OCULOMOTOR NERVE

Presented By

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Second Year

INTRODUCTION

- The oculomotor nerve is the 3rd cranial nerve.
- Entirely motor in nature.
- It contains some 15000 axons, including motor fibers and parasympathetic fibers.
- Supplies LPS and all extrocular muscles except lateral rectus and superior oblique.
- Also supplies the introcular muscles namely sphincter pupillae and ciliary muscle.

NUCLEI

- The oculomotor nerve has two motor nuclei

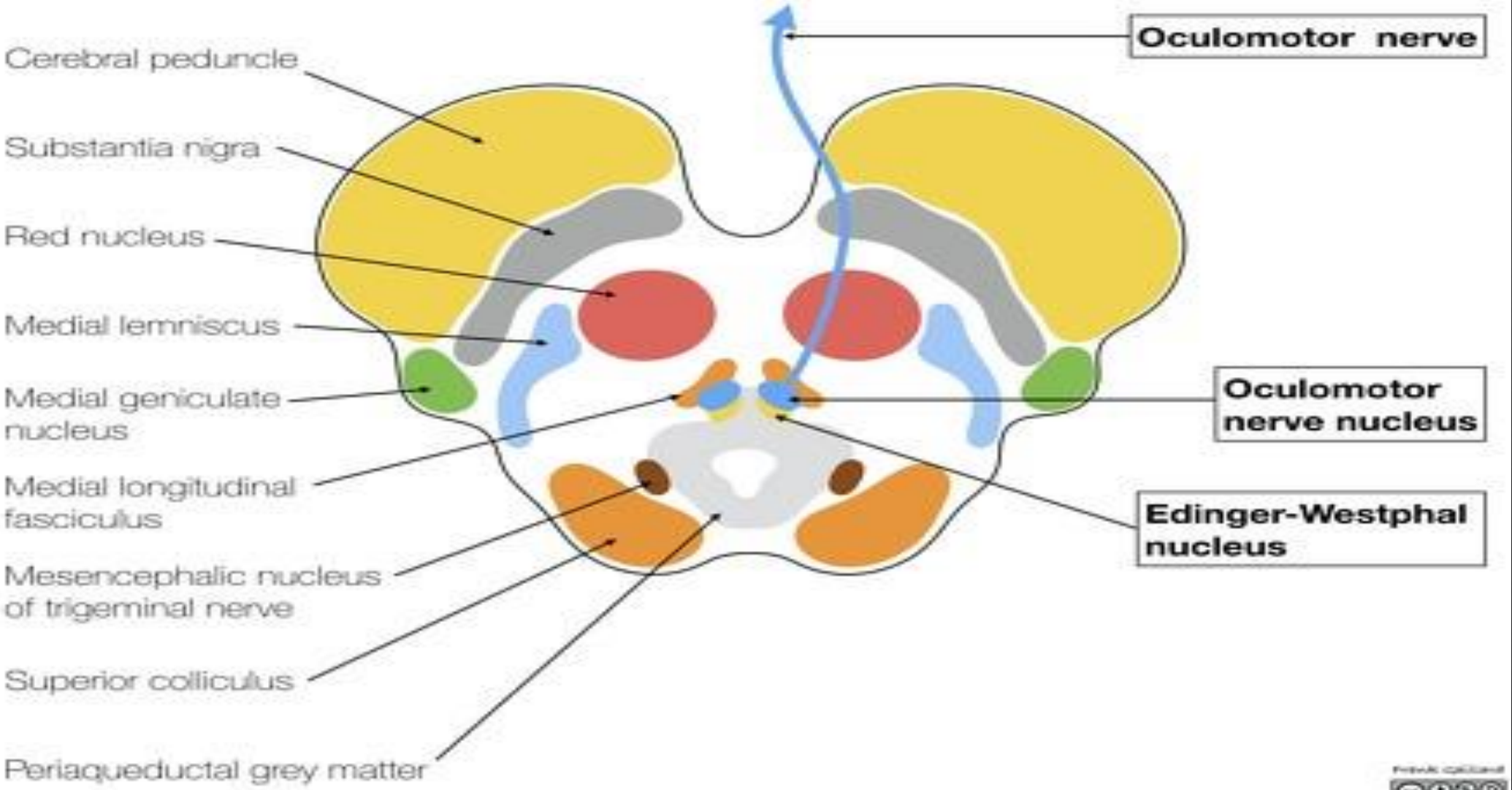
1. **The main motor nucleus** (somatomotor fibers -GSE)
2. **The accessory parasympathetic nuclei** (visceral motor fibers- GVE)

(Edinger-Westphal nucleus)

- Oculomotor nerve nuclei are present at the level of superior coliculi.

