

REQ16725

Post-Doctoral Research Associate – Healthcare Sensors Sensor for Rapid Identification of Pathogen and Drug Resistance (8 months with the latest end date of 31st August 2017)

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Loughborough University has been awarded one of the 12 network grants in Antimicrobial Resistance (AMR) in the UK by the Engineering and Physical Sciences Research Council (EPSRC). The network brings together clinicians, academics and industry across all geographies to study the unmet clinical need in AMR and pump prime innovative solutions to address them. Advancing the state-of-the-art in rapid diagnosis of infection and drug resistance for life impacting early and precise treatment is an important direction of the network. This project will explore the feasibility of a novel approach for rapid and reliable identification of pathogen and drug resistance on the same platform. The solution will be aimed at addressing a key diagnostic need defined by the International Centre for Diarrhoeal Disease Research Bangladesh, who will also provide the clinical steer.

In this AMR network project, you will be involved in feasibility research of a novel test platform and development of bioassay, transducer and operational designs to achieve desired clinical accuracy. You will lead the design of a microfluidic solution for on-chip sample processing and enhancing speed and efficiency of the sensor, and identify solutions for multiplexing. Your work will be based at the Centre for Biological Engineering (CBE), which is a multi-disciplinary research centre, bridging the fields of engineering and biology, and benefits from a suite of laboratories equipped with state-of-the-art facilities. You will work as part of a multi-disciplinary research team and with leading academic and industry collaborators in the field, including Stanford, Cambridge, Leicester and Stockholm University. You are also expected to identify and contribute to new grant applications and guide PhD students working in this field at the Centre.

Job Description

Job Grade: Research Grade 6

Job Purpose

To contribute to the research of portable diagnostic platform for rapid identification of infection and drug resistance

Job Duties

1. To feasibility test a novel acoustic detection platform combining imprinted polymer receptor, and develop bioassay, transducer and operational designs to achieve desired clinical accuracy.
2. To design a microfluidic solution for on-chip processing of complex biological sample, enhance speed and efficiency of the sensor and identify solutions for multiplexing or parallel-plexing.
3. To perform calibration of the test platform for a range of clinically relevant concentrations, and determine sensitivity, specificity and quantitative reproducibility from clean and complex samples.
4. To interact with the clinical leaders to inform the design of the diagnostic platform.

5. To work as part of a multi-disciplinary research team and with international collaborators for timely delivery of project, involving milestones on design and testing of the test platform.
6. To guide PhD students working in relevant area at the Centre for Biological Engineering
7. To identify and contribute to development of new research grant proposals.
8. To work effectively with relevant administrative, technical and academic staff in the Department and across the University.
9. To engage in training programmes in the University (e.g. through Staff Development), which are consistent with your needs and aspirations and those of the project team and the host department.
10. To undertake other duties and responsibilities in connection with the research and its outcomes as may be commensurate with the grade and nature of the post.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Organisational Responsibility

Reports to the Lecturer in Healthcare Engineering
Responsible for: Assigned PhD research student(s)

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below. Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

Essential Criteria

| Area | Criteria | Stage |
|----------------------|---|-------|
| Qualification | A PhD degree (awarded or in examination) or equivalent experience in biological sciences, biochemistry, bioengineering or biotechnology. | 1 |
| Experience | Designing one or more of the following for integrated biological sensing platforms: bioassays, microfluidics for complex sample processing, immobilization techniques, transduction techniques, DNA/RNA/polymer biomolecular receptors. | 1,3 |
| | Research experience in an academic or industrial environment. | 1,3 |
| | Research publication in international journals and conferences. | 1,3 |
| Skills and Abilities | Self-motivated with the ability to work independently and as part of a team. | 1,3 |
| | Good laboratory and analytical skills as suitable for a regulated research environment. | 1,3 |
| | Excellent verbal and written communication skills, organisational and interpersonal skills. | 1,3 |
| | Ability to learn new engineering/analytical tools/instruments. | 1,3 |
| Training | Willingness to undertake further training as appropriate and adopt new procedures as and when required. | 1,3 |
| Other | Willingness to travel as required by the project. | 3 |
| | Willingness to work in a Containment Level 2 laboratory. | 1,3 |
| | Commitment to observing the University's Equal Opportunities policy at all times. | 3 |

Desirable Criteria

| Area | Criteria | Stage |
|---------------|--|-------|
| Qualification | A PhD degree in biological sensors research with a strong multi-disciplinary element. | 1 |
| Experience | Basics of molecular biology, hands on experience with microscopy, image analysis, DNA/RNA isolation, nucleic acid amplification (PCR), ELISA, lateral flow assay, nanoparticles, nanomaterials, nanofabrication, biopolymers for biosensors, handling plasma/sera samples and animal tissues, correlation and regression analysis. | 1,3 |
| | Working experience of design and development of a biological sensor with novel/field-enhancing contributions to sensitivity, specificity or quantitative ability of transduction or bioassay, on-chip integration with automated processing of complex sample, simplicity of use, low cost or speed of detection. | 1,3 |
| | Experience of working in multi-disciplinary research environment. | 1,3 |

| | | |
|----------------------|---|-----|
| | First author journal publications in reputed biosensors journals. | 1,3 |
| Skills and Abilities | Ability to come up with innovative solution ideas. | 1,3 |
| | Analytical skills for design optimization and investigation into underlying mechanisms. | 3 |
| | Ability to work with clinicians for design of a medical device. | 3 |
| | Ability to identify external expertise and technologies for potential collaborations. | 3 |
| | Ability to identify funding opportunities and contribute to writing research grants. | 1,3 |

Conditions of Service

The position is full time and fixed term for 8 months with the latest end date of 31st August 2017. Salary will be within the Research Grade 6, £29,301 - £38,183 per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>

Informal Enquiries

Informal enquiries should be made to Dr Sourav Ghosh, by email at S.Ghosh2@lboro.ac.uk or by telephone on +44 (0)1509 227692.

Applications

The closing date for receipt of applications is **13 November 2016**.

It is expected that interviews will take place in the week commencing **21 November 2016**.