

# Development of the visual system

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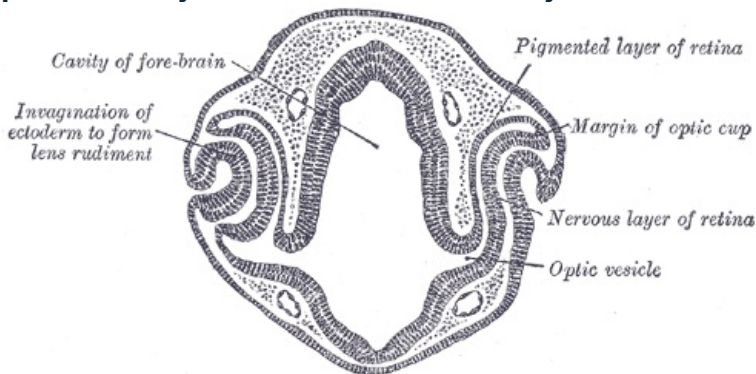
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Visual system is developing from four sources :

- from neuroectoderm at anterior brain ( retina , rear layer iris and vision nerve );
- surface ectoderm ( lens and epithelium corneas );
- [[ mesoderm ] ] ( fibrous and vascular layer eyes );
- cells neural stalks ( choroid , sclera , endothelium corneas ).

## Stages development eyes

Development eye is visible from the 22nd day intrauterine development , in neural wall of head the end the germ appears **eye furrows** ( grooves ). After merging neural eye rolls \_ gutters vchlipi , whereby they create **eye ramparts** . Connection with the front gradually through the brain tapers into shape ocular stalk . At the same time is running out and to changes surface ectoderm head - his part adjacent to the eyes the sacs are thickened , whereby arise the so- called **eye placodes** . Then occurs to their intussusception in the form of " lenticular " . **jamek and with continuing by pinching their edges together \_ zoom in , merge into** lenticular pouches **and thereby is losing connection with surface ectoderm . Ocular pouches will create double layered ocular cups ( initially they close the so- called intraretinal space ) , whose edges gradually they start veer around lenses . On the ventral side eye cups and on the spot their stopwatches appear \_ notches - fissurae optics containing vascular mesenchyme , ze which the [[arteria hyaloidea ] ] ( supplying internal layer eye cups ) and vena hyaloidea . Distal sections these vessel degenerate , however proximal they remain such as the artery and vein centralis retinae.**



## Development retina

Retina develops from the walls of the eye cup , external layer of the eye cup contains cells with small pigmented grains and gives rise pigmented layer retina . Rear four fifths this one layer they give rise pars optica retinae, is formed cells reversed to intraretinal space that gradually \_ \_ they differentiate into rods and cones . To this one layer photoreceptors adjoins mantle layer comprising **external nuclear layer** which make up cones , and **internal nuclear layer** formed bipolar cells and a layer ganglia cells . On the inside surface are located axons nervous cells that converge \_ \_ in visual nerve passing through ocular stem . Front a fifth internal layers of the eye cup gives rise pars caeca retinae, contains amended ganglia cells , but no longer rods and cones . This layer is subsequently divides in pars iridica retinae giving rise internal layer irises and in pars ciliaris retinae, ze which arises ciliated body .

## Development of corpus ciliare

Pigmented part ciliary epithelium has its origin in the external sheet of the eye cup ( hence further turns into pigment epithelium retina ), opposite to that unpigmented part epithelium represents a continuation of the pars nervosa of the retina , which it does not contain neurons . **Muscle ciliaris** ( his by contraction changes optical Properties lens ) differentiates from mesenchyme lying down on edge of the eye a cup .

## Development irises

iris differentiates from the rim of the eye a cup that retracts \_ in and partially so overlaps lens . Both layers of the eye cup here they remain thin , iris stroma has its cell origin \_ neural slats . The **Musculus dilatator pupillae** and the **musculus sphincter pupillae** originate from the neuroectoderm of the eye a cup .

## Development lenses

lens develops from the lenticular pouch ( i.e. from the surface ectoderm ), cells in her front the wall too they do not change and become subcapsular epithelium lenses . Cylindrical cells rear walls they are losing own cores and occurs their \_ transform into long fibers . Thus arise **primary fibers lenses** . With theirs growth obliteration occurs \_ cavities lentil pouch . Cells equatorial zones lenses are gaining cubic shape , they lose cores and changes **secondary fibers lenses** .

## Development choroids , sclerae and corneas

Basis eyes are on end the fifth weekly intrauterine development surrounded by mesenchyme , which subsequently \_ will divide in two layers - external , which gives arise white and substantial parts cornea , and internal , which differentiates into the choroid , iris and ciliary body body .

### Development corneas

Front epithelium cornea has origin in the surface ectoderm , considerable part corneas arises from mesenchyme , which has origin in mesoderm . Corneal the endothelium differentiates from the cells neural slats .

### Development choroids and sclera

Mesenchyme reacts on inductive signals pigmented epithelium retina and thus differentiates \_ on internal vascular layer and outer fibrous layer ( bleach ).

## Development eye chambers

Between basis lens and cornea there is a gap mesenchyme , whereby arises **anterior chamber ocular** . Externally layer spaced out mesenchyme is formed in the substantia propria corneae , inner ( membrana iridopupillaris ) is the basis for the iris stroma . **Rear chamber the eye** ' arises in space before lens for iris . After disappearing pupillary membranes then is running out to communication between both chambers .

## Development eye lid

Emergence lid we can observe from the sixth week , they differentiate from the cells neural slats . They create cutaneous folds overlapping cornea , on the beginning the tenth weekly intrauterine development to each other they grow and separate only in the 26th- 28th week . Algae , as well so glands arise from the surface ectoderm , ligament and tarsal discs they have origin in mesenchyme of the eye eyelids . The *Musculus orbicularis oculi* arises from the second pharyngeal arc and is therefore innervated n . facialis .

## Development tears gland

Tearful the gland develops from the lobes surface ectoderm . At birth they are glands small , non -functional ( approximately until the sixth of the week ). From this reason newborn at screaming he doesn't cry . < noinclude >

## Related articles

- Eye

### Used literature

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