

PhD Funded Studentship to “Explore the bush-cricket (katydid) ear from various perspectives: structural, mechanical and physiological”.

We are seeking an outstanding, highly motivated PhD student to work on an ERC Consolidator Award project entitled “*The Insect cochlea: a non-invasive path towards enhanced sound detectors*” within the University of Lincoln’s School of Life Sciences.

The successful candidate will be passionate about biomechanics, acoustics, sensory and comparative biology and will investigate the implementation of non-invasive techniques to measure inner ear activity.

Project Description

Our recent research has shown that the ear of the bush-cricket has general functional similarities with the mammalian ear: they both exhibit outer, middle and inner ear components. Frequency analysis in the inner ear depends on travelling waves and the tonotopic organization of the auditory mechanoreceptors. However, these similarities are very general and we do not understand the bush-cricket hearing process.

Much research remains to be done to completely understand entire hearing process in order to determine to which extent the mammalian and the bush-cricket ears are equivalent.

Training Environment

The host laboratory will offer a highly interdisciplinary research environment, where biologists, engineers and physicists work together. Further collaborative supervision is offered with Dr Berthold Hedwig from the University of Cambridge, and his team. The studentship is therefore integral part of a team of leaders in their fields, including postdoctoral researchers and other graduate students.

The successful candidate will be given training and opportunities to gain experience in a range of techniques and disciplines, ranging from experimental techniques to study the sensitivity of the bush-cricket ear to vanishing ultrasonic energy in field and laboratory conditions, as well as to X-ray micro-CT, Laser Doppler Vibrometry, and Calcium Imaging techniques.

The School of Life Sciences at Lincoln also offers rich support in the form of postgraduate mentors, regular progress meetings, and postgraduate training on specific topics from experimental design through statistical analysis to lab safety. In addition, the student has access to an extensive programme of personal and professional skills development courses through the Doctoral College and the University Career Service.

Location

The PhD student will be based at the Joseph Banks Laboratories at the School of Life Sciences, University of Lincoln, UK, supervised by a Supervisory Committee led by Professor of Sensory Biology, Dr Fernando Montealegre-Zapata, School of Life Sciences, University of Lincoln, UK, and Professor Berthold Hedwig, Department of Zoology, University of Cambridge, UK.

Funding Notes

Open to UK, EU and Overseas Students

Tuition Fees (capped at UK/EU fee level) covered through the ERC Consolidator Award and the Graduate Teaching Assistantship (GTA), which requires the student to conduct up to 6 hours of teaching or related work per week

Stipend/Living allowance: £15,549.74 per annum

Start date 2nd July 2018 or as soon as possible thereafter

Duration: 36 months

Informal enquiries may be made to Professor Fernando Montealegre-Zapata:

fmontealegrez@lincoln.ac.uk

Entry requirements

Applicants should have a first or higher upper second-class honours degree, and preferably a relevant Master's degree (or equivalent experience) in sensory biology with substantial experience of excellent report-writing and English language communication skills, and ability to work to deadlines. Suitably qualified candidates worldwide may apply, although International students must self-fund the difference between the International and UK/EU fee rate.

How to apply:

Applications must comprise: 1-page covering letter, 2-page research proposal, 2-page CV, and be e-mailed to Professor Montealegre-Zapata at

fmontealegrez@lincoln.ac.uk

The letter and any communication should be in English.

Closing Date: Thursday 31st May 2018

Interviews: June 2018

References to directly related literature:

Isaacson M.D. & Hedwig B. 2017. Electrophoresis of polar fluorescent tracers through the nerve sheath labels neuronal populations for anatomical and functional imaging. *Scientific Reports* 7:40433.

Sarria-S. F.A., Chivers B.D., Soulsbury C.D. & F., & Montealegre-Z F. 2017. Non-invasive biophysical measurement of travelling waves in the insect inner ear. *Royal Society Open Science*. 4, 170171.

Jonsson T, Montealegre-Z F, Soulsbury C. D., Robson Brown K. A., & Robert D. 2016. Auditory mechanics in a bush-cricket: direct evidence of dual sound inputs in the pressure difference receiver. *Journal of the Royal Society Interface*. 13: 20160560.

Montealegre-Z F., Jonsson T., Robson Brown K. A., Postles M. & Robert D. 2012. Convergent evolution between insect and mammalian audition. *Science*. 338 (6109): 968-971.