Oculomotor nerve

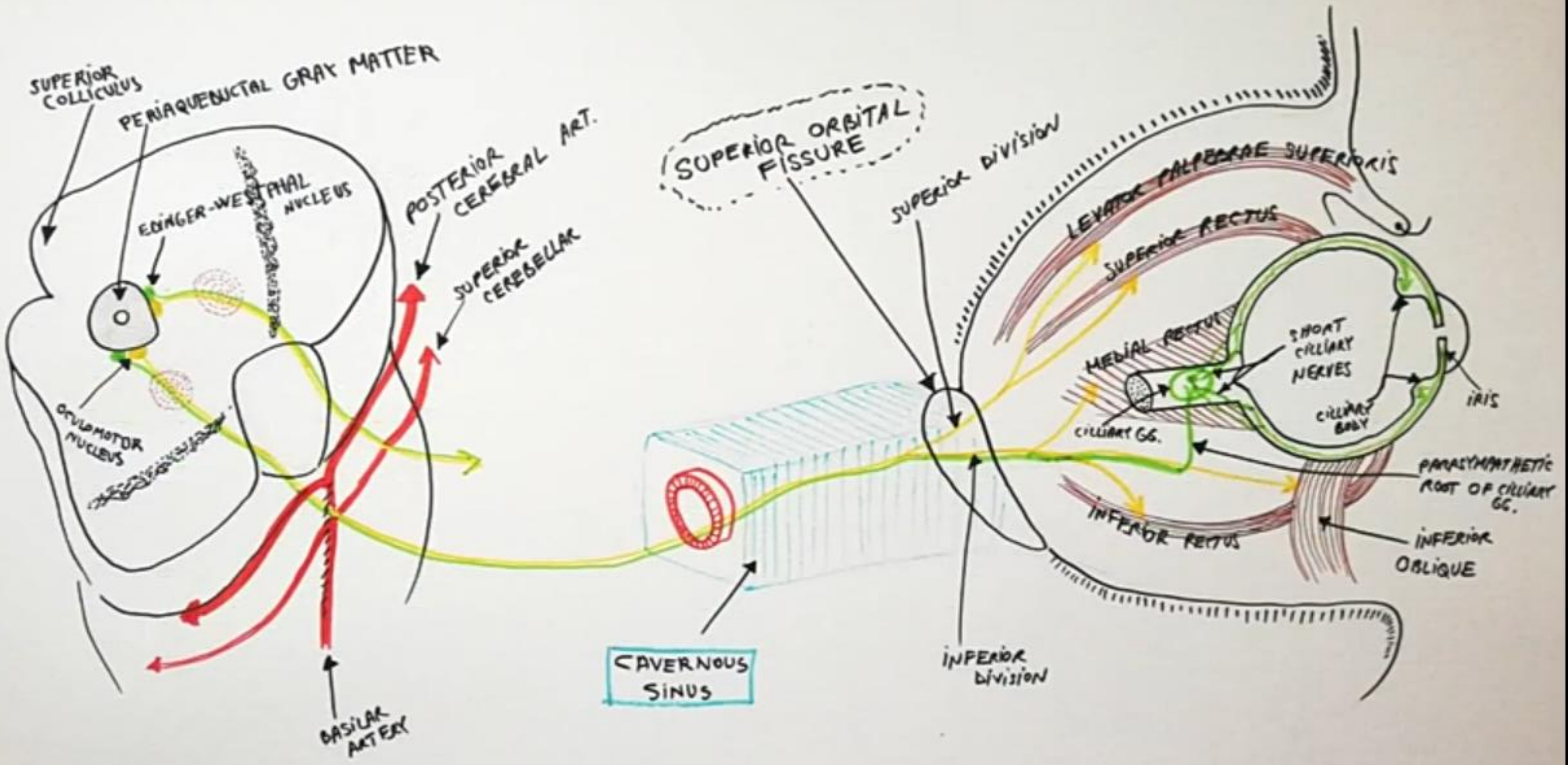
CN III

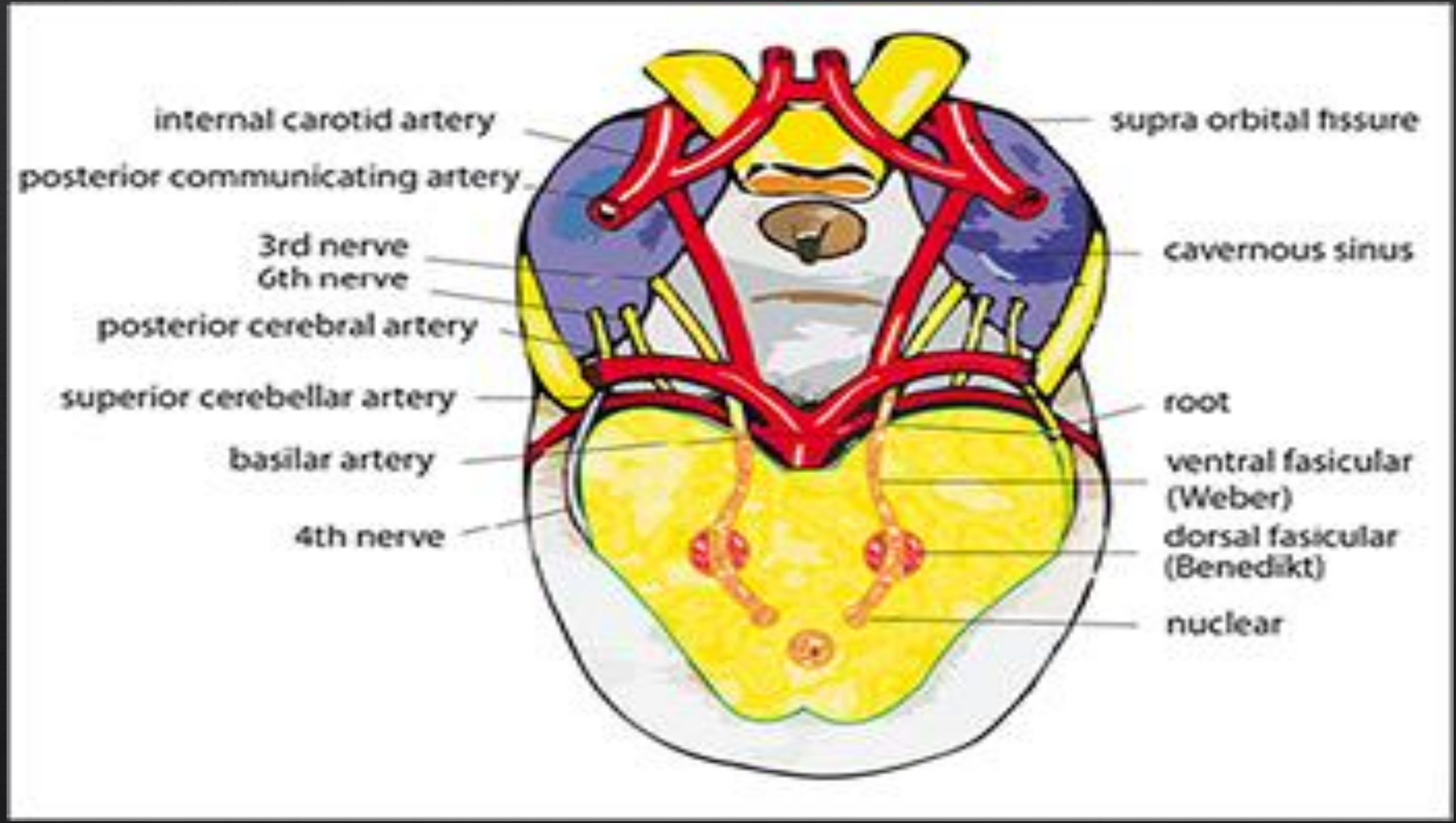


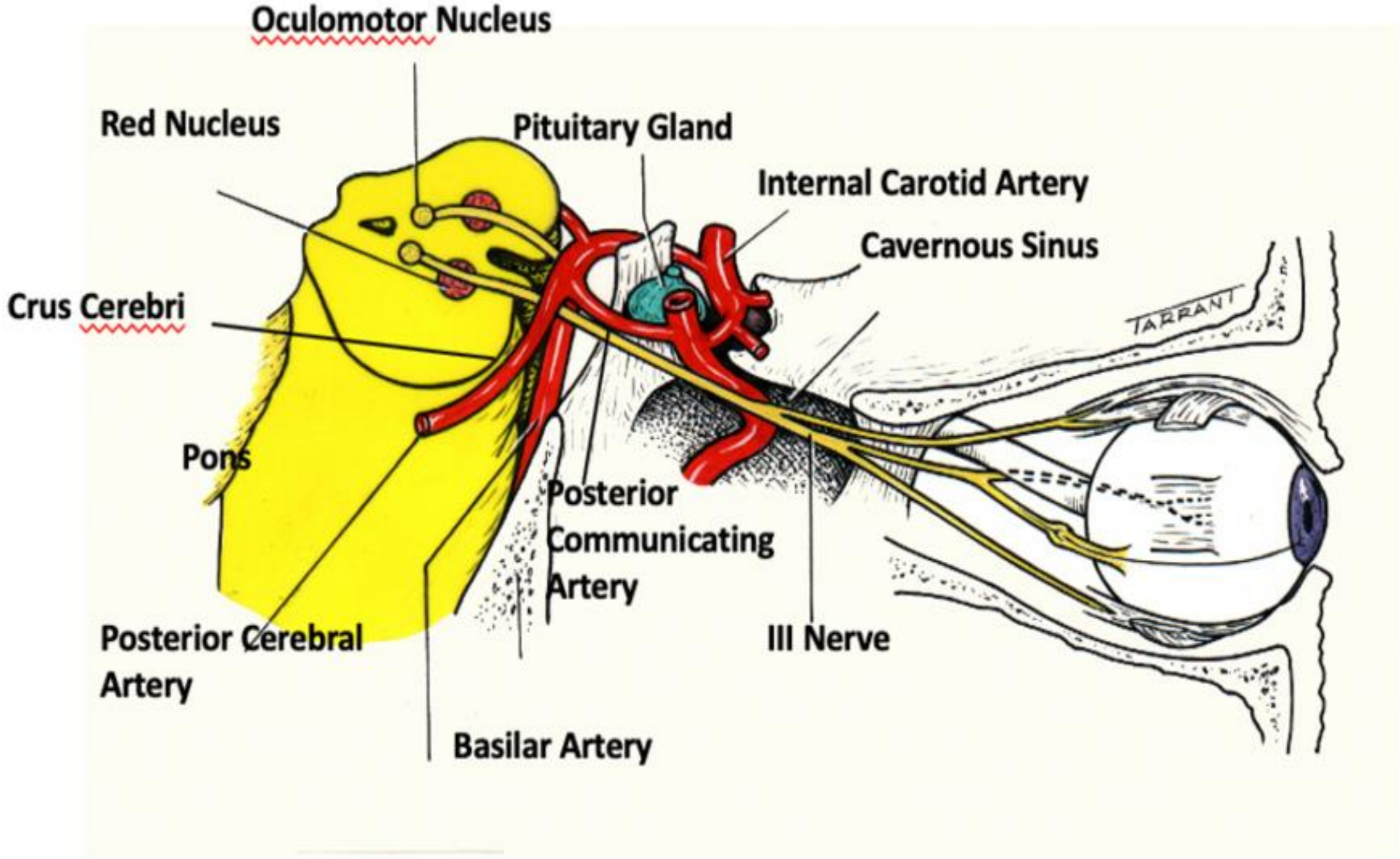
ANATOMICAL COURSE

- The main oculomotor nucleus is situated in the anterior part of the gray matter that surrounds the cerebral aqueduct of the mid brain.
- The oculomotor nerve originates from the nucleus at the level of superior colliculus.
- These nerves passes anteriorly through the red nucleus and then the medial part of substantia nigra exiting from brain stem through interpeduncular fossa.
- Accessory parasympathetic nucleus is situated posterior to the main nucleus.
- They accompany the other oculomotor fibers to the orbit.

- The oculomotor nerve emerges on the anterior surface of the mid brain.
- It passes forward between the posterior cerebral and the superior cerebellar arteries.
- It then continues into the cranial fossa in the lateral wall of cavernous sinus.
- ***With in the cavernous sinus it receives sympathetic branches from the internal carotid plexus.***
- In the cavernous sinus it divides into superior and posterior branch.
- The nerve leaves the cranial cavity through superior orbital fissure.


