VICE CHANCELLOR’S SCHOLARSHIPS – ELIGIBLE PHD PROJECTS IN LIFE SCIENCES

The Department of Life Sciences is committed to developing a supportive and stimulating environment to pursue excellence in teaching, learning, research and knowledge transfer activities. Our scholars work in various academic disciplines, including Anthropology, Aquatic Biology, Biomedical, Sport and Health sciences. The Department is home to several undergraduate and postgraduate programmes, which are underpinned by first-class research undertaken by staff. We also work with a range of organisations in industry and the public sector to be fully engaged in knowledge transfer activities and to promote public engagement in science.

Our fully funded PhD studentships provide you with a chance to work with both world-leading academics and our key external partners, enabling you to develop important networks and to develop the impact of your own research. Our research is funded internally and externally, with grants from the Research Councils, the Leverhulme Trust and diverse smaller funding agencies. Further information on our thriving research centres can be found on our research pages:

- Centre for Research in Ecology
- Centre for Research in Evolutionary and Environmental Anthropology
- Health Sciences Research Centre
- Sport & Exercise Science Research Centre

Eligible Projects:

Remote sensing of seabird energetics, behaviour and stress – a Caribbean case study, with Dr Lewis Halsey and Dr Enrico Rezende

Some seabird adults annually rear a chick to maturity, while others are perennial failures. Thus there is a skew between individuals in terms of their contribution to the next generation. It seems reasonable to hypothesise that individuals can possess phenotypes (sets of traits) of differing suitability to the environment, and individuals with more suitable phenotypes have a propensity to survive and also to rear young that survive and join the next generation of breeders. Seabirds are colonial, accessible, long-lived, easily observed and have a tendency to monogamy. For these reasons, much of the present understanding of variation in individual quality comes from studies of these taxa. Yet while the existence and importance of differing individual quality among seabirds is now established, it is unclear what specific traits high-quality individuals possess which enable them to reproduce successfully. Conservation management plans could well benefit from targeting reproductively successful individuals.

For the last four years, researchers at the University of Roehampton have collaborated with leading local and international NGOs and other universities to develop a research programme dedicated to the study of seabirds in the Caribbean, with a focus on populations in UK overseas dependencies (www.caribbeanseabirds.org.uk). Long-term seabird monitoring programs in both Anguilla and the British Virgin Islands have been established, and analyses arising from these have related the foraging behaviour of globally and regionally important seabird populations to natural and anthropogenic threats facing them. Dovetailing with this work, the present PhD study will measure morphological and physiological traits of adult seabirds along with recording foraging tracks at sea, and the birds will be instrumented with data loggers that indirectly ascertain foraging success and energy expenditure. These variables will then be correlated with measures of reproductive success. This project also includes an explicit conservation angle, as there will be a particular emphasis on comparing birds from rat-infested islands with birds from non-infested locations. The successful applicant will join the Centre for Research in Ecology (CRE) in the Department of Life Sciences at the University of Roehampton.

Applications should have suitable qualifications in biology or another relevant science/engineering subject to Masters level. Preferably, applicants will have some knowledge of a programming language (e.g. Matlab or R), and experience of handling medium sized animals. They will spend several months in total working in the field in the Caribbean.
Social bonds and stress in small-scale human societies: from attitudes to behaviour, with Dr Julia Lehmann and Dr Colette Berbesque

We are currently seeking applicants for a funded Ph.D. studentship on a project on human bonds and stress. This project will aim to assess what people in a small-scale Tanzanian society report about their social bonds and attitudes about social stressors, while also collecting data on observational-based social networks and a physiological measure of stress (i.e. cortisol). The role of social buffering in relieving stress is well studied and known from western societies, and there is evidence that social buffering also works in alleviating stress in animals. However, data on social bonds from animals are from observing behaviour, whereas data on bonds in humans are often inferred from self-reporting of feelings rather than behavioural observations. So far, it has not been investigated how self-reported bonds translate into actual behaviour and whether these ways of understanding social bonds are comparable. Here we propose a project that combines these approaches and thus enables direct comparison.

The candidate must have a Master’s degree in biological sciences, anthropology or a related area, including a knowledge of evolutionary biology concepts and methods. You must be willing to conduct extensive fieldwork in basic conditions (spending an extended period of time in Tanzania). A basic understanding of social network analysis, prior field work experience and or/basic laboratory skills would be beneficial.

The successful applicant will join the Centre for Research in Evolutionary and Environmental Anthropology (CREEA), a highly interactive centre comprising both social and biological anthropologists. We draw creatively and dynamically on diverse intellectual traditions within and beyond anthropology, their distinctions and synergies.

