

# The Branchial Arches

Professor Alfred Cuschieri

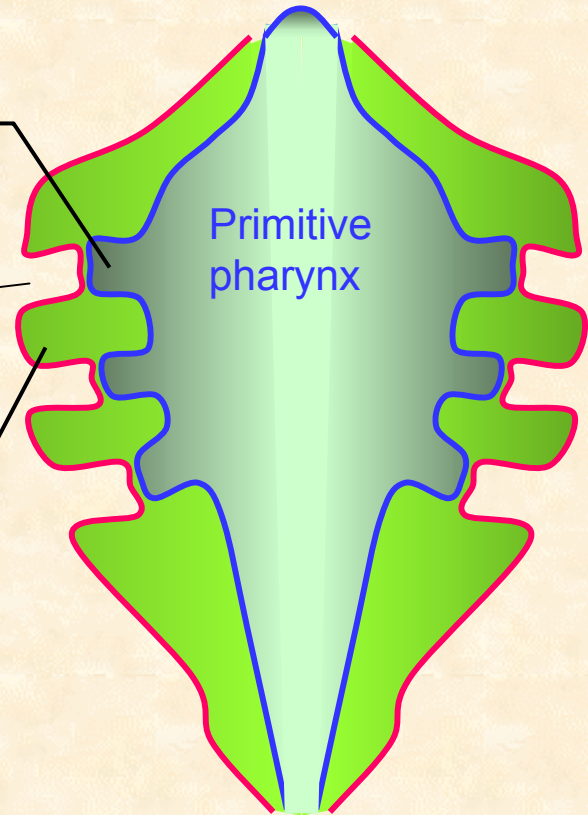
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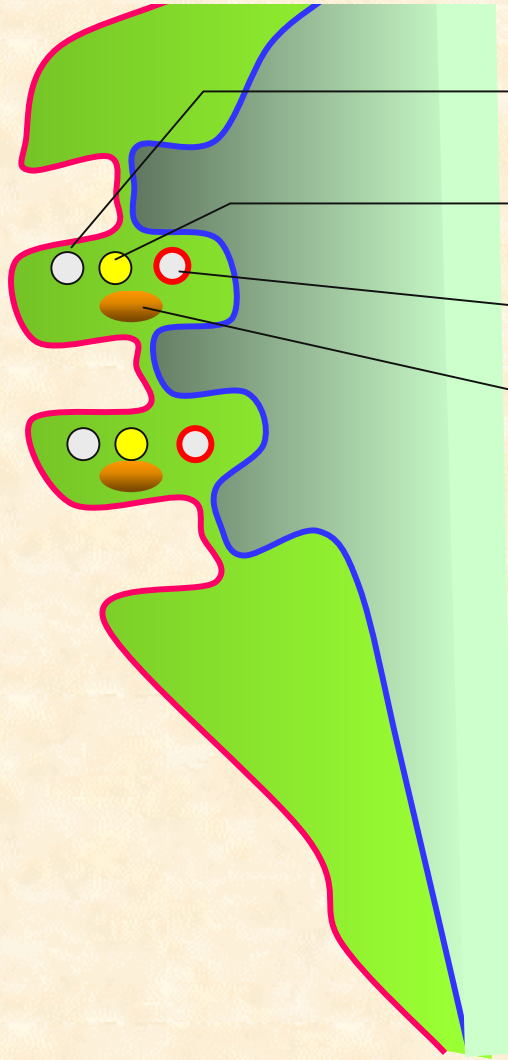


In the 4-week embryo, the primitive pharynx is associated with paired arches and pouches

- Pharyngeal pouches
  - lateral pockets of endoderm
- Branchial clefts
  - corresponding pockets of ectoderm
- Branchial arches
  - intervening mesodermal thickenings



## Each branchial arch contains:



- A cartilage
- A cranial nerve
- An aortic arch
- Myoblasts

These elements are of neural crest origin

In fish there are 6 pairs of branchial arches, but only four are well developed in humans