SUPERIOR COLLICULUS
PERIAQUEDUCTAL GRAY MATTER
EDINGER-WESTPHAL NUCLEUS
POSTERIOR CEREBRAL ART.
SUPERIOR CEREBELLAR
OCULOMOTOR NUCLEUS
BASILAR ARTERY
SUPERIOR ORBITAL FISSURE
SUPERIOR DIVISION
LEVATOR PALPEBRAE SUPERIORIS
SUPERIOR RECTUS
MEDIAL RECTUS
SHORT CILIARY NERVES
CILIARY GG.
CILIARY BODY
IRIS
PARASYMPATHETIC ROOT OF CILIARY GG.
INFERIOR RECTUS
INFERIOR OBLIQUE
CAVERNOUS SINUS
INFERIOR DIVISION

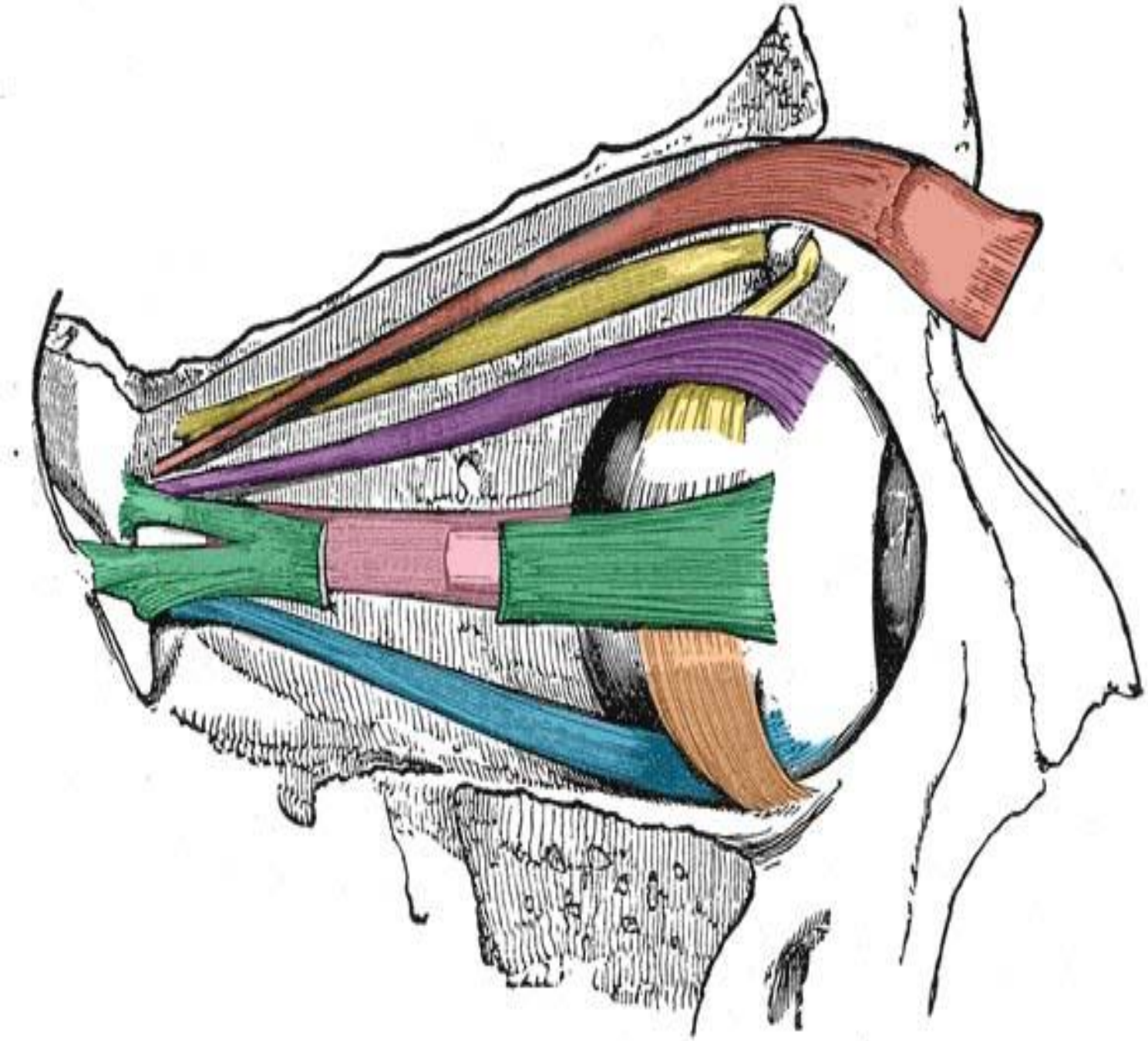

internal carotid artery
posterior communicating artery
3rd nerve
6th nerve
posterior cerebral artery
superior cerebellar artery
basilar artery
4th nerve
supra orbital fissure
cavernous sinus
root
ventral fasicular (Weber)
dorsal fasicular (Benedikt)
nuclear


Oculomotor Nucleus
Red Nucleus
Pituitary Gland
Internal Carotid Artery
Cavernous Sinus
Crus Cerebri
TARRANT
Pons
Posterior Communicating Artery
Posterior Cerebral Artery
III Nerve
Basilar Artery

