



جامعة المستقبل  
كلية التقنيات الصحية والطبية  
قسم تقنيات البصريات



First Stage 2023-2024

Anatomy of The Eye  
Practical Lecture Title  
Retina

Lecture Number: 3 / course 2

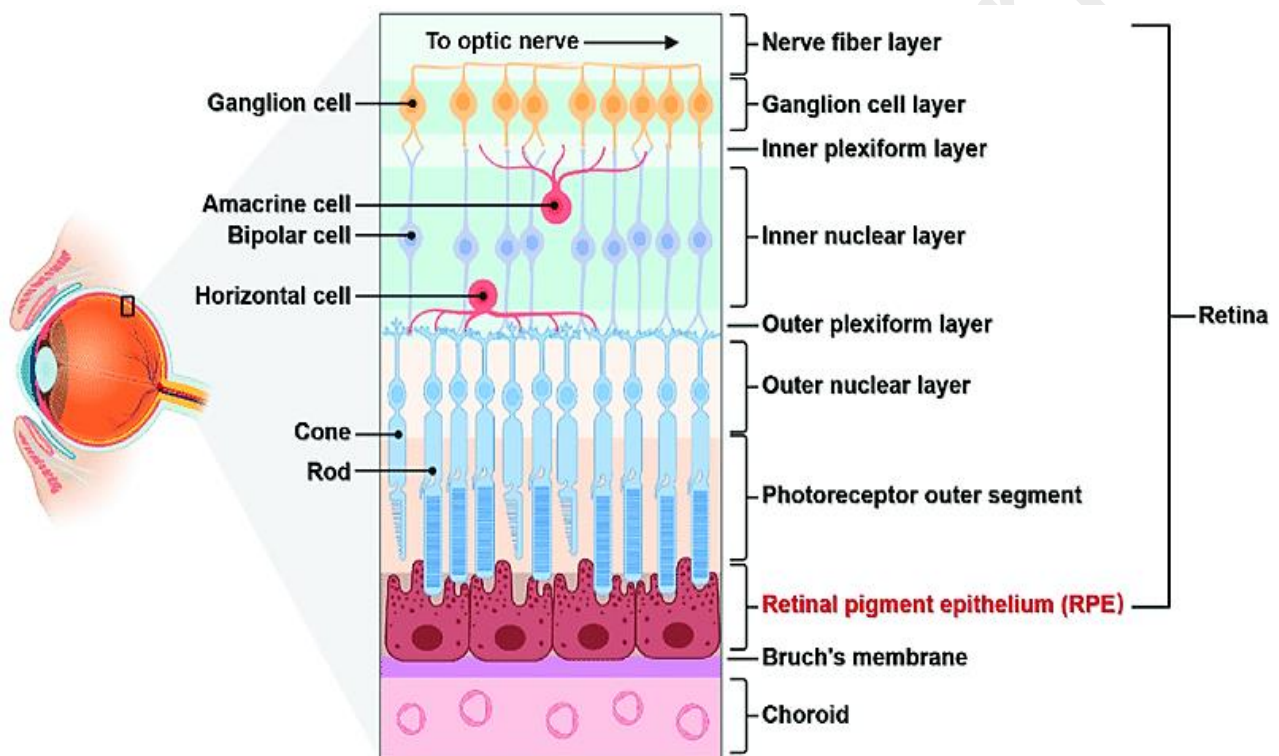
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## شبكية العين **RETINA**

The retina is a light-sensitive layer of tissue that lines the back of the eye. It plays a crucial role in the process of vision by converting the light that enters the eye into electrical signals that can be interpreted by the brain.

### Structure of Retina

The retina is a highly organized and complex structure composed of several layers of specialized cells.



