



لجان الرُّفَعَات

ANATOMY

MORPHINE ACADEMY

MORPHINE
ACADEMY

The Autonomic Nervous system

في السريخ ب، العصبون ٢ ينشأ من
 ١٢ يترجم دماغه للمصدر، حيث انشاء المخاض
 نفسها كما يقول مادي عايه الرضعات، تنتشر
 الرضعات.

- ❑ The autonomic nervous system (ANS) is part of the peripheral nervous system. It operates unconsciously to control involuntary muscles (cardiac and smooth) and glands. It's formed of two divisions: The Sympathetic and Parasympathetic.

تعلق من ال CNS تعلق لا Ganglia

- ❑ The ANS is formed of Preganglionic and Postganglionic fibers. The preganglionic fibers arise from autonomic centers in the CNS and pass through cranial and spinal nerves to autonomic ganglia outside the CNS. The postganglionic fibers arise from the autonomic ganglia to supply the involuntary muscles and glands.

تعلق من
 ال CNS
 تعلق لا
 ganglia

- ❑ The autonomic centers are controlled by the Hypothalamus.

controls body T.
 controls eating + drinking
 controls hormone secretions.

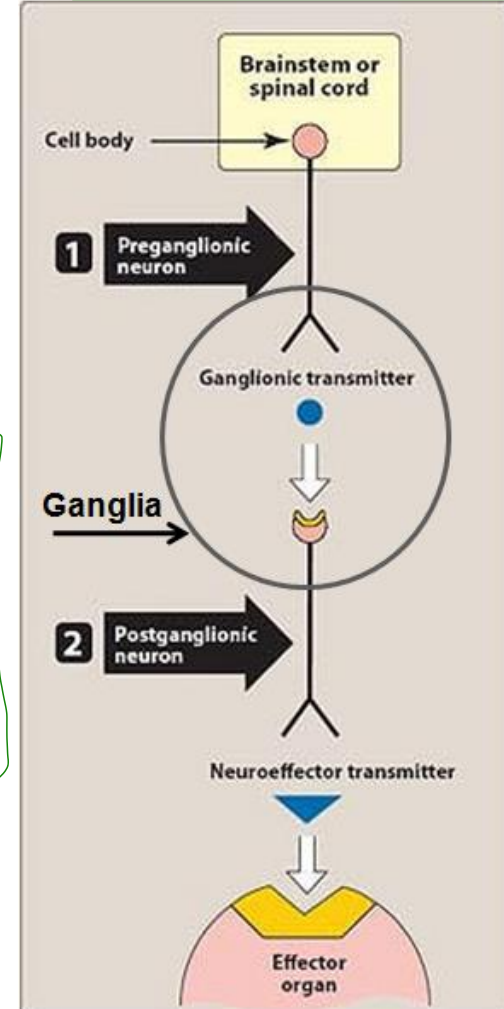


Fig.22: The two-neuron pathway of the ANS.

منطقة T₁ إلى L₂ من الحبل الشوكي
منطقة T₁ إلى L₂ من الحبل الشوكي

The Sympathetic (Thoracolumbar) Division

منطقة T₁ إلى L₂ من الحبل الشوكي
منطقة T₁ إلى L₂ من الحبل الشوكي

- ❑ The gray matter of the **T1-L2 segments** of the spinal cord possess a **lateral horn** in which are located the cell bodies of the sympathetic preganglionic neurons.
منطقة T₁ إلى L₂ من الحبل الشوكي
منطقة T₁ إلى L₂ من الحبل الشوكي
- ❑ The myelinated axons of these neurons leave the spinal cord through the anterior root of the spinal nerves.
منطقة T₁ إلى L₂ من الحبل الشوكي
منطقة T₁ إلى L₂ من الحبل الشوكي
- ❑ They pass through the white ramus to enter the sympathetic trunk.
منطقة T₁ إلى L₂ من الحبل الشوكي
منطقة T₁ إلى L₂ من الحبل الشوكي
- **Sympathetic trunk** is a chain of ganglia located on each side of the vertebral column.

