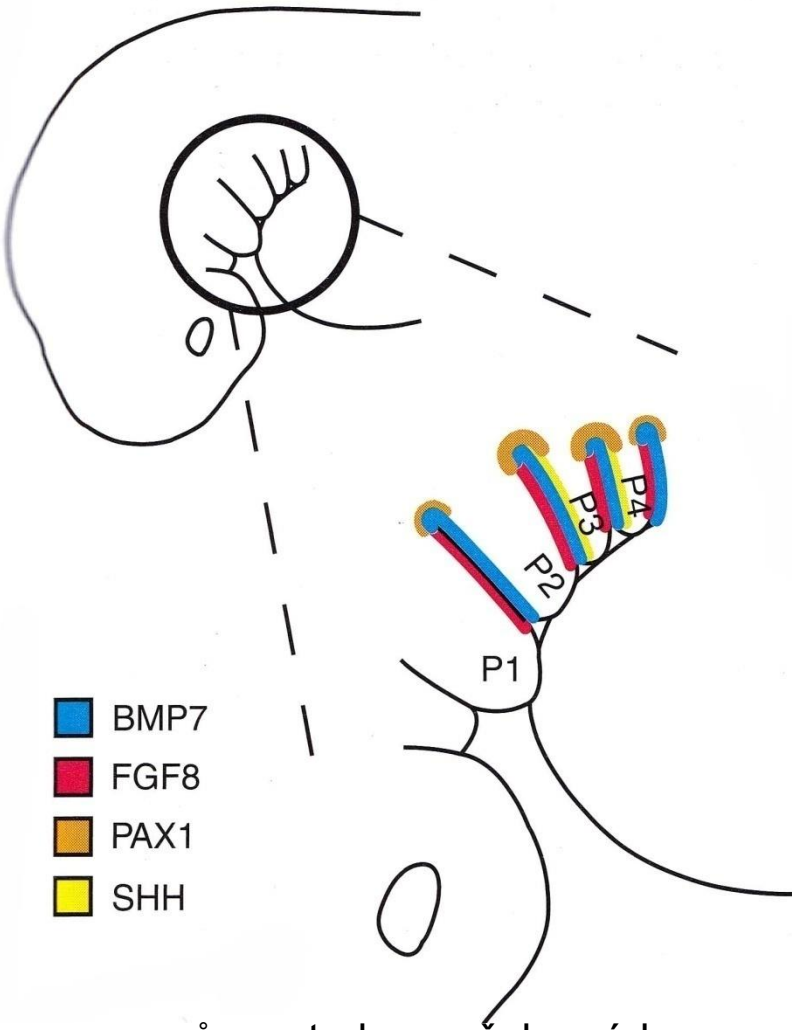

neuroektoderm
Goosecoid
(via chordin elevation) together with noggin a follistatin - BMP4 inhibition
BMP 4
BMP 4
BMP 4
BMP 4
BMP 4
BMP 4


neuroektoderm
Goosecoid
(via chordin elevation) together with noggin a follistatin - BMP4 inhibition
WNT – neural crest
BMP 4
BMP 4
BMP 4
BMP 4
BMP 4
BMP 4

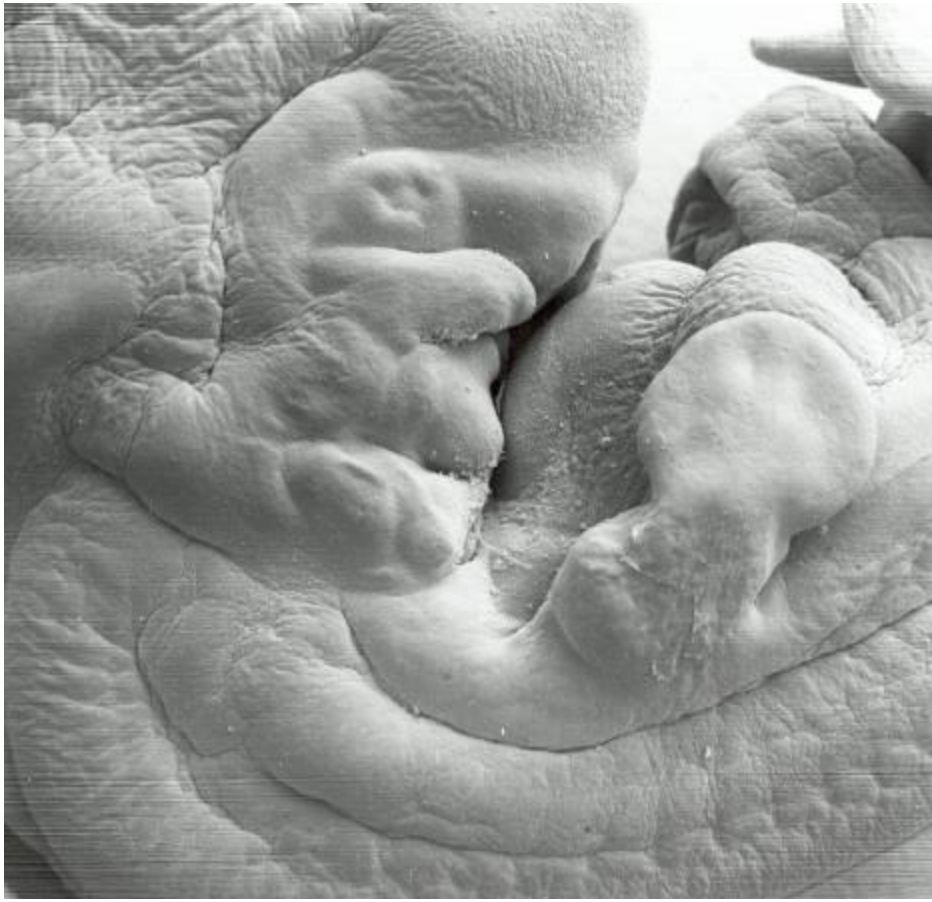
Molekulární řízení vzniku žaberních oblouků

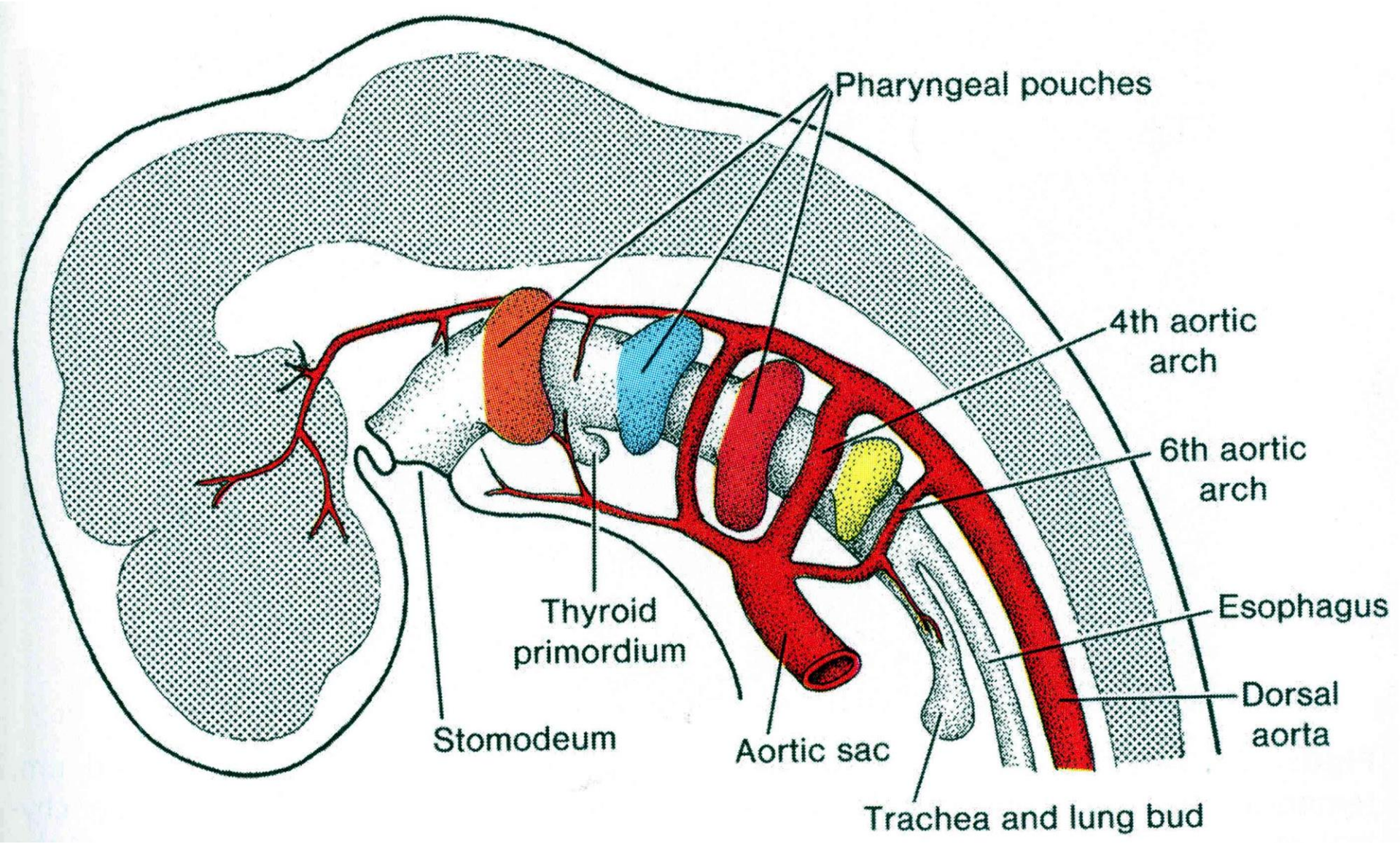


exprese genů v migračních proudech buněk neurální lišty

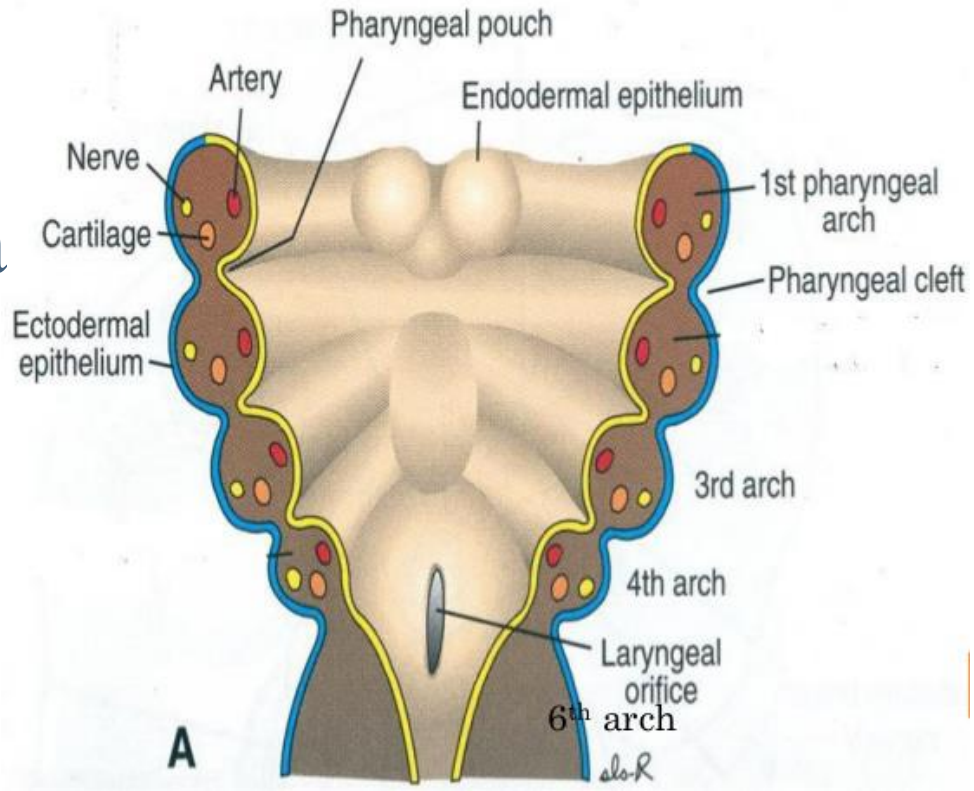


exprese genů v entodermu žaberních výchlipek

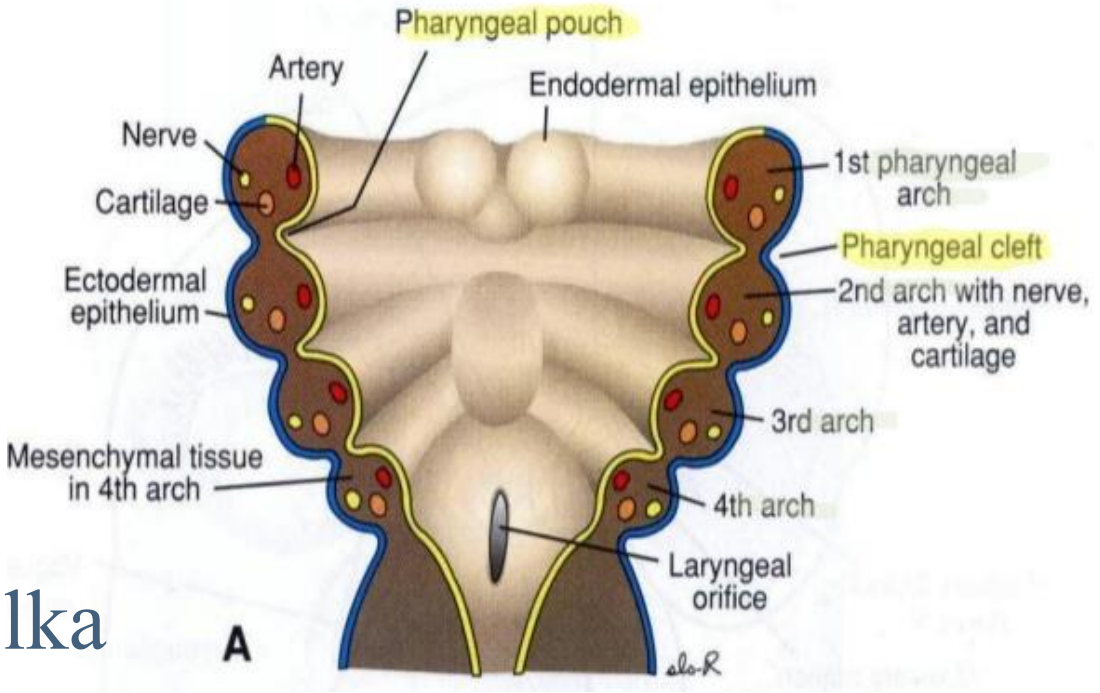



Pharyngeal pouches
4th aortic arch
6th aortic arch
Esophagus
Dorsal aorta
Thyroid primordium
Stomodeum
Aortic sac
Trachea and lung bud

- Faryngový oblouk
- Faryngová výchlipka
- Faryngová štěrbina
- Faryngová membrána

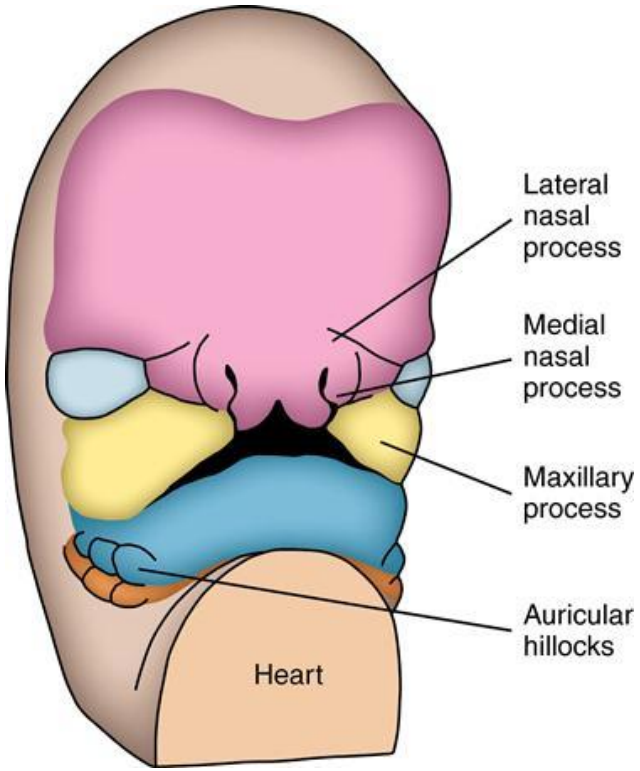


- Povrch kryt ektodermem
- Mezenchymové jádro (mezoderm + **buňky neurální lišty**)
- **Aortální oblouk**
- **Chrupavka**
- **Komponenta kosterního svalu** inervovaná **specifickým nervem**
- Endodermální výstelka

