

UGRL Scholarship Learning Contract

This document provides the framework for the project to be undertaken by the UGRL Scholar. It provides an outline of the larger research project to which the Scholar will contribute and the detail of that contribution, including timing, duties, outcomes and supervision arrangements.

It will be considered by the Faculty/School Scholarship Committee and if a Scholarship is awarded for the project should be signed by the Faculty Academic Lead, the project supervisor and the scholar.

- 1. Title of Overarching Research Project:** Testing cuttlefish camouflage success on predatory fish
- 2. Research Project Leader:** Steven Sait
- 3. Scholarship Project Supervisor:** Aliya El Nagar/Steven Sait
- 4. Working title of Scholarship Project:** Testing cuttlefish camouflage success on predatory fish
- 5. Period of Scholarship Project Work** (*see note i*): 2 x 6 – 8 week summer projects
- 6. Summary of the research to which the Scholar will contribute (200 words):**

The evolutionary ecology of camouflage is a fundamental aspect underpinning many predator-prey interactions. Cuttlefish, for example, are renowned for their ability to instantly change their body patterns to become undetectable by their predators, and the patterns they display vary depending on the environmental backgrounds on which they rest. The success of camouflage is often measured by how they visually deceive a human observer (“predator”) and, despite the fact that it is well known that visual perception differs between taxa, very little work has considered how camouflage affects detection by natural predators. This will be the research area in which the Scholar will work. The study of cuttlefish camouflage is the focus of a BBSRC grant (PI Sait, postdoc El Nagar) and so the UGRL Scholarship would work alongside on-going experiments and will build upon techniques developed by the lab.

- 7. Summary of the work to be undertaken by the Scholar (200 words):**

The Scholar will conduct animal behaviour experiments in lab aquaria and train fish to perceive and attack contrasting images of cuttlefish against different environmental backgrounds. The experiments will test how long it takes the predatory fish to detect images of cuttlefish that vary in their degree of camouflage.
- 8. Detail of the work to be undertaken by the Scholar (500 words) (*see note ii*):**

Very little work has been tested how cuttlefish body patterns are visually perceived by fish predators. In this project the scholar will test the success of camouflage on real predators by conducting animal behaviour experiments with cichlid fish. The scholar will train fish to attack images of cuttlefish in order to test how long it takes them, as the predators, to detect these images. The design will include contrasting images of cuttlefish appropriately camouflaged to their backgrounds in comparison with those that are not. This will indicate the extent to which known camouflage patterns are able to deceive natural predators. Based on the postdoc’s experience, the training of individual fish does take time so in order to have a large sample size for robust statistical analysis the student will need to carry out the project over two 6-week periods. The Scholar will carry out their research project in the School of Biology, working with and handling live fish, in order to study their ability to perceive different patterns of cuttlefish camouflage against different environmental backgrounds. The method has been designed and

trialled by the postdoc and the Scholar will build upon this preliminary work to train fish and measure their perception of camouflaged prey. They will learn about principles of camouflage, animal behaviour, experimental design and the techniques associated with the study of animal behaviour.

9. Detail of the Leadership development to be undertaken as part of the project (see note iii)

The Scholar will work on an independent research project, under the overarching guidance of the postdoc, and so will be able to develop skills and experience in experimental design, data collection and analysis where appropriate. Additionally, the Scholar will present their results and discuss progress at the regular research group meetings, produce reports and materials suitable for a UK conference. Hence, the Scholar will develop skills and confidence in communicating science, presentation and written skills. As part of working in the lab environment, the Scholar will become familiar with health and safety and carrying out risk assessments associated with lab experiments. The Scholar will attend the group journal club and develop the experience and confidence to read, understand and critique scientific studies.

10. Outputs expected of the Scholar (200 words) including the final report (see note iv)

The Scholar will complete a first report at the end of the first summer placement, which will address both the project work (including literature review, data analysis and appraisal of the broader significance of the work) and the development of the appropriate leadership skills. A final report will also be produced at the end of the second period of research. This will be in the form of a manuscript because we expect that the work carried out by the Scholar should be of high enough quality to contribute to a scientific paper by the end of the project. The Scholar will also be expected to attend a UK conference and either give a poster presentation or talk.