Internal features of the spinal cord

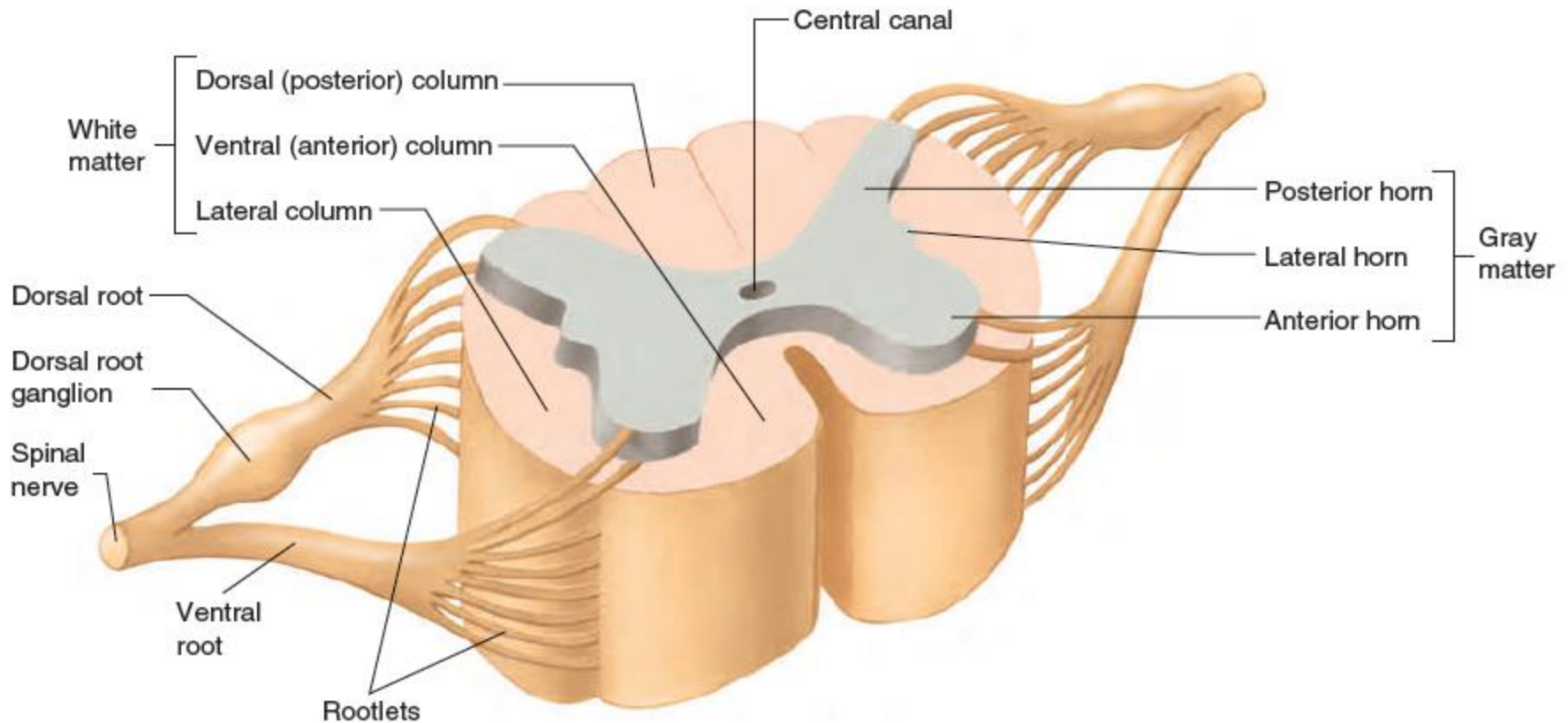


Fig.20*: Cross section through the spinal cord showing important internal features.

بعد ما تدخل ال sympathetic trunk، قدامها 3 خيارات:

❑ In the sympathetic trunk, the preganglionic neuron may either:

1. *Synapse* with the postganglionic neurons in the ganglia at the same level on the same side. In this case, the unmyelinated postganglionic fibers exit the trunk through the gray ramus to re-enter the spinal nerves where they pass to supply the smooth muscles of blood vessels, sweat glands, and the arrector pili muscles of the skin.

تصل synapses بنفس المستوى = الليف بعد ذلك يخرج عبر ال gray ramus

وتخرج ال spinal nerves، ويتوزع لـ :

① الأوعية الدموية - Blood vessels

② الغدد العرقية - sweat glands

③ عضلات الجلد - Arrector pili

2. Pass up/down in the sympathetic trunk to synapse with postganglionic neurons at a different level to supply skin.

→ Some postganglionic fibers will supply various organs in the head, chest, abdomen and pelvis.

← تعلق ليفه او تنزل لتتطابق (trunk) مع غبغبي اعصاب اوجده بنا فيه اخرى (رأس/صدر/بطن)

3. Leave the trunk without synapsing. Here preganglionic fibers will form the Splanchnic nerves and they will eventually synapse with postganglionic neurons in the preaortic ganglia (celiac, superior mesenteric, inferior mesenteric and renal). The postganglionic fibers will then pass to supply the viscera.

4
تخرج ليفه من trunk بدون ان يتصلب مع تسمى Splanchnic nerves
وتتصلب مع Postganglionic neurons في Preaortic ganglia
التي هي: ① celiac ② superior mesenteric ③ inferior mesenteric ④ Renal
(Postganglionic) اعصاب (viscera) تغذي الاعضاء