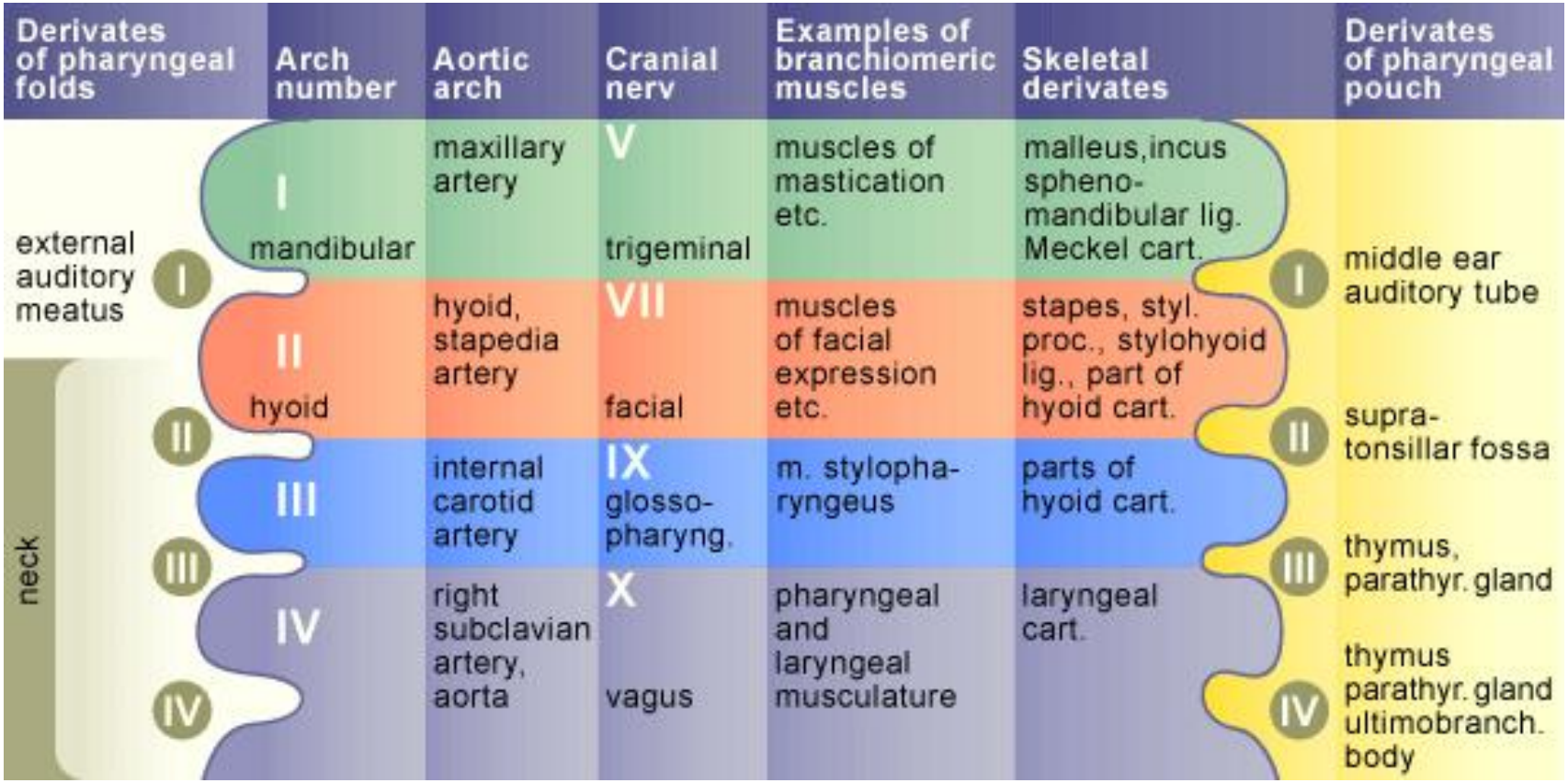


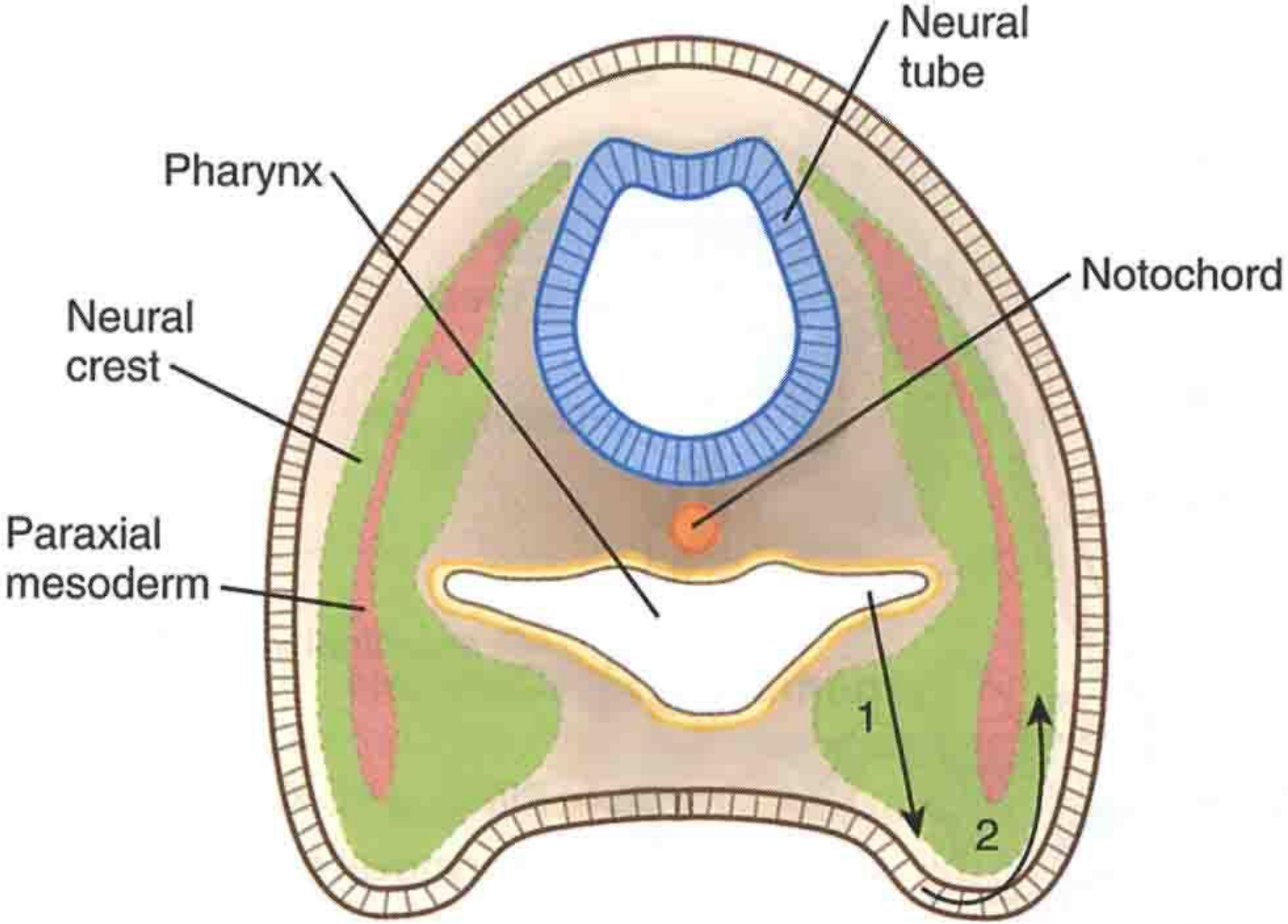
- 4. – 10. týden vývoje

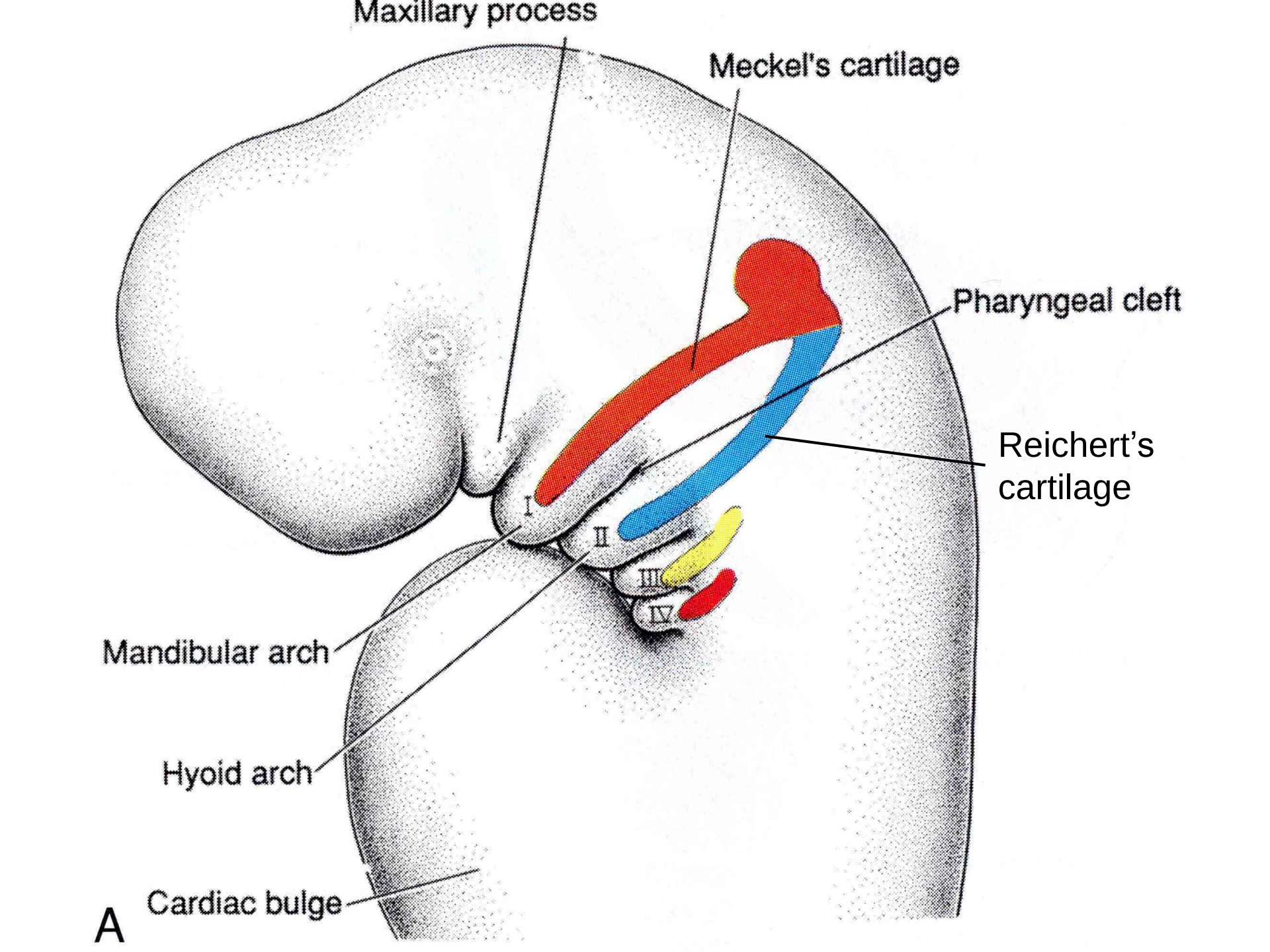
- Frontonasální výběžek
- 1. FO
  - Párový maxilární výběžek
  - Párový mandibulární výběžek