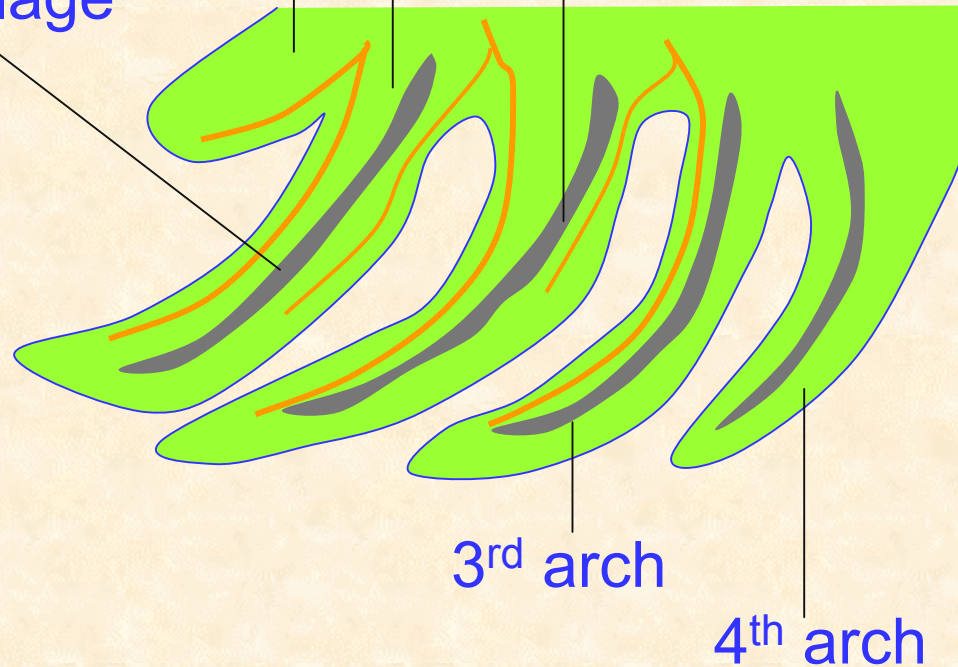
- The fifth branchial arch fails to develop
- The sixth branchial arch is rudimentary

# The first two arches and their cartilages are named

1<sup>st</sup> - Mandibular arch  
& its maxillary process

- contains  
Meckel's cartilage

2<sup>nd</sup> - Hyoid arch  
-contains Reichert's cartilage



# Derivatives of the first, second and third arch cartilages

1<sup>st</sup> arch (Meckel's) cartilage

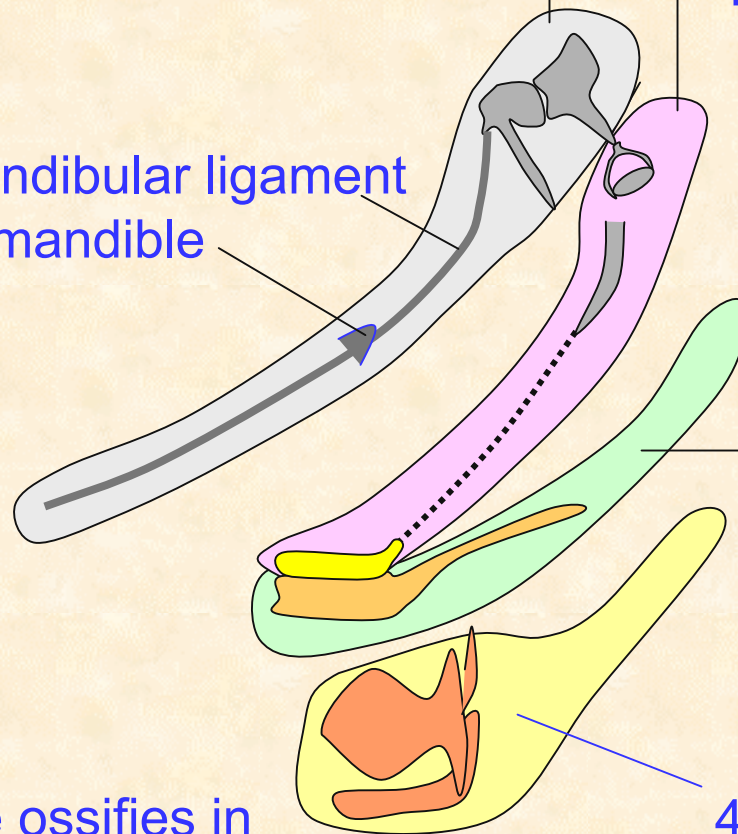
forms the:

- Incus
- Malleus
- Sphenomandibular ligament
- Lingula of mandible

2<sup>nd</sup> arch (Reichert's) cartilage

forms the:

- Stapes
- Styloid process
- Stylohyoid ligament
- Lesser cornu & part of body of hyoid bone.



3<sup>rd</sup> arch cartilage forms the:

- Greater cornu & part of body of hyoid bone

The mandible ossifies in membrane from the mesoderm around Meckel's cartilage

4<sup>th</sup> arch cartilage forms the:

- Laryngeal cartilages

# Each Branchial Arch Is Supplied by a Cranial Nerve.

1<sup>st</sup> arch

Mandibular nerve

- Muscles of mastication
- Tensor veli palatini
- Tensor tympani
- Mylohyoid
- Anterior belly of digastric

2<sup>nd</sup> arch

Facial nerve

- Muscles of facial expression
- Stapedius
- Stylohyoid
- Posterior belly of digastric

3<sup>rd</sup> arch

- Glossopharyngeal n.

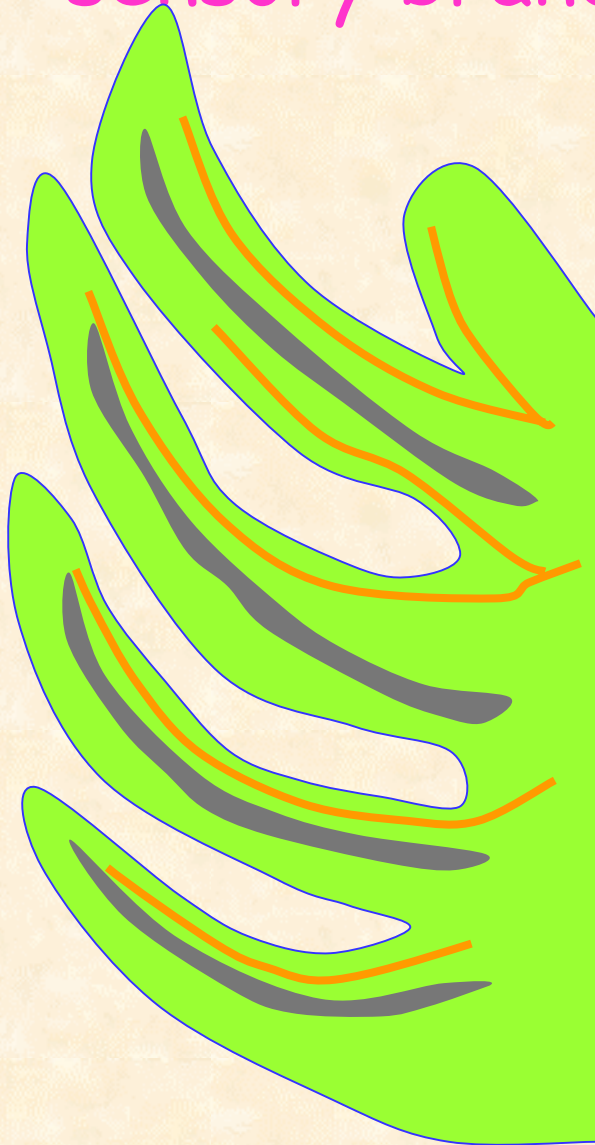
- Stylopharyngeus

4<sup>th</sup> arch

- Vagus nerve

- Pharyngeal & laryngeal m.

