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| Last updated: | <10/11/17> |

**JOB DESCRIPTION**

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| Post title: | **Research Fellow** | | |
| Academic Unit/Service: | Human Development and Health | | |
| Faculty: | Medicine | | |
| Career Pathway: | Education, Research and Enterprise (ERE) | Level: | 4 |
| \*ERE category: | Research pathway | | |
| Posts responsible to: | Associate Professor | | |
| Posts responsible for: | Some supervision of junior research staff | | |
| Post base: | Office-based/Non Office-based (see job hazard analysis) | | |

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| Job purpose |
| To undertake research in accordance with the specified research project under the supervision of the award holder. To undertake leadership, management and engagement activities.  The project is part of a collaboration between the Departments of Human Development & Health and Mechanical Engineering at the University of Southampton and the Institute of Biomedical Engineering at the University of Oxford, to develop more effective means of treating bone fractures. Bone fractures and their associated complications pose a major societal problem that is set to get significantly worse as our population ages. They represent an annual cost to the UK economy of ~£2 billion and ~€37 billion across the EU. New therapies are urgently required. At present, there is no clinically approved, systemic therapy for bone fracture. In a new interdisciplinary collaboration between engineers, biologists and orthopaedic surgeons, we aim to address this challenge by targeted delivery of osteogenic drugs to bone fracture sites, using focused ultrasound for remote activation of stimuli responsive particles. The specific role of the person appointed will be to determine whether acoustic stimulation of nanoparticles leads to drug release, cell uptake and the subsequent differentiation of stem cells to bone-producing cells. You will also test ultrasonic devices in models of bone healing. The project will involve significant collaboration with engineers in Oxford and Southampton, to better develop synthetic ultrasound-responsive particles and devices used to stimulate them. |

| Key accountabilities/primary responsibilities | | % Time |
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|  | Developing and testing acoustically responsive nanoparticles based on phase change emulsions encapsulating osteogenic drugs. This will involve exposing cell types including human skeletal stem cells, macrophages and endothelial cells to suspensions of particles and using a variety of molecular and imaging techniques to determine their effectiveness.  Applying appropriate characterisation techniques including (but not restricted to): optical (including fluorescence) and electron microscopy, confocal microscopy, dynamic light scattering and related particle sizing techniques, ultraviolet (UV) spectroscopy, high performance liquid chromatography, ultrasound attenuation and backscattering measurements.  Using and developing established in vivo models of bone repair to test the ability of particles to localise drugs at specific sites, to release payload, to induce signalling and to exert a phenotypic effect. | 60 % |
|  | Regularly disseminate findings by taking the lead in preparing publication materials for referred journals, presenting results at conferences, or exhibiting work at other appropriate events. | 5 % |
|  | Contribute to the writing of bids for research funding. | 2 % |
|  | Collaborate/work on original research tasks with colleagues in other institutions. | 10 % |
|  | Carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control. | 3 % |
|  | Supervise the work of junior research staff. | 10 % |
|  | Carry out occasional undergraduate supervision, demonstrating or lecturing duties within own area of expertise, under the direct guidance of a member of departmental academic staff. | 5 % |
|  | Any other duties as allocated by the line manager following consultation with the post holder. | 3 % |
|  | Assisting, where appropriate, with the authoring and filing of invention disclosures in collaboration with Research and Innovation Services at the University of Southampton | 2 % |

| Internal and external relationships |
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| Direct responsibility to holder of research award or academic supervisor.  May have additional reporting and liaison responsibilities to external funding bodies or sponsors.  May be asked to serve on a relevant Academic Unit committee, for example research committee.  Collaborators/colleagues in other work areas and institutions.  Internal & External Relationships: (nature & purpose of relationships)  Within University: IfLS Grouping, Chemistry, and Faculty of Engineering and the Environment and Biological Imaging Unit (SGH).  Outside the University (Collaborators): Project Grant Partners in Oxford, University Hospital Southampton and Dstl (Porton Down) |

| Special Requirements |
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| To be available to participate in fieldwork as required by the specified research project.  To attend national and international conferences for the purpose of disseminating research results.  *Applications for Research Fellow positions will be considered from candidates who are working towards or nearing completion of a relevant PhD qualification. The title of Research Fellow will be applied upon successful completion of the PhD. Prior to the qualification being awarded the title of* ***Senior Research Assistant*** *will be given.* |