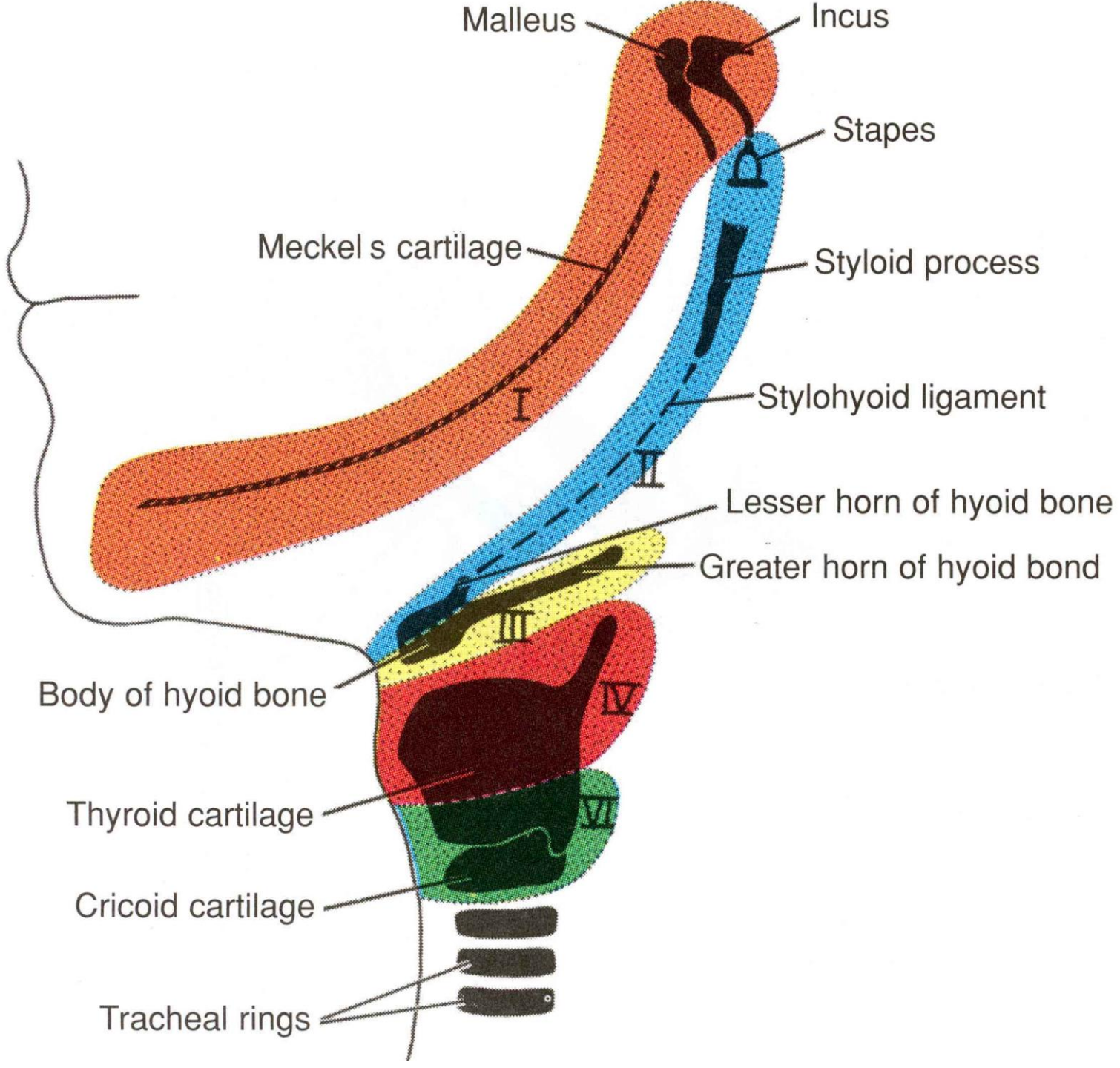


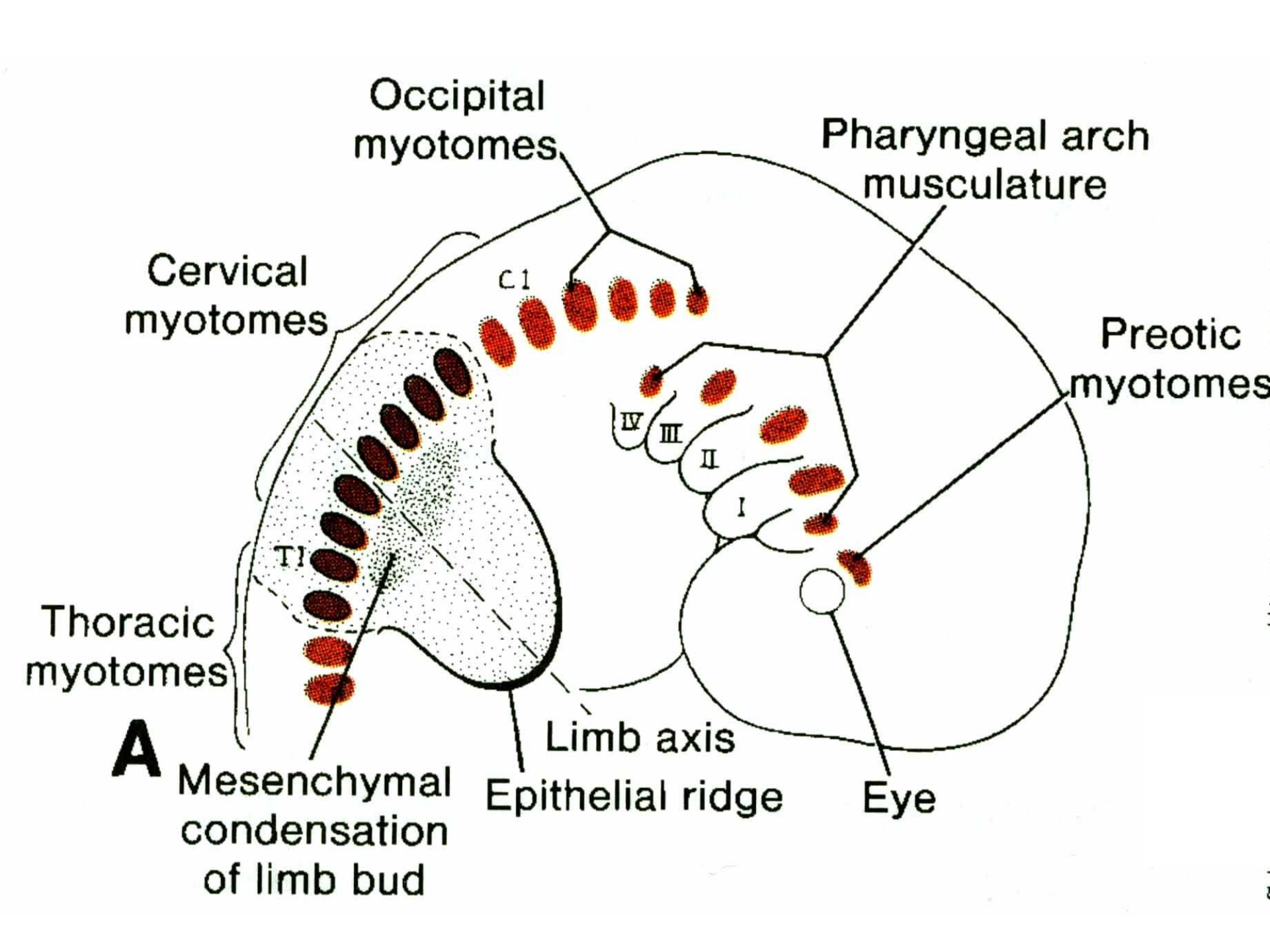
Faryngeální oblouky

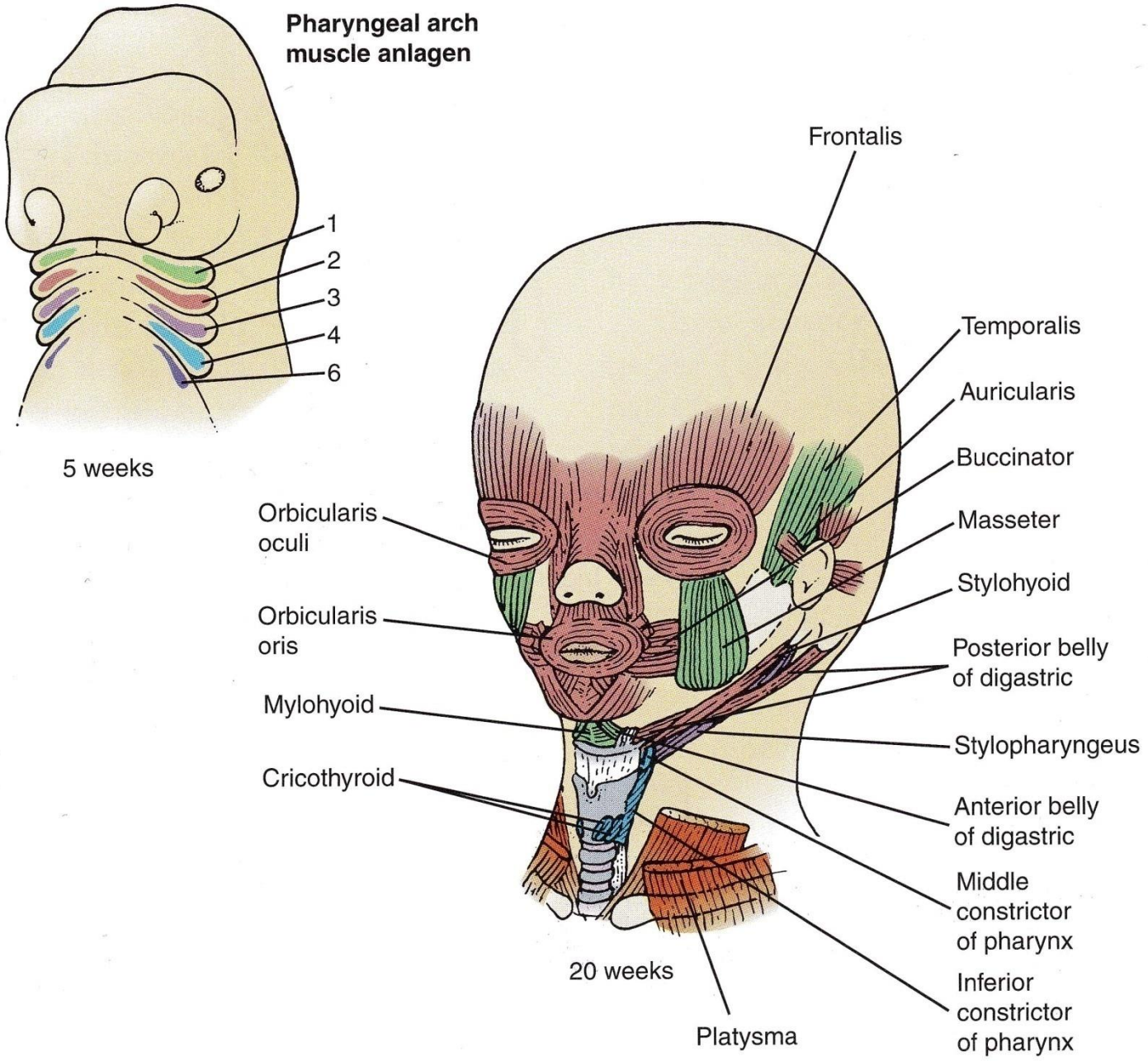

Derivates of pharyngeal folds
Arch number
Aortic arch
Cranial nerv
Examples of branchiomeric muscles
Skeletal derivates
Derivates of pharyngeal pouch
external auditory meatus
neck
I
mandibular
maxillary artery
V
trigeminal
muscles of mastication etc.
malleus, incus
spheno-mandibular lig.
Meckel cart.
middle ear
auditory tube
II
hyoid
hyoid, stapedia artery
VII
facial
muscles of facial expression etc.
stapes, styl. proc., stylohyoid lig., part of hyoid cart.
supra-tonsillar fossa
III
internal carotid artery
IX
glosso-pharyng.
m. stylopha-ryngeus
parts of hyoid cart.
thymus, parathyr. gland
IV
right subclavian artery, aorta
X
vagus
pharyngeal and laryngeal musculature
laryngeal cart.
thymus
parathyr. gland
ultimobranch. body

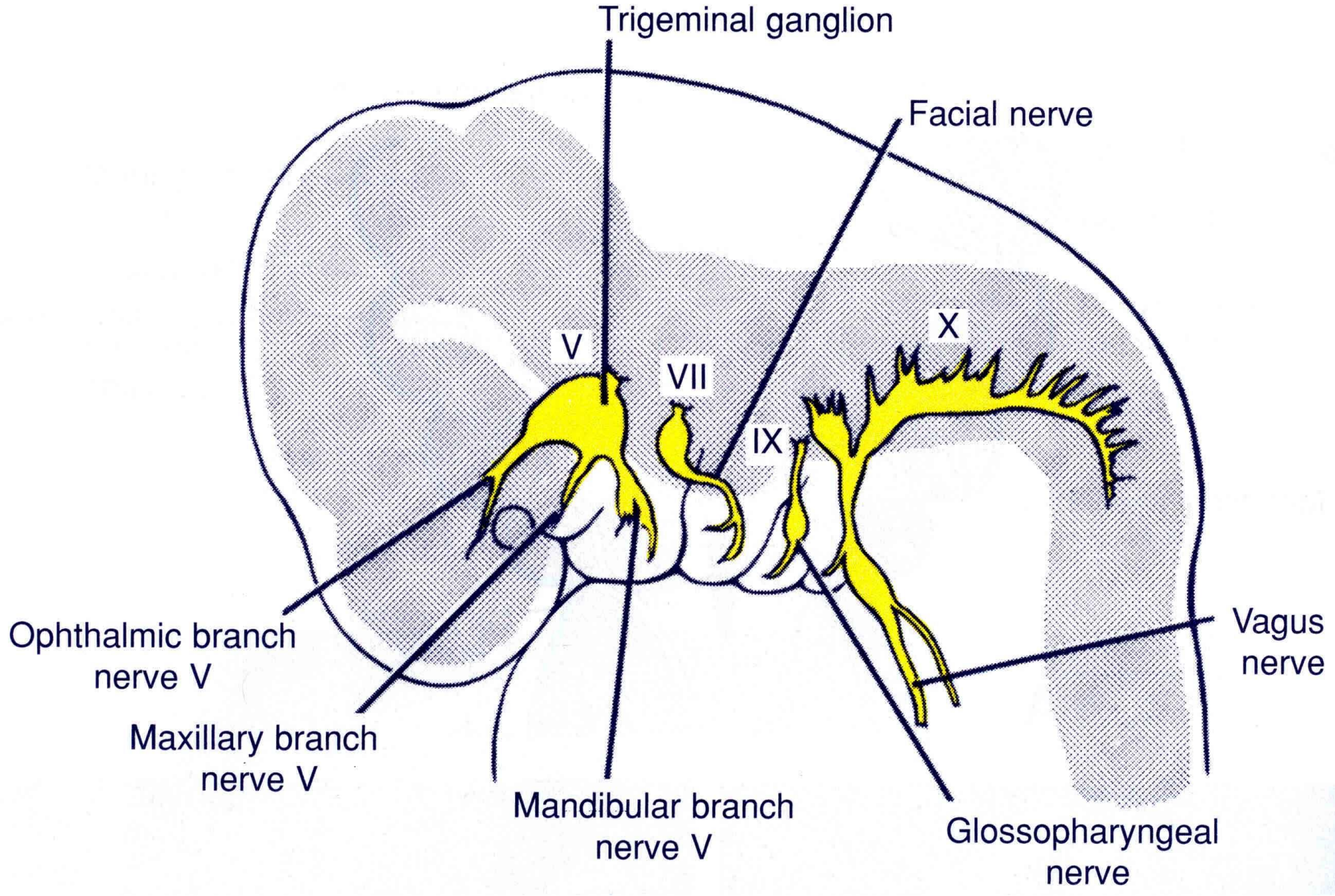

Neural tube
Pharynx
Notochord
Neural crest
Paraxial mesoderm
1
2


Maxillary process
Meckel's cartilage
Pharyngeal cleft
Reichert's cartilage
I
II
III
IV
Mandibular arch
Hyoid arch
Cardiac bulge
A

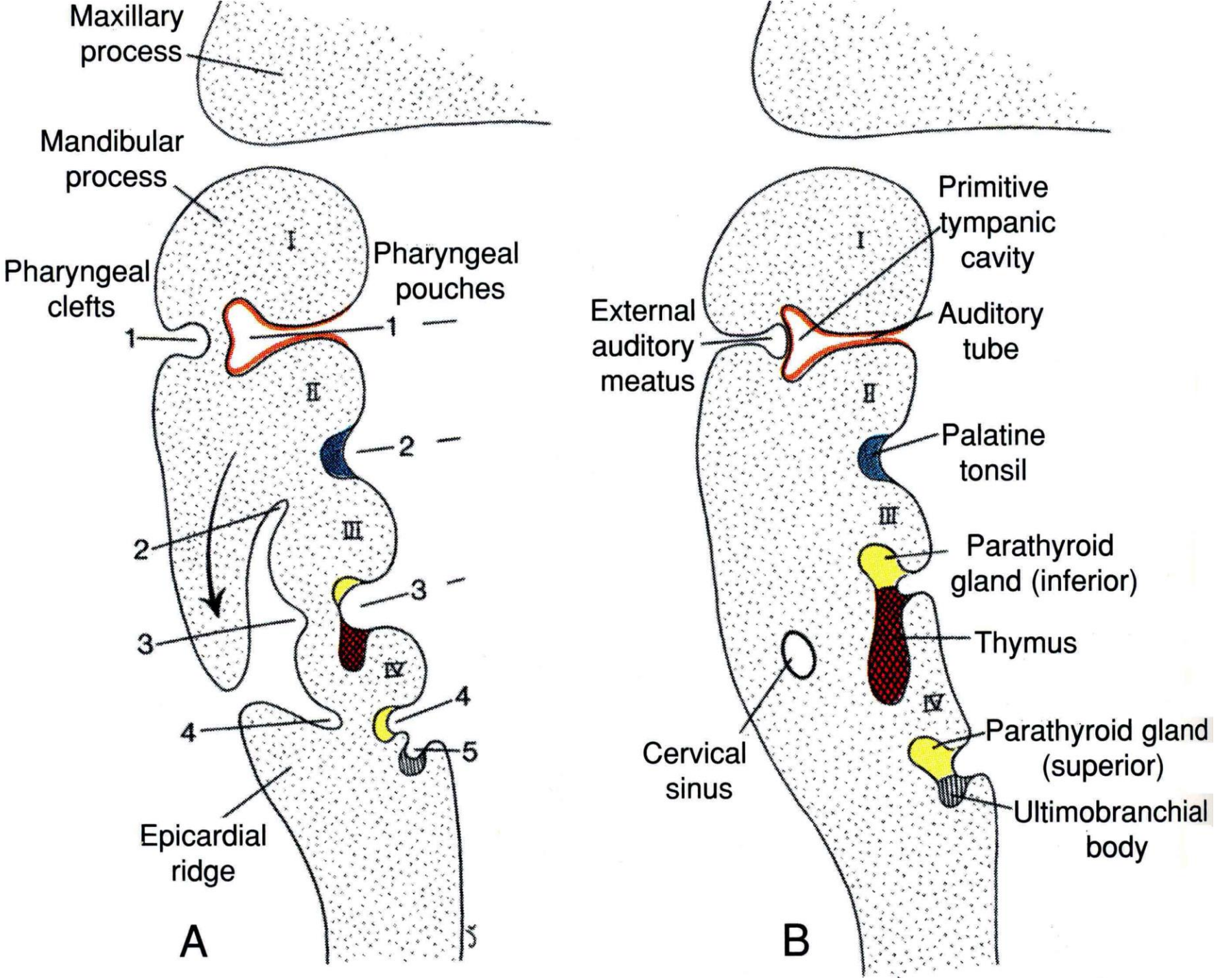

Malleus
Incus
Stapes
Meckel s cartilage
Styloid process
Stylohyoid ligament
Lesser horn of hyoid bone
Greater horn of hyoid bond
Body of hyoid bone
Thyroid cartilage
Cricoid cartilage
Tracheal rings
I
II
III
IV
VI


Occipital myotomes
Pharyngeal arch musculature
Cervical myotomes
C1
Preotic myotomes
IV
III
II
I
T1
Thoracic myotomes
A
Limb axis
Mesenchymal condensation of limb bud
Epithelial ridge
Eye


Pharyngeal arch muscle anlagen
1
2
3
4
6
5 weeks
Frontalis
Temporalis
Auricularis
Buccinator
Masseter
Stylohyoid
Posterior belly of digastric
Stylopharyngeus
Anterior belly of digastric
Middle constrictor of pharynx
Inferior constrictor of pharynx
Orbicularis oculi
Orbicularis oris
Mylohyoid
Cricothyroid
Platysma
20 weeks


Trigeminal ganglion
Facial nerve
V
VII
IX
X
Ophthalmic branch nerve V
Maxillary branch nerve V
Mandibular branch nerve V
Vagus nerve
Glossopharyngeal nerve

Faryngeální výchlipky


Maxillary process
Mandibular process
Pharyngeal clefts
Pharyngeal pouches
I
II
III
IV
1
2
3
4
5
Epicardial ridge
A
Primitive tympanic cavity
External auditory meatus
Auditory tube
Palatine tonsil
Parathyroid gland (inferior)
Thymus
Parathyroid gland (superior)
Ultimobranchial body
Cervical sinus
B