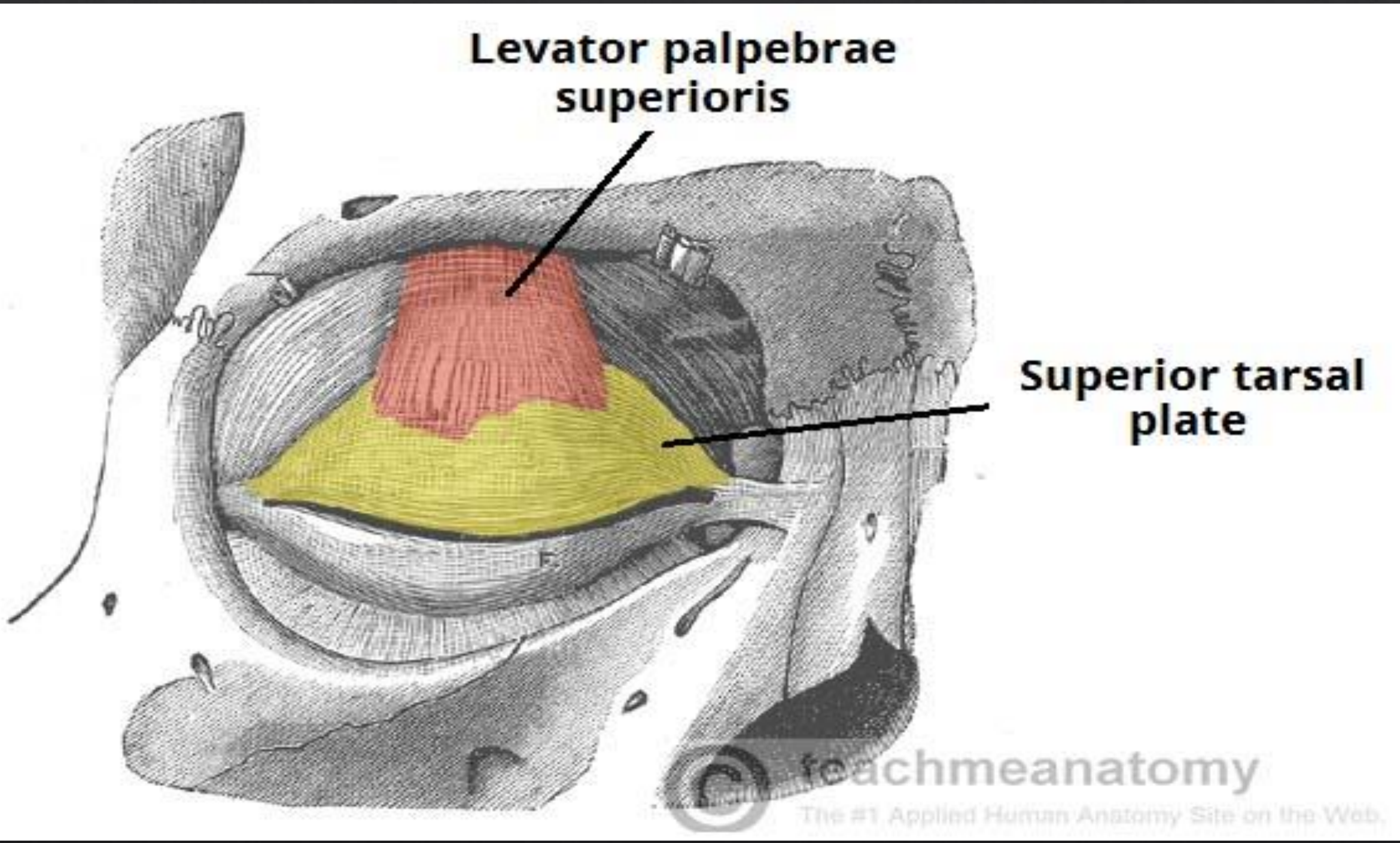
SUPERIOR BRANCH

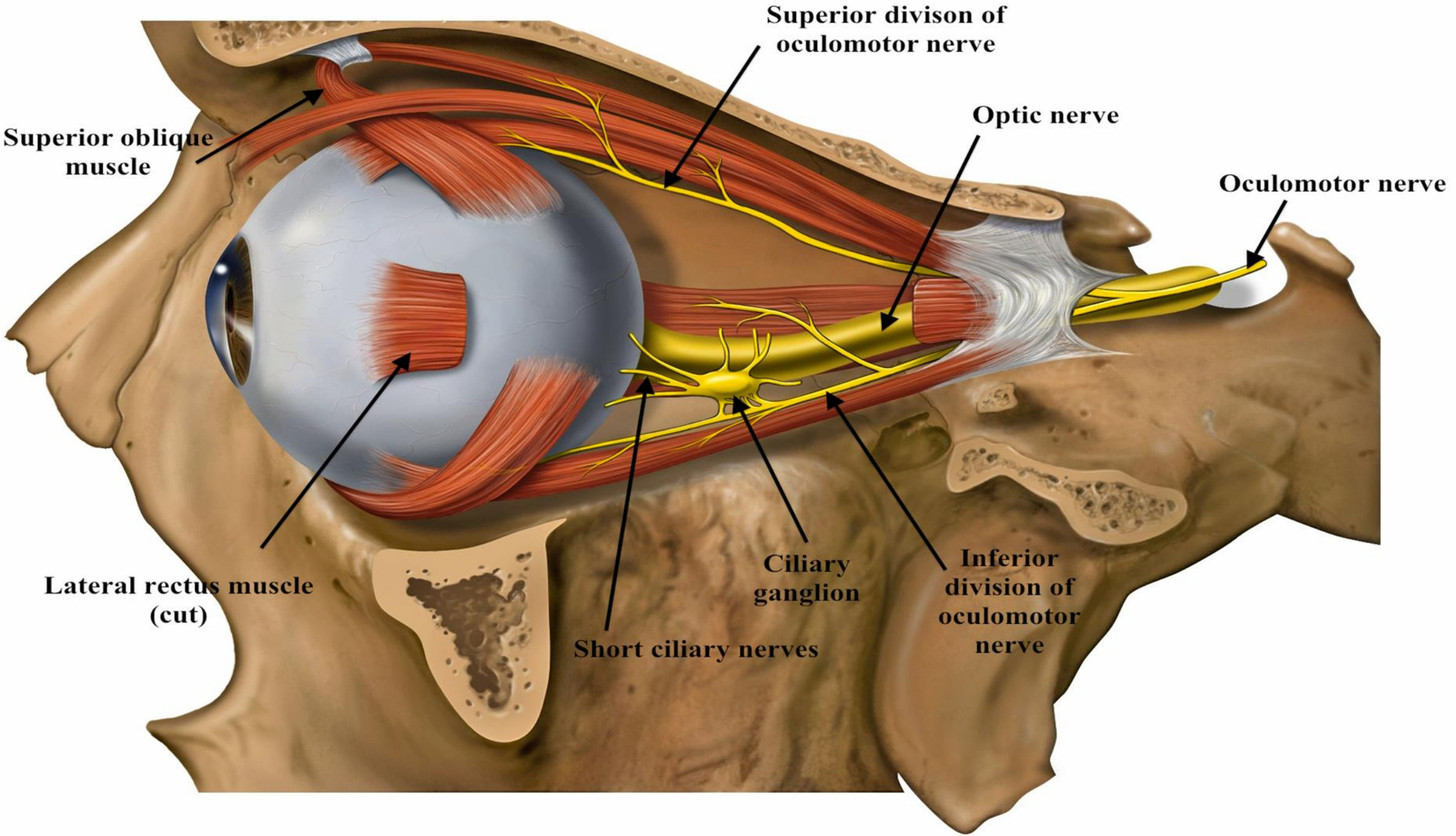
- Provides motor innervation to the ***superior rectus*** and ***levator palpabrae superoris***
- ***Superior rectus*** –elevates the eyeball
- ***Levator palpabrae superioris*** – raises the upper eye lid

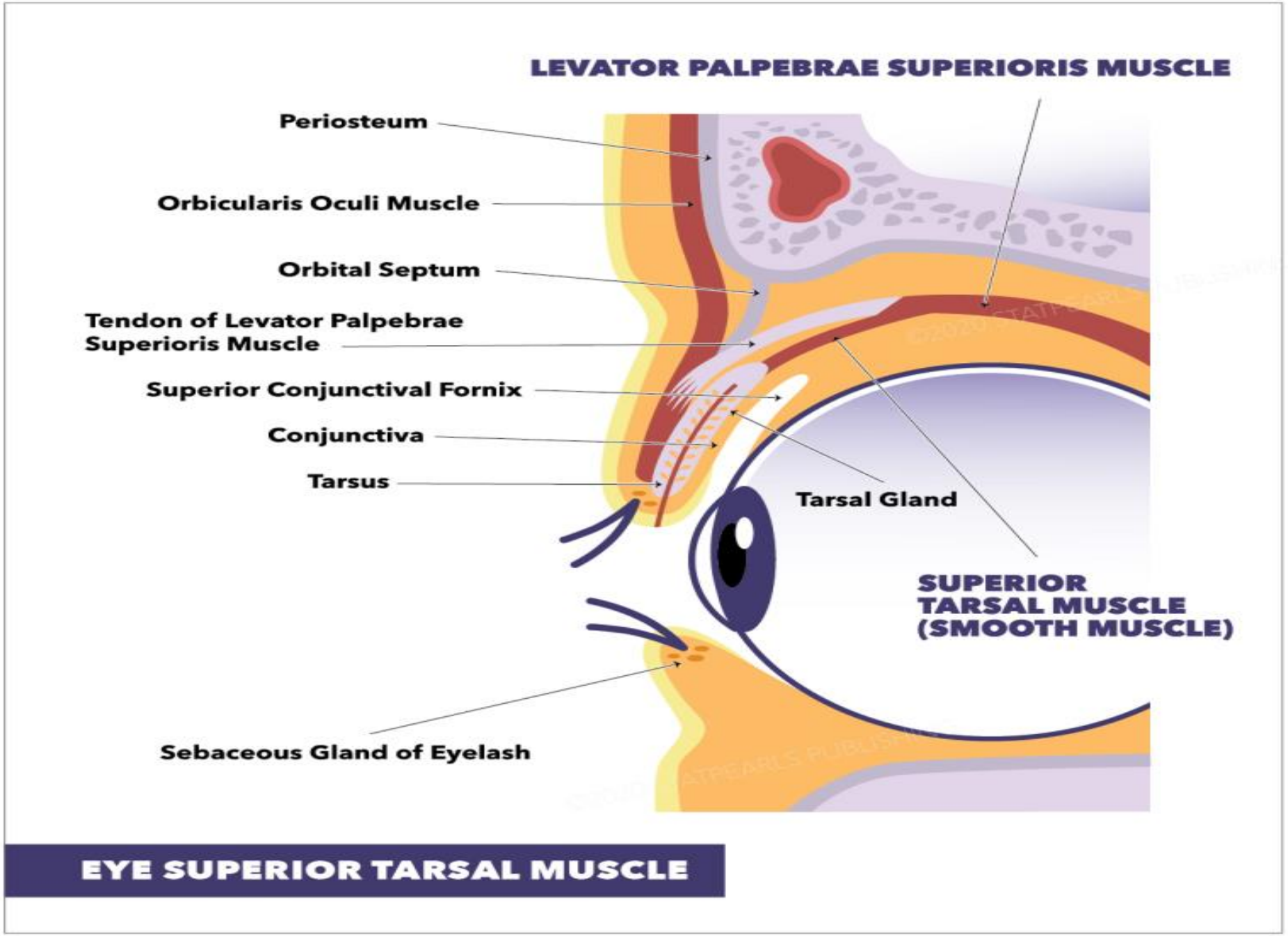
- Additionally there are ***sympathetic fibers*** that travel with superior branch of the oculomotor nerve. They innervate the ***superior tarsal muscle*** which act to keep the eye elevated after the levator palpabrae superioris has raised it.



- Levator palpebrae superioris
- Superior oblique
- Inferior oblique
- Superior rectus
- Medial rectus
- Lateral rectus
- Inferior rectus


Levator palpebrae superioris
Superior tarsal plate
teachmeanatomy
The #1 Applied Human Anatomy Site on the Web.

