



UNIVERSITY OF
LINCOLN

UNIVERSITY OF LINCOLN JOB DESCRIPTION

JOB TITLE	Research Fellow (Biochemistry & Neurosciences)				
DEPARTMENT	School of Life Sciences				
LOCATION	Brayford Pool				
JOB NUMBER	COS653	GRADE	7	DATE	May 2019
REPORTS TO	Professor of Sensory Biology				

CONTEXT

The postholder will be part of a new interdisciplinary research group with the freedom to work on an exciting project for an extended period. The post is funded by an ERC Consolidator Award to the Professor of Sensory Biology, entitled '*The Insect cochlea: a non-invasive path towards enhanced sound detectors*'. The project's overarching aim is to develop new technological improvements that constitute the grounds of new theoretical advances in the design of super-sensitive acoustic sensors, using the katydid (or bush-cricket) ear as primary model.

This project will integrate two major objectives: 1) to develop a method that allows in-real time measurements of sensory cell activation using calcium imaging and Laser Doppler Vibrometry in intact hearing organs; and 2) to measure the natural response of the ear sensory cells to multiple sound inputs in intact hearing organs.

The sensory biology lab offers a dynamic research environment and facilities where the successful applicant will be a member of a multi-disciplinary group working closely together on a defined problem applying techniques from fields as diverse as acoustics, electro-physiology, hearing, material engineering, applied mathematics and biophysics.

JOB PURPOSE

This project will be conducted as a collaborative effort between the Universities of Lincoln and Cambridge.

The Research Fellow is responsible for conducting research on the project, as directed by the project supervisor: Dr Fernando Montealegre-Z (Lincoln), and major collaborator Dr. Berthold Hedwig (Cambridge), and is expected to operate with a significant degree of autonomy.

The post holder will be required to help supervise the work of more junior researchers and students.

KEY RESPONSIBILITIES

Literature Surveys
Undertake literature surveys and other investigations of the state-of-the-art, and prepare reports as required.
Programme of Research
Design and undertake programme of research under the direction of a supervisory team, demonstrating a significant level of autonomy. Lead in the production of high-quality research outputs, including grant reports, papers and other publications of national/international standing.
Project Management
Participation in weekly lab meetings. Perform project management activities, planning, scheduling, monitoring and reporting on progress of research projects.
Liaison and Networking
Identify and liaise with internal and external collaborators, and with colleagues in the Department, maintaining positive and effective working relationships.
Internal Research Activities
Participate in and help to organise internal research activities, including weekly lab meetings, seminars, research meetings and conferences, as well as caring for ethics protocols, and health and safety in the research environment.
Continuous Professional Development
Undertake continuous professional development activities.
Grant Applications
Contribute to the production of grant applications.
Teaching Support
Engage in teaching support activities, up to a maximum of six hours per week.

In addition to the above, undertake such duties as may reasonably be requested and that are commensurate with the nature and grade of the post.

ADDITIONAL INFORMATION

Scope and dimensions of the role

Using their skills and experience, the postholder will drive research on optical measurement of auditory afferents using calcium imaging.

They will also be involved in the practical supervision of undergraduate and postgraduate students.

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. The inner ear can be non-invasively measured using laser vibrometry. This is possible because the leg cuticle covering the ear is highly transparent in some species, which facilitates focusing the laser beam on the *Crista acustica*, the inner ear surface that contains the sensory cells. Using calcium dyes and a calcium imaging system, we expect to visualise and measure, through transparent cuticle, the activity of the inner ear sensory receptors as the ear is stimulated with sound.

The postholder is expected to understand the role of calcium ions in nerve transmission. This project involves two major objectives: 1) to develop a technique that allows staining intact ear neurons; and 2) to map the effect of mechanical waves on sensory cell activation using calcium imaging in intact hearing organs using species with highly transparent cuticles. This project will involve one PhD student and close collaboration with Dr. Berthold Hedwig in Cambridge.

The postholder will help write and publish high quality peer-reviewed scientific papers. In addition to contributing to the development of research proposals and applications for external funding, will contribute to the dissemination of the results to the scientific community through presentation at international conferences and workshops, and to the general public through public lectures and interviews with the media where appropriate.

Key working relationships/networks

Internal	External
• Professor of Sensory Biology • Head of Research Group • Head of School • Other research and academic staff within the School	• Research collaborators • Funder (ERC)



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UNIVERSITY OF LINCOLN PERSON SPECIFICATION

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Selection Criteria	Essential (E) or Desirable (D)	Where Evidenced Application (A) Interview (I) Presentation (P) References (R)
Qualifications:		
PhD or equivalent (good candidates may be accepted with a PhD pending, subject to publication record)	E	A
Experience:		
Experience of relevant research methods (e.g., the use of traces for neuronal labelling, the use of suction electrodes).	E	A/I/P
Authorship of research outputs of national/international standing	E	A/I
Experience of research in specific project area (biochemistry/electrophysiology)	E	A/I/P
Experience using in-vivo fluorescent imaging	E	A/I
Teaching support	D	A/I
Skills and Knowledge:		
Extensive knowledge specific to project/area	E	A/I/P
Ability to design, conduct and project manage original research in the subject area	E	A/I/P
Excellent written communication, including the ability to write reports and research outputs	E	A/I
Ability to prioritise own workload and work to specified deadlines under pressure	E	A/I
Ability to communicate complex subjects orally	E	A/I/P
Skills specific to project/area	E	A/I/P
Competencies and Personal Attributes:		
Flexible approach to workload	E	I
Ability to work on own and as part of a team	E	I
Enthusiasm and commitment	E	I

Essential Requirements are those, without which, a candidate would not be able to do the job. **Desirable Requirements** are those which would be useful for the post holder to possess and will be considered when more than one applicant meets the essential requirements.

Author	FM-Z	HRBP	SP
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