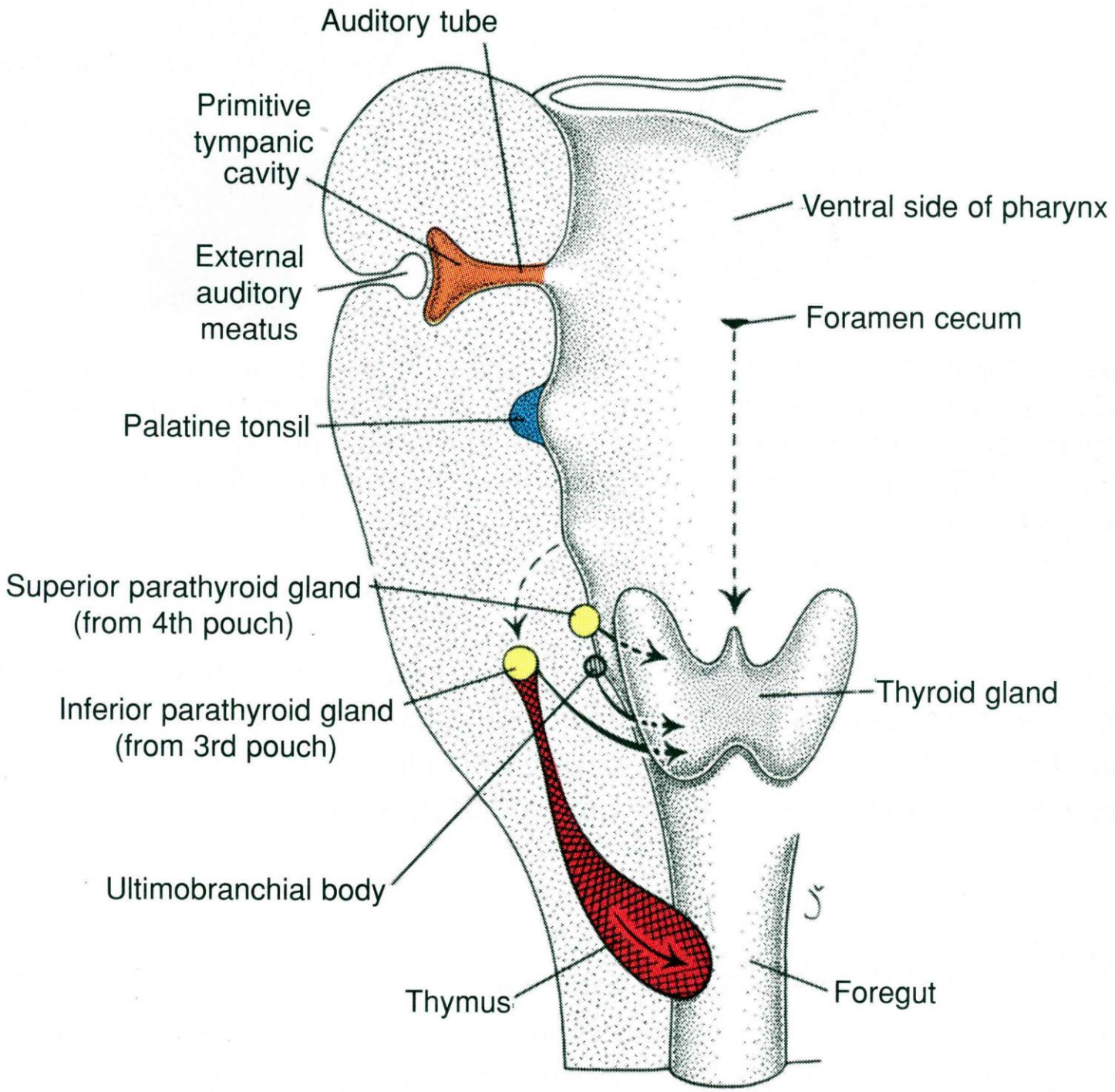
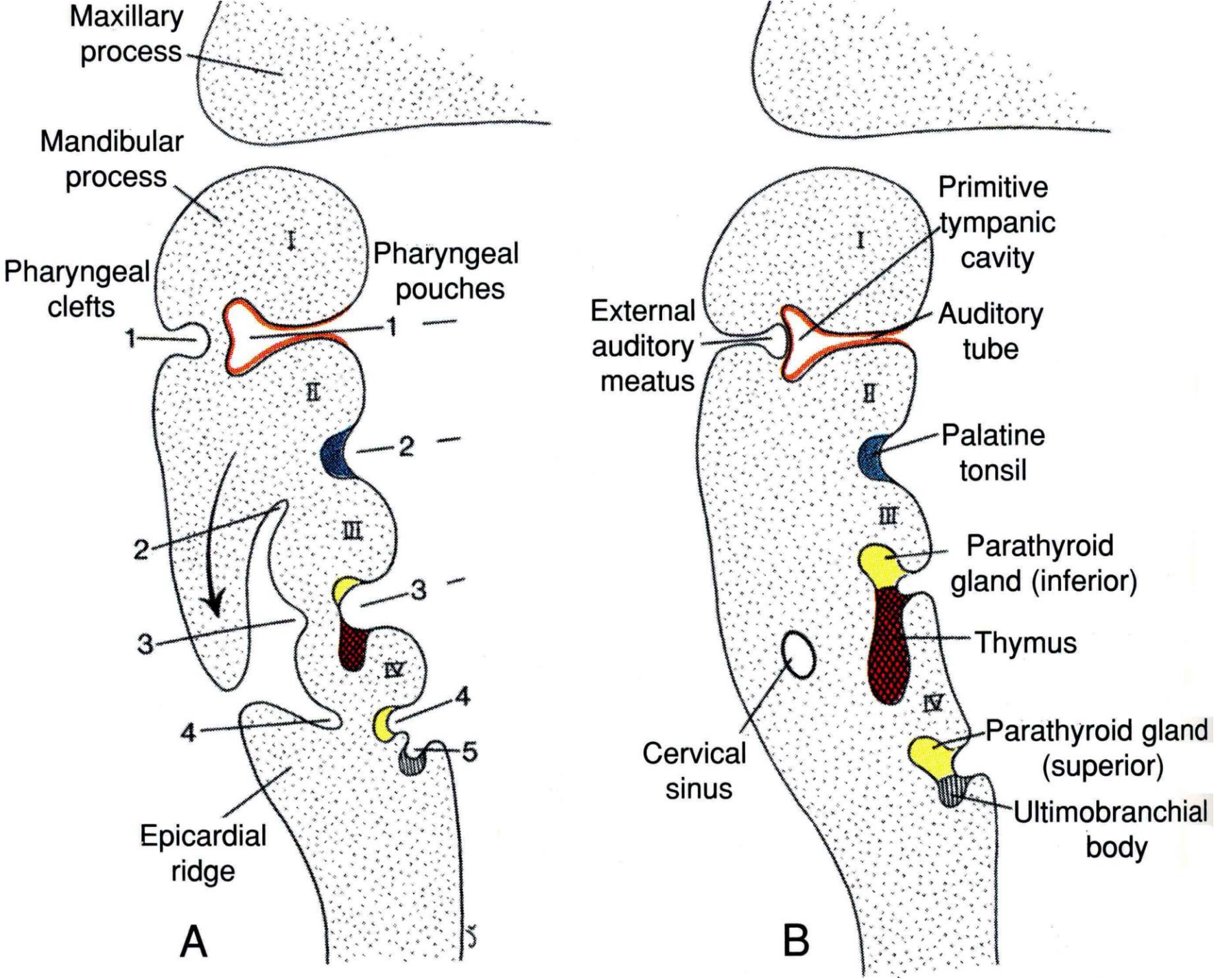

Auditory tube
Primitive tympanic cavity
External auditory meatus
Ventral side of pharynx
Foramen cecum
Palatine tonsil
Superior parathyroid gland (from 4th pouch)
Inferior parathyroid gland (from 3rd pouch)
Thyroid gland
Ultimobranchial body
Thymus
Foregut

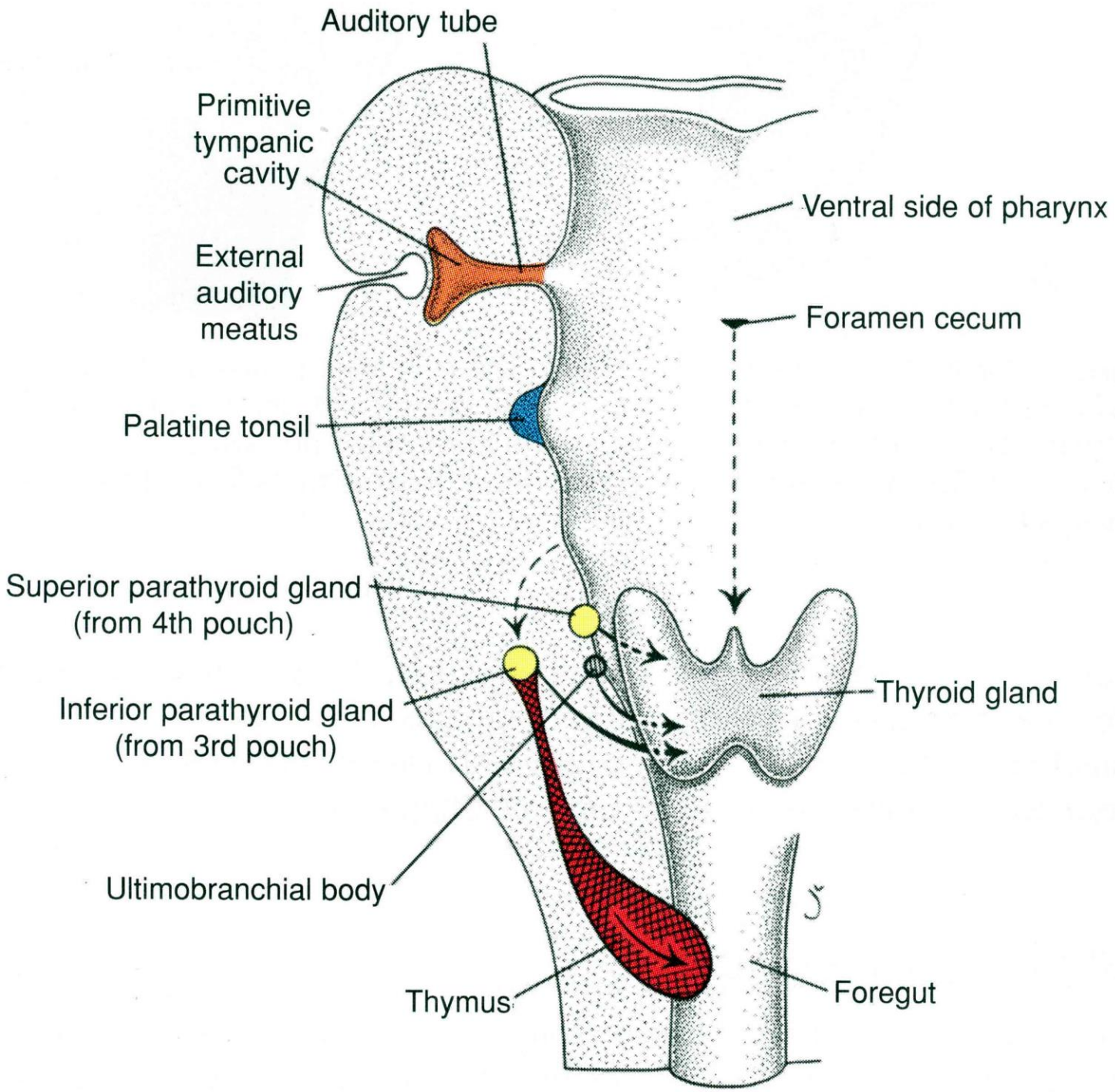
TABLE 17.2 *Derivatives of the Pharyngeal Pouches*

Pharyngeal Pouch	Derivatives
1	Tympanic (middle ear) cavity
	Auditory (eustachian) tube
2	Palatine tonsils
	Tonsillar fossa
3	Inferior parathyroid gland
	Thymus
4	Superior parathyroid gland ultimobranchial body (parafollicular [C] cells of the thyroid gland)

http://embryocentral.blogspot.com/2015/07/details-of-pharyngeal-apparatus.html

Faryngeální štěrbiny


Maxillary process
Mandibular process
Pharyngeal clefts
Pharyngeal pouches
I
II
III
IV
1
2
3
4
5
Epicardial ridge
A
Primitive tympanic cavity
External auditory meatus
Auditory tube
Palatine tonsil
Parathyroid gland (inferior)
Thymus
Parathyroid gland (superior)
Ultimobranchial body
Cervical sinus
B

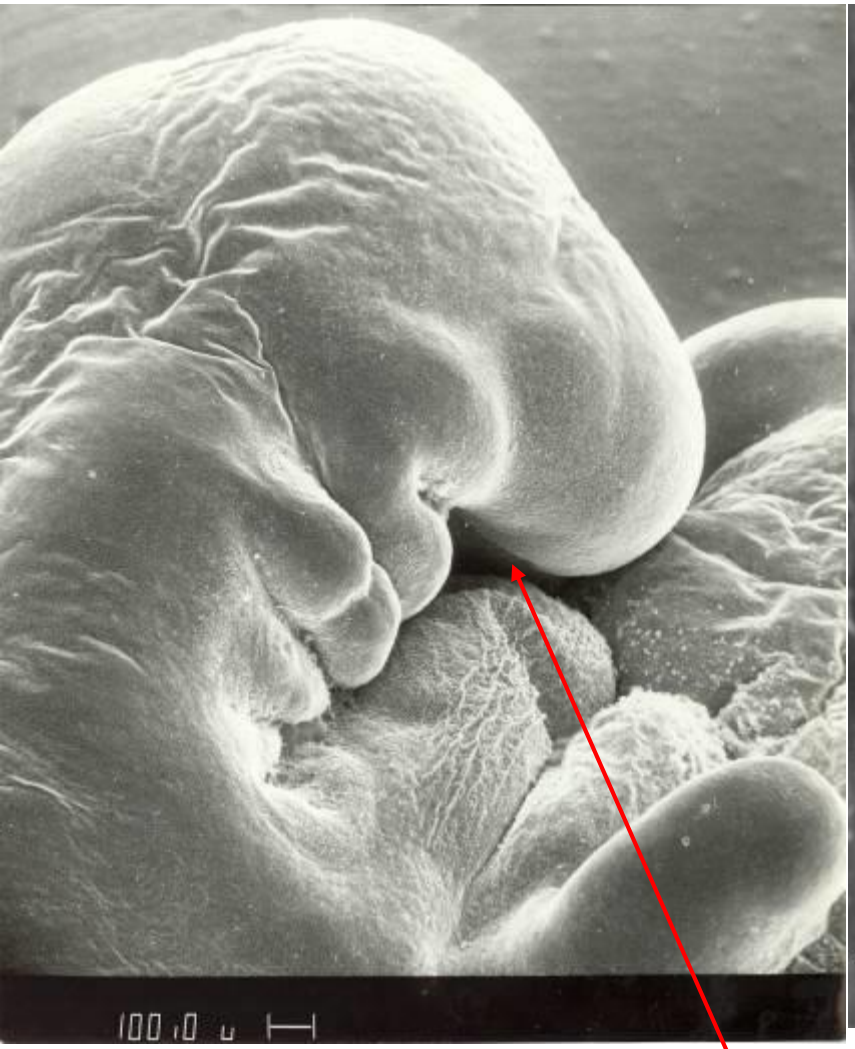

Auditory tube
Primitive tympanic cavity
External auditory meatus
Ventral side of pharynx
Foramen cecum
Palatine tonsil
Superior parathyroid gland (from 4th pouch)
Inferior parathyroid gland (from 3rd pouch)
Thyroid gland
Ultimobranchial body
Thymus
Foregut

Malá Beátka dobývá svět. Do osvěty o Treacher-Collins syndromu se zapojují i celebrity

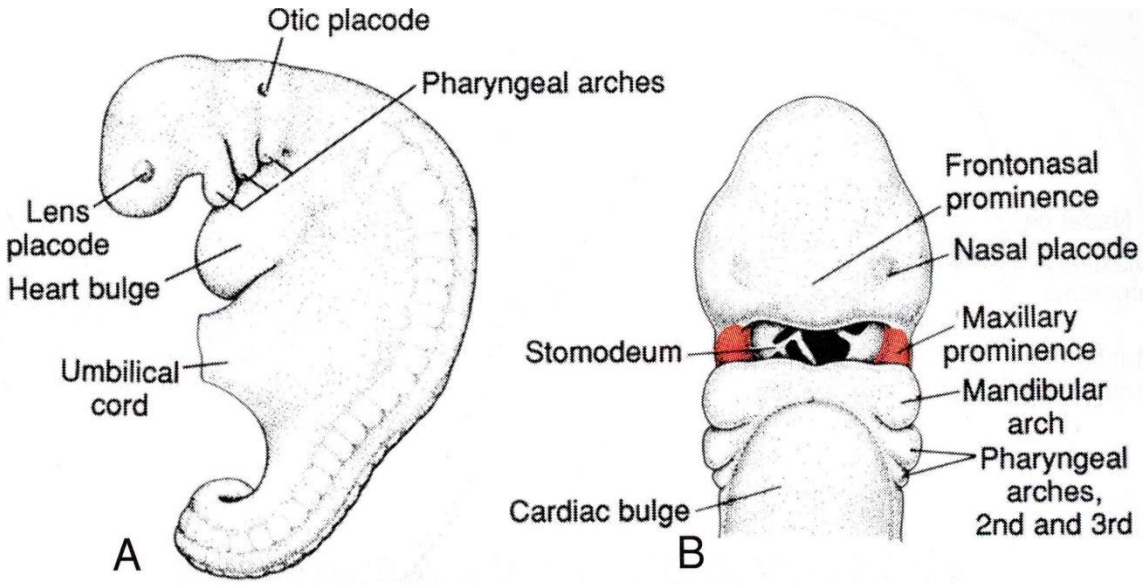
úterý, 12. února 2019, 18:54

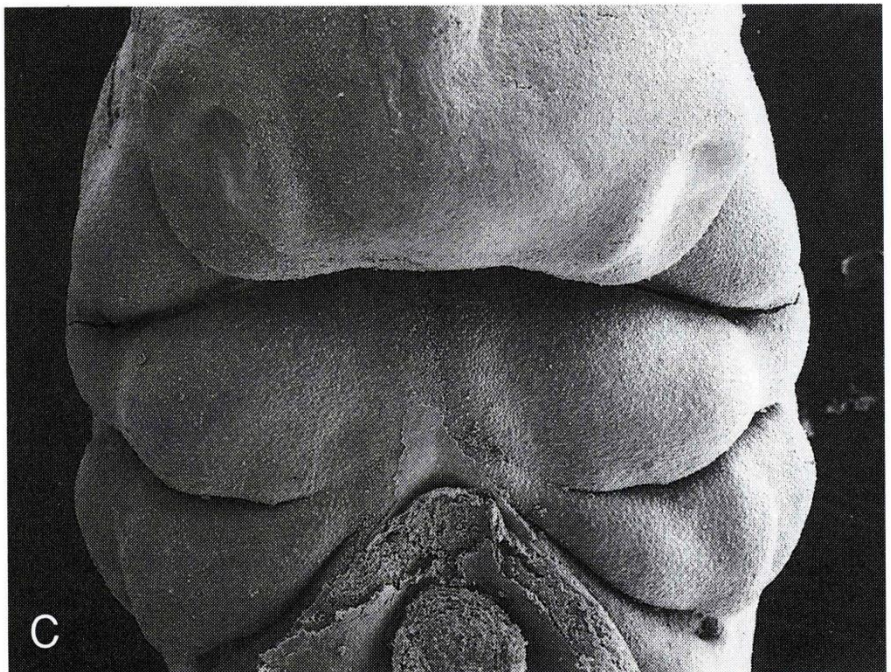
O malé Beátce, která trpí Treacher-Collins syndromem (TCS), už jsme psali v jednom z dílů pravidelného seriálu (Ne)Obyčejní. Její rodiče, Eliška a Dalibor, už se v té době snažili dostat do povědomí lidí, co vlastně TCS je. Jejich osvěta nabrala obrovských rozměrů a zapojují se do ní i slavné osobnosti.