Hijacking of host cellular functions and metabolism in MRSA pathogenesis, with Dr Michal Letek, Dr Volker Behrends, and Dr Yolanda Calle-Patino

Our objective is to dissect the interaction of Methicillin-Resistant Staphylococcus aureus (MRSA) with mammalian host cells. We have recently discovered that the depletion of a human membrane protein called TMEM59 results in the reduced intracellular replication of MRSA, while host cell viability remains unaffected (EMBO J. 2013. 32(4):566-82). The candidate will perform a range of genomic, proteomic and metabolic profiling studies to find previously unknown factors required for the intracellular survival of MRSA. This could lead to the identification of novel host-targeted therapeutics against MRSA, which may circumvent the problem of antibiotic resistance.

The successful applicant will join the Health Sciences Research Centre (HSRC) at the University of Roehampton. The HSRC represents a multidisciplinary team with research interests on different aspects of human disease, ranging from neurological disorders, to bacterial infections or metabolic disorders. 84% of our research output is rated as internationally excellent and world leading in terms of originality, significance and rigour (REF2014).

The HSRC has well-equipped laboratories including an ultra-high performance liquid chromatography triple quadrupole mass spectrometer (UPLC-(TQ)-MS), clinical and microscopy analysers, molecular biology equipment, and cell and tissue culture facilities. Our excellent research facilities make the HSRC a stimulating environment for PhD students.

Social resilience in macaques: investigating demonstrated reactive scope, with Professor Ann MacLarnon and Professor Stuart Semple

Making use of non-invasive means of assessing animals' physiological stress response, a number of studies in recent years have investigated the social and ecological circumstances under which primates and other mammalian species experience more or less stress, as reflected in the relative strength of the stress response (e.g. ref. 1). Recently a means of comparing the results of such studies, and placing them in a more adaptive, broader evolutionary context, has been proposed, namely using the concept of demonstrated reactive scope (ref. 2). The usefulness of the approach was illustrated with an ecological example. The current project will examine the same concept, focusing on social stressors; investigating the effectiveness of potential strategies for dealing with these stressors, such as social buffering, social integration (assessed using social network measures) and coping behaviours. It will examine the variation in demonstrated reactive scope of individuals in different social circumstances, at different life-history stages.
The project will involve (1) fieldwork with free-ranging macaques, involving collection of behavioural data and faecal samples for hormone analysis, and (2) laboratory based analysis of stress - and potentially other - hormones. It is planned that fieldwork will take place with Barbary macaques in Ifrane National Park, Morocco (subject to research permit approval). Laboratory work will take place in our hormone laboratory at the University of Roehampton.

Students on university research studentships are required to provide up to 6 hours teaching or other assistance per week. For this studentship, a substantial proportion of this assistance will involve supporting research data management and associated work of the hormone laboratory.

Indicative references

Neuromuscular function of lower-limb amputees and its association with mobility, with Dr Siobhan Strike and Dr Neale Tillin

Whilst lower-limb amputees are encouraged to exercise, there is very little research on how the limb-loss has affected their neuromuscular function, and thus information on how they should exercise healthily is extremely limited. The current project will be the first to provide a comprehensive investigation of neuromuscular function.

Lower limb amputees are encouraged to exercise; however, this population are at an increased risk of developing musculoskeletal pathology, such as osteoarthritis, which may be perpetuated by regular exercise. The pathology stems from the abnormal movement pattern due to the limited function of the incomplete neuromuscular system. Specifically, factors such as voluntary activation, muscle size and architecture, intrinsic contractile properties, tendon stiffness and proprioception will limit the capacity of skeletal muscle to produce force and transfer that force to bone. However, there is a considerable paucity of information on the effects of lower-limb amputation on neuromuscular function of both the amputated and intact limbs. Such insight might provide a better understanding of the physiological mechanisms underpinning any abnormal loading patterns commonly observed in amputees.

The overall aim of the project is to investigate neuromuscular function (e.g., muscle strength, contractile properties, neuromuscular control and activation) in the amputated and intact limbs of lower-limb amputees, and consider the association between neuromuscular function and mobility. The PhD will start by considering the knee joint.

The successful applicant will have a Masters degree in Sport and Exercise Science, Physiology, Biomechanics, or a related area. A knowledge of neuromuscular physiology and assessment (e.g., dynamometry, EMG, electrical stimulation) and 3D motion analysis would be advantageous. You will join the Sport and Exercise Science Research Centre (SESRC), a dynamic interdisciplinary group with a portfolio of research encompassed within a number of multidisciplinary research themes.