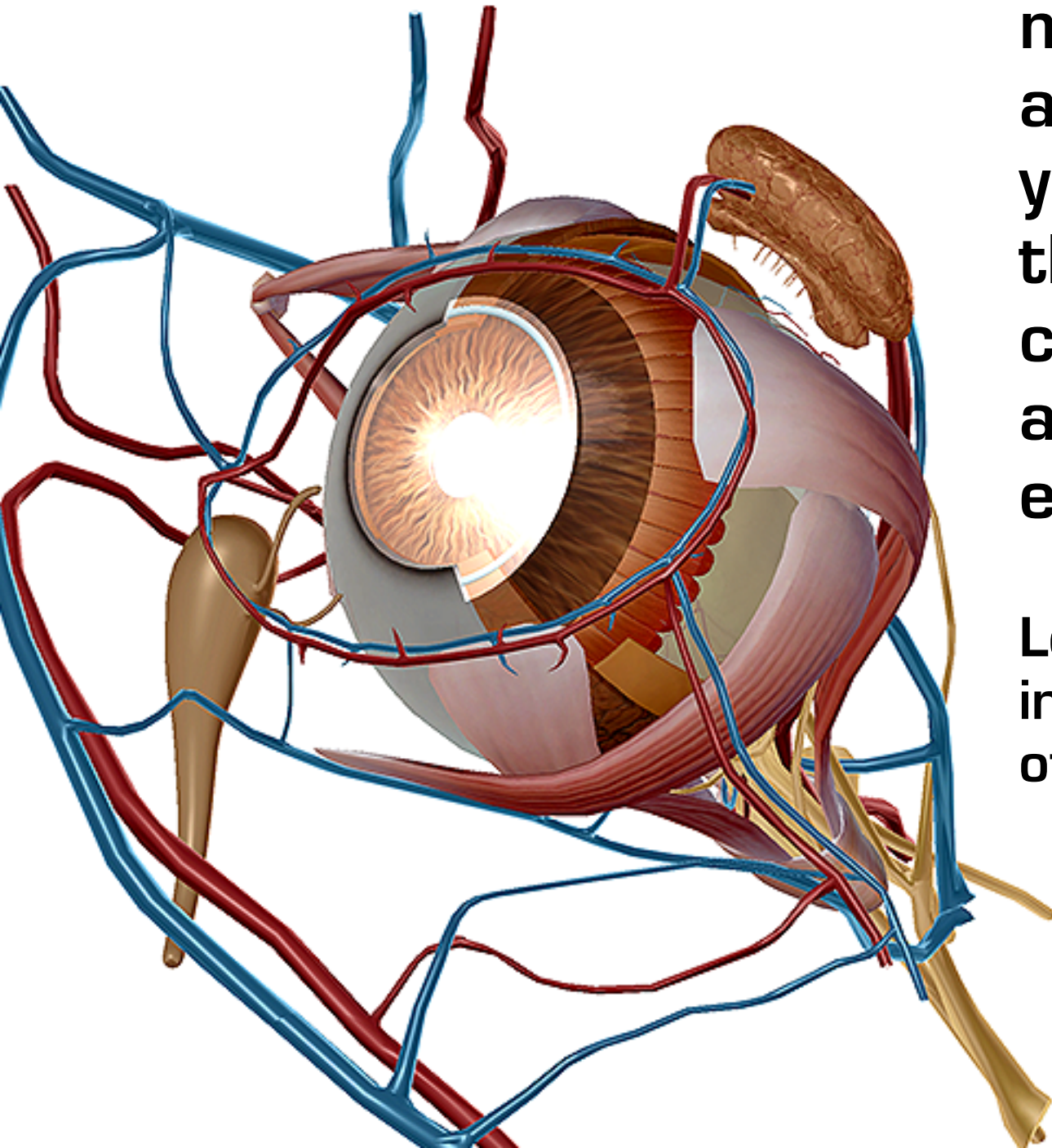


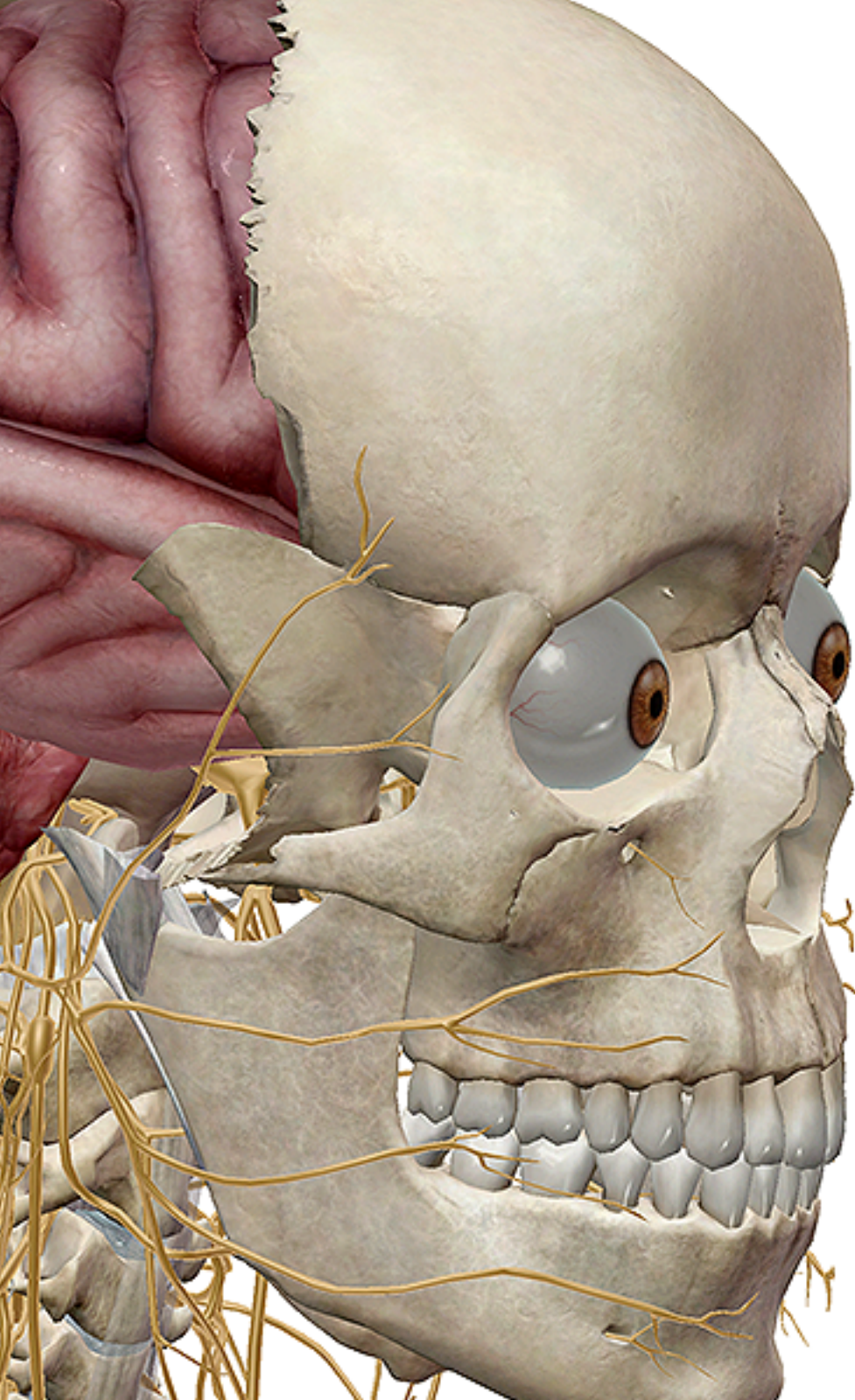
The Eye

(We'll leave the Lord Sauron jokes to you.)



When you look in the mirror, you only see a very small part of your eyes. In reality, they are incredibly complex organs with a pretty big job: enabling you to see.

Let's take a look (pun intended) at the anatomy of the eye!



The eye itself is a spherical sensory organ of the **nervous system**, responsible for sight.

Contained within the orbits of the skull, the eyes are protected from injury by pads of fat.

Factoid: The word “eye” has a long history, including Old English “ege” and Proto-Germanic “*augon.”

Some cognates are Greek “okkos” and Latin “oculus,” both meaning “eye” or “sight.”

The eye is comprised of several layers and chambers—more than we can even show in this little eBook! But here are four to know.