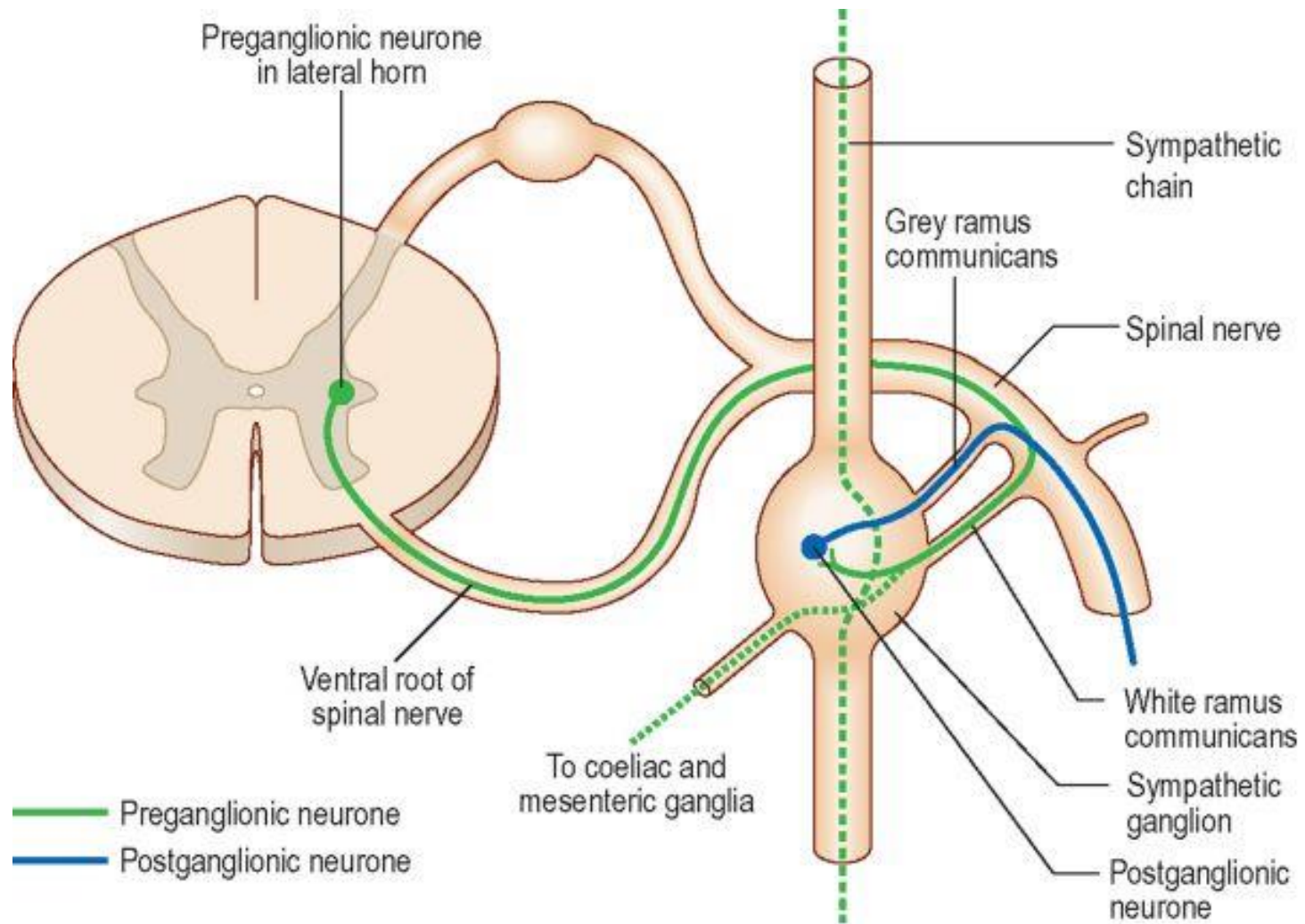


Fig.23: The pathway of the sympathetic neurons.

The Parasympathetic Division

- Also called Craniosacral division. منه يخرج منه
- Preganglionic neurons pass through:
 - The cranial nerves III, VII, IX and X
 - Sacral spinal nerves S2-S4 (form the Pelvic Splanchnic nerves)
- A preganglionic neuron usually synapses with 4-5 postganglionic neurons all of which supply a single visceral effector. So the effect is limited.

الاعصاب
• Preganglionic طولية ، توصل تقریباً صلبة للعقود المستطرفة .
Preganglionic 1 أو postganglionic عديدة .
• Preganglionic 1 أو postganglionic 4-5 فقط ، من 1 postganglionic ← يعني التأثير محدود

بالنسبة الى متحكم تختلف عليه الاغور بجله A preganglionic neuron usually synapses with 4-5 postganglionic neurons

postganglionic هو الذي واحد منه يتفرع مع 4-5 preganglionic كونه تأين محدود

منه فالله انك في وحدة معالجة من CNS (منخلية وحدة بي) - بتنتج تقريباً 45 خلية postganglionic

بالتالي كل خلية من postganglionic يروحوا لعضو كحد واحد او اجزاء مزيجية منه .

General and Special Sensations

General and Special Senses

هو مجموعة من الحواس مسؤولة عن إدراك الأشياء الحسية:

Special Senses

- Include
 - Smell
 - Taste
 - Vision
 - Hearing and equilibrium.
- Concentrated in specific locations in the head.
- Anatomically distinct structures.
- **Complex neural pathway.**

General Senses

- Include:
 - **Somatic sensations** (tactile, thermal, pain, and proprioceptive – sense of position) from body and joints
 - Visceral sensations from the organs.
- Scattered throughout the body. } skin/joints/muscle/organs
- **Simple structures.**