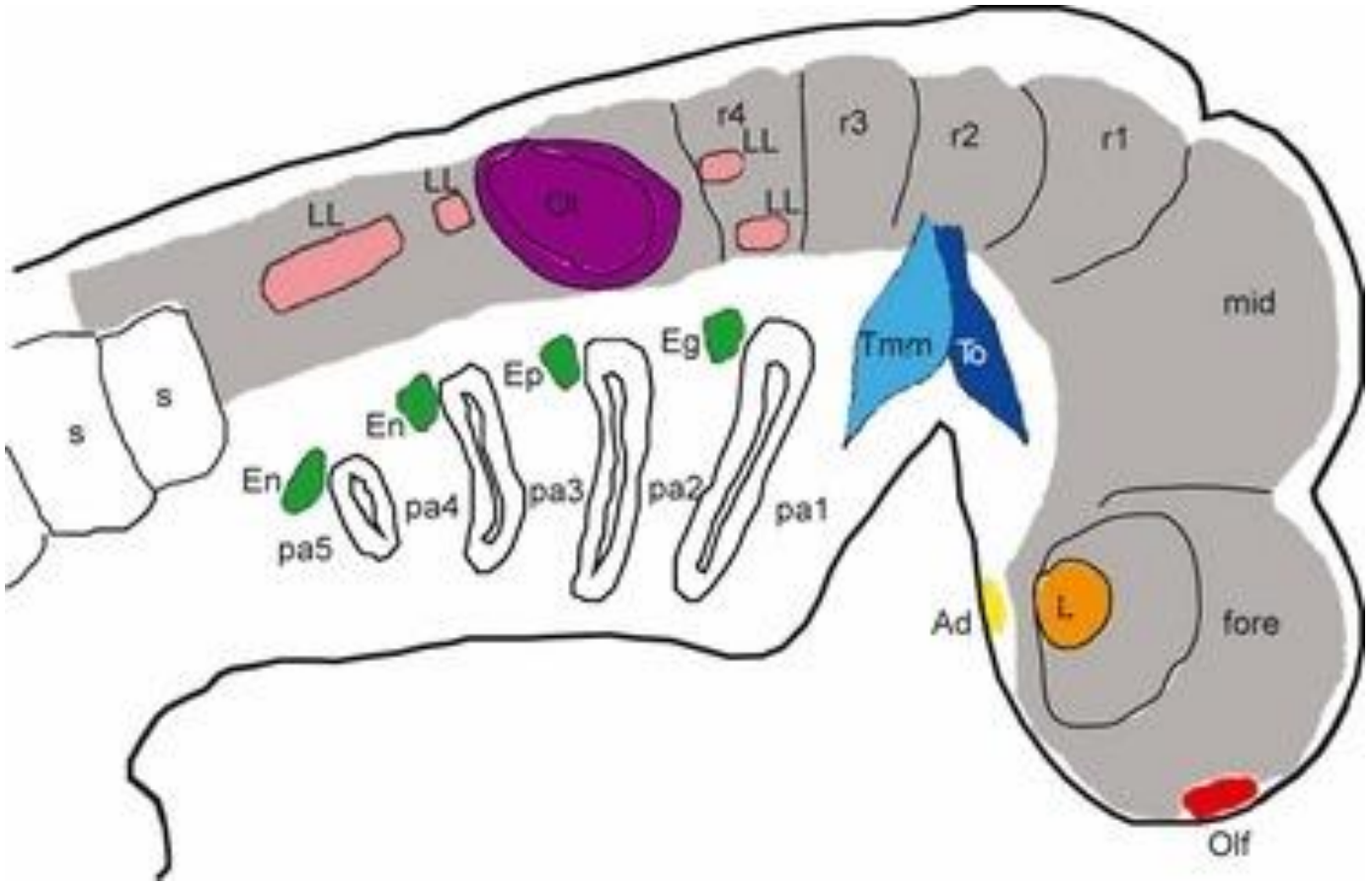
VÝVOJ OBLIČEJE, ÚSTNÍ A NOSNÍ DUTINY, PATRA A JAZYKA



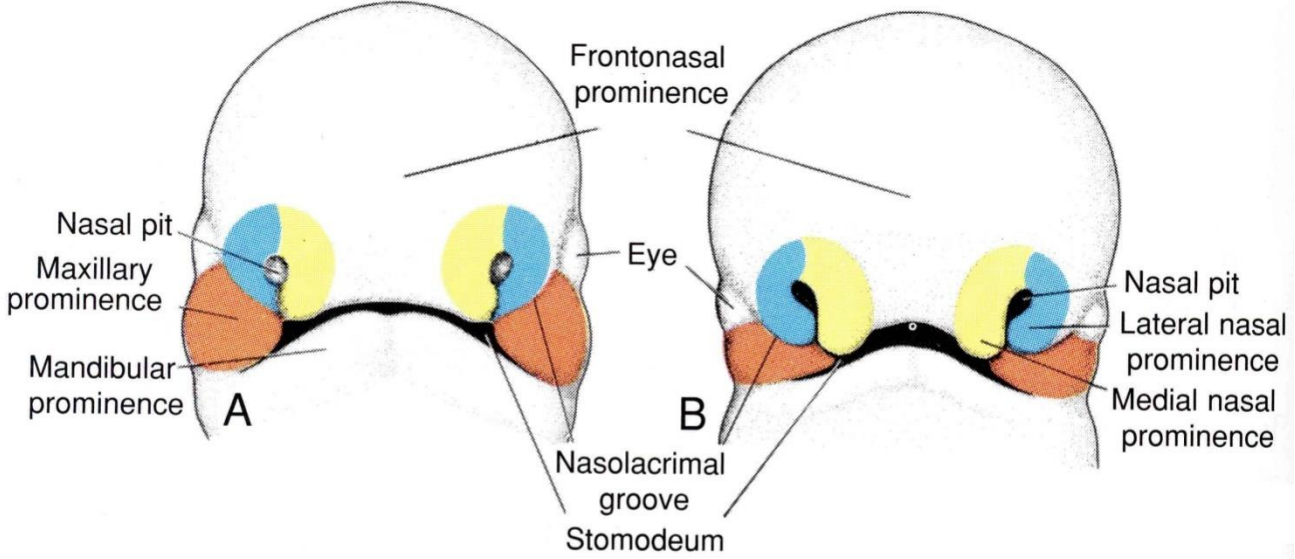
stomodeum

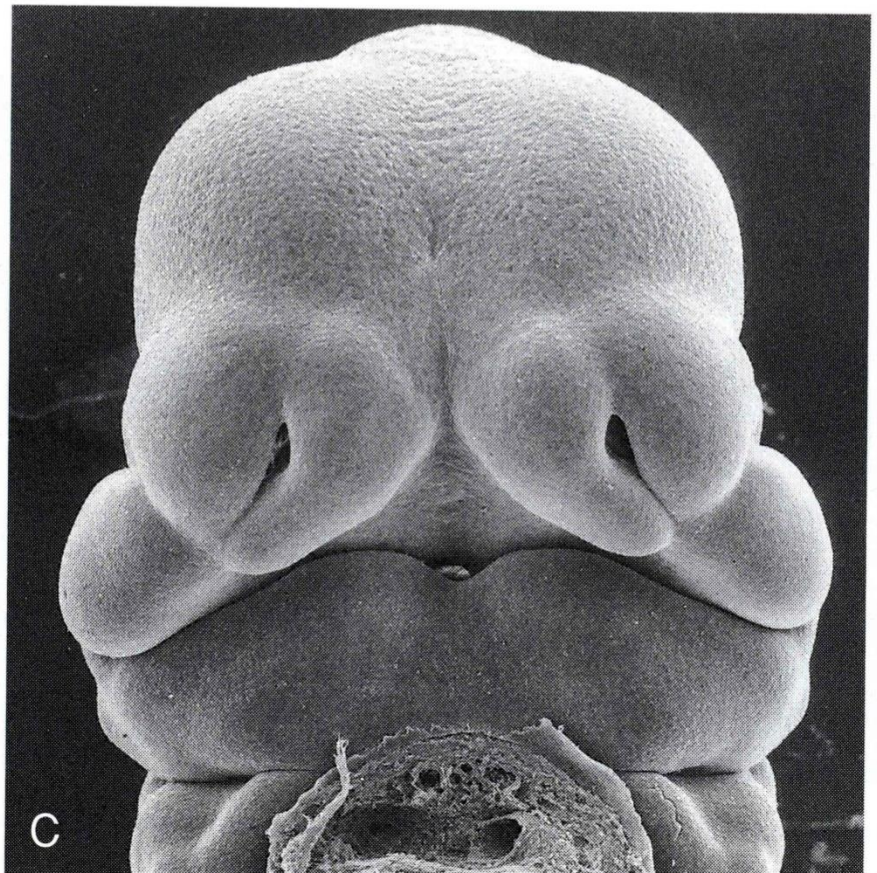

Otic placode
Pharyngeal arches
Lens placode
Heart bulge
Umbilical cord
A
Frontonasal prominence
Nasal placode
Maxillary prominence
Stomodeum
Mandibular arch
Pharyngeal arches, 2nd and 3rd
Cardiac bulge
B

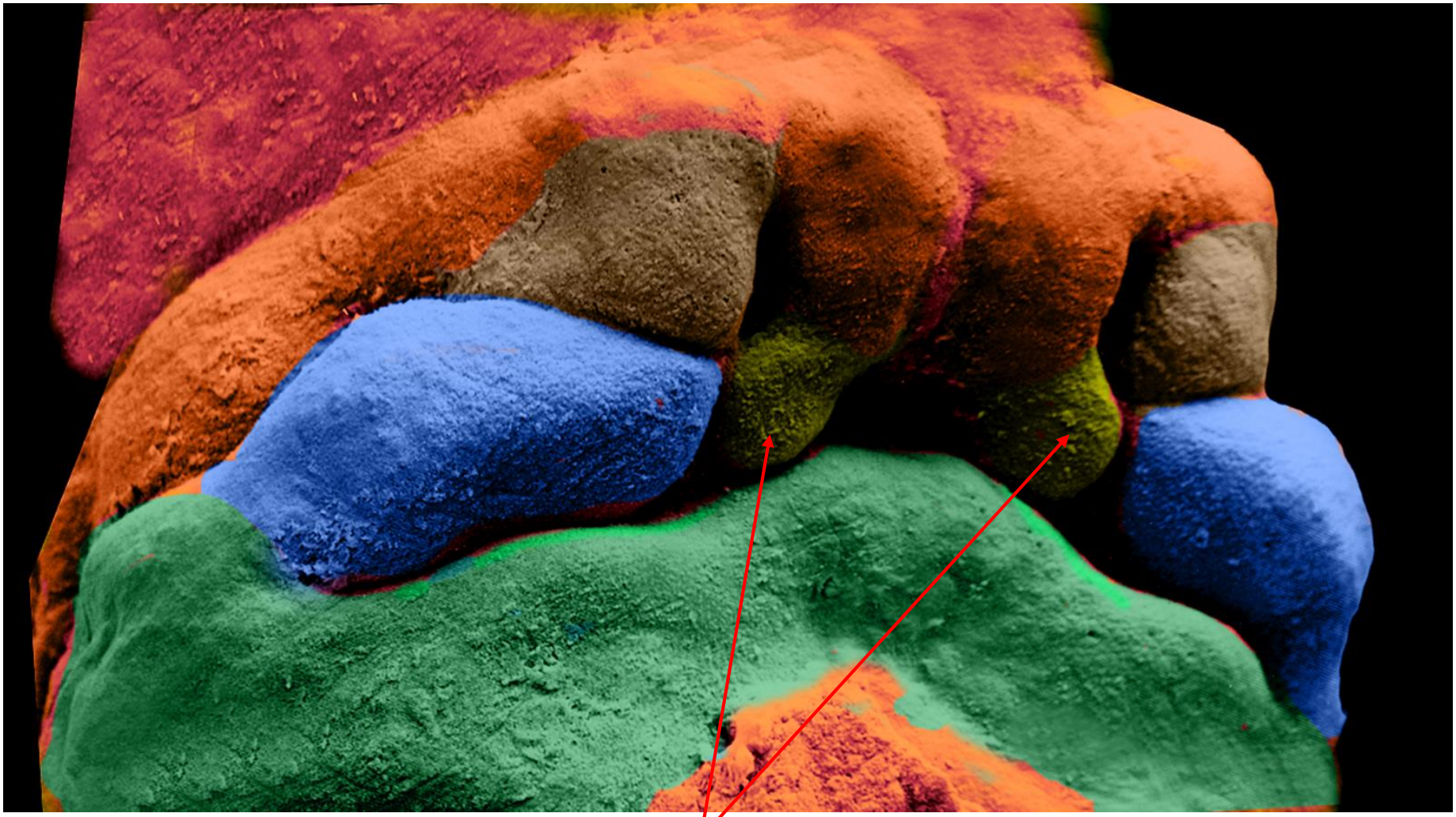

C



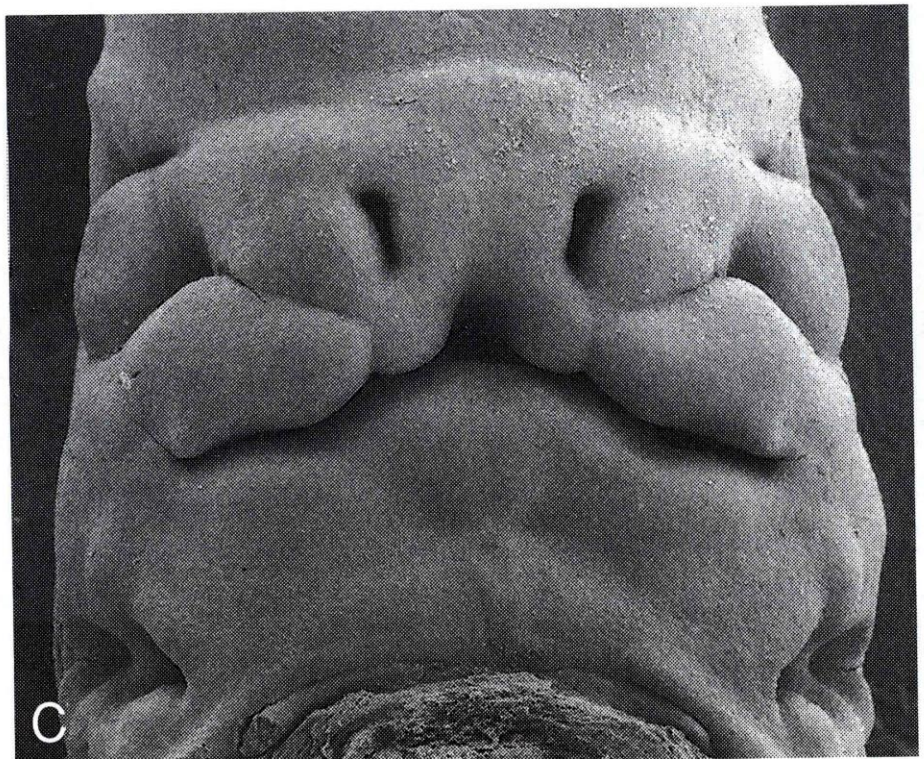
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3552413/