The nerves of the 1<sup>st</sup> & 2<sup>nd</sup> arches give a sensory branch to the preceding arch



Maxillary nerve - sensory

Mandibular nerve - motor

Chorda tympani n -sensory

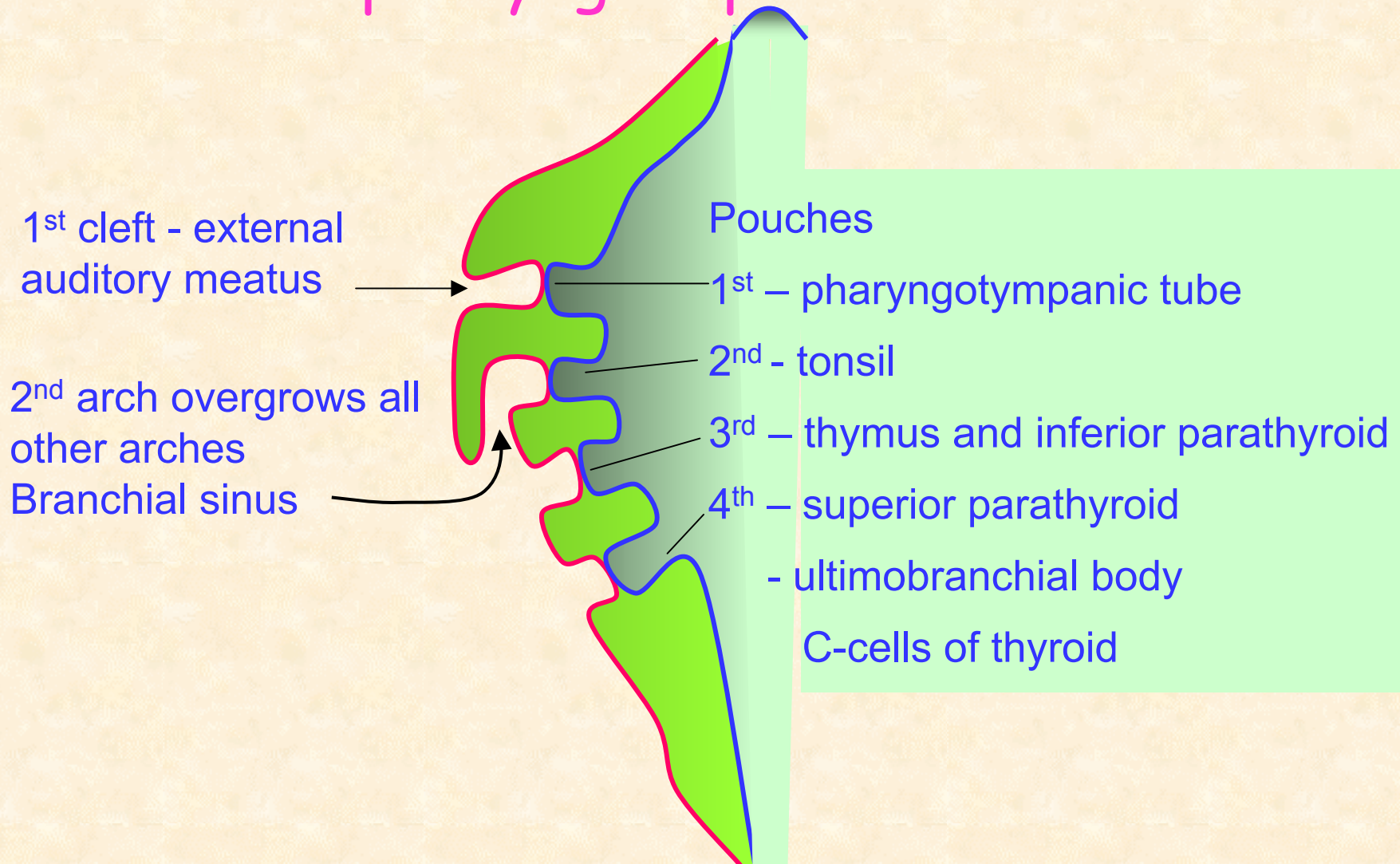
Facial nerve - motor

Glossopharyngeal nerve - motor