The General Sensory Structures

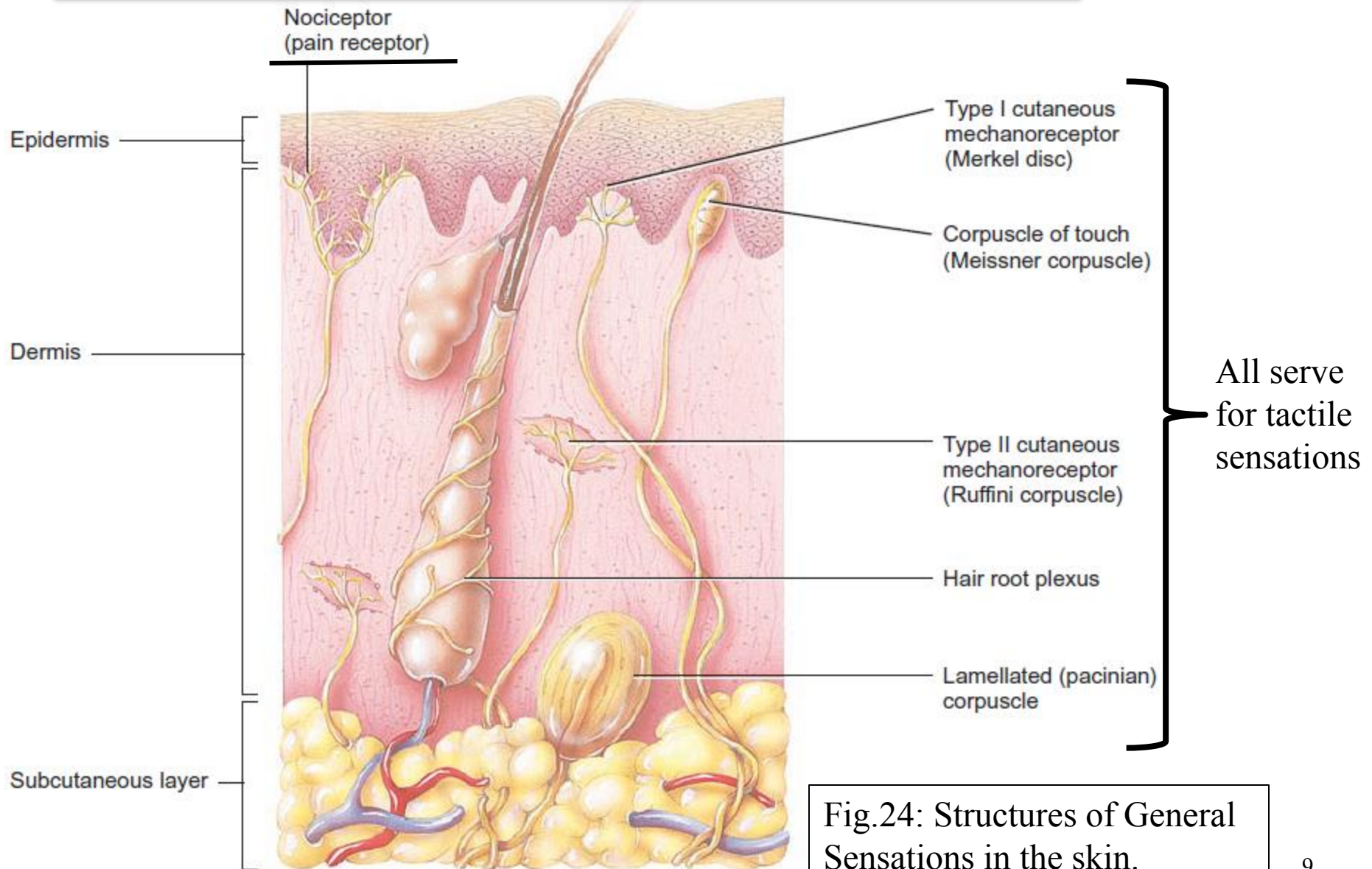


Fig.24: Structures of General Sensations in the skin.

Special Senses – Olfaction = Smell

سقف التجويف (المنفذ العلوي) من التجويف

- The olfactory epithelium is located in the roof of the nasal cavity.

- The olfactory epithelium is formed of:

1. **Olfactory receptors** - bipolar neurons with cilia called olfactory hairs.
 زوائد شعيرية عصبية
2. **Supporting cells** - provide support and nourishment.
 خلايا بيئية
3. **Basal cells** - replace olfactory receptors.
 خلايا بيئية

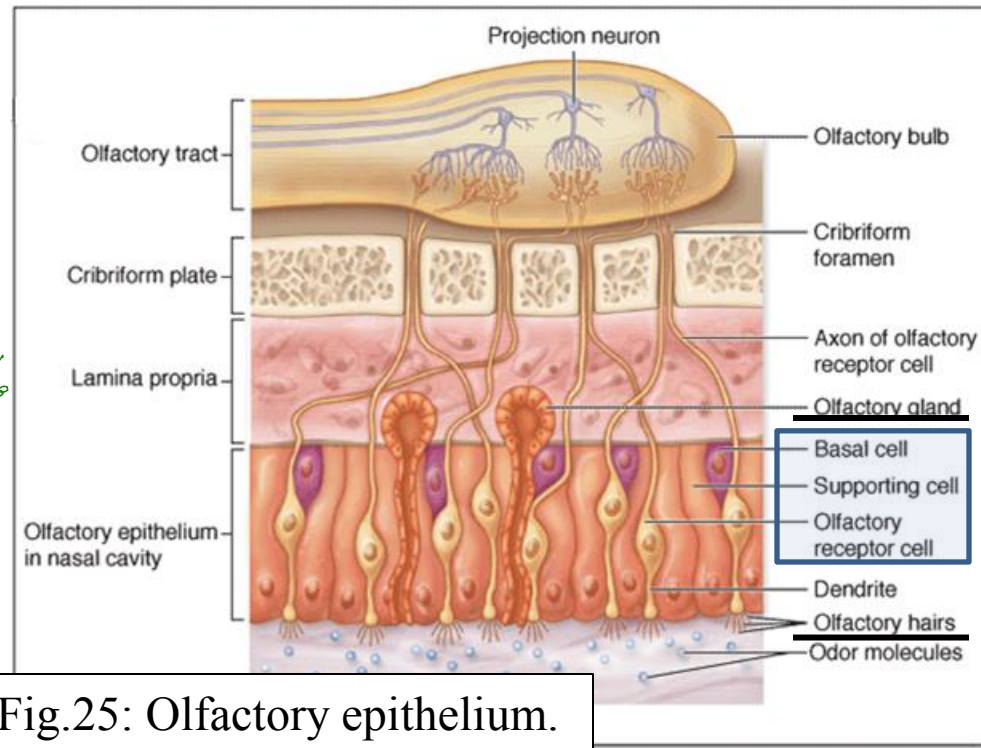


Fig.25: Olfactory epithelium.

- Olfactory glands produce a secretion that helps in moistening the surface of the epithelium

تنتج الغدد العظمية إفرازات تساعد على ترطيب سطح الخلايا العظمية

+ تنتج مادة لزجة لترطيب

Special Senses – Gustation = Taste

الذوق
Taste buds

- Gustation is performed by specialized structures called **Taste Buds** that are mainly present in the papillae of the tongue.

- Taste buds are oval structures formed of:

1. **Gustatory cells** - Each one has a gustatory hair (a long microvillus) that projects through an opening in the bud called the taste pore.

2. **Supporting cells** - provide support and nourishment.

3. **Basal cells** - replace the other cells.