The layers of the retina, from *inner to outer*, are:

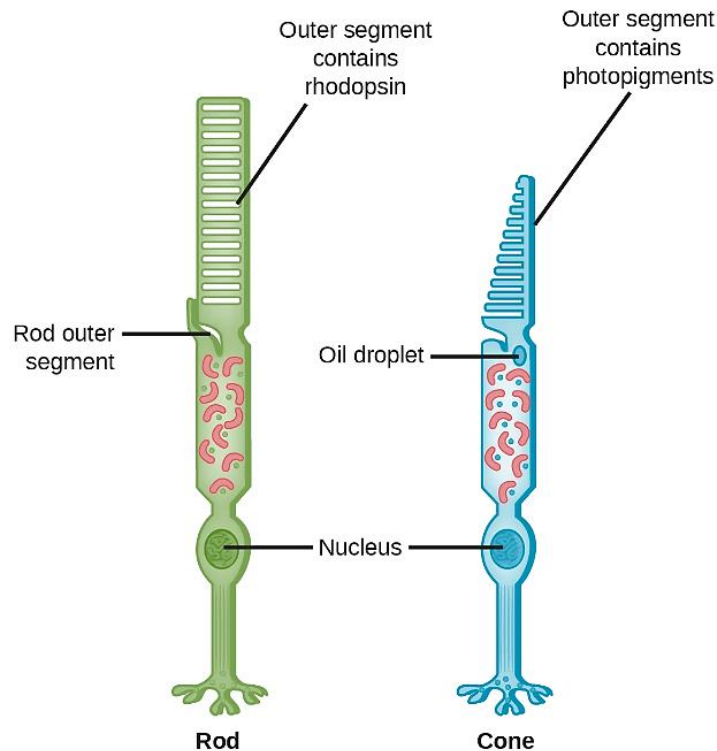
1. Inner Limiting Membrane (ILM)
2. Nerve Fiber Layer (NFL)
3. Ganglion Cell Layer (GCL)
4. Inner Plexiform Layer (IPL)
5. Inner Nuclear Layer (INL)
6. Outer Plexiform Layer (OPL)
7. Outer Nuclear Layer (ONL)

8. External Limiting Membrane (ELM)
9. Photoreceptor Layer (containing rods and cones)
10. Retinal Pigment Epithelium (RPE)

## Rod and Cone

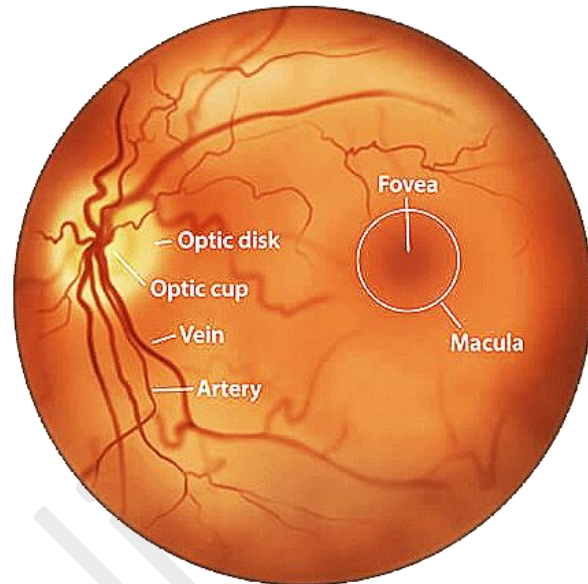
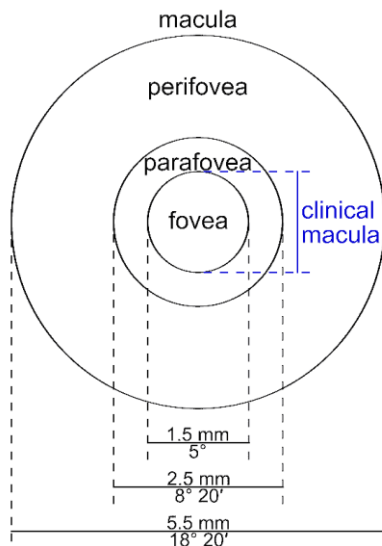
Rods and cones are the two types of photoreceptor cells found in the retina of the eye. These cells are responsible for converting light energy into electrical signals that can be interpreted by the brain as vision. differences between rods and cones:

Feature	Rods	Cones
Shape	Rod-like	Cone-like
Light Sensitivity	High	Low
Vision Condition	Dim light (scotopic)	Bright light (photopic)
Color Vision	No	Yes (red, green, blue)
Visual Acuity	Low	High
Distribution in Retina	Widespread (except fovea)	Concentrated in fovea
Abundance	High (120 million)	Low (6 million)



**Macula:** Located at the retina's center, it's rich in cone cells and helps us see details in our central visual field.