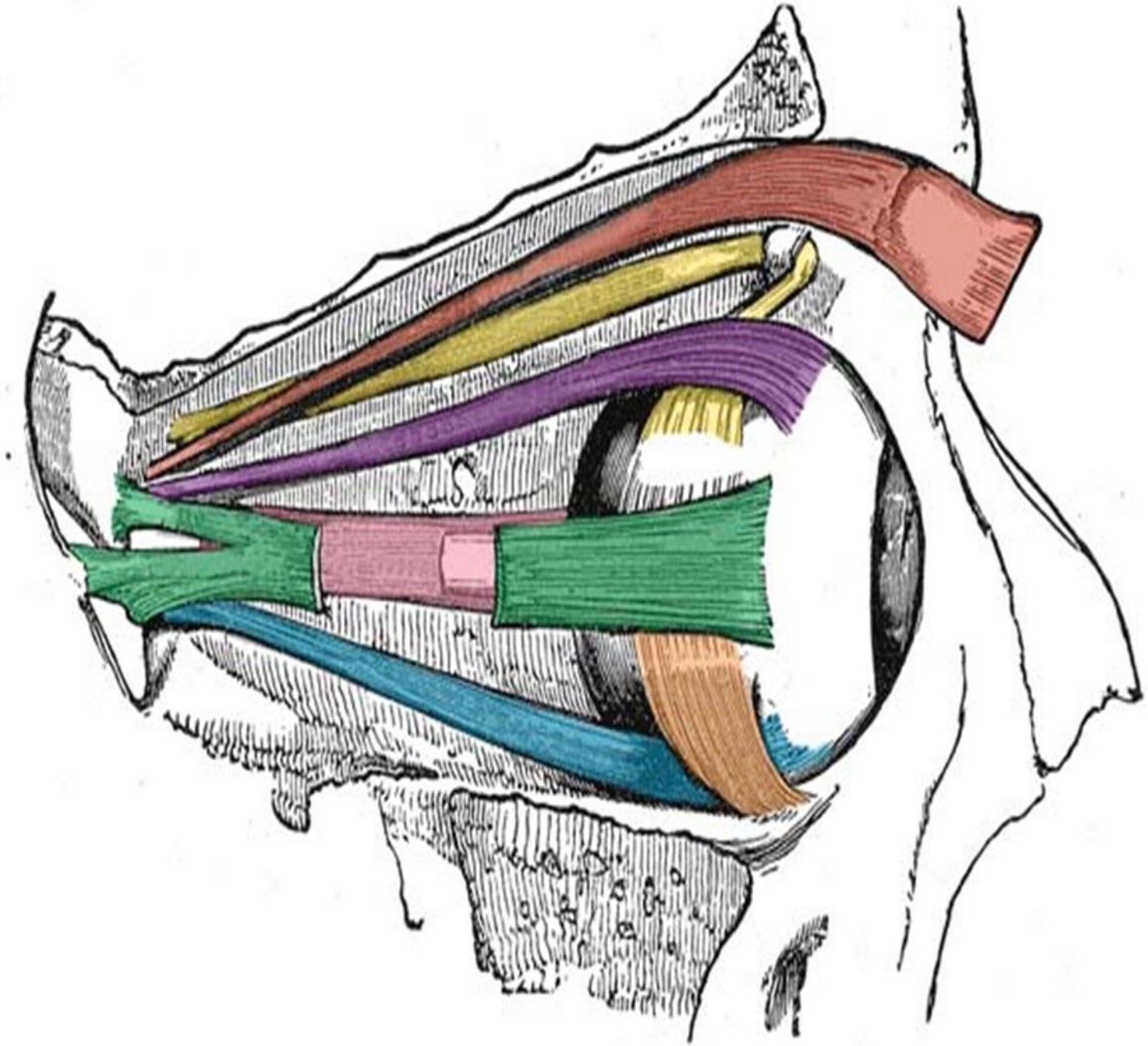

Superior divison of oculomotor nerve
Optic nerve
Superior oblique muscle
Oculomotor nerve
Lateral rectus muscle (cut)
Ciliary ganglion
Inferior division of oculomotor nerve
Short ciliary nerves


LEVATOR PALPEBRAE SUPERIORIS MUSCLE
Periosteum
Orbicularis Oculi Muscle
Orbital Septum
Tendon of Levator Palpebrae Superioris Muscle
Superior Conjunctival Fornix
Conjunctiva
Tarsus
Tarsal Gland
SUPERIOR TARSAL MUSCLE (SMOOTH MUSCLE)
Sebaceous Gland of Eyelash
EYE SUPERIOR TARSAL MUSCLE

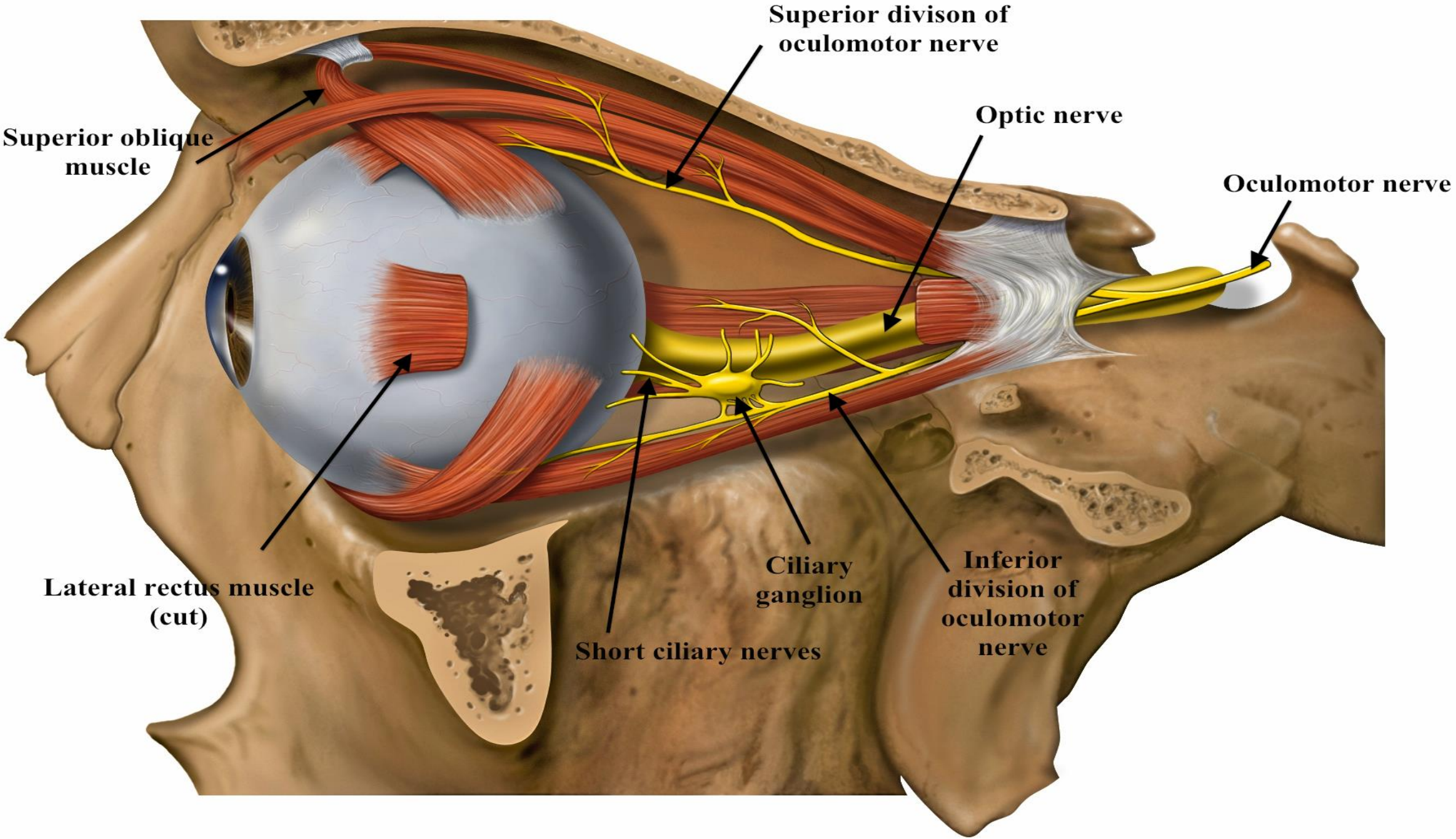
INFERIOR BRANCH

- Provides the motor innervation to ***inferior rectus***, ***medial rectus*** and ***inferior oblique***.