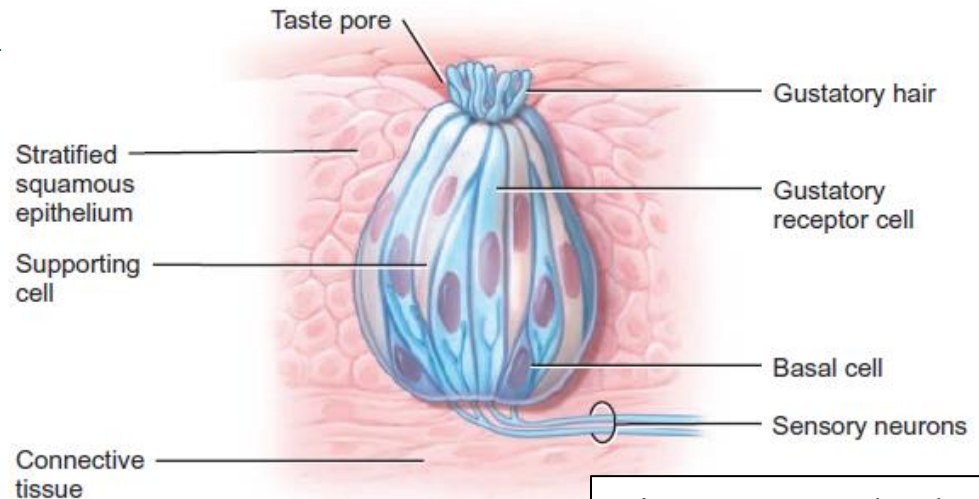


Fig.26: Taste bud.

خلايا مبطنة -
تقبل الذوق

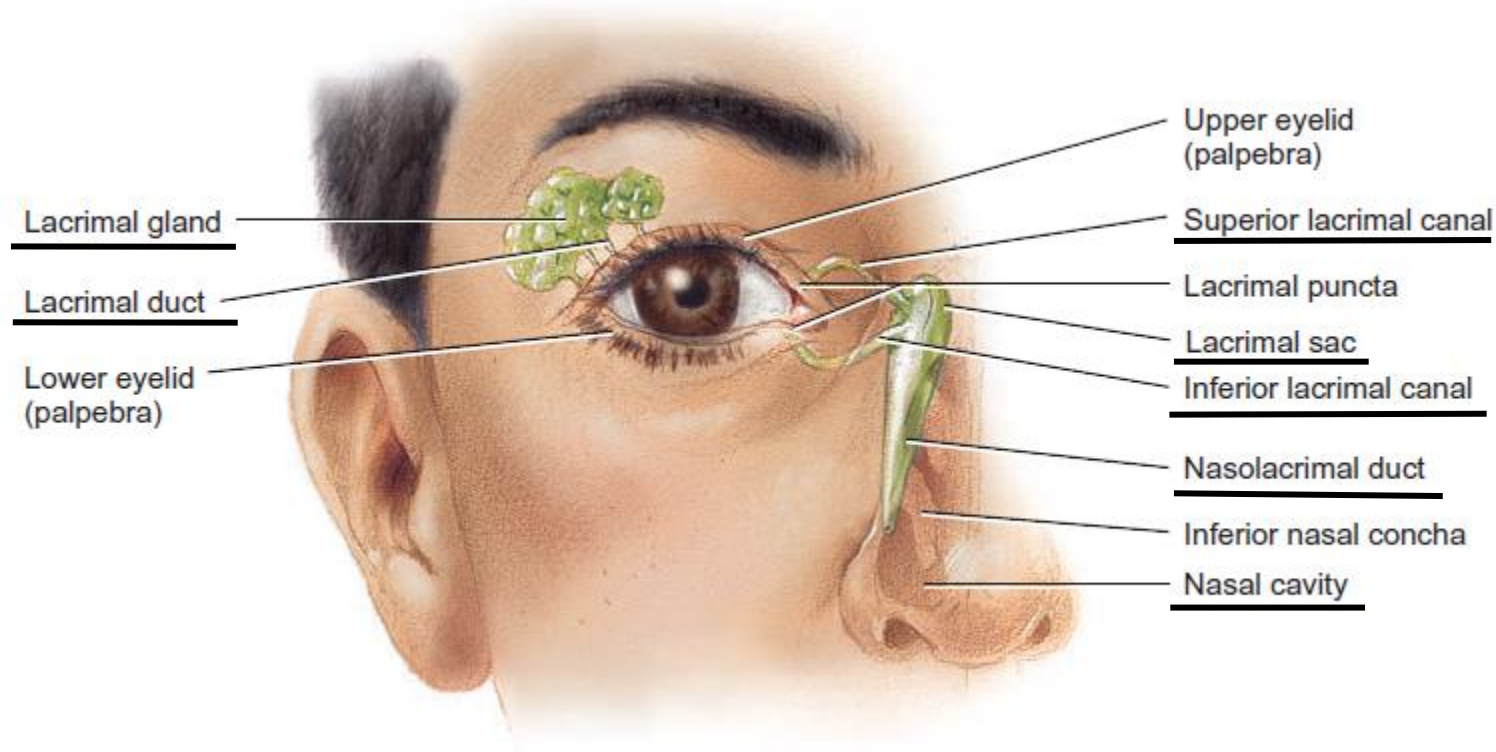
Special Senses – Vision

- Vision is the function of the eye.
- The eyeball is located in the orbital cavity of the skull.
- Accessory structures of the eye include:
 1. The eyelids الجفون
 2. The lacrimal apparatus جهاز الدمع
 3. The extrinsic muscles of the eye العضلات الخارجية للعين
- The two eyelids (palpebrae) (1) protect eye from light, (2) shade eye during sleep, and (3) spread tear.
- The space between the eyelids that exposes the eyeball is called the **palpebral fissure**. → الفتحة بين الجفون
- The **levator palpebrae superioris** muscle raises the upper eyelid.