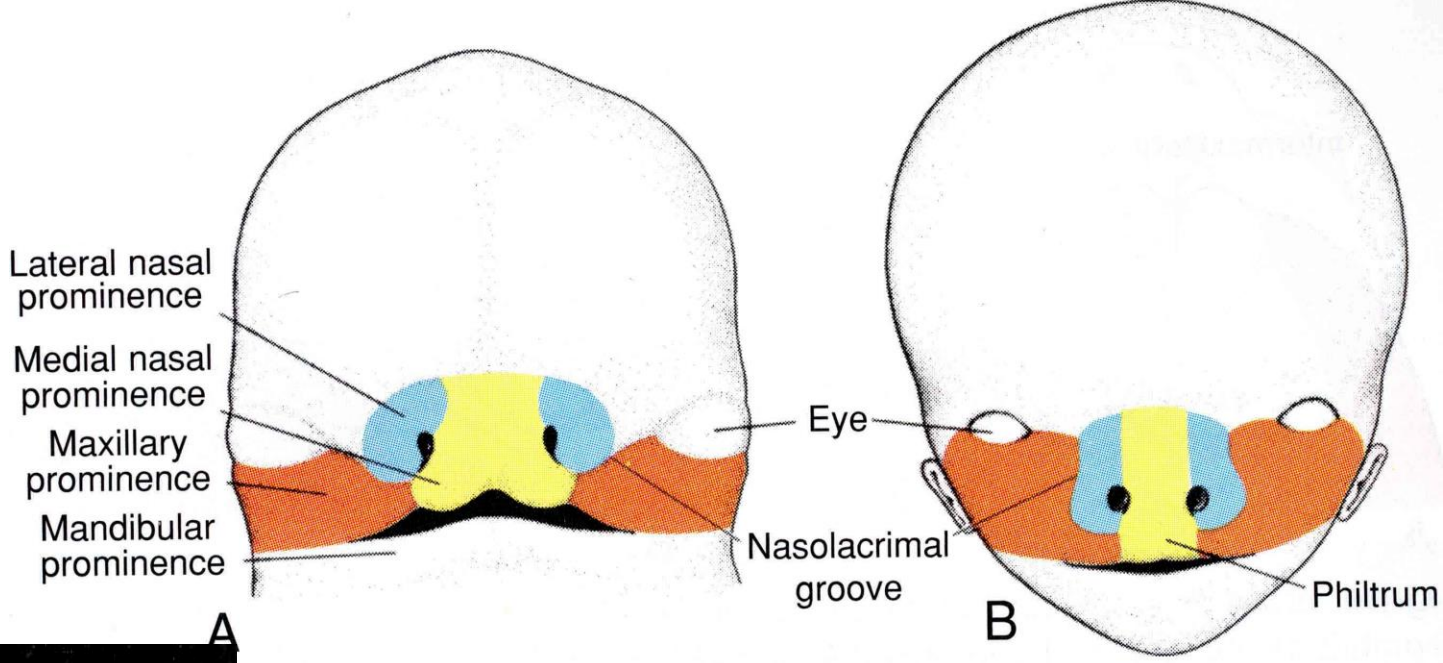

Frontonasal prominence
Nasal pit
Maxillary prominence
Mandibular prominence
A
Eye
B
Nasal pit
Lateral nasal prominence
Medial nasal prominence
Nasolacrimal groove
Stomodeum


C

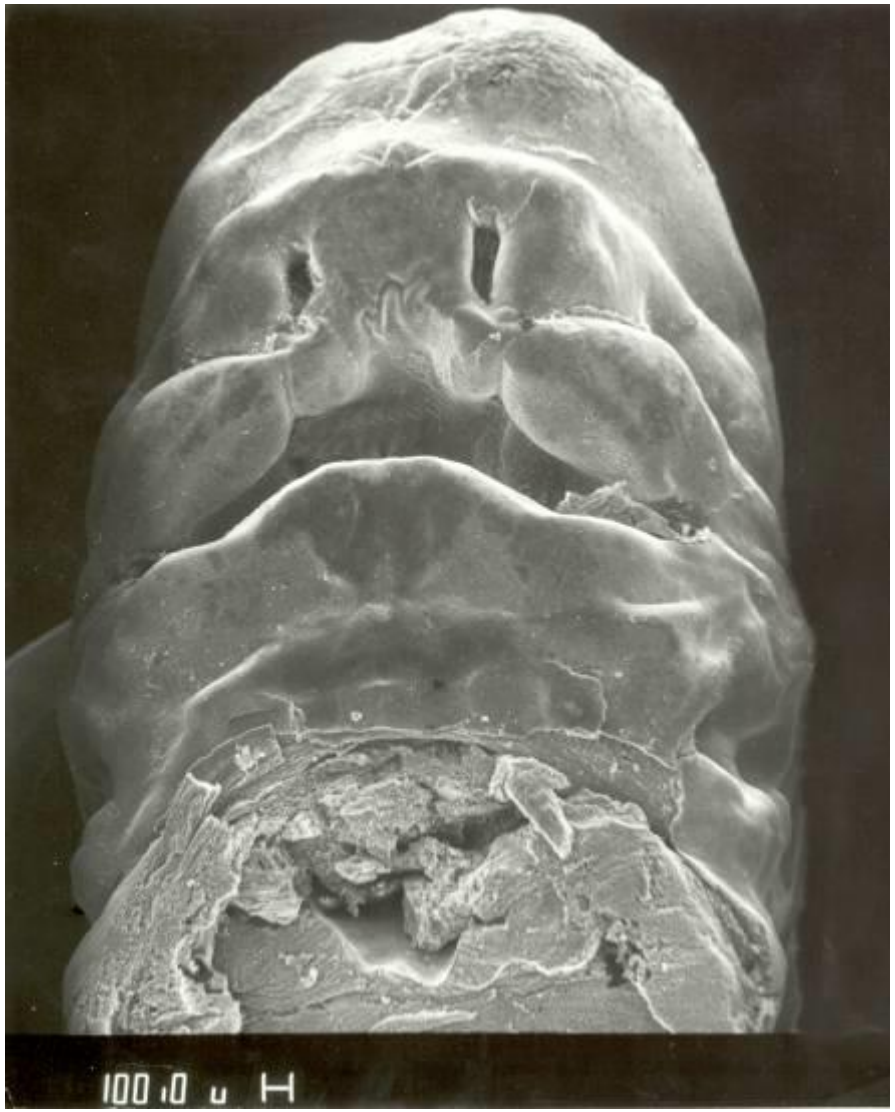


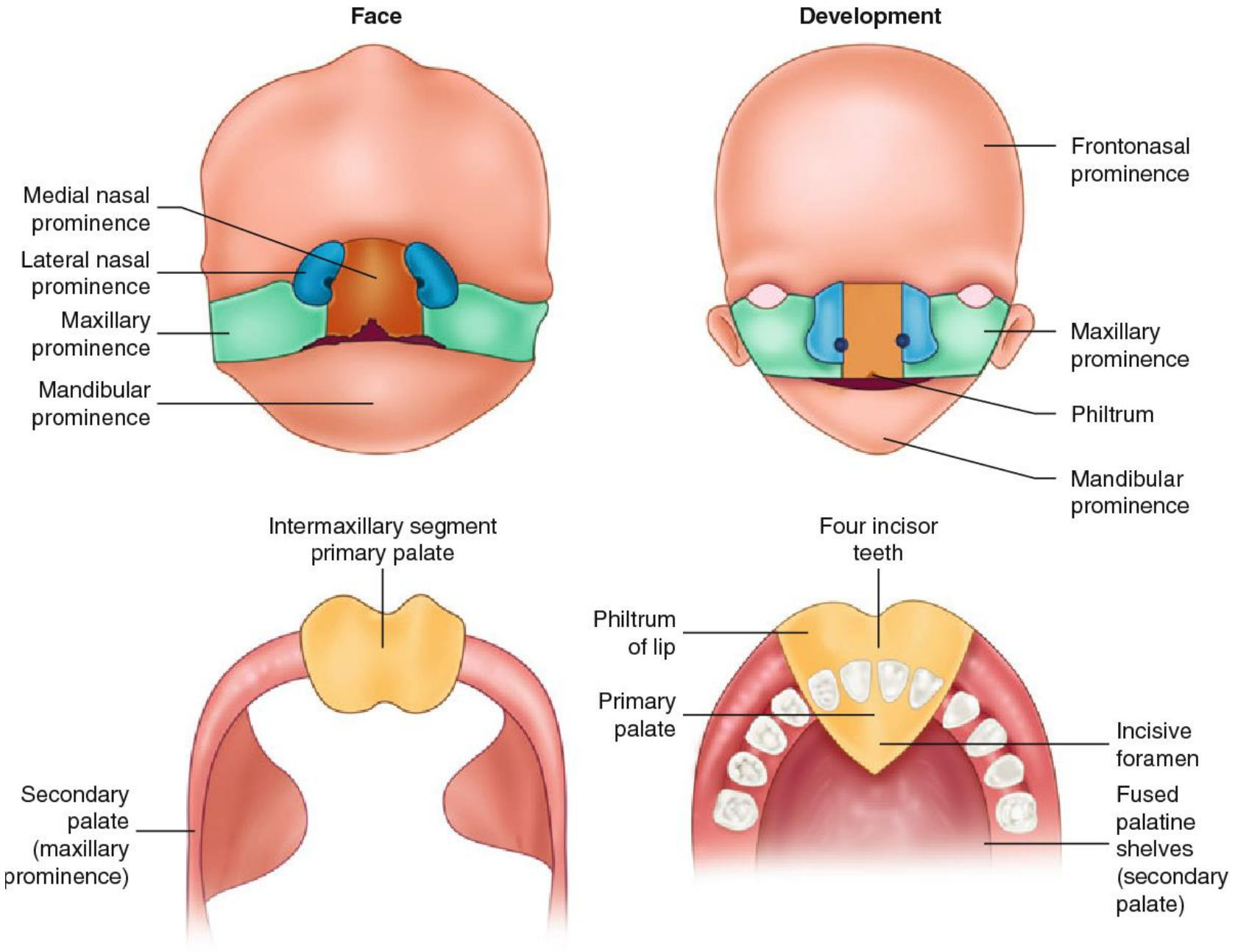
premaxilární výběžky




Lateral nasal prominence
Medial nasal prominence
Maxillary prominence
Mandibular prominence
A
Eye
Nasolacrimal groove
B
Philtrum

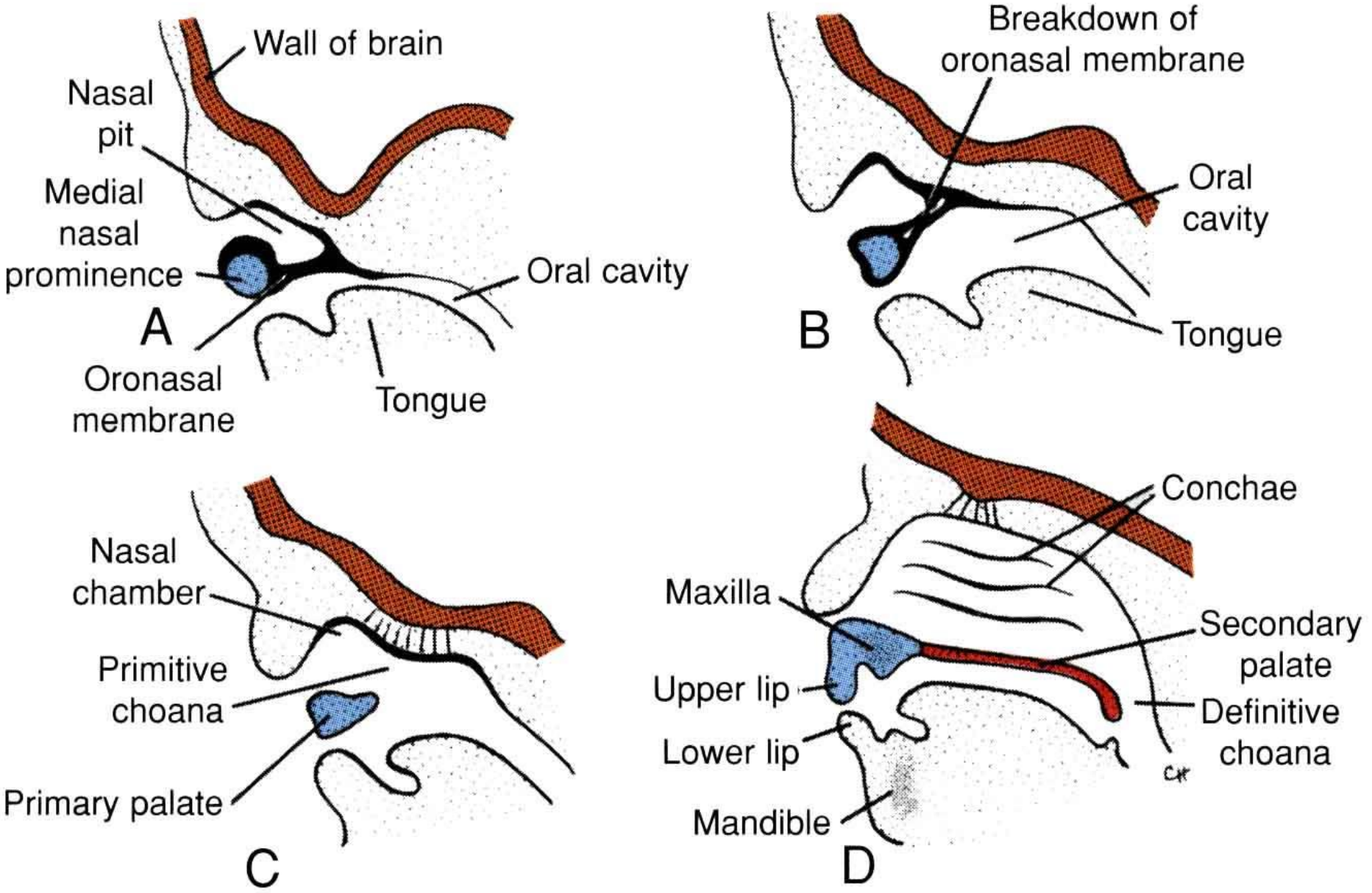
intermaxilární segment



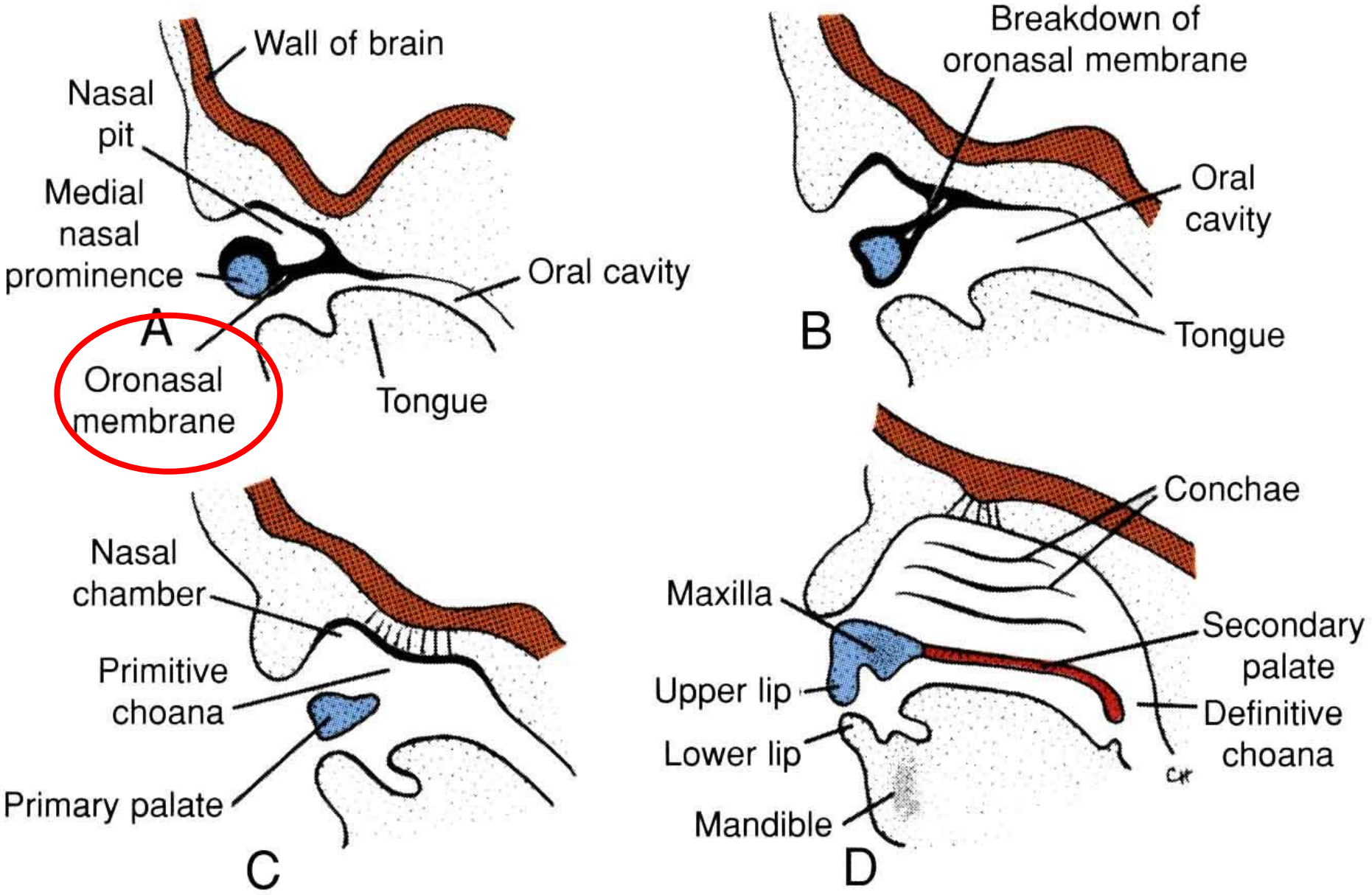


https://www.semanticscholar.org/paper/Embryology-of-the-Head-and-Neck-Taub-Mesa/cd5723a01ade59b0b487c2fdcc817cd9bf43816e/figure/3

