

PhD position on fish cognition

Hólar University College, Iceland, seeks a PhD student for an Icelandic Research Fund (RANNIS) project to study the evolution of Arctic charr (*Salvelinus alpinus*) sympatric morphs cognition.

Cognitive abilities are involved in the way individuals cope with their environment. To understand individual variation in cognition, it is necessary to consider the ecological and evolutionary context of the species being studied. Fishes experience a wide variety of environments, even within the same species leading to different morphs such as anadromous, benthic and pelagic morphs in Arctic charr (*Salvelinus alpinus*, AC). The present study aims to explore how environment of AC shapes their cognition. We hypothesize that cognition can be impacted by the degree of divergence i.e. divergence along an evolutionary and ecologically gradient. We will compare spatial cognition, personality traits, brain size allometry, brain morphology, molecular markers of cognitive abilities (from brain tissue) in offspring of wild-caught AC morphs along a degree of divergence raised in enriched vs plain environments.

This is therefore a pluridisciplinary project including different research fields such as animal cognition and personality, genetics, morphometrics, evolution and ecology. The PhD student will be participating to field work collecting eggs from mature wild populations in different lakes and making crosses using several males and females. Most of the work will be conducted in the lab where the student will test all the behavioural methods during the first year. The student will carry out spatial cognition experiments on the different populations that will be maintained in our aquaculture facilities. In parallel to the cognitive tasks, each individual will be assessed for personality to disentangle the impact of personality traits on individual learning performances. This specific part will be conducted by a MSc student. Behavioural experiments will be carried out in a dedicated room fully equipped with automated video tracking software.

The PhD student will also systematically check the brain size and morphology (brain subdivisions) of each individual tested for cognition and personality. Finally, the student will identify at molecular level clues underpinning behavioural and cognitive ability differences between population origin, morphs and environment, monitoring genes expression in different brain structures (i.e. telencephalon, optic tecta, cerebellum, hypothalamus).

The project is lead by Dr. David Benhaïm (lead PI, Hólar University College, Iceland) in collaboration across Hólar Univ. College (Prof. Bjarni K. Kristjánsson, Dr Camille Leblanc), University of Caen, France (Dr. Christelle Jozet-Alves), IFREMER, France (Dr. Marie-Laure Bégout, Dr. Benjamin Geffroy), INRA, France (Dr. Xavier Cousin).

The student will have the opportunity to conduct part of their research at the collaborative institutions and will have assistance in conducting the experiment and in analysing the results, as well as the opportunity of supervising a graduate student.

Location: The students will be based at the Dept. of Aquaculture and Fish Biology (DAFB - http://holar.is/en/department_of_aquaculture_and_fish_biology) at Hólar Univ. College (North Iceland) and registered at the Univ. of Iceland (Reykjavik). HUC is situated in the beautiful village of Hólar (Skagafjörður), with offices and research laboratories in the nearby town Sauðárkrúkur. DAFB is an active research centre and the students will become part of a dynamic international team of graduate students and faculty. The beautiful natural setting and easy travel allow both outdoor and cultural activities.

Requirements: The candidates must hold a MS degree in Ethology, Behavioural Neurobiology, Cognitive Neuroethology or related disciplines.

The ideal candidate has a strong interest in pluridisciplinary research with an emphasis on animal cognition and personality, enjoy working in a dynamic group, and have mainly experience from laboratory experiments. The student has to be able to work independently as well as a part of a team. *The position is funded for three years.*

The working language is English. Peer-reviewed publication(s), previous experience with animal experiments (fish in particular) and statistical skills (GLMM) will be a plus. A valid driving license is a requirement.

Applicants should send an application letter, with a statement of research interests and relevant experience (max 2 pages), curriculum vitae with a list of publications, copies of academic qualifications and the names and e-mail addresses of three referees, **as a single pdf** to benhaim@holar.is latest February 25, 2019. *Preferred starting date is April 1st 2019.*

For further information contact David Benhaïm (Dept. of Aquaculture and Fish Biology, Hólar Univ. College) (benhaim@holar.is).