تجميع عيني
بالجفون

تقلل العين اشراق النور

The Lacrimal Apparatus



FLOW OF TEARS

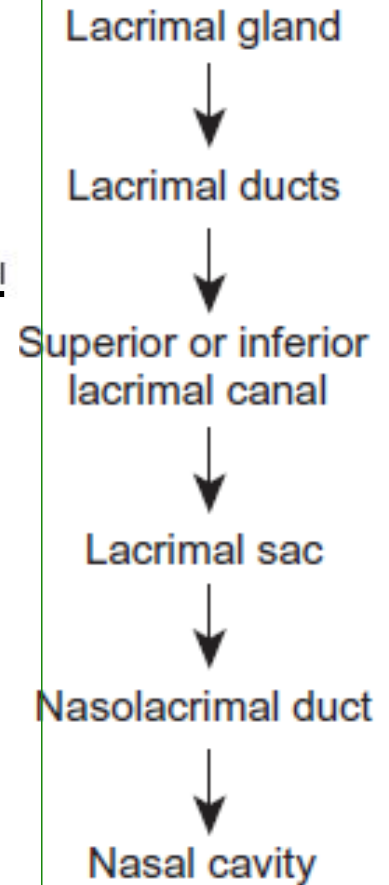


Fig.27*: Components of the lacrimal apparatus.

تتميز بتركيبها البنية بالانتماءات المختلفة + لنقل
بالسحب الخارجى لـ sclera.

العضلات الخارجية للعين

Extrinsic Eye Muscles

- **Six extrinsic eye muscles** control movements of each eyeball. They are called **extrinsic** because they originate outside the eyeball in the bony orbit and insert on the outer surface of the **sclera**. **These muscles are supplied by cranial nerve III, IV, and VI.**

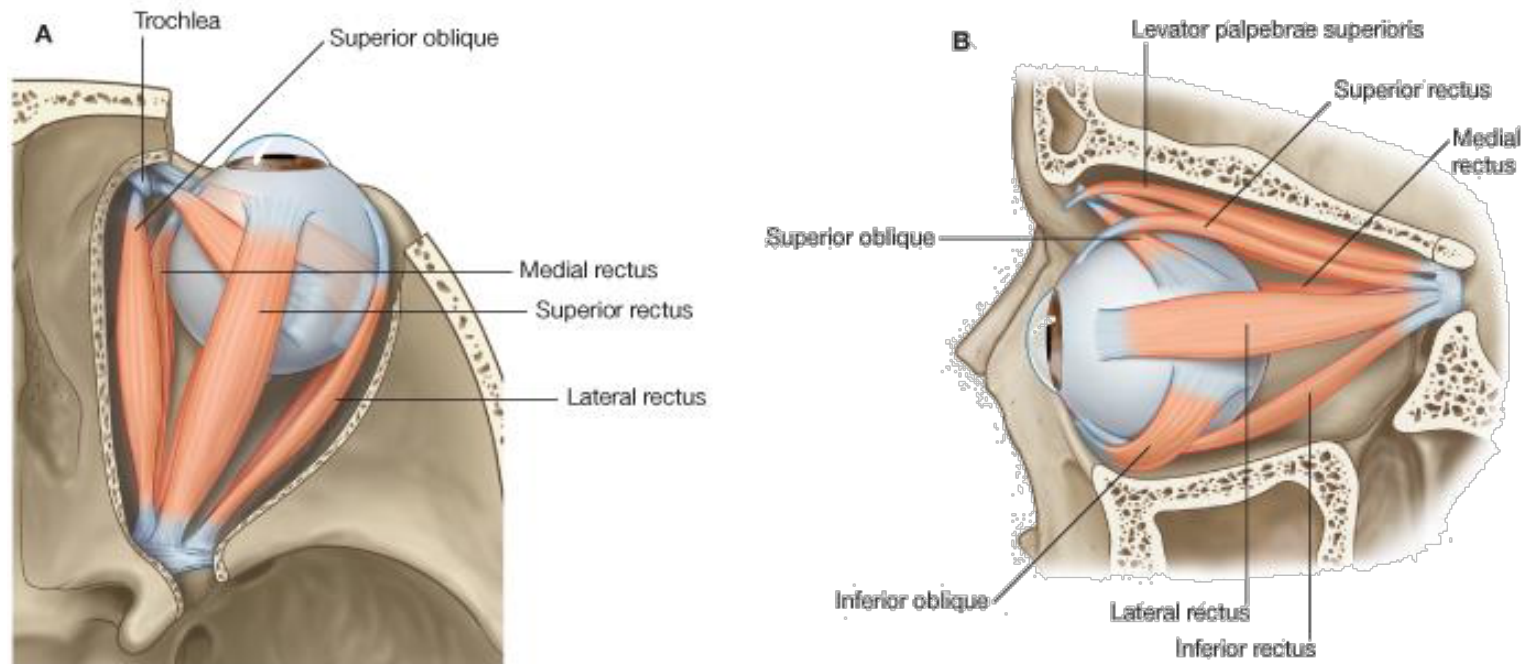


Fig.28: Extrinsic muscles of the eye. (A) superior view. (B) lateral view.