- ***Inferior rectus*** – depresses the eyeball
- ***Medial rectus*** – adducts the eyeball
- ***Inferior oblique*** – Elevates, abducts and laterally
- rotates the eye ball

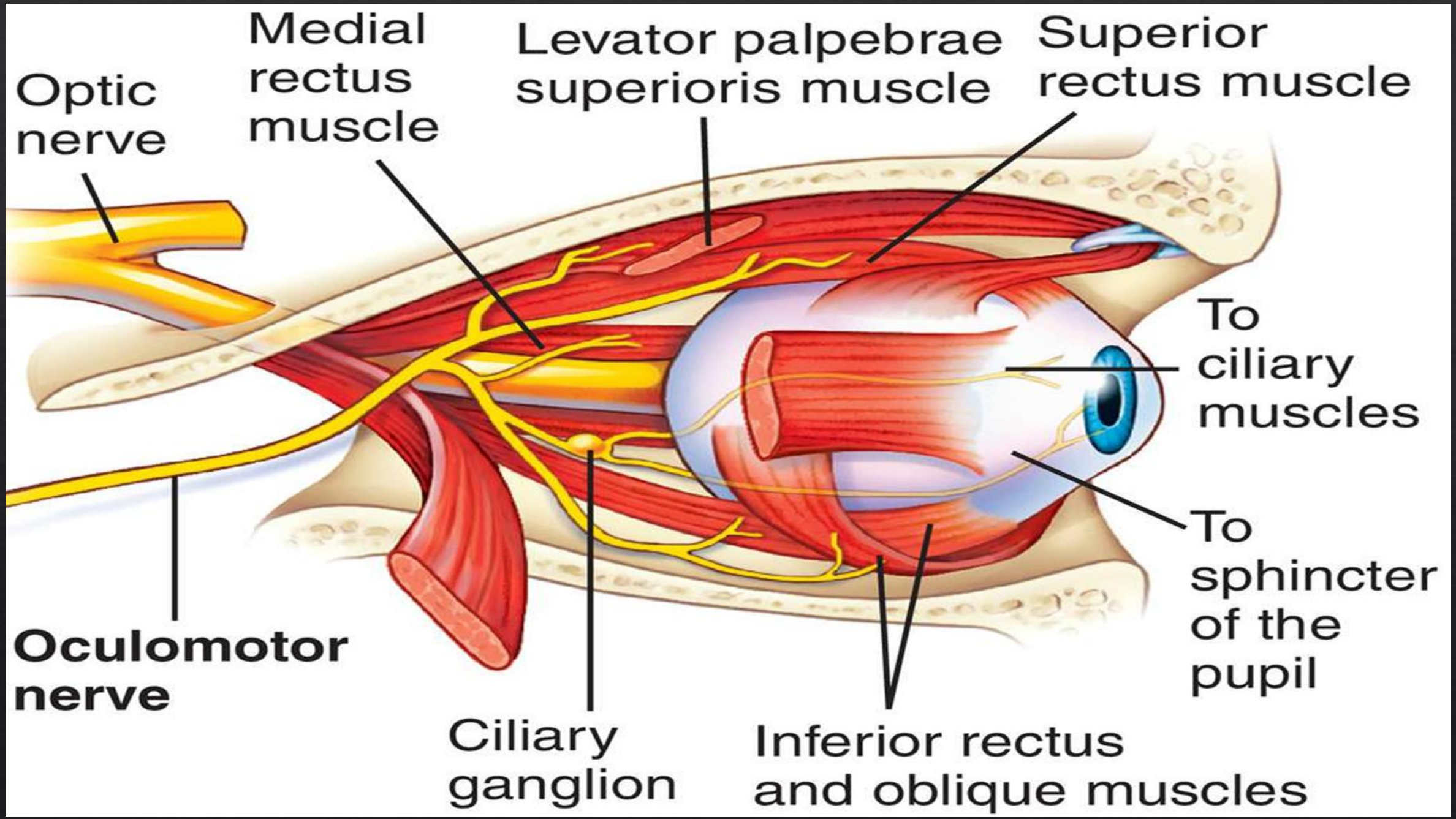


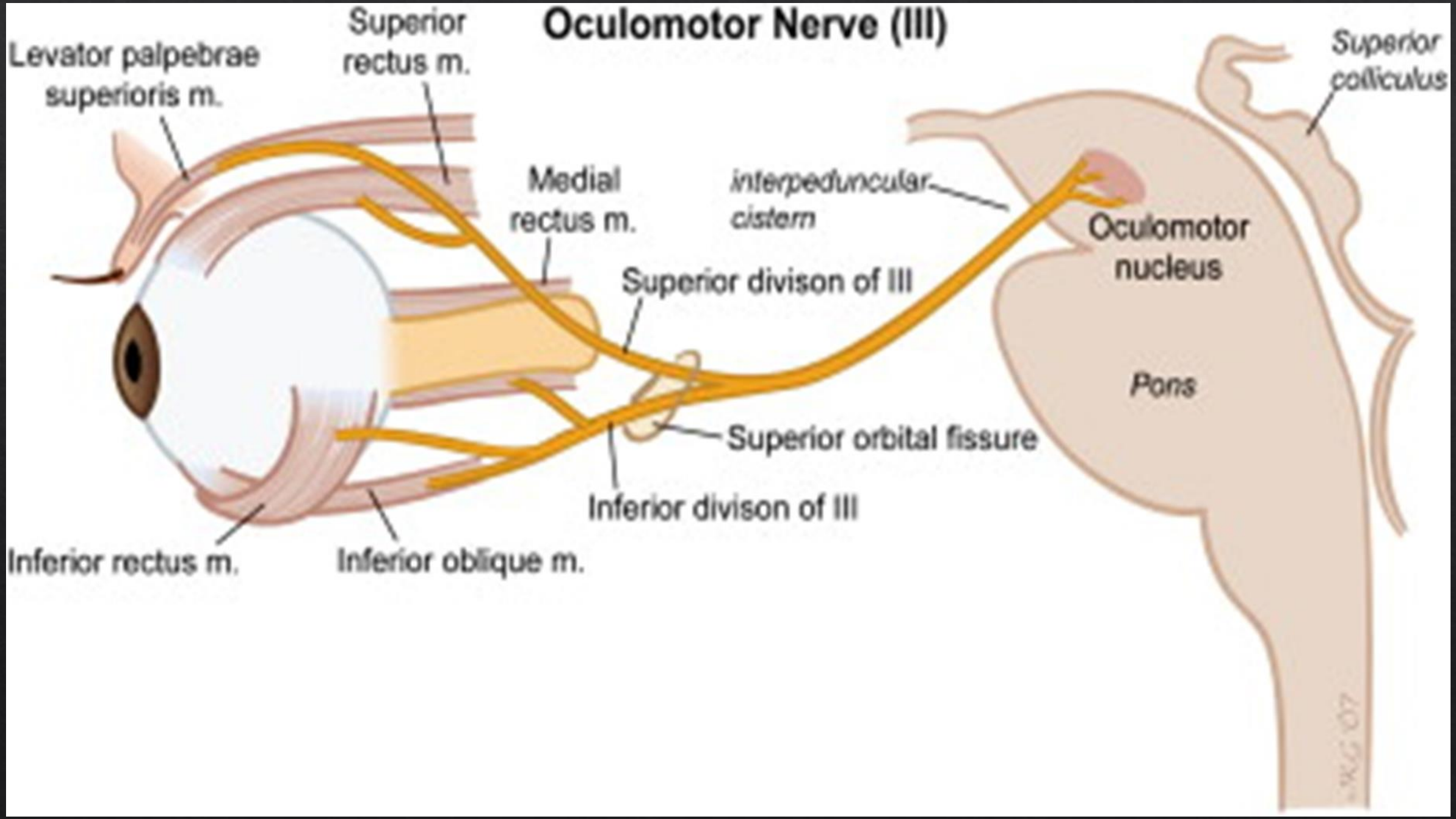
- Levator palpebrae superioris
- Superior oblique
- Inferior oblique
- Superior rectus
- Medial rectus
- Lateral rectus
- Inferior rectus

