

## Master thesis available on Round goby eye fluorescence

We recently unexpectedly discovered that the invasive round goby (*Neogobius melanostomus*) emits red fluorescence above the eyes.



Front view of a round goby in an aquarium. The image was taken in filtered green light. All visible red light is therefore emitted by the round goby itself.

It is unknown how the round goby produces the fluorescence, which cells emit the signal, and what its function is. To gain first insights, we are looking for a master student to tackle some or all of the following questions:

1. **What is the life history dynamic of the signal?**  
Is it stronger or weaker in young individuals, females, or males? Does it change throughout the spawning season? Does it depend on the environment? The student will image individuals throughout the year at different life stages using lightsheet microscopy at the Imaging Core Facility of the Basel Biocenter.
2. **Which cell populations emit the signal, and how?**  
Is the signal crystal- or protein-based? Which cells are involved? How are they specified during development? This step will be done by histology and fluorescence microscopy of different life stages.
3. **What are the spectral properties of the signal?**  
What are the excitation and emission wavelengths? This will help to understand the significance of the signal in relation to season and habitat structure / depth. Analyses will be performed in collaboration with the University of Tübingen.
4. **What is the function of the signal?**  
Does it help round goby to identify prey items? Is it a social signal relevant for intraspecies communication? The student will design illumination and video recording setups in our in-house aquaria.

We are looking for a person who is

- ready to work with live animals.
- willing to do field work (mostly collecting specimen by setting and emptying traps).
- interested in high-end microscopy and skilled at fine motor tasks (dissections).
- creative and innovative, able to develop novel solutions to experimental challenges (such as green light video setups).
- good at interpersonal skills and able to work in an interdisciplinary environment.

To apply for the position, send cover letter, CV, a current copy of university grades, and contact details of two referees (mail and phone) in a single PDF called "Lastname\_MA\_Fluorescence" to irene.adrian-kalchhauser@unibas.ch.

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