Anatomy of the Eyeball

The Wall of the eyeball

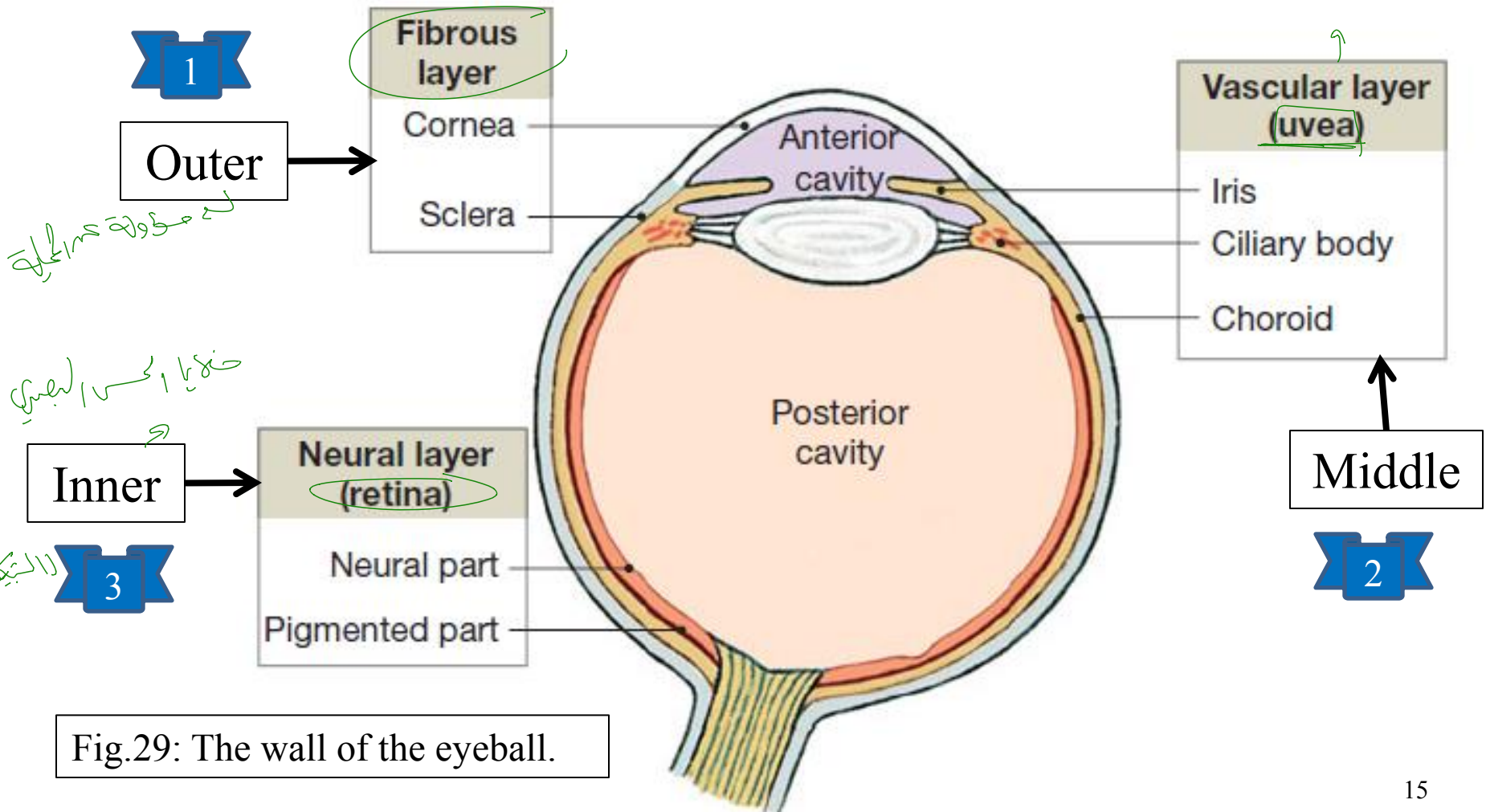


Fig.29: The wall of the eyeball.

1. Fibrous tunic (layer)

a) Sclera “white” of the eye

- The larger posterior part. (خارجية واستر للاحقة)
- A strong fibrous layer.

— Functions:

1. Protect the eye.
2. Help maintain shape of the eye.
3. Site of attachment of extrinsic eye muscles.

تعمل كمكافئ ارتباط العضلات الخارجية
التي تتحرك العين.

b) Cornea

الجزء الأمامي الشفافي من
الغشاء الأبيض.

قمام القرنية الشفافة

- The smaller anterior part. Located in front of the iris.

- Transparent. شفافة مئة بالمئة بمرور الضوء.

- Function: it allows light to enter the eye and it's the major refractory structure in the eye.

السطح الأكثر انكساراً
للعين يعني يعمل كمواقع
المنزلة البصرية.

2. *Vascular tunic*

الوعائية

Uvea.

تمويها او عروق صلبة كثيرة وحملها صبغية

تحت الضوء المرئي

a) *Choroid*

الكثيفة

الجزء الخلفي الأكبر

- The large posterior part. It's highly vascular layer with numerous melanin-producing melanocytes.

Functions: (1) supply nutrients to the retina, (2) melanin pigment absorbs any stray lights, thus, making the image sharp.

تحت
الجزء المتناثرة
يحمل الضوء وامتصاصه
في الشبكية

b) *Ciliary body*

منه هذا

يقع خلف القزح والعدسة

- The middle part of the vascular tunic.
- Located just posterior to the junction of the cornea and sclera.
- Has numerous protrusions called the *ciliary processes*. These produce the aqueous humor. From them extend the *zonular fibers* (suspensory ligaments) that are attached to the lens.
- The *ciliary muscle* is a smooth muscle within the ciliary body. It's responsible for changing the shape of the lens.

زوائد عدسية

zonular fibers
تعلقها بال lens

لها تغير الشكل الداخلي داخل العين + تامة معها

مسؤولة عن تغير شكل العدسة أثناء التركيز على الأشياء القريبة او البعيدة (Accommodation)

