



THE POST

College:	<u>College of Engineering, Mathematics and Physical Sciences</u>
Post:	Postdoctoral Research Fellow
Reference No:	P69169
Grade:	F
HERA:	ARF/RFEL
Reporting To:	Prof Nick Stone

The above post is full-time and available from 01 October 2019 for 36 months in the College of Engineering, Mathematics and Physical Sciences.

Job Description

Main purpose of the job:

MRC have funded the University of Exeter to undertake a multi-disciplinary project entitled: *Breast Cancer: Early diagnosis using materials immortalisation*.

Within the UK there are >55000 new cases of breast cancer diagnosed every year (world-wide >1.7 million) and the economic cost of breast cancer to the UK is >£1.5bn per annum. Early and accurate diagnoses are critical for the most effective treatments and reduced costs. Current diagnostic inadequacies are characterised by (i) an >80% false positive rate for mammography, (ii) significant overtreatment of some breast cancers, and, (iii) equivocal histopathology leading to uncertain prognoses.

This project will generate a new understanding of the physicochemistry of involved tissues and, as a result, will identify potential new biomarkers and diagnostic methods. We will adopt a new, multidisciplinary approach to disease diagnosis, and combine the expertise of senior clinicians with material scientists to study tissue physicochemistry. We will also exploit a distinct, retrospective approach to sampling that will enable access to unprecedented patient numbers. Successful outcomes from this work will have significant impacts for understanding disease and development of accurate breast cancer diagnostics.

Calcifications within breast tissues are used as a primary marker of malignancy although the precipitation mechanism of biologically derived calcifications remains a matter of considerable debate. In contrast, the capacity of apatites to incorporate 'foreign', environmental ions at the time of precipitation is incontrovertible. Thus chemical features of tissue physiology at the point of formation become immortalised within calcifications. Precipitation of calcific phases in vivo is triggered by slight modifications to tissue chemistry and this, in the case of breast tissue, occurs at the very onset of the cancer.

The College wishes to recruit a Postdoctoral Research Fellow, based in Exeter, to participate in the above project. This post is available from 1st October 2019 for 36 months. The post will be part of a team of leading scientists working to develop engineering and physical science solutions to solve the clinical needs in patient specific diagnosis and effective treatment of cancers.

Expertise in Biomedical Raman and FTIR spectroscopy is essential, expertise in cell culturing and calcified tissues and formation mechanisms is highly desirable.

The successful applicant will be able to present information on research progress and outcomes, communicate complex information orally, in writing and electronically and prepare proposals and applications to external bodies.

A suitable candidate will be a PhD graduate (or near completion) in Physics, Medical Physics, Chemistry or Bioengineering, with advanced research experience in vibrational spectroscopy / imaging / microscopy; FTIR or Raman of calcified tissue and particularly breast calcifications; experience in cell culturing and working with calcified breast tissues, will be advantageous.

This MRC funded multidisciplinary project, brings together clinicians, clinical scientists, physicists and chemists. The postdoctoral research fellow will benefit from working in this environment, as well as from regular travels and meetings between sites collaborator sites.

The successful candidate will be appointed at Postdoctoral Research Fellow (Grade F). Candidates should demonstrate their achievement against the relevant criteria in the accompanying person specifications which will be used to make an appointment at an appropriate level.

Main duties and accountabilities:

1. To undertake research as appropriate to the field of study. The responsibilities may include all or some of the following:
 - Acting as principal investigator on individual research projects;
 - Developing research objectives, projects and proposals;
 - Conducting individual or collaborative research projects;
 - Identifying sources of funding and contributing to the process of securing funds;
 - Extending, transforming and applying knowledge acquired from scholarship to research and appropriate external activities;
 - Writing or contributing to publications or disseminating research findings using media appropriate to the discipline;
 - Making presentations at conferences or exhibiting work in other appropriate events;
 - Assessing, interpreting and evaluating outcomes of research;
 - Developing new concepts and ideas to extend intellectual understanding;
 - Resolving problems of meeting research objectives and deadlines;
 - Developing ideas for generating income and promoting research area;
 - Developing ideas for application of research outcomes;
 - Deciding on / following research programmes and methodologies, often in collaboration with colleagues and sometimes subject to the approval of the head of the research programme on fundamental issues.
2. To contribute to teaching and learning programmes in the School and to supervise postgraduate research students.
3. To act as research team leader including:
 - Mentoring colleagues with less experience and advising on their professional development;
 - Coaching and supporting colleagues in developing their research techniques;
 - Supervising the work of others, for example in research teams or projects;
 - Developing productive working relationships with other members of staff;
 - Co-ordinating the work of colleagues to ensure equitable access to resources and facilities;
 - Dealing with standard problems and help colleagues to resolve their concerns about progress in research.
4. To routinely communicate complex and conceptual ideas to those with limited knowledge as well as to peers using high level skills and a range of media and to present the results of scientific research to sponsors and at conferences.
5. As determined by the nature of the project and at the direction of the PI, to plan, co-ordinate and implement research programme activity including:
 - Managing the use of research resources and ensure that effective use is made of them;
 - Monitoring and reporting on the use of research budgets;
 - Helping to plan and implement commercial and consultancy activities;

This job description summarises the main duties and accountabilities of the post and is not comprehensive: the post-holder may be required to undertake other duties of similar level and responsibility. Please visit the Human Resources website to view the Research Fellow role profiles.

Person Specification

Competency	Essential	Desirable
Attainments/Qualifications	PhD or equivalent qualification/experience in a related field of study.	Be a nationally recognised authority in the subject area.
Skills and Understanding	Possess sufficient specialist knowledge in the discipline to develop/follow research programmes and methodologies. Record of research output in high quality publications.	
Prior Experience	Experience of managing research projects and research teams.	Experience of undergraduate / postgraduate teaching and supervision. Experience of acting as principal investigator or lead researcher on research projects.
Behavioural Characteristics	Excellent written and verbal communication skills. Able to communicate complex and conceptual ideas to a range of groups. Evidence of the ability to collaborate actively within the Institution and externally to complete research projects and advance thinking. Able to participate in and develop external networks. Able to balance the pressures of research, administrative demands and competing deadlines.	Able to identify sources of funding, generate income, obtain consultancy projects, or build relationships for future activities. Evidence of supporting equality and diversity within your department and beyond.
Circumstances or Additional Competencies/Experience	Experience with Raman and IR spectroscopy and microscopy. Experience of peak assignment and fitting.	Experience with cell culturing and calcified tissue samples.

Terms & Conditions

Our Terms and Conditions of Employment can be viewed [here](#).

Further Information

Please see our [website](#) for further information on working at the University of Exeter.