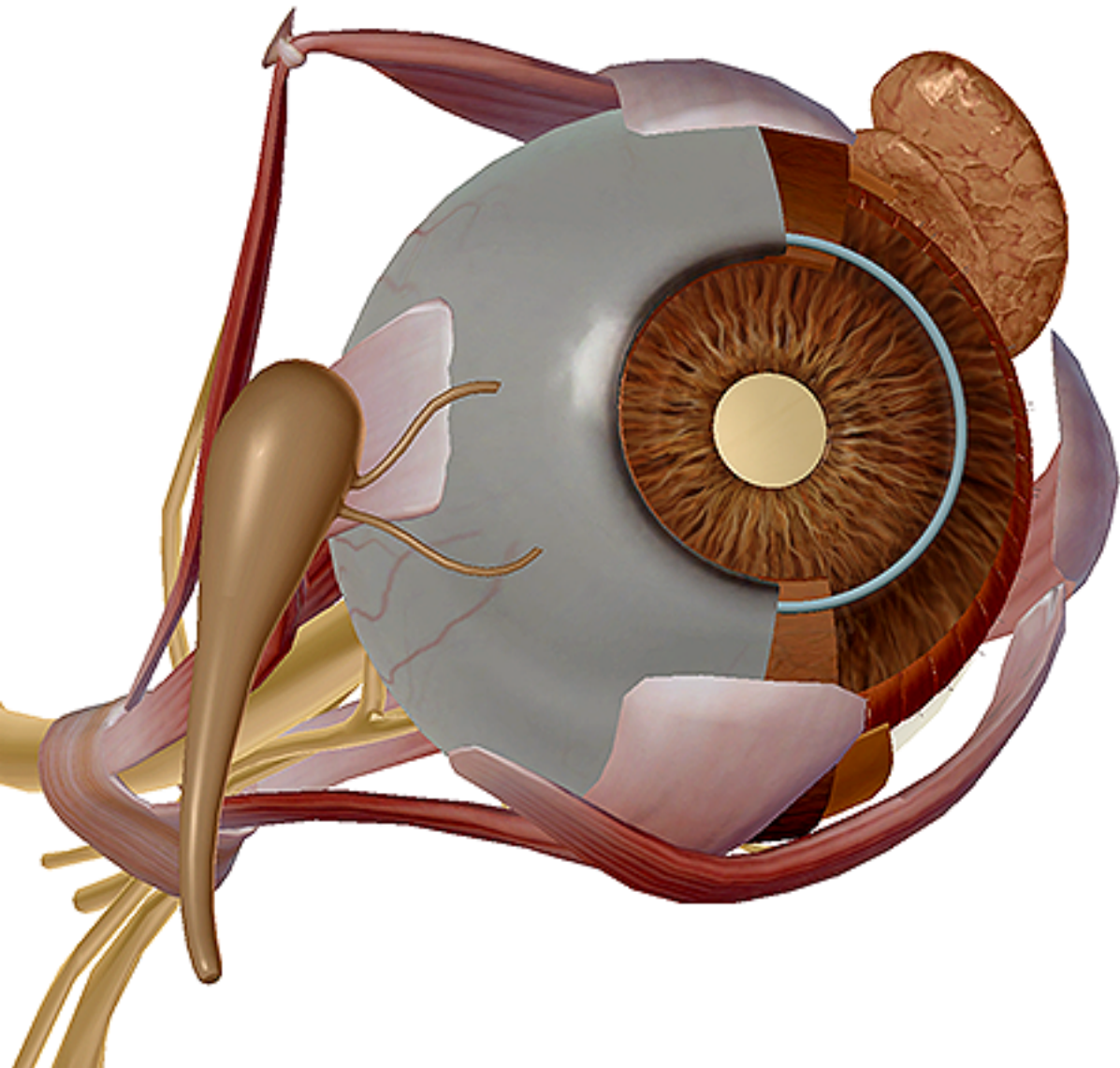


1. **Sclera:** The white part of the eye; the sclera is made up of white fibrous tissue and fine, elastic fibers. It maintains the shape and rigidity of the eyeball.

2. **Choroid:** The choroid lines most of the internal surface of the sclera. It provides nutrients to the posterior surface of the retina and helps prevent reflection in the eyeball.

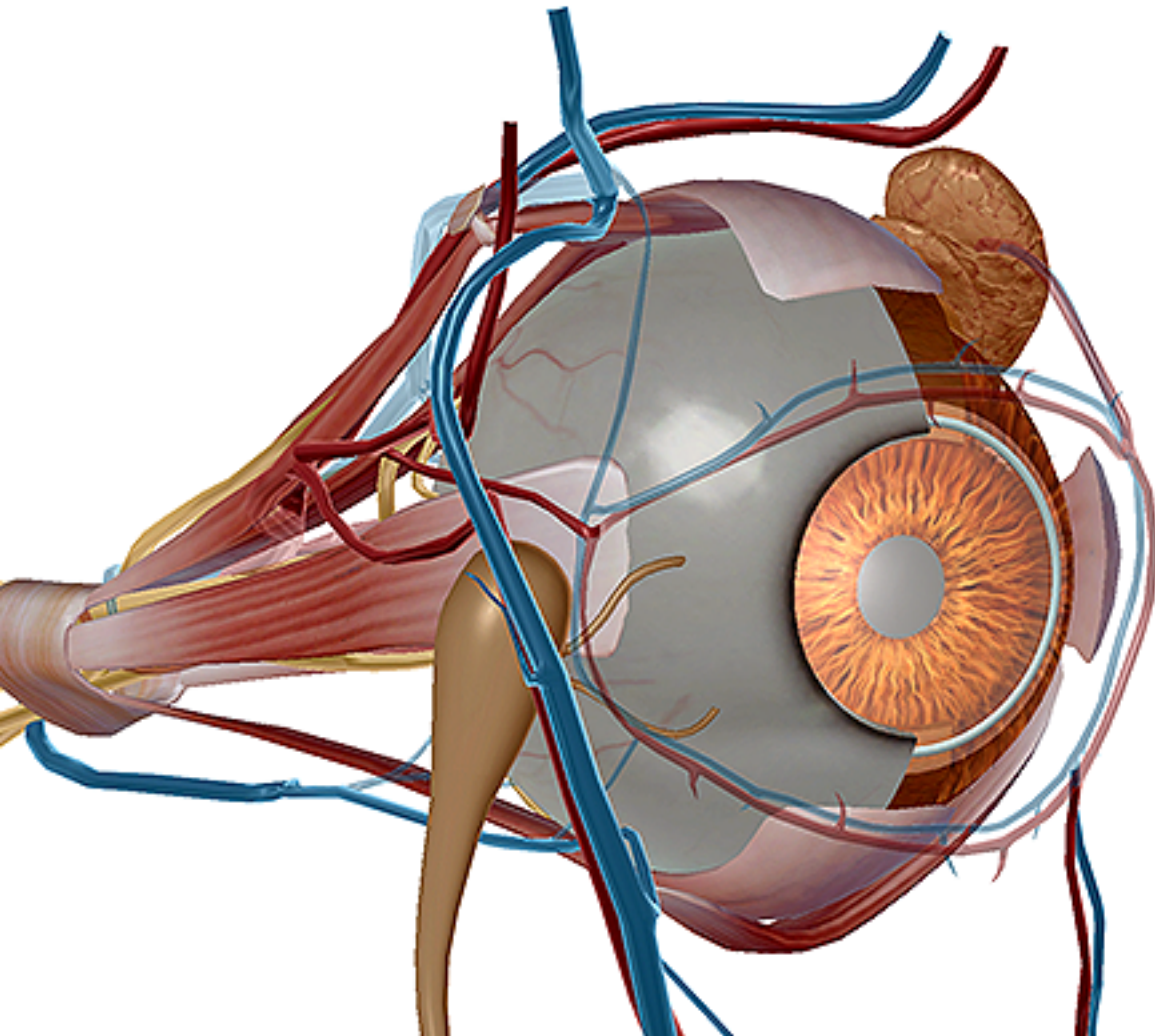
3. **Retina:** A delicate, nervous tissue membrane, the retina is the inner layer of the eye. The images of external objects are received by the retina. Each retina has about 120 million rods, which allow the eye to see in dim light, and about 6 million cones, which detect color.

4. **Vitreous body/humor:** Forming about four-fifths of the bulb of the eye, the vitreous body holds the retina against the choroid, giving the retina a flat, even surface for receiving images.



The pupil is a circular opening in the center of the iris that allows light to enter the eye. The pupil constricts to decrease the amount of entering light, and dilates to increase the amount of entering light.

