

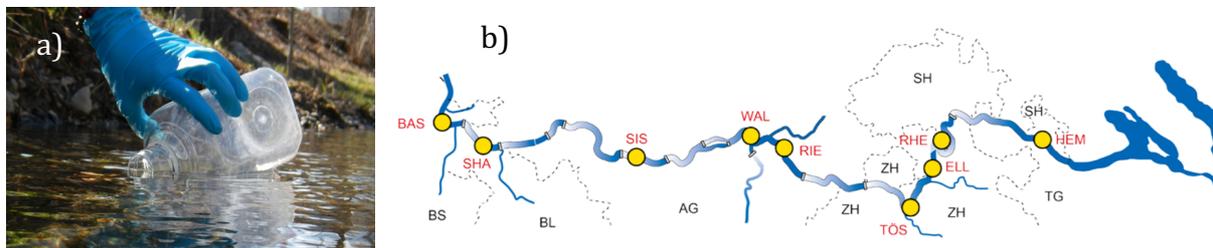


## MSc Project

### Biodiversity: Detection of aquatic species in the river Rhine using eDNA

We are looking for a motivated candidate with a keen interest in community ecology and biodiversity research, but also in working with large next generation sequencing data sets.

Biodiversity is lost at unprecedented rates due to global change, increasing land use or invasive species spreading. River systems host over-proportionate numbers of species, but they are among the most threatened and over-abstracted ecosystems. In the era of next generation sequencing, molecular surveys offer great promise to become essential biodiversity monitoring tools. As all organisms leave DNA traces in their environment, biodiversity can be assessed by the isolation of DNA fragments from the environment i.e. water samples taken from rivers (Figure 1 a).



**Figure 1: a) A water sample is taken for the analysis of environmental DNA. b) The sampling scheme of the Hochrhein monitoring.**

This MSc project will analyse eDNA samples from river Rhine, which is hydrologically connecting Switzerland to Germany and is crossing urban and agricultural areas. The “Hochrhein monitoring” is part of a large-scale monitoring project for the surveillance of Swiss surface waters (the NAWA project) that the BAFU started in 2011. Biological indicators and physico-chemical parameters were sampled in several years for nine sites between Basel and Thurgau. More recently, eDNA was taken at both river banks and in the middle of the stream to complement the traditional techniques. The goal of this project is to look at the community composition along the river Rhine and biodiversity distribution on a larger scale. Furthermore, the ecosystem Rhine is potentially threatened by the introduction of non-native species by boat-traffic and eDNA can serve as an important monitoring tool for invasive species.

The project offers the opportunity to work in a specialized clean-lab, to use cutting-edge sequencing technologies and to get hands-on experience in community ecology and biodiversity analysis. We are looking for a motivated candidate doing both lab work as well as bioinformatic analyses of the data. The candidate should have a strong interest, and ideally already some experience, with basic molecular techniques.

Contact/Supervision:

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Feel free to contact us if you are interested and we can schedule a meeting!  
[www.altermattlab.ch](http://www.altermattlab.ch)