**Fovea:** The very center of the macula, where vision is sharpest due to a high concentration of cone cells.



### Functions of the Retina

- The retina converts incoming light into visible images, like to film in a camera.
- Although vision is associated with the eyes, the brain processes visual information into recognizable images.

### Visual Processing

- When light enters the eye, it passes through the cornea, pupil, and lens before reaching the retina.
- The photoreceptor cells in the retina absorb the light energy and convert it into electrical signals.

- These signals are then transmitted to the bipolar cells, which relay the information to the ganglion cells.
- The ganglion cells then send the visual information through the optic nerve to the brain, where it is processed and interpreted as vision.

## Blood Supply

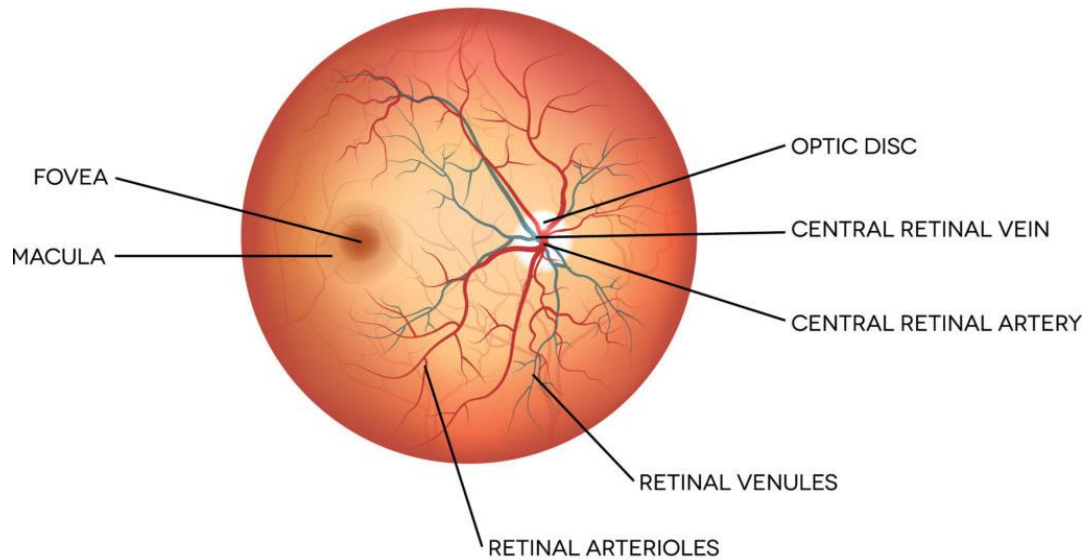
The retina receives its blood supply from two main vascular systems:

### 1. Central Retinal Artery:

- The central retinal artery is a branch of the ophthalmic artery.
- It enters the eye through the optic nerve and supplies blood to the inner layers of the retina.
- This artery provides oxygen and nutrients to the retinal cells, including the photoreceptors (rods and cones).

### 2. Choroidal Vessels:

- The choroid is a vascular layer located between the retina and the sclera (the white part of the eye).
- Choroidal vessels supply blood to the outer layers of the retina, including the photoreceptor cells.



## Diseases and Disorders

Various diseases and disorders can affect the retina, such as:

- ✓ age-related macular degeneration
- ✓ diabetic retinopathy
- ✓ retinal detachment
- ✓ retinitis pigmentosa

These conditions can lead to vision impairment or blindness if not properly treated.