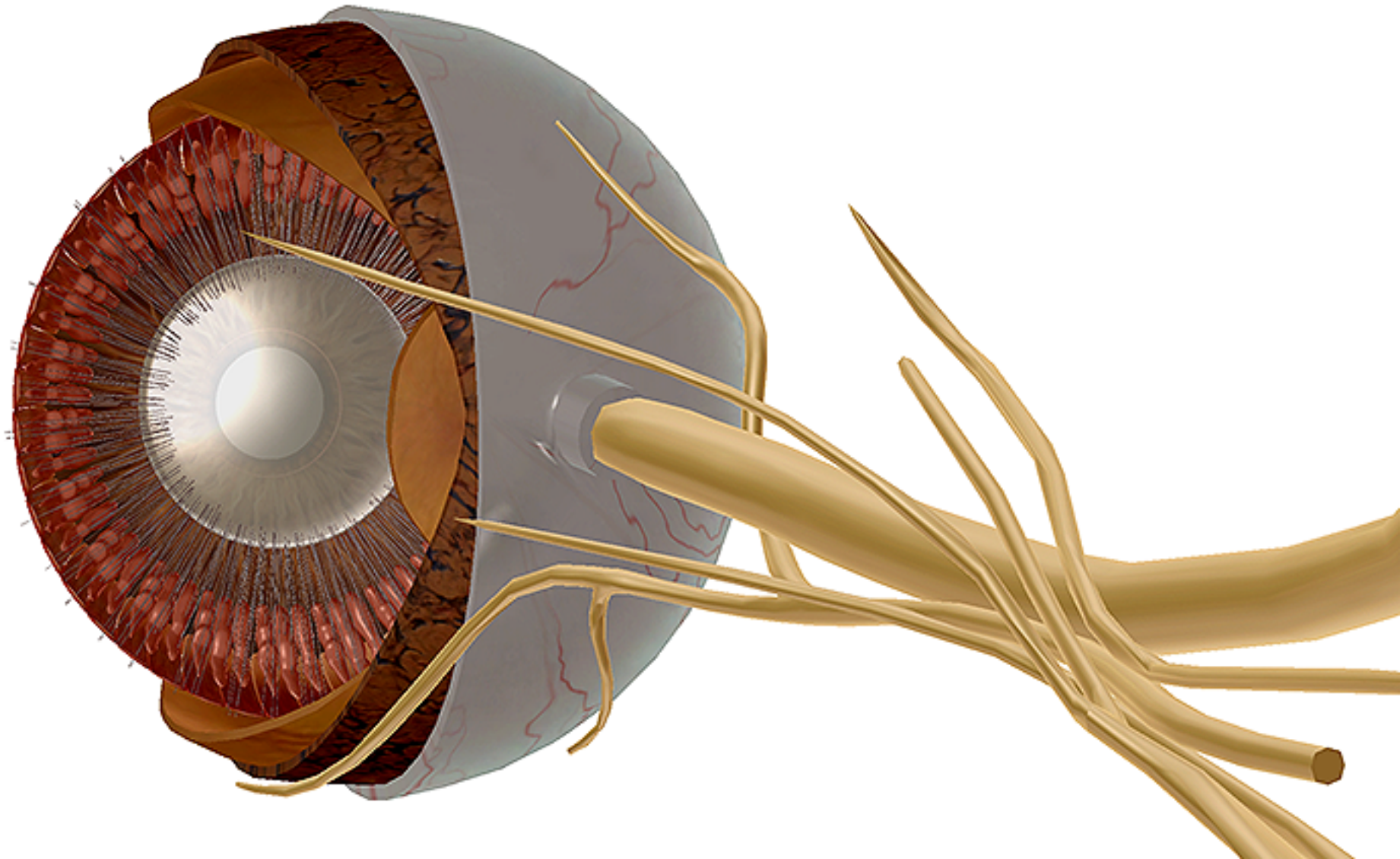
The **iris** is the colored part of the eye. Eye color depends on the amount of melanin in the iris—low amounts of melanin result in blue, moderate amounts result in green, and large amounts result in brown, hazel, and sometimes black.