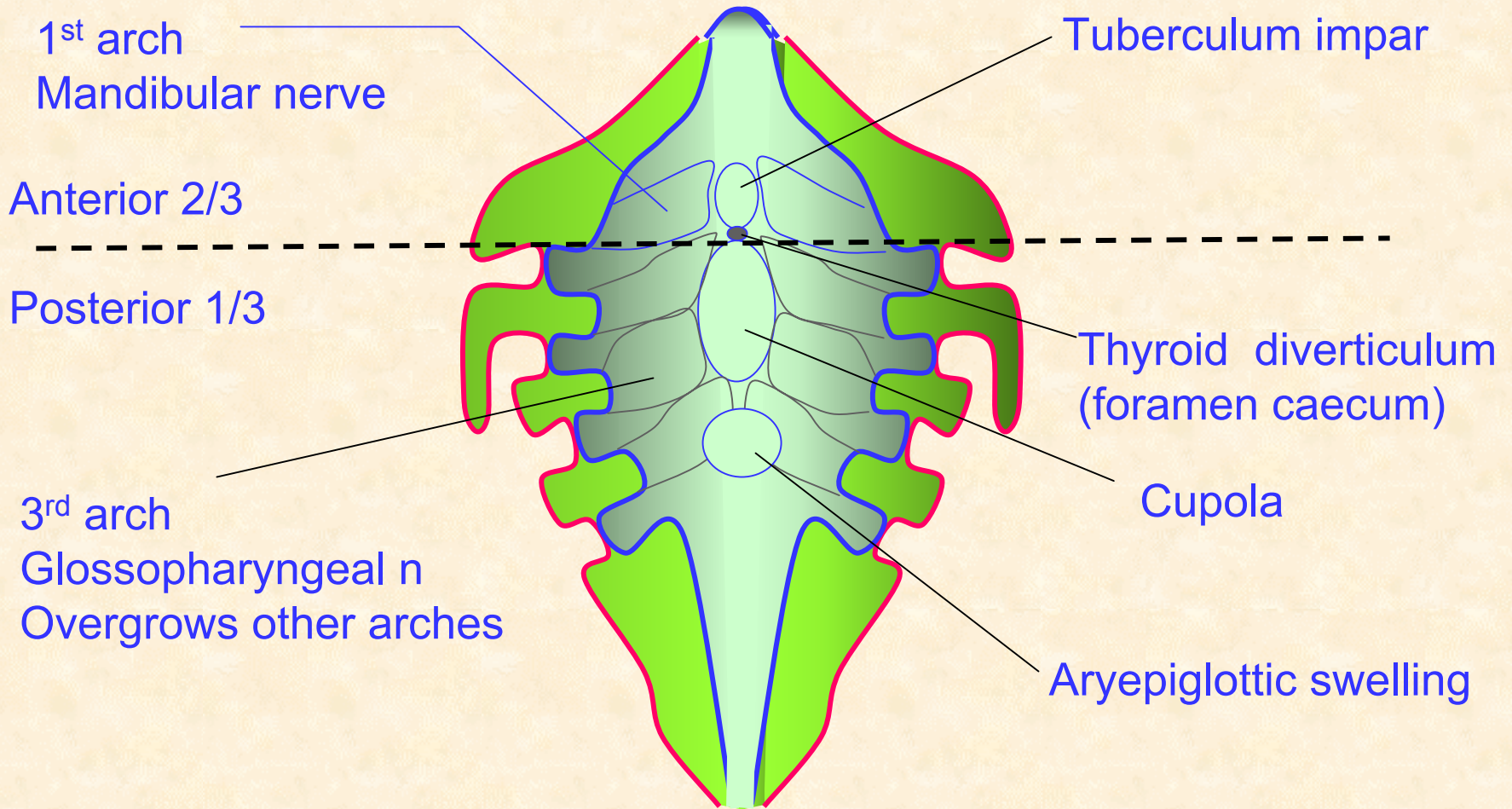
Vagus nerve - motor



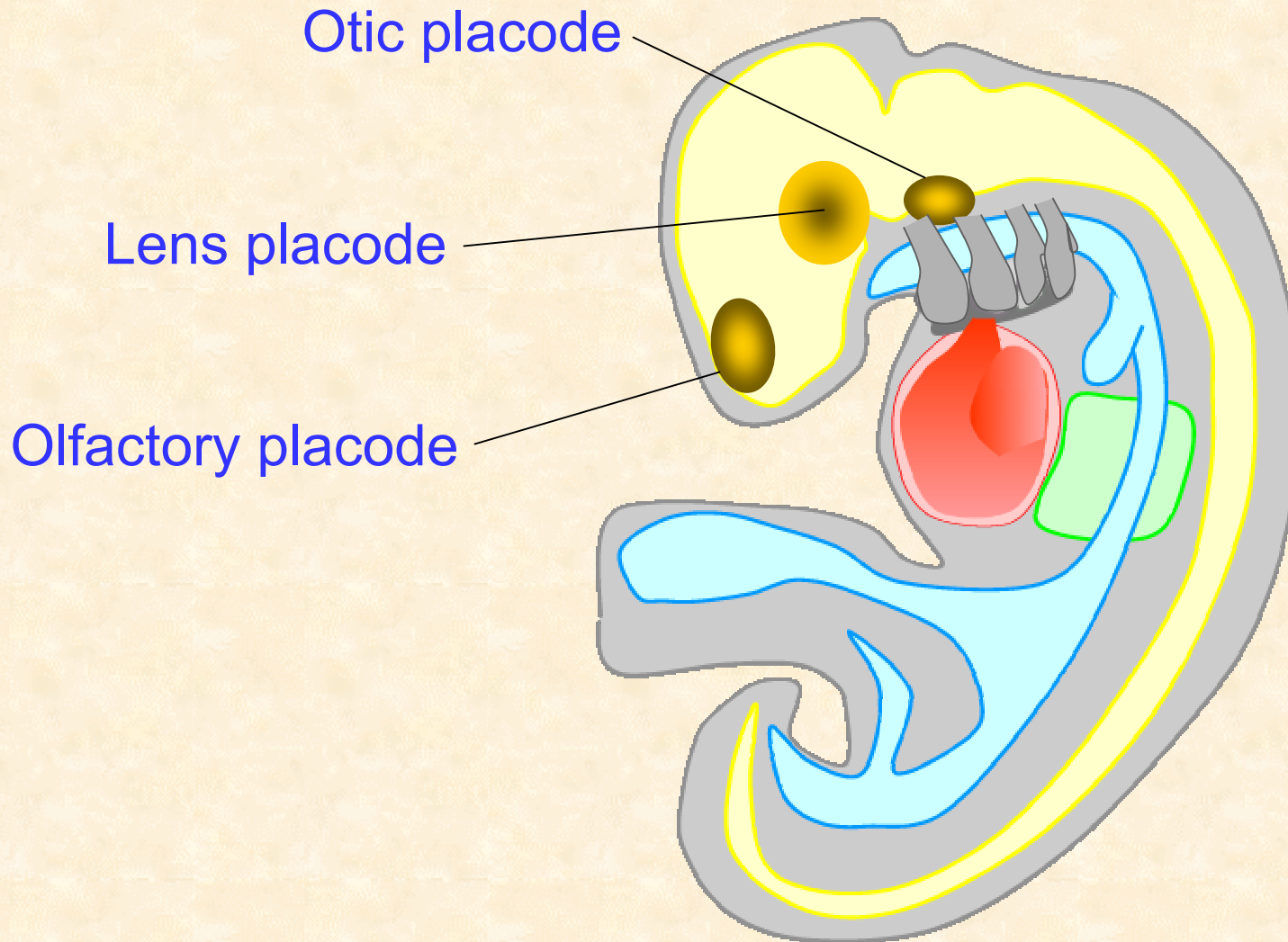
# Derivatives of branchial clefts and pharyngeal pouches