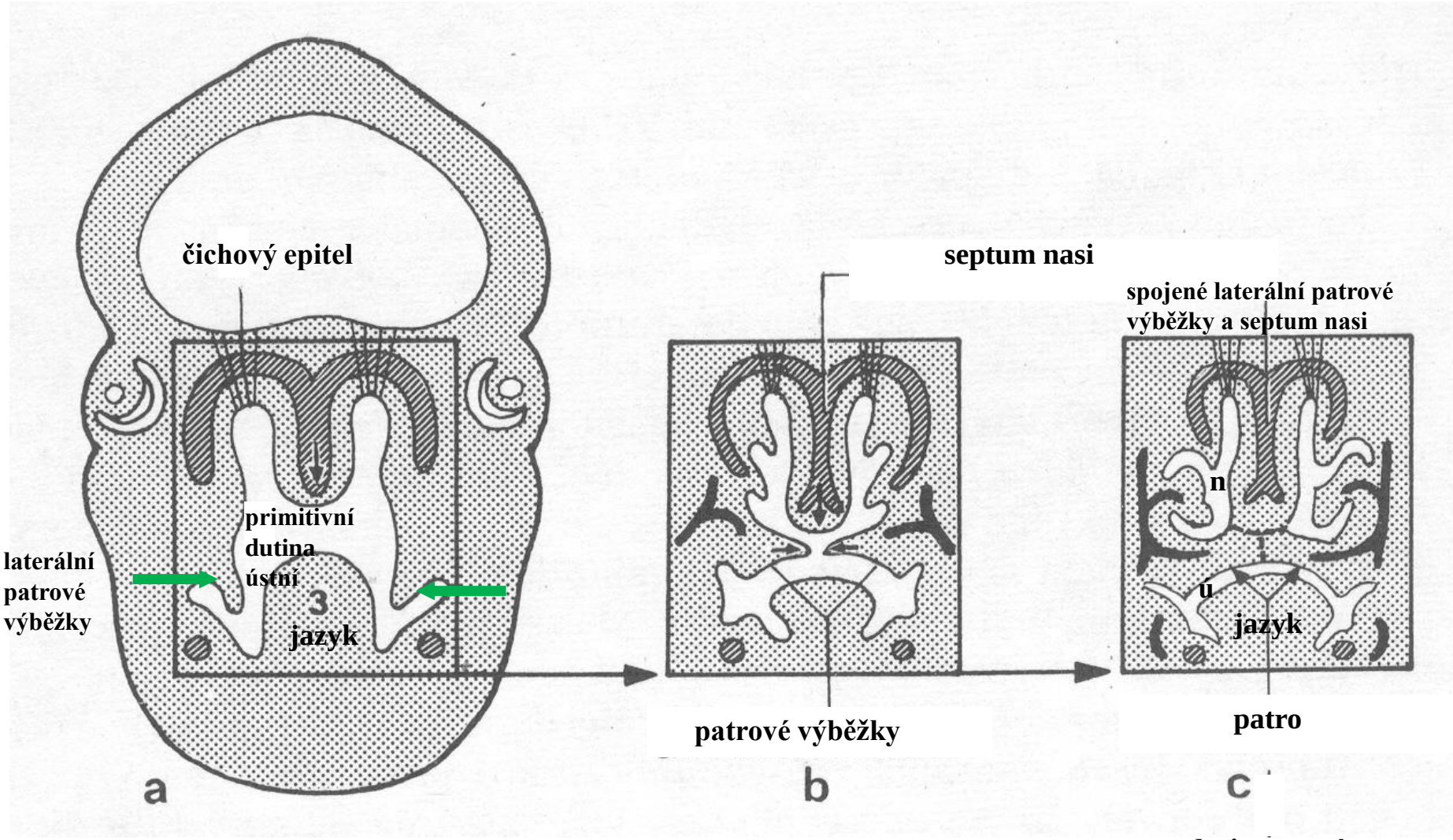
Vývoj nosní dutiny



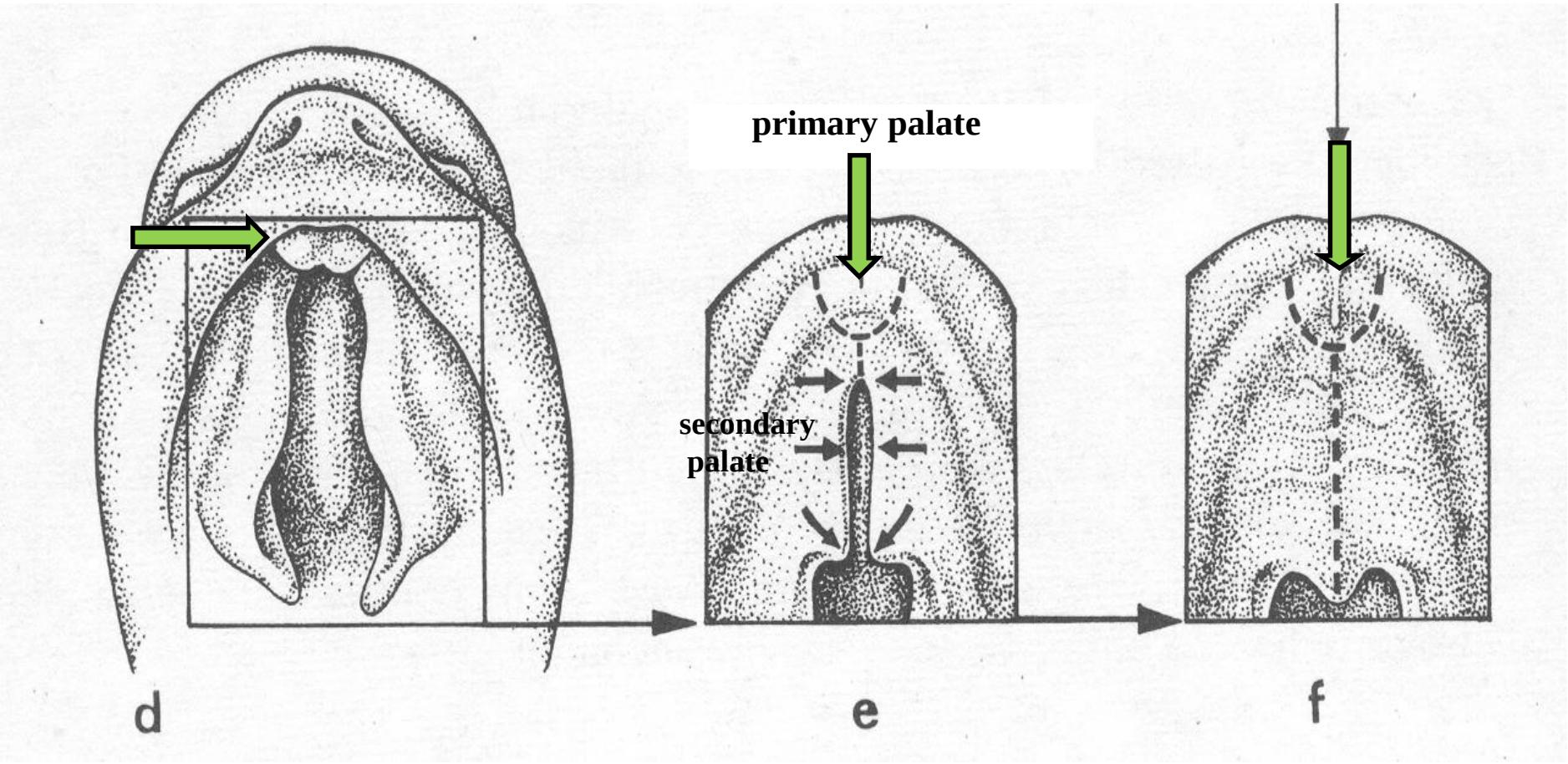
Vývoj nosní dutiny

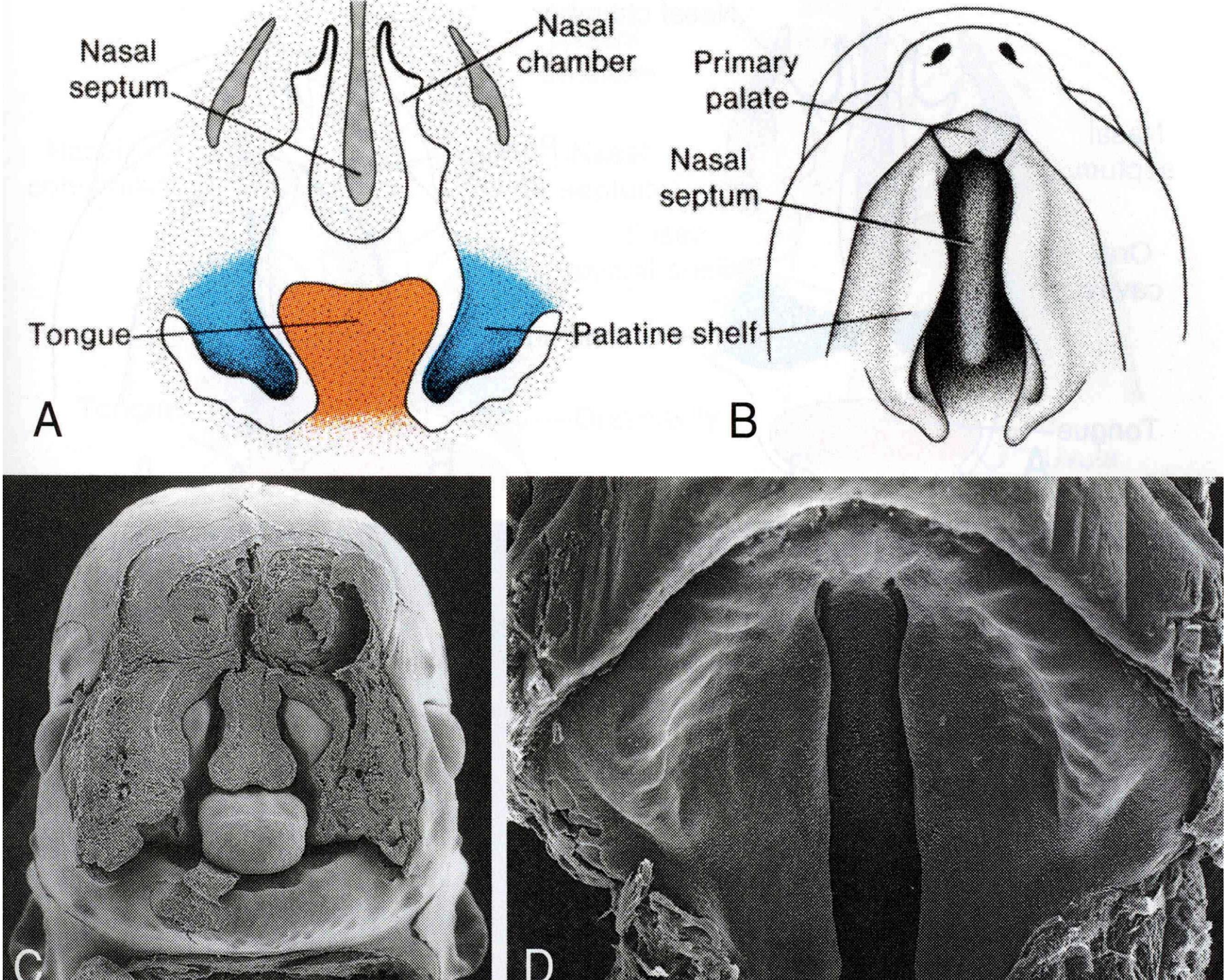


vývoj patrových výběžků, patra, vývoj dutiny nosní, dutiny ústní

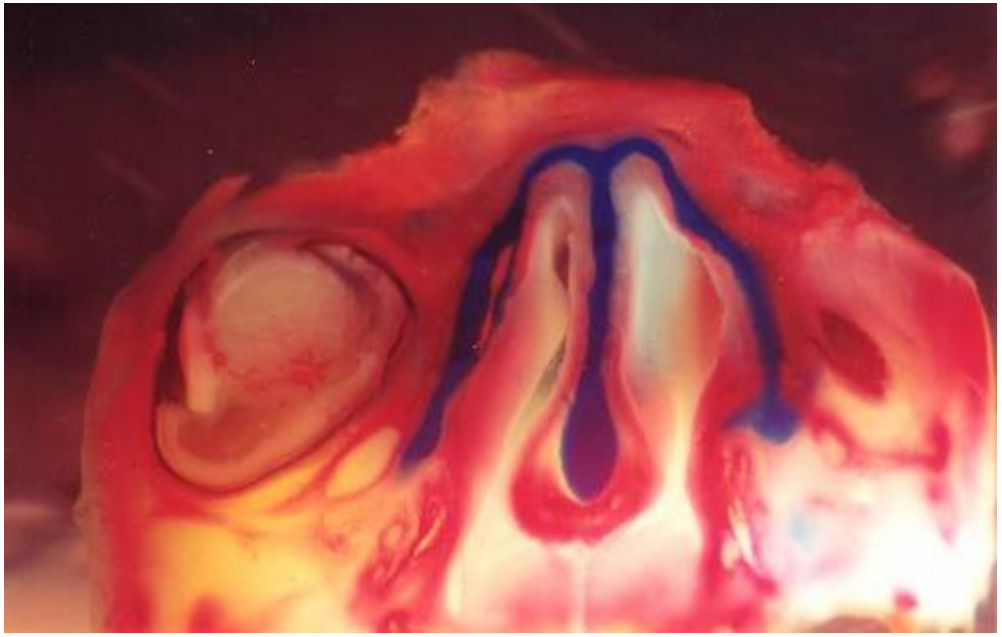


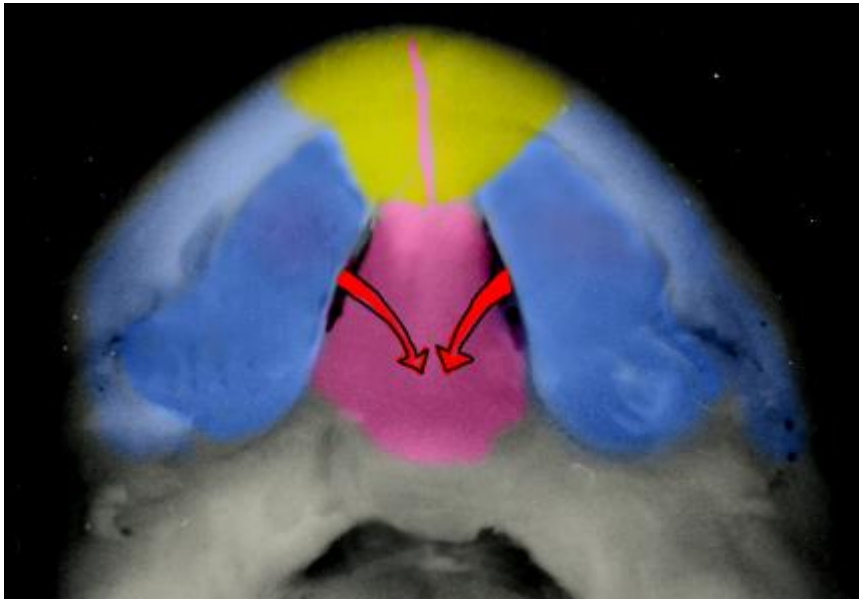
n= dutina nosní
ú= dutina ústní

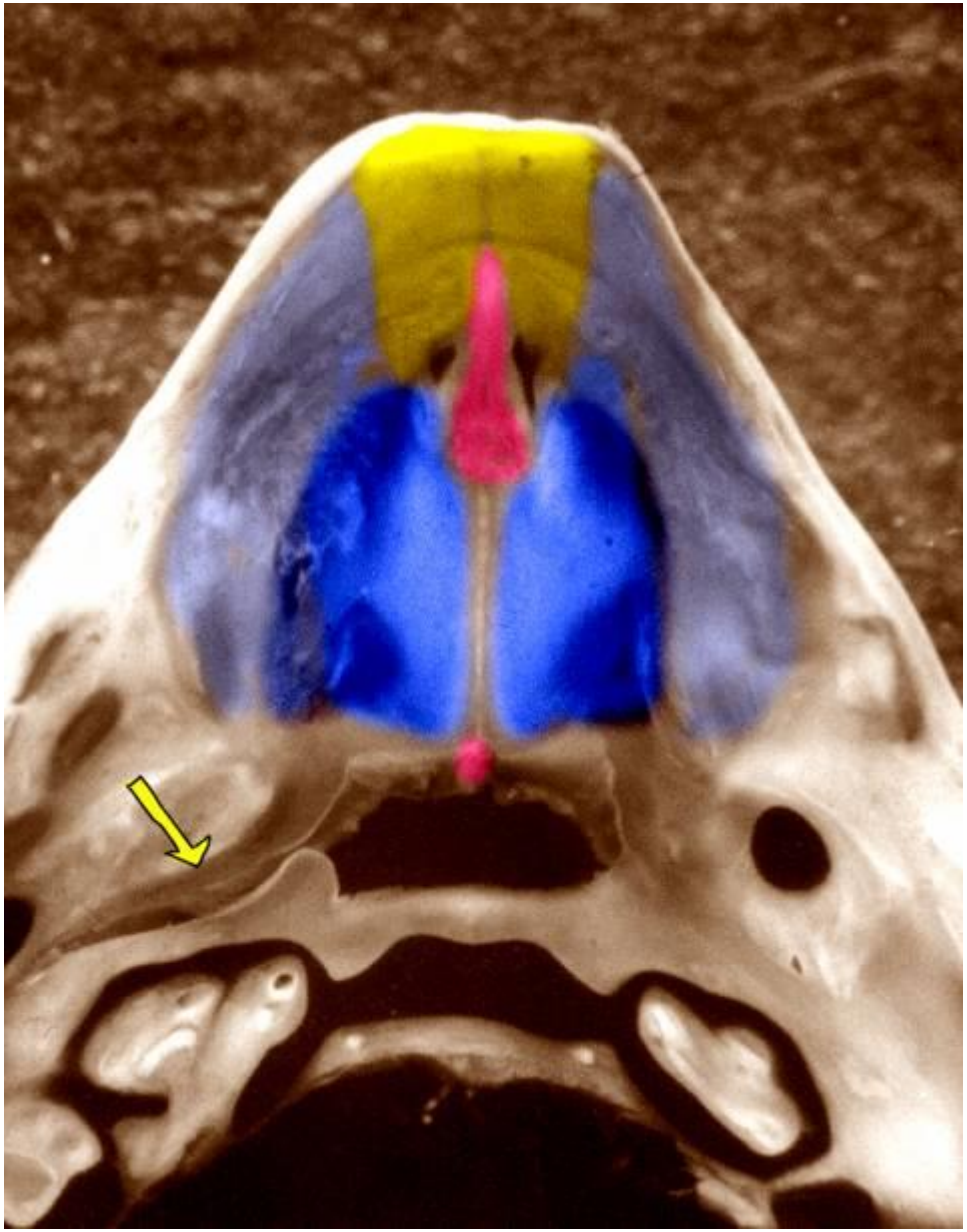

primary palate
secondary palate