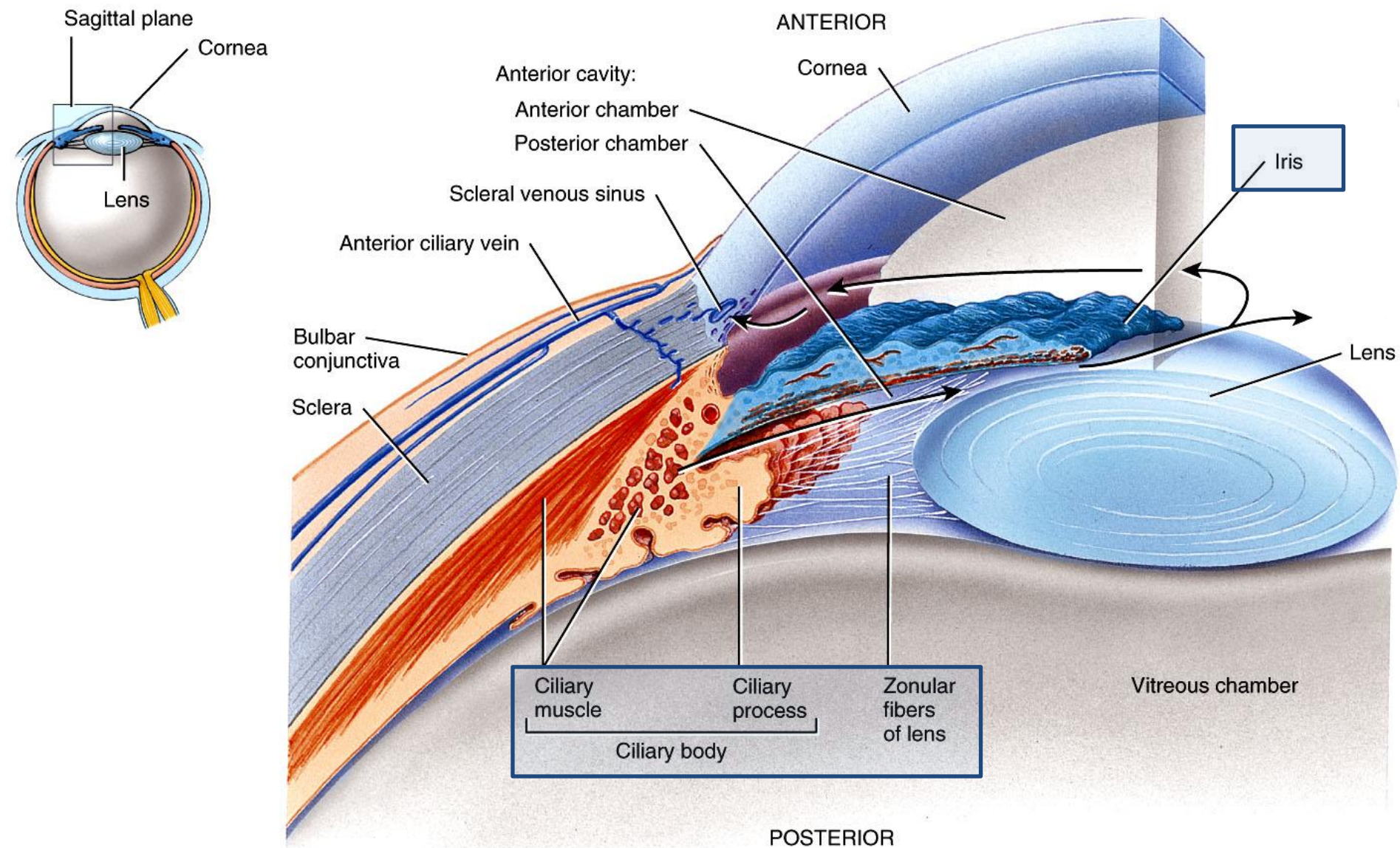


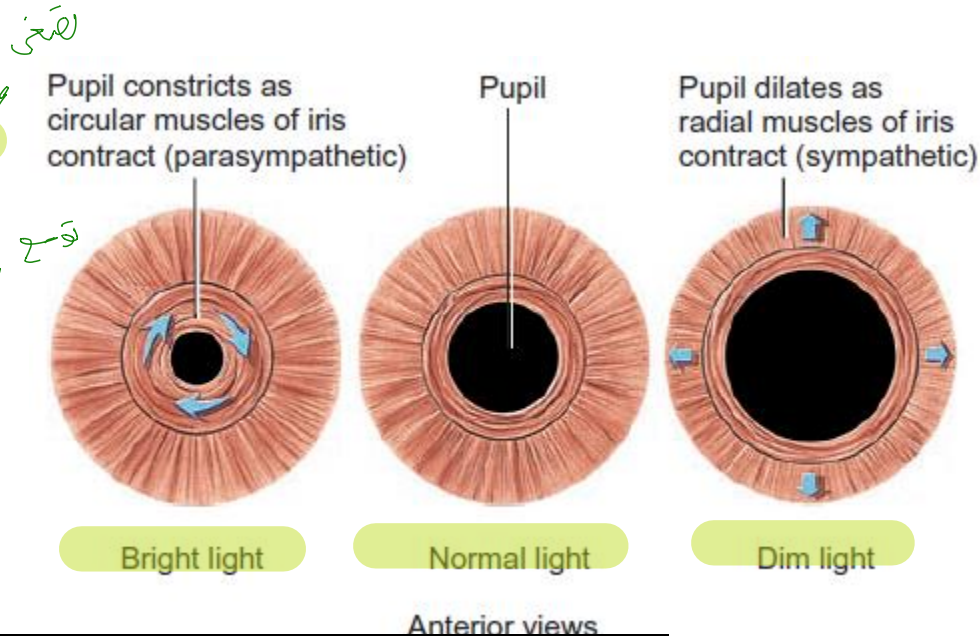
Fig.30: The ciliary body and the iris.

c) The Iris

- The anterior colored portion of the vascular tunic.
- The opening in the middle of the iris is called the **pupil**.
Through this pupil light can pass to the lens.

البؤبؤ

- The iris contains the circular **sphincter pupillae muscle** and the radial **dilator pupillae muscle**. These muscles change the diameter of the pupil regulating the amount of light passing through it.



الطبقة	المكونات الرئيسية	الموقع	أهم الوظائف
Fibrous Tunic (الليفية)	1. Sclera 2. Cornea	الخارجية	الحماية، الحفاظ على الشكل، انكسار الضوء
Vascular Tunic (الوعائية)	1. Choroid 2. Ciliary body 3. Iris	الوسطى	تغذية العين، إفراز السائل المائي، تنظيم الضوء، التحكم في شكل العدسة
Inner Tunic (الشبكية - لم تُشرح بعد)	—	الداخلية	تحتوي على خلايا الإحساس بالضوء (Photoreceptors)

Note the effect on them.