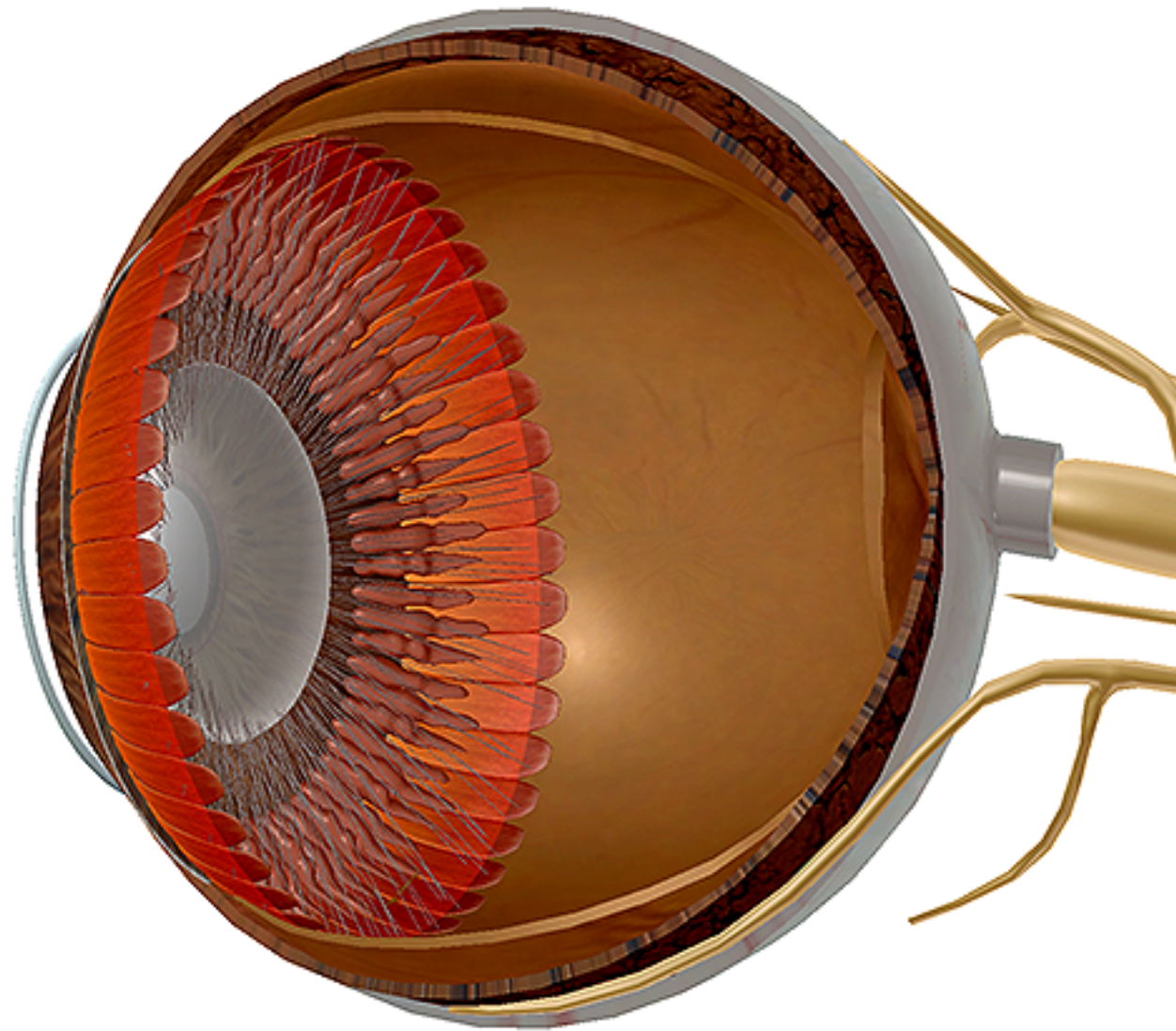
A contractile disc, the iris **regulates** the amount of light that flows into the eye by constricting or expanding the pupil.

Factoid: The iris is named after Iris, the greek goddess of the rainbow.

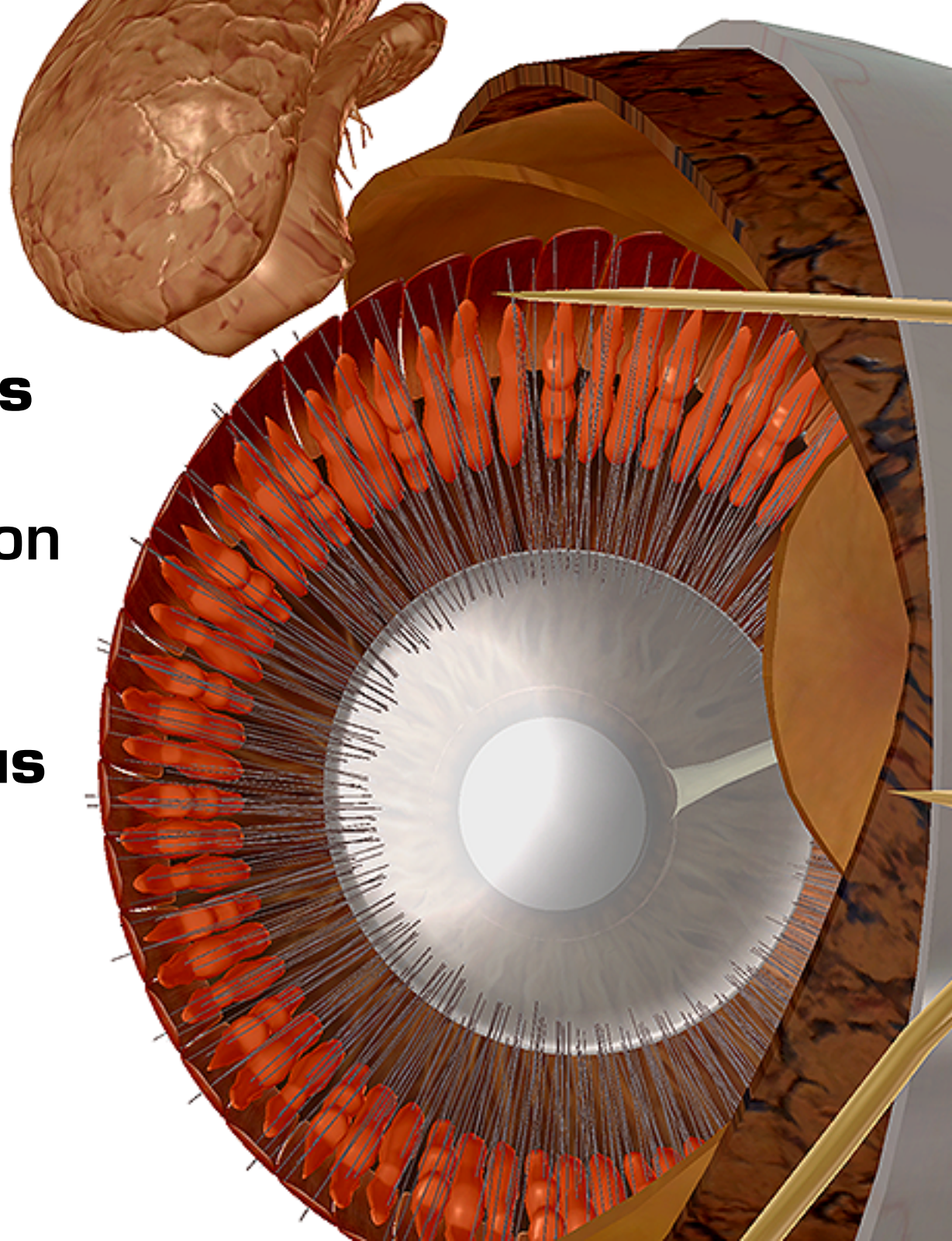
The lens is located behind the pupil and iris and is enclosed in a protective membrane. It focuses images onto the retina to produce clear vision.