**PERSON SPECIFICATION**

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| Criteria | Essential | Desirable | How to be assessed |
| Qualifications, knowledge and experience | PhD or equivalent professional qualification and experience in biomedical sciences, biomaterial science, bio-physics or biomedical engineering | PhD in *in vivo* biomedical acoustics  Knowledge of in vivo models and acoustics theory  Experience of building acoustic stimulation rigs and working with murine models of tissue repair  Experience with cell culture models  Experience in molecular biology  Knowledge of drug delivery systems or stimuli responsive biomaterials or nanoparticles |  |
| Planning and organising | Able to organise own research activities to deadline and quality standards |  |  |
| Problem solving and initiative | Able to develop understanding of complex problems and apply in-depth knowledge to address them  Able to develop original techniques/methods |  |  |
| Management and teamwork | Able to supervise work of junior research staff, delegating effectively  Able to contribute to Academic Unit management and administrative processes  Work effectively in a team, understanding the strengths and weaknesses of others to help teamwork development |  |  |
| Communicating and influencing | Communicate new and complex information effectively, both verbally and in writing, engaging the interest and enthusiasm of the target audience  Able to present research results at group meetings and conferences  Able to write up research results for publication in leading peer-viewed journals  Work proactively with colleagues in other work areas/institutions, contributing specialist knowledge to achieve outcomes |  |  |
| Other skills and behaviours | Understanding of relevant Health & Safety issues  Positive attitude to colleagues and students |  |  |
| Special requirements | Able to attend national and international conferences to present research results |  |  |

**JOB HAZARD ANALYSIS**

**Is this an office-based post?**

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| Yes | If this post is an office-based job with routine office hazards (eg: use of VDU), no further information needs to be supplied. Do not complete the section below. |
| No | If this post is not office-based or has some hazards other than routine office (eg: more than use of VDU) please complete the analysis below.  Hiring managers are asked to complete this section as accurately as possible to ensure the safety of the post-holder. |

## - HR will send a full PEHQ to all applicants for this position. Please note, if full health clearance is required for a role, this will apply to all individuals, including existing members of staff.

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| **ENVIRONMENTAL EXPOSURES** | **Occasionally**  (<30% of time) | **Frequently**  (30-60% of time) | **Constantly**  (> 60% of time) |
| Outside work |  |  |  |
| Extremes of temperature (eg: fridge/ furnace) |  |  |  |
| ## Potential for exposure to body fluids | X |  |  |
| ## Noise (greater than 80 dba - 8 hrs twa) |  |  |  |
| ## Exposure to hazardous substances (eg: solvents, liquids, dust, fumes, biohazards). Specify below: |  | X |  |
| Frequent hand washing |  | X |  |
| Ionising radiation |  |  |  |
| **EQUIPMENT/TOOLS/MACHINES USED** | | | |
| ## Food handling |  |  |  |
| ## Driving university vehicles(eg: car/van/LGV/PCV) |  |  |  |
| ## Use of latex gloves (prohibited unless specific clinical necessity) |  |  |  |
| ## Vibrating tools (eg: strimmers, hammer drill, lawnmowers) |  |  |  |
| **PHYSICAL ABILITIES** | | | |
| Load manual handling | X |  |  |
| Repetitive crouching/kneeling/stooping |  |  |  |
| Repetitive pulling/pushing |  |  |  |
| Repetitive lifting |  |  |  |
| Standing for prolonged periods |  |  |  |
| Repetitive climbing (ie: steps, stools, ladders, stairs) |  |  |  |
| Fine motor grips (eg: pipetting) |  |  |  |
| Gross motor grips |  |  |  |
| Repetitive reaching below shoulder height |  |  |  |
| Repetitive reaching at shoulder height |  |  |  |
| Repetitive reaching above shoulder height |  |  |  |
| **PSYCHOSOCIAL ISSUES** | | | |
| Face to face contact with public |  |  |  |
| Lone working |  |  |  |
| ## Shift work/night work/on call duties |  |  |  |