11. Details of supervision arrangements (see note v)

The PI and postdoc will meet with the Scholar to discuss the details of the project prior to the start of the summer placements and they will then have weekly meetings with the Scholar to discuss progress once the project has started as part of the lab group meetings. The Scholar will be supervised on a day to day basis by the postdoc.

12. Resources required for the Scholar to undertake the project (see note vi):

£2000 in total for the two summer projects, which includes; collection and shipping of study animals; aquaria and pumps; consumables for animal husbandry; registration, accommodation and poster production costs for one UK conference.

(to be completed if a Scholarship is awarded)

Project Leaders – please tick to confirm the following:

- Consideration of Health and Safety context and appropriate risk assessment and risk management exercises have been completed
- Relevant ethical clearance has been sought
- Scholar and project leader are aware that any additional expenses or equipment costs are the responsibility of project leader to plan for and approve (if approved, students must provide receipts)

Signature of Scholar _____

Date: ____/____/____

Signature of Project Leader _____

Date: ____/____/____

Notes

- i. Scholars are expected to work the equivalent of six weeks full-time over the summer following their first and second year, they need not be continuous weeks but the dates are to be agreed between project supervisor and student. Any changes to the dates in the Learning Contract to be updated and signed by the supervisor and the scholar.
- ii. The work is normally assumed to be campus-based unless otherwise agreed, and where this is the case allocated office space and equipment (eg in spaces allocated to PG students) is expected to be available during office hours for the period of the project

The majority of the work must not take place in term time, but exceptionally an early start when exams and assessments are complete may be appropriate, but please note the dates of the induction programme that all scholars are expected to attend. If there is an event or output falling during term time it would be useful for the scholar to contribute to, please ensure time demands are light and does not conflict with programme study.

- iii. **Leadership development:** The project work undertaken by the Scholar is required to develop both research and leadership skills. All Scholars receive leadership training before they start their project and expect to be able to practice and develop those skills as part of their Scholarship Project. Projects should therefore include a specific strand of work which enables the Scholar to practice and develop leadership skills in some aspect of the project, eg data collection, analysis and presentation; dissemination event organisation; experimental design; project management; client feedback; market research design and evaluation. The University's Leadership and Management Standard informs the leadership development to be provided by the Scholarship scheme and details are provided in Annex 2c on page 13.
- iv. **Outcomes:** Describe the intended project outcomes, these may be broken down for summer year 1 and summer year 2, or one long-term goal over the two years. Outcomes must be realistic and clear, and depending on the nature of the project outcomes might include reports, events, media, artefacts, experiments etc). A clear statement of timeframes for work to be completed and reported on is essential so that the responsibility of the Scholar is clear.

Reports: Please indicate the reporting expectations. It is expected that this should include at least a first report at the end of summer 1 covering both the project work and the development of the appropriate leadership skills and a final report at the end of the second period of research which should be a reflective and summative report of the whole project covering both the project work and the development of the appropriate leadership skills. Both reports (each of between 1000 and 2500 words depending on the nature of the project) should be scheduled to be completed within the periods of project work and not left for completion during term time.

- v. The minimum requirement for UGRL Scholarship supervision is a formal meeting between scholar and project supervisor at the start, middle and end of each period of project work. The Scholar will provide a record of each of these meetings, to include a review of progress and a action points, to be confirmed in writing by the project supervisor
- vi. Funding is available to cover any essential costs directly associated with project work the Scholar will be undertaking. This is not a grant, it is available where necessary to ensure the Scholar has the resources they need to undertake their project. It might, for example, cover additional equipment needed by the Scholar, travel and accommodation costs to attend a conference to inform the project work or to present its outcomes. Any equipment purchased remains the property of the School and must be retained for the benefit of future

scholars. Any funds not used in this way are returned to the Alumni Office at the end of the Scholarship.