The ciliary muscles change the tension of the zonular fibers, adapting the lens for near or far vision.



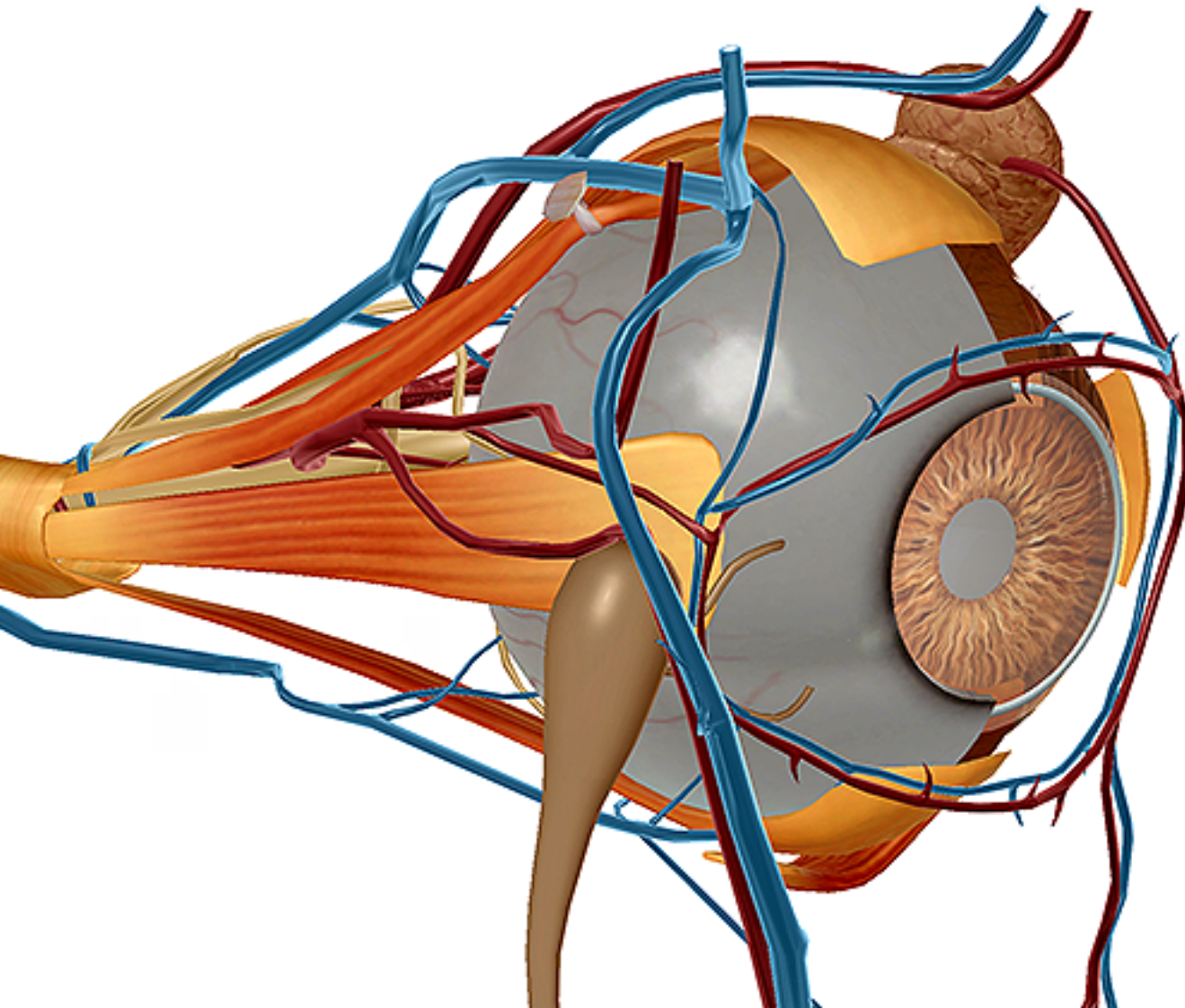
The **ciliary processes** are folds that are arranged in a circle on the internal surface of the ciliary body. They secrete **aqueous humor**.



Zonular fibers, or ciliary zonules, extend from the ciliary processes and attach to the lens, holding it in place. Tense or loose fibers change the shape of the lens, allowing for long-range or short-range focus, respectively.



The extraocular muscles are responsible for eye motion and movement.