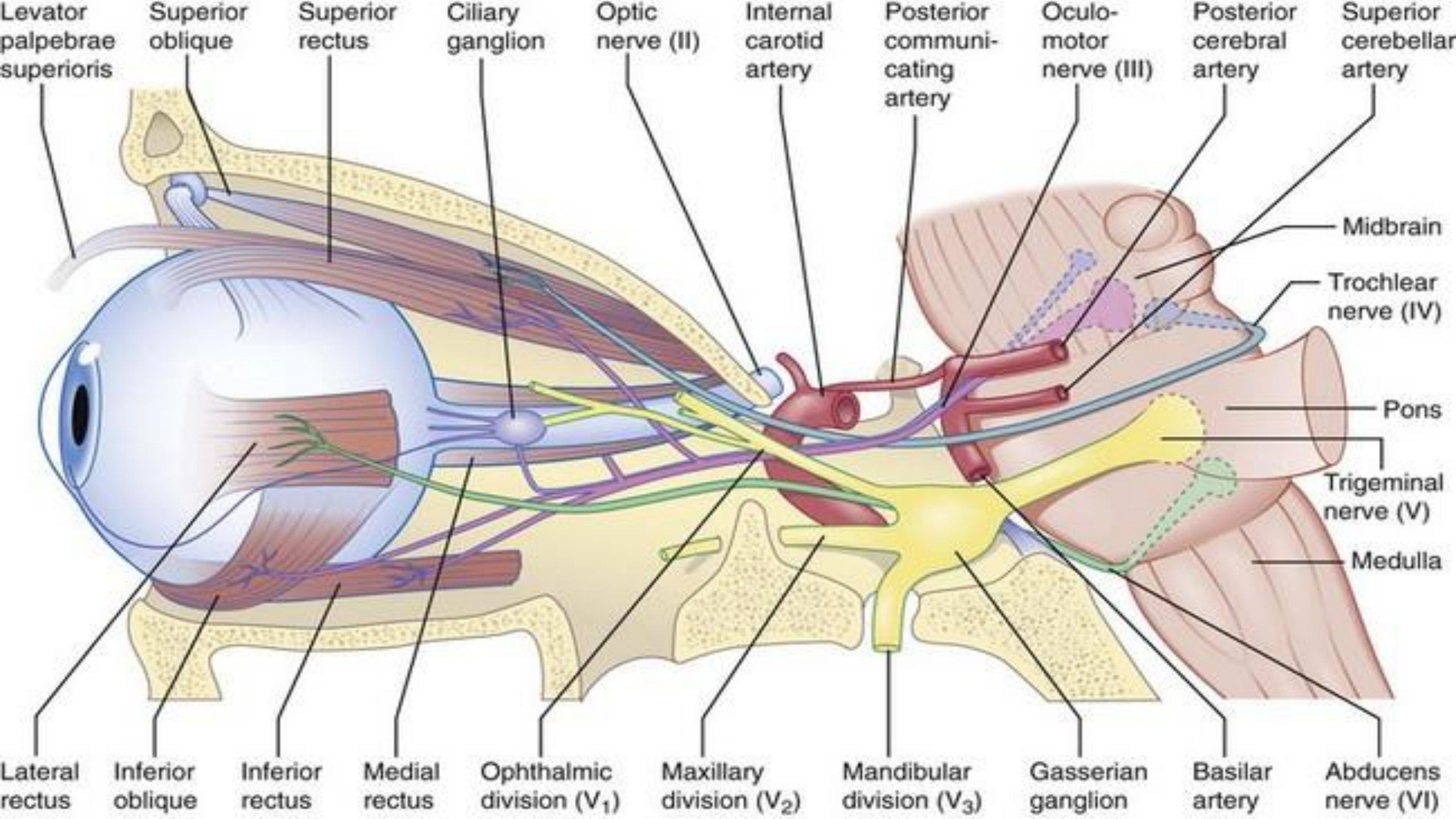

Superior divison of oculomotor nerve
Optic nerve
Superior oblique muscle
Oculomotor nerve
Lateral rectus muscle (cut)
Ciliary ganglion
Inferior division of oculomotor nerve
Short ciliary nerves

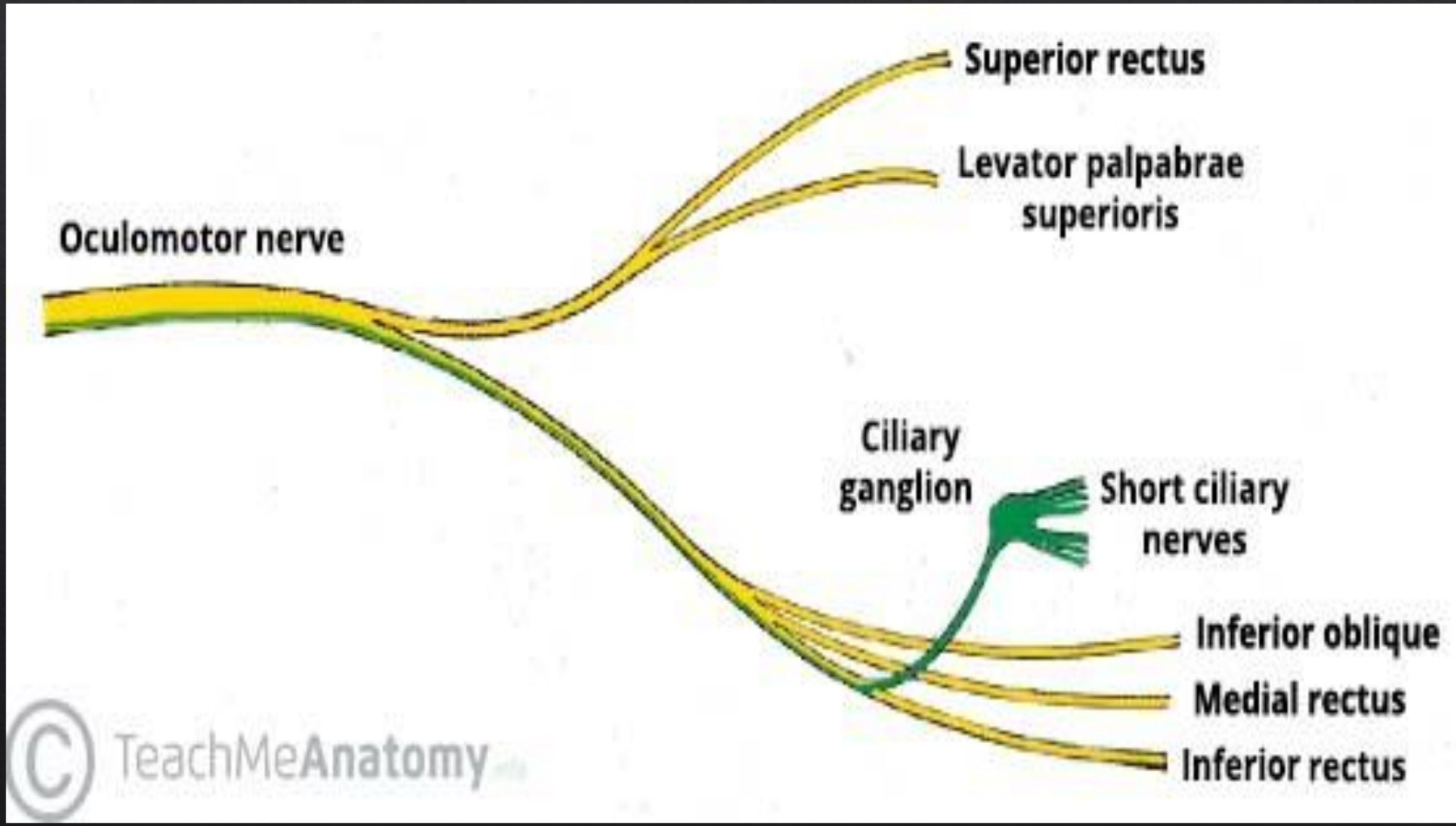
INFERIOR BRANCH

- PARASYMPATHETIC INNERVATION
- The pre ganglionic parasympathetic fibers travel in the inferior branch of the oculomotor nerve.
- With in the orbit they branch off and synapse in the ciliary ganglion.
- The post ganglionic fibers are carried to the eye via short ciliary nerve.
-
- PARAYMPATHETIC FUNCTION
- There are two structures in the eye that receive parasympathetic innervation from the oculomotor nerve.
- ***Sphincter pupillae*** – constricts pupil
- ***Ciliary muscles*** – controls lens shape to focus up on close eye o object.


Optic nerve
Medial rectus muscle
Levator palpebrae superioris muscle
Superior rectus muscle
To ciliary muscles
To sphincter of the pupil
Oculomotor nerve
Ciliary ganglion
Inferior rectus and oblique muscles


Oculomotor Nerve (III)
Levator palpebrae superioris m.
Superior rectus m.
Medial rectus m.
interpeduncular cistern
Superior colliculus
Oculomotor nucleus
Pons
Superior divison of III
Superior orbital fissure
Inferior divison of III
Inferior rectus m.
Inferior oblique m.


