

Postdoctoral position for a Bio-engineer on insect acoustic behavior in malaria mosquitoes

A 2 year postdoctoral position in insect acoustic behaviour is available within the Anofeel project funded by the French Agence Nationale de la Recherche (ANR) and hosted by the Research Institute for Development (IRD, Mivegec Lab, Montpellier, France), in collaboration with the IRSS (Bobo-Dioulasso, Burkina Faso) and the NRI (Greenwich University, Kent, UK). The Anofeel project aims at investigating the mating behavior of malaria mosquitoes using state-of-the-art synchronized 3D video and audio recording devices.

Scientific context: Malarial mosquitoes are the most dangerous animal on Earth; they kill more humans than any other animal. Prof. G. Gibson at the NRI and colleagues at the University of Brighton have discovered that mosquitoes use acoustic cues in a unique way to identify and locate mates. The aim of the project is to discover how this novel behavior might be exploited to control or even eradicate these deadly insects. For example, the development of sterile male release strategies to control mosquito populations highlights the necessity of producing competitive males which will require a detailed analysis of their acoustic capabilities. The findings of the project will also be used to develop new control and monitoring strategies.

Observing mating behavior is technically challenging, as it occurs in mid-flight within a volume $\sim 1 \text{ m}^3$ and in virtual darkness. Prof. Gibson has developed a recording studio designed to mimic the natural lighting and atmospheric conditions mosquitoes encounter during mating flights, and instrumented the space with 3D video recording and high-quality acoustic recording to document every stage of mating behavior. An experienced bio-engineer is required to operate the equipment, to design and construct modifications as required for this project and to write code for capturing and analyzing the video and audio recordings. The Post doc will also be required to set up similar equipment at the IRSS research centre in Burkina Faso, West Africa to build capacity in the field for similar experiments where there is access to wild populations of mosquitoes.

The postdoc fellow will work on acoustic cues emitted by males swarm at the NRI under Prof. Gabriella Gibson's supervision. She/He will conduct the following studies:

- *Characterise male swarms; record the flight paths of individual mosquitoes in 3D and the simultaneous sounds they emit by their flight-tones.*
- *Determine the distance of attraction to swarms for males and females.*
- *Test the effects of pure tones within the range of male and female flight-tones to determine whether pure sounds can trigger similar responses.*
- *If it can be shown that mosquitoes hear swarms, arrangements will be made with the University of Brighton to conduct key investigations of the sensory physiology underlying this acoustic behavior.*
- *The Postdoc will be expected to contribute to the maintenance of the equipment related to the project and assist with rearing the mosquitoes used in the project.*
- *The Postdoc will make one - two field trips to Burkina Faso to test for biological activity of recorded sounds in semi-field and field conditions and to assist with setting up a swarming studio equipped with 3D video recording for use by co-PIs on other tasks of the project.*

This project is highly challenging, so we are looking for a highly motivated and independent candidate able to think 'out of the box'. A strong background in bio-engineering and programming,

preferably in Java, is essential. A background in acoustics and neurophysiology would be desirable, but not essential. The project will require construction of experimental arenas, so experience and enthusiasm for basic building activities is highly recommended. Gross monthly salary will be between 2150-2500€ according to experience (Net salary of 1700-2000€). This salary includes French health insurance, retirement contribution and other social security contributions, but not income tax.

The [Natural Resources Institute](#) (NRI) of the University of Greenwich is located on the [Medway Campus of the Greenwich University](#) in UK. NRI's mission is to discover, apply and share knowledge in support of global food security, sustainable development and poverty reduction.

To apply, please send an email to both Olivier Roux (project PI: olivier.roux@ird.fr) and Gabriella Gibson (Task leader: g.gibson@gre.ac.uk) which includes your research interests (including why you are specifically interested in working on this project), research experience, CV, degree certificates and complete contact information for at least two references (all in a single PDF file). The position will start in April 2016 but is open until filled.