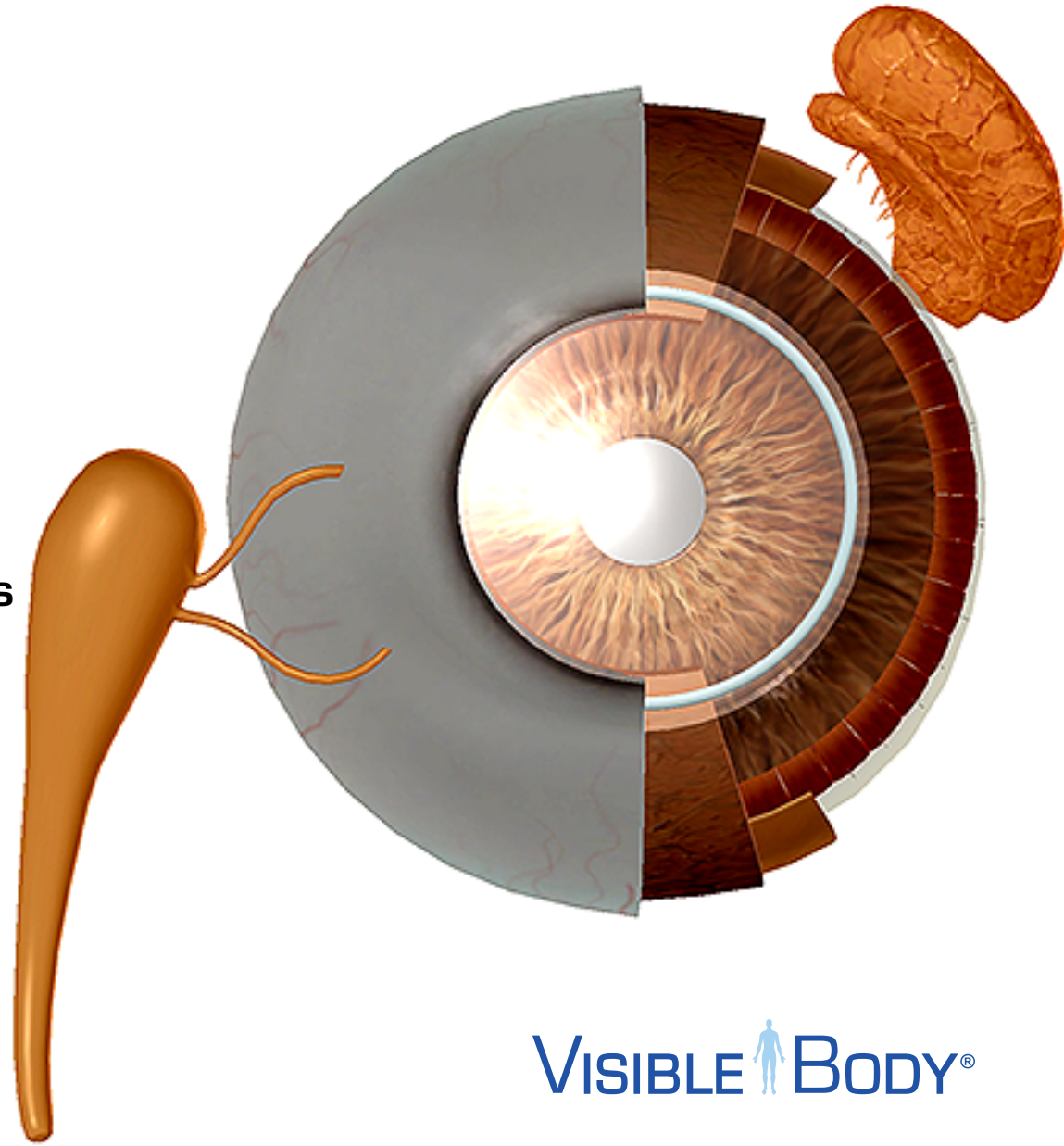
The extraocular muscles include the superior rectus, inferior rectus, medial rectus, lateral rectus, superior oblique, and the inferior oblique. They originate on the common tendinous ring.

Factoid: The extraocular muscles move over 100,000 times a day!

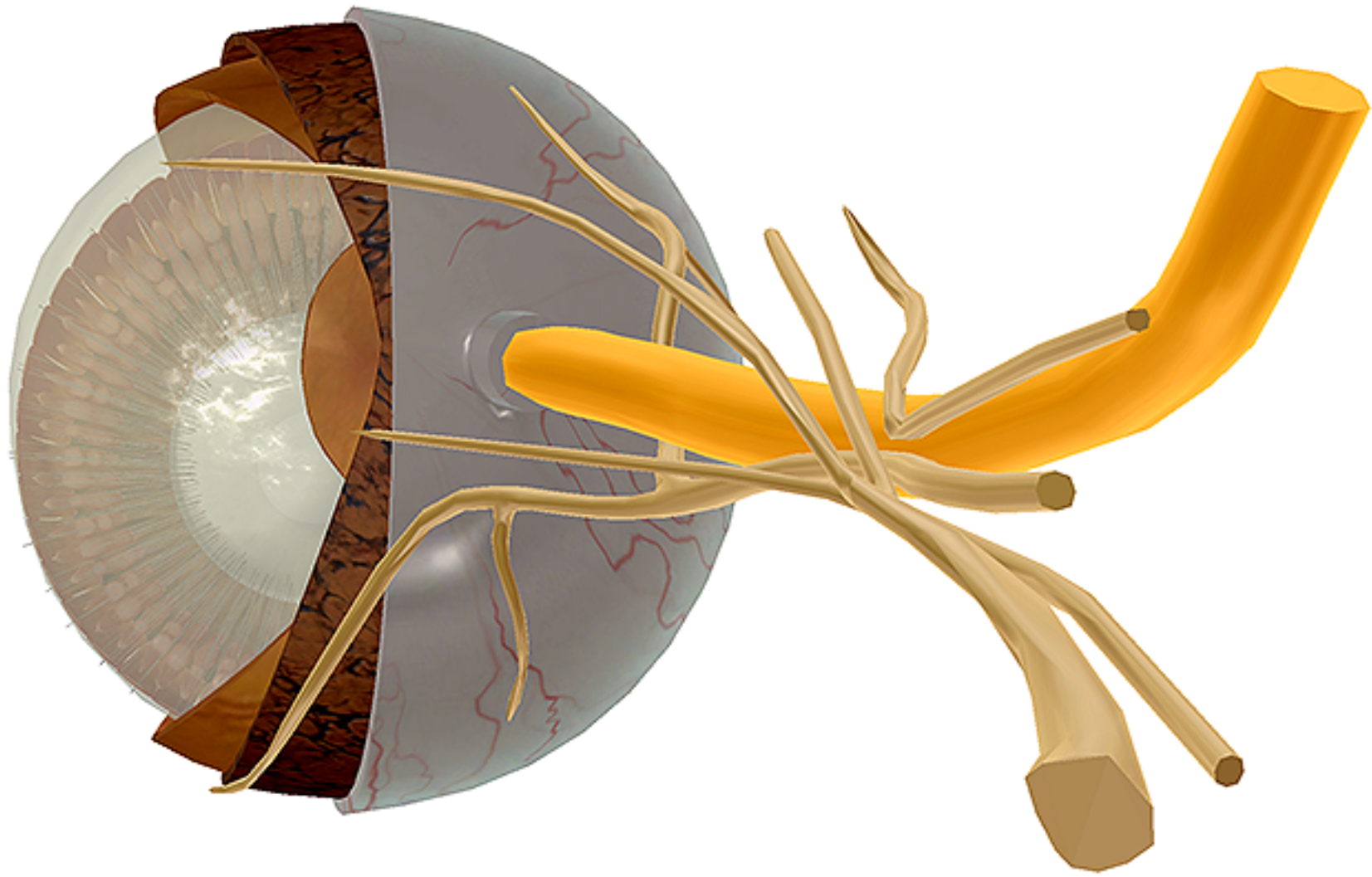
The **lacrimal apparatus** is a group of structures that produce and drain tears into the eye.