d
e
f


Nasal septum
Nasal chamber
Tongue
Palatine shelf
A
Primary palate
Nasal septum
B
C
D

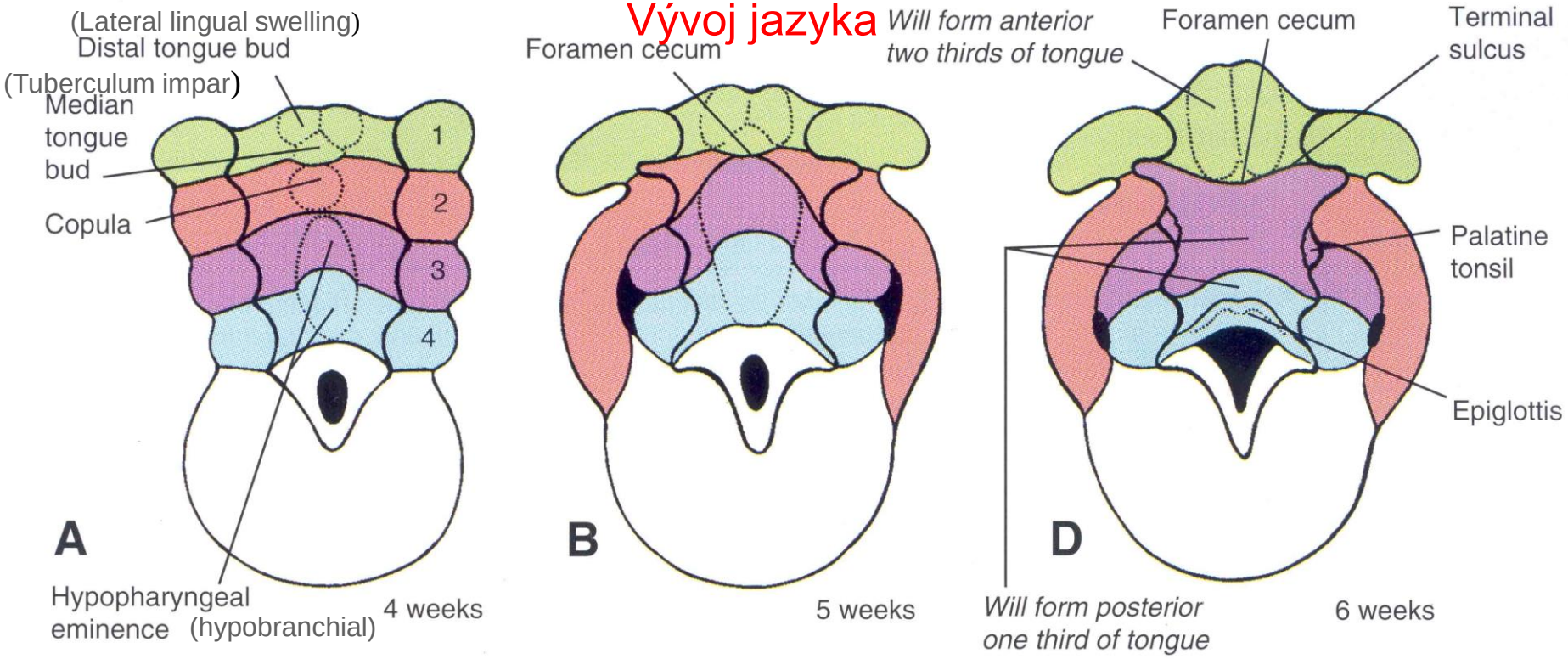
uzavírání sekundárního patra

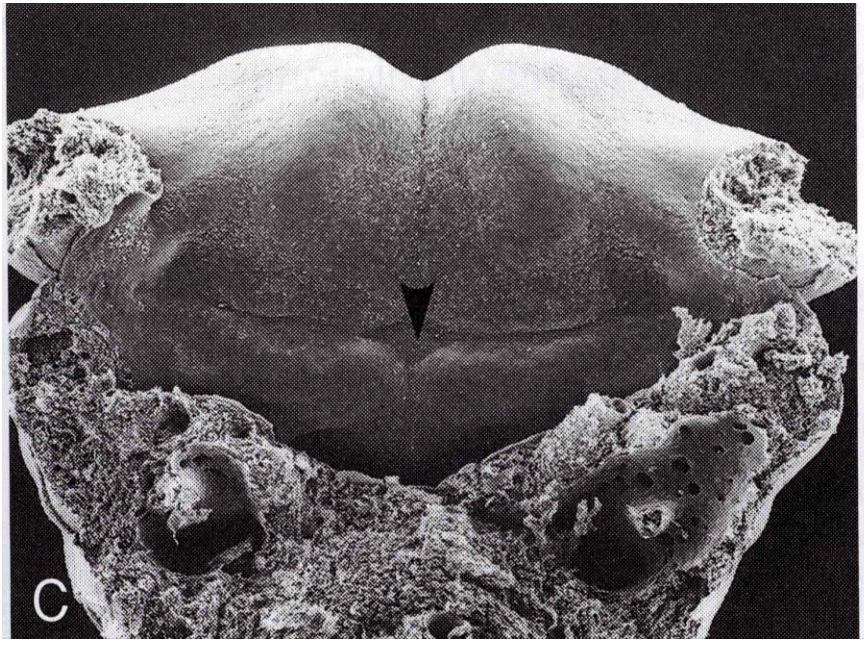


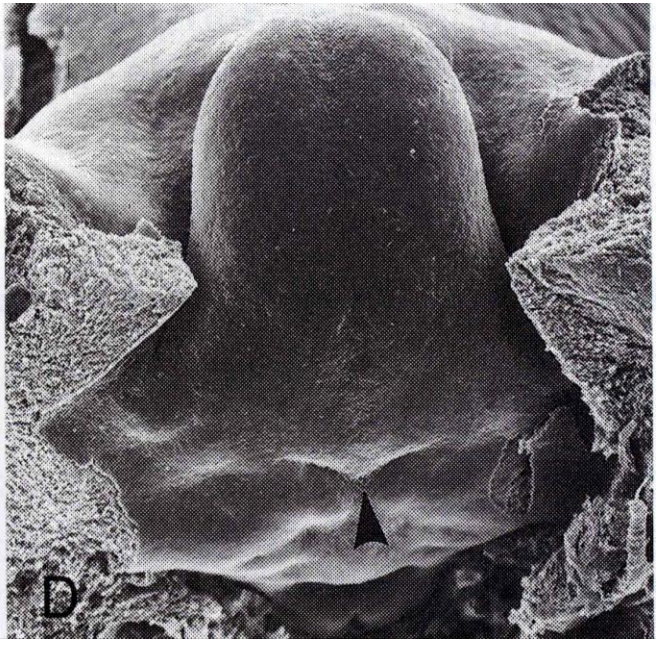


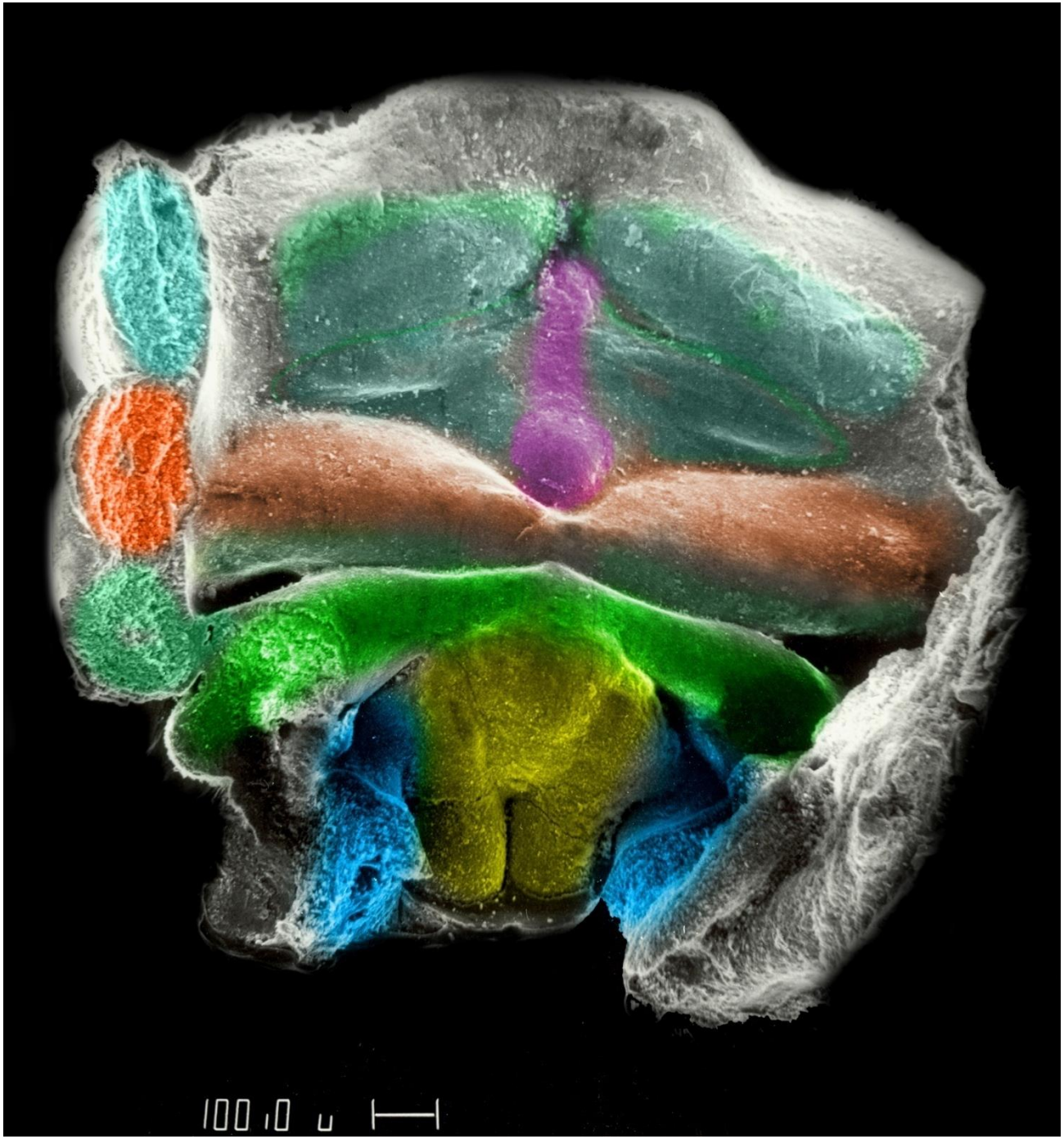


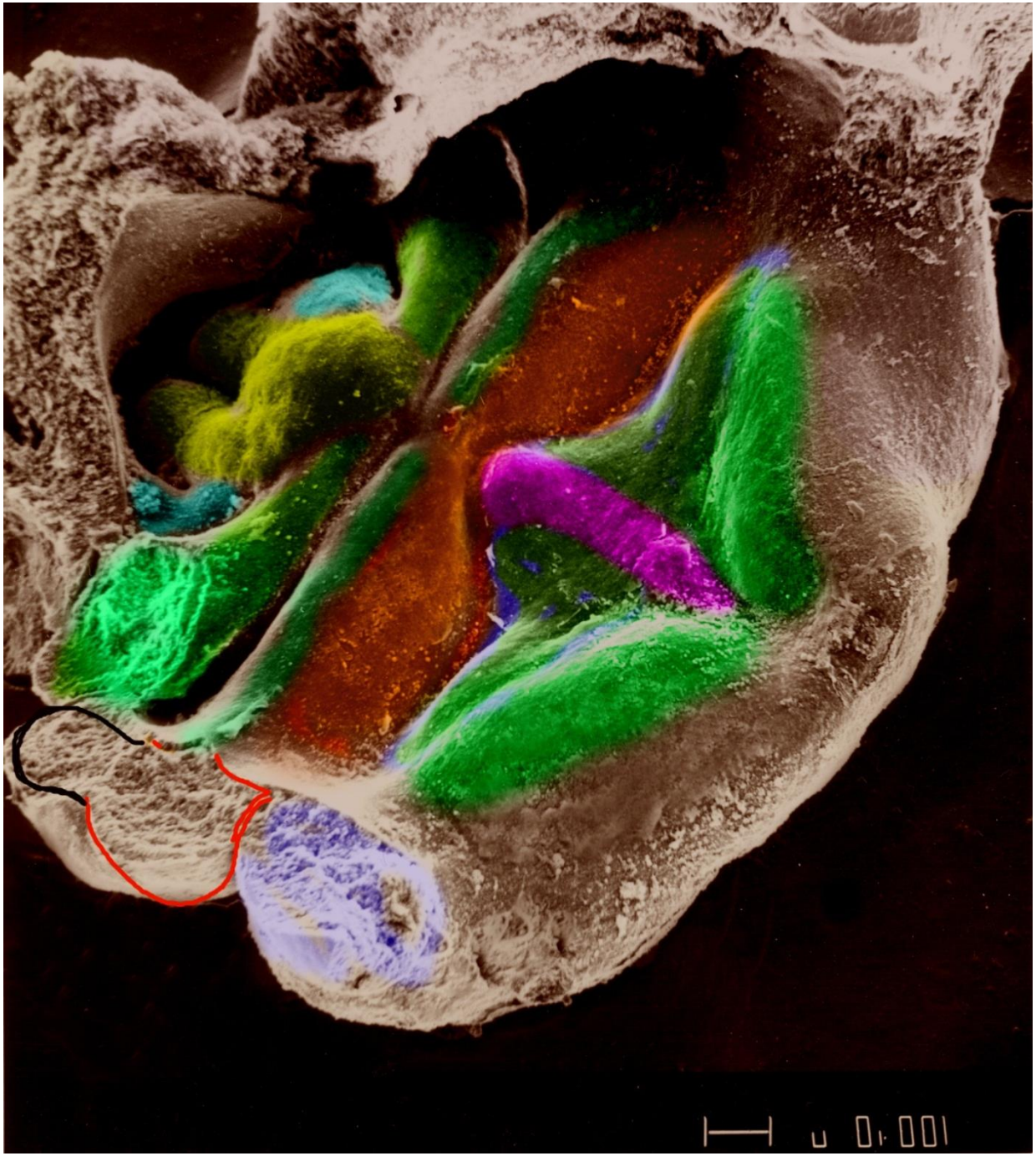
Vývoj jazyka








100.0 u


0.001

https://wanna-joke.com/sorry-tongue/