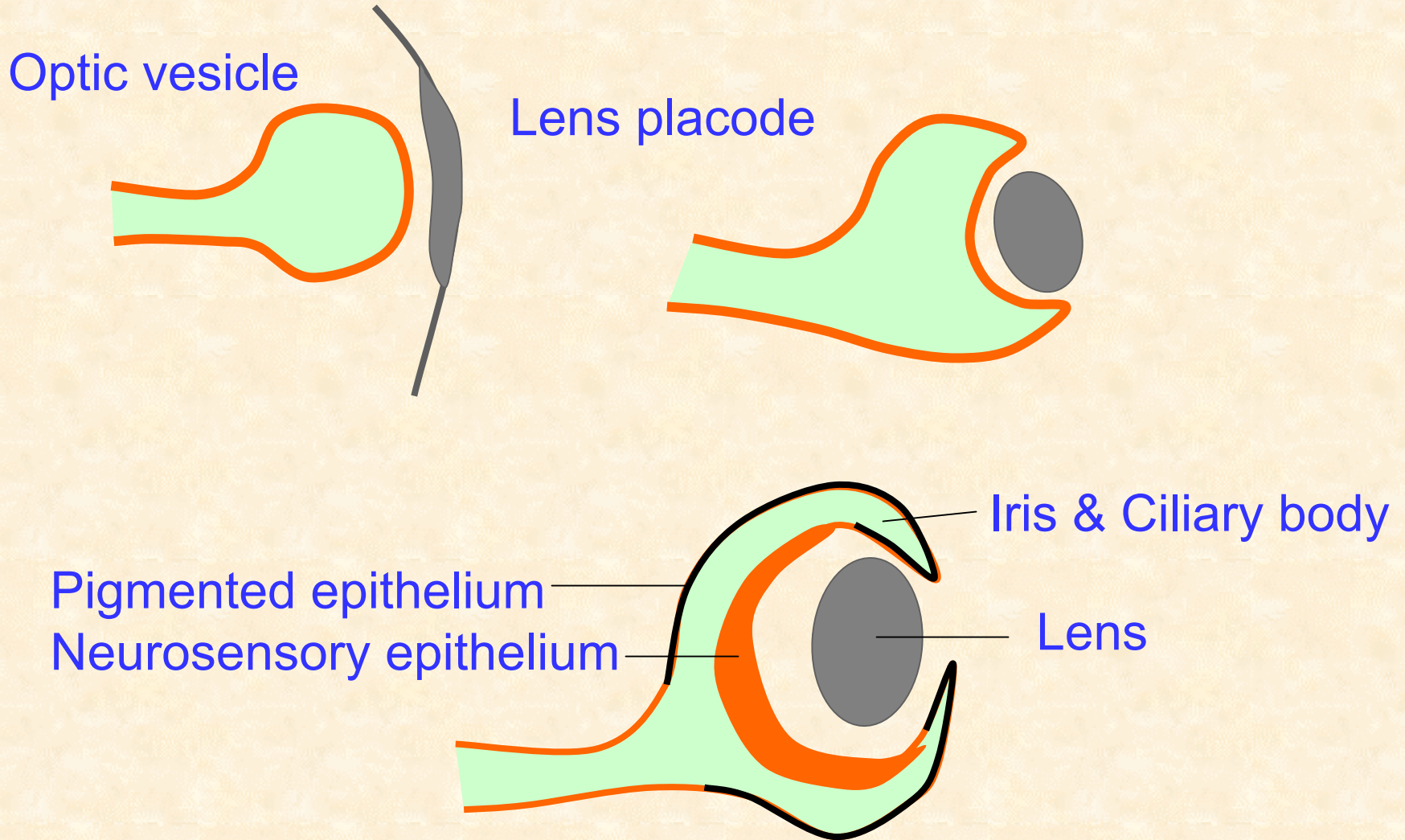
# Development of Tongue



# The head develops in relation to the special sense placodes



# Development of the eye



# Rudiments of face