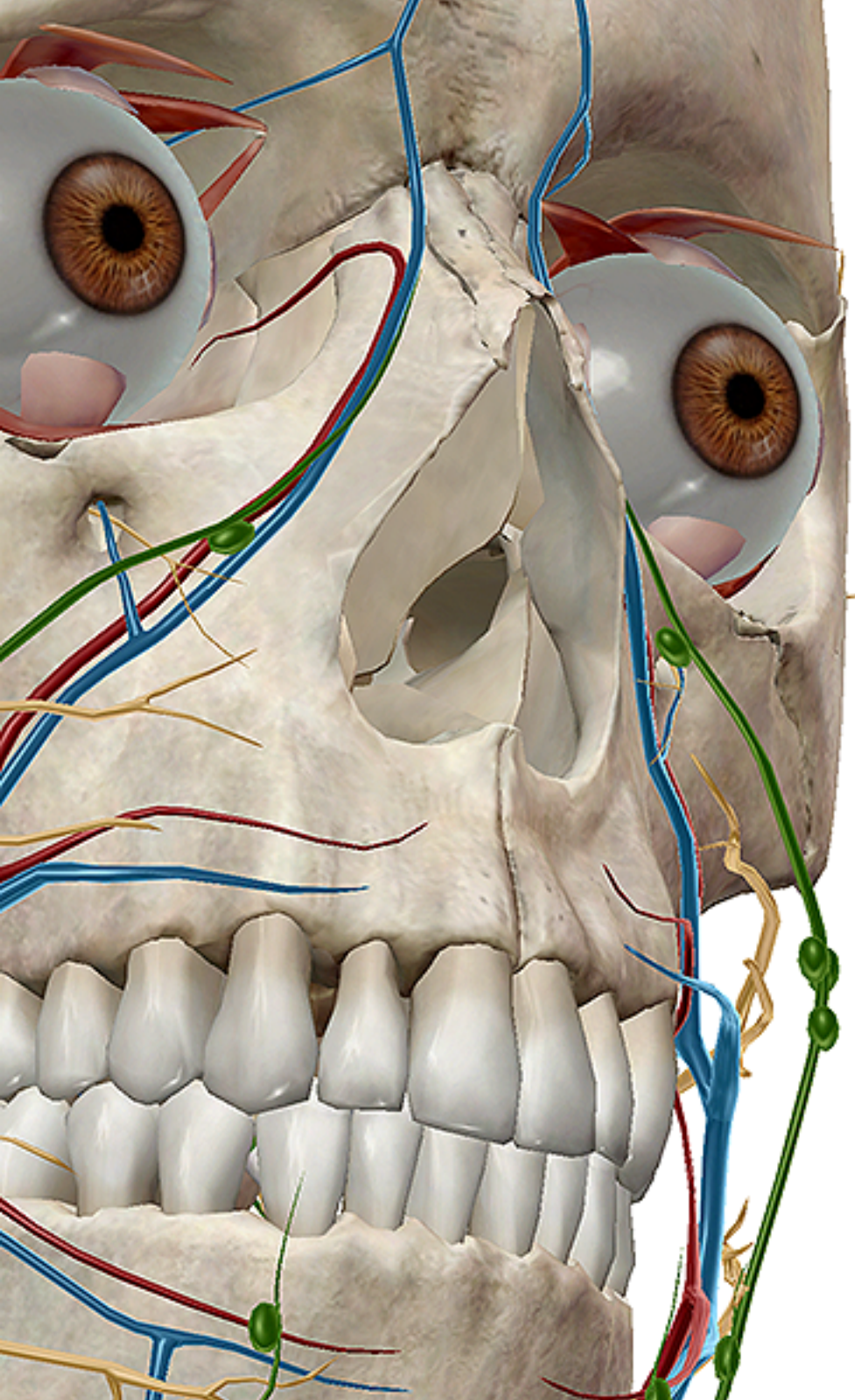
The apparatus consists of the lacrimal gland (which resembles a serous salivary gland) and 6 – 12 excretory ducts, including the lacrimal ducts, lacrimal sac, and the nasolacrimal duct.

To generate tears, the lacrimal glands produce a watery solution containing salts, mucus, and a protective enzyme. When the eyelid blinks, it spreads the fluid medially over the anterior of the eyeball.



The eye would be useless if not for the **optic nerve**, which is a special sensory nerve that transmits the images on the retina to the visual cortex in the brain for processing.





Factoid: Alcmaeon of Croton, an ancient Greek philosopher, believed the eyes were made of fire and water, and vision was what was reflected in their gleam.



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