

# INNER EYE STRUCTURES

## Structures in front of the lens

1. **Conjunctiva:** mucous membrane that lubricates the eye. Consists of stratified columnar epithelium, a rare type of tissue.
2. **Cornea:** transparent “window” on the world; contains no blood vessels (by which WBCs would arrive) and thus is usually not rejected if transplanted.
3. **The anterior chamber** contains aqueous humor, a thin watery secretion that light must pass through before it enters the:
4. **Pupil,** a hole in the iris.
5. **Iris,** the pigmented part of the eye. The iris is composed of circular smooth muscle so that it can dilate or constrict to allow more or less light in. The iris muscles are controlled by and attached to the **ciliary bodies.**
6. **The ciliary body** controls the constriction of the pupil by changing the opening in the iris. It also controls the convexity (curvature) of the **lens.**
7. **The suspensory ligament** connects the lens to the ciliary body.
8. **The lens** determines the refraction of light entering the eye (which is essential for focusing). A flat lens helps you see far away, a curved lens helps you see close up (also called accommodation).

## Structures behind the lens

9. **Vitreous humor:** jello-consistency substance that fills the posterior chamber of the eye. This firmness gives the eyeball its shape.
10. **The retina** is neural tissue, composed of receptors called either rods or cones. When the cones send nerve impulses (action potential), it is interpreted by our brain as different colors. When the rods send nerve impulses, we can see in black and white. Generally, rods give better depth perception, far vision, and movement tracking; cones give greater detail up close and in good lighting.
  - a. **The fovea centralis** is the “sweet spot” for focusing. It is found in the center of the **macula** of the retina. When light hits the retina, an image is interpreted, but light that hits directly on the **fovea centralis** provides the most focused part of the image. The lens curves and flattens in order to refract light more or less and thus direct the light onto the **fovea centralis.** Peripheral vision is a result of light that is hitting other areas on the retina.
  - b. **The optic disk** is where the neural receptors send axons back into the optic nerve. This location is the “blind spot” because it is part of the retina but it does not have receptors—only axons. The **optic nerve** is directly behind the optic disk.
11. **The choroid** contains the blood vessels that nourish the eye. It appears black to reduce reflective light within the eye. It is the cause of “red eye” in night shots.
12. **The sclera** is a continuation of the cornea, except that the sclera is white and not transparent like the cornea.
13. **The optic nerve** carries the information from the rod and cone receptors to the occipital lobe of the brain.

**Summary:** Light passes through the clear cornea, the aqueous humor, then through the pupil, then the lens, then the vitreous humor, then the retina. Nerve impulses originate in the retina and are sent to the brain via the optic nerve. Close vision requires a curved lens, contracted ciliary muscle. Far vision requires a flat lens and relaxed ciliary muscle.