Eye Anatomy & Function

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Cornea

- Transmission of light
- Refraction of light: +42 dioptres
Aqueous Humour Functions

include:

- Nutrition of the (avascular) cornea and lens
- Maintenance of the intra-ocular pressure
Ciliary Body

- Secretion of aqueous humour: Ciliary epithelium
- Accommodation. Ciliary body smooth muscle
- Attachment of zonules (suspensory ligament of the lens)
(Crystalline) Lens

- Composed of $\alpha$, $\beta$, and $\gamma$ crystallins (water soluble proteins)
- Transmission of light
- Refraction of light. +17 dioptres
- Variable refraction of light - accommodation
Retinal Function

- Conversion of light to electrical impulses
  - Cones. 6 million. High threshold to light, high acuity, colour vision- 3 types of cones: red, green, blue.
  - Rods. 120 million. Low threshold to light (sensitive). Sensitive to movement. No colour. Low resolution.
  - Optic nerve. 1 million fibres.
Spectral sensitivity ranges (nm)
Vitreous
Inner limiting membrane
Nerve fibre layer
Ganglion cell layer
Inner plexiform layer
Inner nuclear layer
Outer plexiform layer
Receptor nuclear layer
External limiting membrane
Inner and outer segments of photoreceptors
RPE
Choroid
Optic nerve head (Masson’s trichrome)
Left Visual Fields

Nasal retina
Optic N.
Optic tract

Right Visual Fields

Temporal retina

Left

Total blindness of right eye
Right nasal hemianopsia
Left homonymous hemianopsia
Bitemporal heteronymous hemianopsia

Right

A
B
C
D
The Uveal Tract
the eye’s vascular and immunological pool

• **Iris.** Variable size of pupil (iris diaphragm)
  – with light level
  – with nearness of fixation

  – **Ciliary Body.** Aqueous, accommodation, zonule

  – **Choroid.** Nutrition of retina and sclera

*The most vascular tissue in the body*
Extra-ocular muscles

- Medial rectus. Adducts.
- Lateral rectus. Abducts.
- Superior rectus. Elevates.
- Inferior rectus. Depresses.
Parallel rays from a distant object

The cornea and crystalline lens focus the rays onto the retina

Myopic eye

Blurred image

Hypermetropic eye

Blurred image

Parallel rays from a distant object
Intra-ocular lens
Intraocular Lens (posterior)