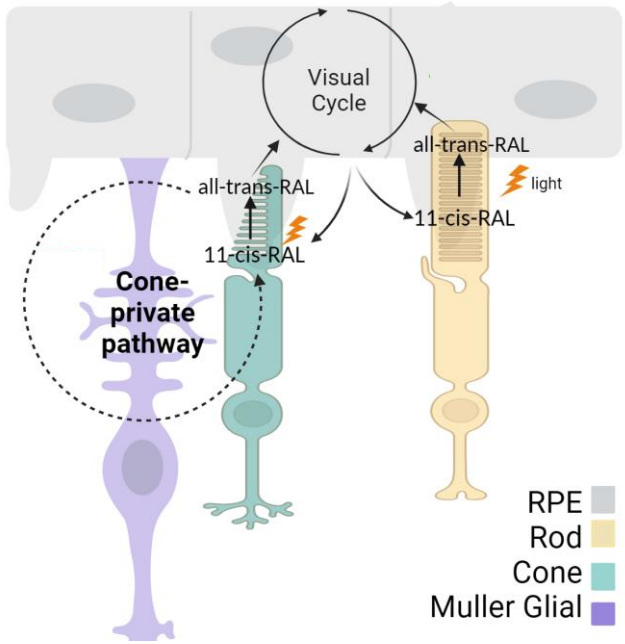
Master thesis recruitment



Background

- The chromophore 11cisRAL is **vital** for sustained **vision** ,expecially in bright light
- Both cone and rod photoreceptors need this chromophore to absorb light. Upon photoreceptor **excitation the chromophore** is photo-**converted** (see scheme).
- The chromophore is **recycled back to 11cisRAL via** a multistep process known as the **Visual Cycle** that provides both photoreceptors with chromophore.
- **Cones** have an **additional private** pathway, providing extra 11cisRAL mediated by **Müller Glia** cells
- Humans have a **rod-dominant** retina with 5% of cone concentrated just in the fovea, that contribute to over 90% of our daylight vision.
- The **cone-only** zebrafish **larval retina** is consisted only of functional cones,and therefore, we use it as a **model** for the human fovea.

Aims

1. Investigate how the cone-dominant zebrafish retina recycles the 11cisRAL in different light conditions.

2. Interfere with the recycling machinery to understand cone photoreceptor demand in chromophore, using our mutant lines.

3. Apply the field knowledge for retinal degeneration prevention/treatment using our zebrafish model for inherited retinal disorders.

Open Projects

1 Generate transgenic lines that label endogenously RGRa and RGRb

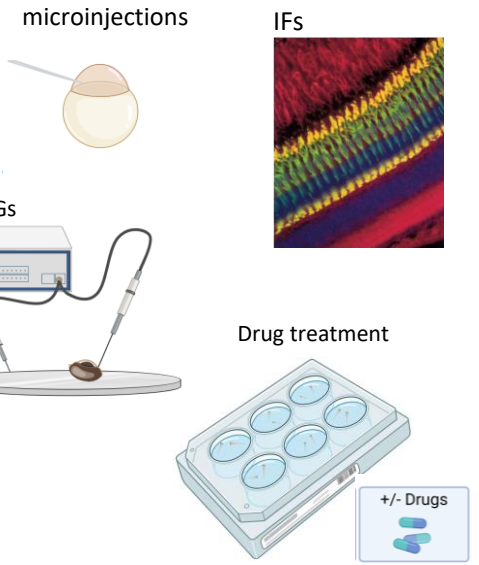
Cloning the constructs→ microinjecting into zebrafish embryos → identify founders and establishing a stable line → verify the RGR localization by Immunofluorescence (IFs)

2 Investigate the contribution of CRALBP1b in the cone-private pathway

Inject embryos- CRISPR *rlpb1b* mts to generate double mutants→ assessing the retina via electroretinograms (ERGs)→ assess retina morphology via histology

3 Test drugs treatments using the retinal degeneration model *rlbp1a* mt

Titrating drug concentration → treat zebrafish larvae → assessing the retina physiology via electroretinograms (ERGs)



- ✓ Projects are flexible and adaptable to students interests!
- ✓ Feel free to do your own mini research and pick the project you will enjoy the most
- ✓ If you are interested, please contact

Prof. Dr. Stephan Neuhauss
stephan.neuhauss@mls.uzh.ch
or
Ioanna Koutroumpa
ioanna.koutroumpa@uzh.ch