Levator palpebrae superioris
Superior oblique
Superior rectus
Ciliary ganglion
Optic nerve (II)
Internal carotid artery
Posterior communi-cating artery
Oculo-motor nerve (III)
Posterior cerebral artery
Superior cerebellar artery
Midbrain
Trochlear nerve (IV)
Pons
Trigeminal nerve (V)
Medulla
Lateral rectus
Inferior oblique
Inferior rectus
Medial rectus
Ophthalmic division (V_1)
Maxillary division (V_2)
Mandibular division (V_3)
Gasserian ganglion
Basilar artery
Abducens nerve (VI)




END OF THE PRESENTATION?
FALSE. IT IS NEVER OVER
memegenerator.net

CLINICAL RELEVANCE

Oculomotor nerve palsy

Oculomotor nerve palsy is a condition resulting from damage to the oculomotor nerve. The most common structural causes include:

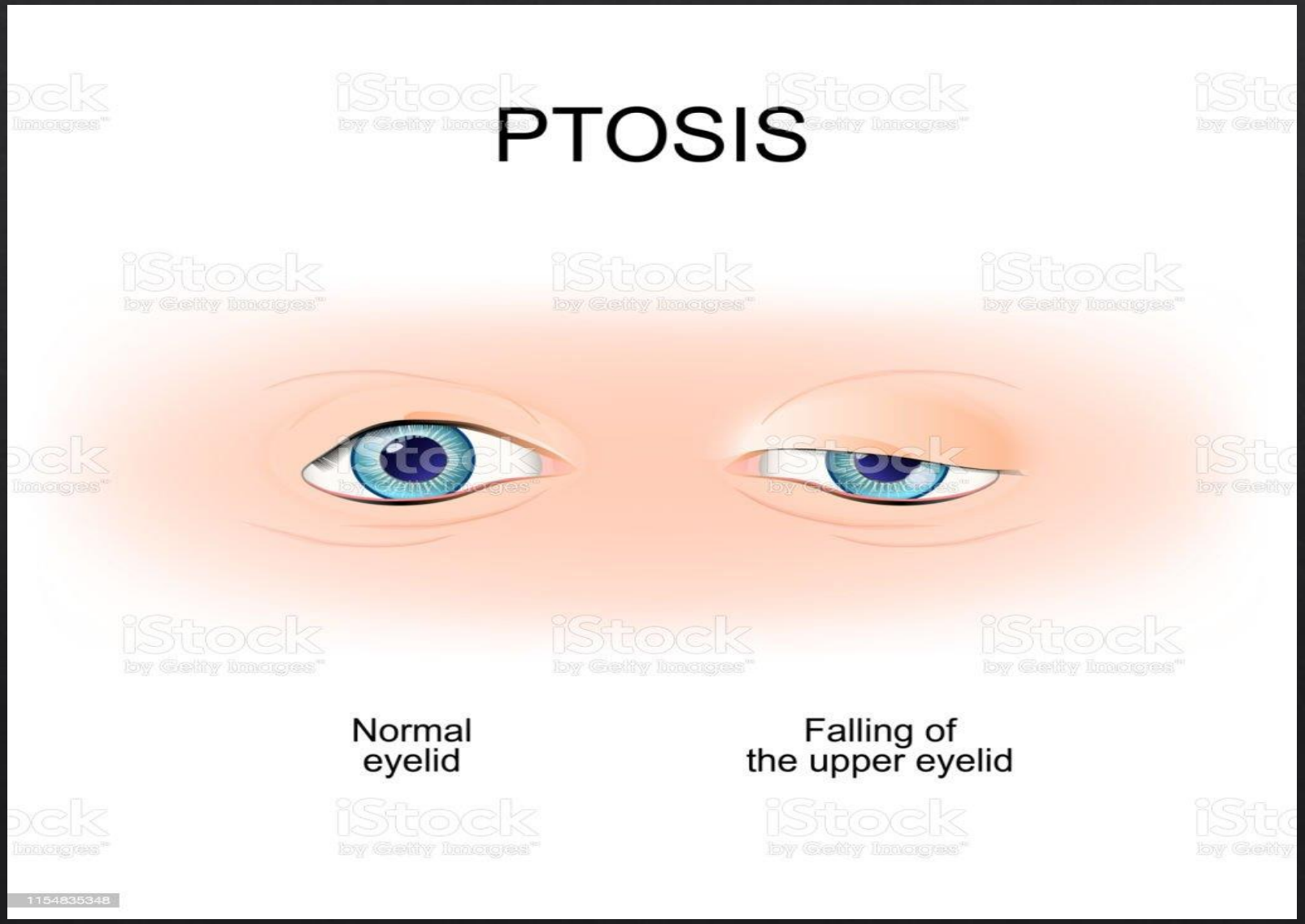
- Raised intercranial pressure (compresses the nerve against the temporal bone.
- Posterior communicating artery aneurysm.
- Cavernous sinus infection or trauma.

Other pathological causes of oculomotor nerve palsy are diabetes, multiple sclerosis, myasthenia gravis and giant cell arteritis.

PTOSIS

drooping upper eyelid

- Due to the paralysis of the levator palpabrae superioris muscle.



DOWN AND OUT

- Down and out position of the eye at rest – due to paralysis of the superior, inferior and medial rectus, and the inferior oblique (and therefore the unopposed activity of the lateral rectus and superior oblique).
- The patient is unable to elevate, depress or adduct the eye.

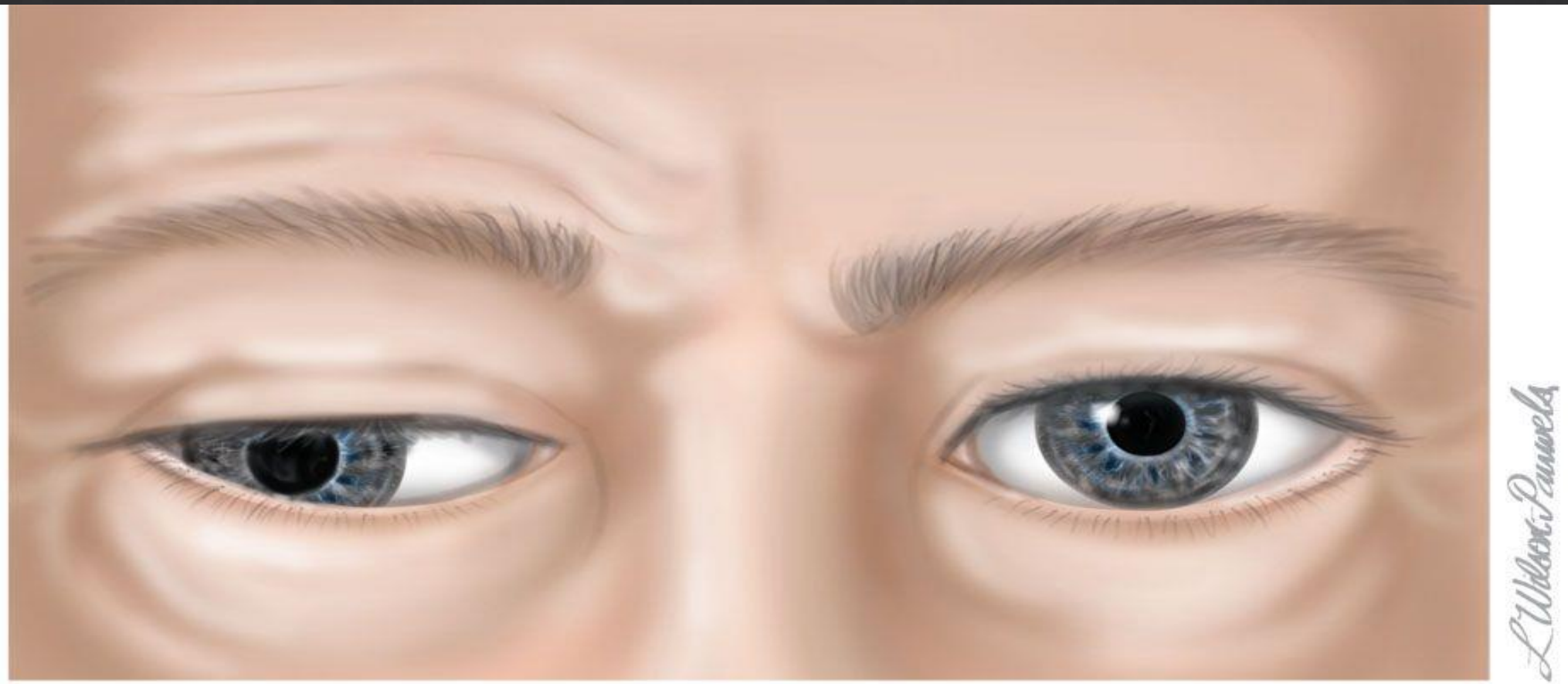


Figure III–13 Appearance of the eyes in right third nerve palsy.
The right side of Werner's face illustrates: a wrinkled brow due to the inability to raise the right eyelid; ptosis of his right eye lid due to the inactivation of the levator palpebrae superioris muscle; dilation of his right pupil due to the decreased tone of the constrictor pupillae muscle; and downward and outward movement of his right eye due to the unopposed action of the right superior oblique and lateral rectus muscles.

DILATED PUPIL

- Due to unopposed action of dilator pupilae muscle.

OCULOMOTOR NERVE PALSY (PARESIS)

The characteristic signs of a unilateral oculomotor nerve palsy are:

Ptosis (drooping) of the upper eyelid, due to lack of action of the levator palpebrae superioris

Dilation of the pupil due to loss of sphincter pupillae function

Depressed and abducted resting eye position due to the IVth and VIth nerve eye muscles acting unopposed

Hence the term "down and out syndrome"


THIS IS THE END
OF MY PRESENTATION
38
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