LOUGHBOROUGH UNIVERSITY IN CONJUNCTION WITH KEELE UNIVERSITY, UNIVERSITY OF LEEDS, UNIVERSITY OF NOTTINGHAM, UNIVERSITY OF SHEFFIELD AND UNIVERSITY OF YORK

EPSRC LANDSCAPE FELLOW

Engineering Tissue Engineering and Regenerative Medicine (24 Months)

REQ1114030 **November 2011**

About the Landscape Fellowship Programme

Continued improvement in the nation's health depends upon the efficient development of affordable replacement human tissue and related therapies; an acute shortage of willing organ donors and the shortcomings of conventional therapies lead to the preventable death of many patients each year. The next healthcare revolution will apply to regenerative medicines, creating biological therapies or substitutes for the replacement or restoration of tissue function lost through failure or disease. However, whilst science has revealed the potential, and early products have shown the power of such therapies, there is now a need for the long term supply of people properly trained with the necessary skills to lead the engineering and life science challenges before the predicted benefits in human healthcare can be realised. Realisation of these benefits requires a new generation of translational professional leaders immersed in both the fundamental science of these new products and the clinical, engineering and commercial realities of their creation and application.

This Landscape Fellowship programme brings together the complementary skills of vibrant research concentrations at Loughborough, Leeds, Nottingham, Sheffield, Keele and York Universities to create a competitive research environment with the breadth of capability and critical mass to develop the next generation of translational leaders in tissue engineering and regenerative medicine. This Cross-disciplinary Research Landscape award, a joint initiative between the Life Sciences Programme Doctoral Training Centres (DTCs) led by Loughborough and Leeds, will identify and nurture future research leaders capable of delivering in academic, public sector and/or industrial settings and these Fellows will deliver a beacon of research addressing technological challenges in the translation of promising science to practical therapeutics. This includes scaling up the science to real world applications, stratifying the host environment and patient needs, addressing biological variability, improving product reliability and the development of technology demonstrators and evaluation platforms.

We will competitively award two early career Fellowships per year to exceptional candidates drawn from the tissue engineering and regenerative medicine Doctoral Training Centres and their wider research communities. Through both directed and individual research, their contributions to the doctoral training centres and personal development, the Fellows will be developed for leadership roles in cross-disciplinary, large scale interface science.

Each Fellow will be chosen based on their ability to become leaders in the field within 10 years of appointment. Fellows will be appointed for two years and a proportion (50%) of their work will be guided by the strategic research themes and experimental research platforms of the two DTCs. These are described in the accompanying document. In total this programme will develop 10 future leaders - it will be a highly selective and competitive programme addressing strategic post doctoral training and development in this emerging field.

A particular focus for the Fellows will be the development of new leadership teaching material on leadership of large multidisciplinary teams, leadership of research where there are significant ethical sensitivities and of large experimentally led 'big science' laboratory programmes that are resource intensive. This material will then be delivered within the DTCs existing training infrastructures.

LOUGHBOROUGH has, over the last seven years, built a world class capability in industry facing research and post graduate education in regenerative medicine. The Institution is recognised for its broad and integrative approach to translation and policy influence. Its mission is to assist the growth of medical technology SMEs and the detail of its science includes particularly the delivery of world firsts in manufacturing, automation and bio-processing applied to stem cells. A strong multidisciplinary research team with skills ranging from clinical and pharmaceutical, through biochemistry, biotechnology and tissue engineering to mechanical, chemical, biochemical and polymer engineering has been created. ***Prof David Williams FREng*** has been 'Star Professor' in Healthcare Engineering since 2003. He is PI of the DTC in Regenerative Medicine and the EPSRC Centre for Innovative Manufacturing in Regenerative Medicine. ***Prof Chris Hewitt*** has over 15 years experience in training graduate engineers to equip them with the necessary skills to work in academia and industry at the life science/engineering interface. He is Director of the DTC in Regenerative Medicine.

The Loughborough-led DTC in Regenerative Medicine
focuses research on:
- controlling differentiation environments
- designing minimally invasive scaffolds
- cell and tissue biomanufacturing

LEEDS – ***Prof John Fisher FREng***, is Director of the Institute of Medical and Biological Engineering (iMBE) and the WELMEC Centre of Excellence in Medical Engineering, and leads one of the largest medical engineering research and innovation units in the world, with 200 doctoral researchers. iMBE focuses on three research areas, joint replacement, functional spinal biomechanics and tissue engineering; the wider WELMEC centre includes imaging, biosensors, dental biomaterials and minimally manipulated autologous stem cells. It is recognised as a world leader in joint replacement tribology and simulation and regenerative biological scaffolds. ***Prof Zhongmin Jin*** is Director of the DTC in Tissue Engineering and Regenerative Medicine. He has 25 years research experience in the area of biotribology enhanced with tissue engineering for the last decade. His research focuses on the computational modelling of cell-matrix interactions, mechanotransduction, and nutrient transport.

The Leeds-led DTC in Tissue Engineering and Regenerative Medicine
focuses research on:
- biological scaffolds
- synthetic scaffolds
- functional physiological bioreactors
- stem cells
- simulation and modelling

KEELE – ***Prof Alicia El Haj*** is a leading member of and former Director of the Institute of Science and Technology in Medicine (ISTM). Her research programme is focused on the challenges of controlling cell behaviour in vitro and in vivo during cell therapy with an emphasis on developing scalable and functional clinical solutions. The multidisciplinary ISTM is linked to the University Hospital of North Staffordshire and RJAH Orthopaedic Hospital at

Oswestry with a major focus on enabling technologies involved in cell and tissue engineering and introduction to the clinic of cell therapies for regenerative medicine.

NOTTINGHAM – ***Prof Kevin Shakesheff*** was a prime mover in the creation of the *remedi* Grand Challenge and has in recent years explored new scaffolds for tissue regeneration. Nottingham has invested more than £25 million in the Centre for Biomolecular Sciences and the interdisciplinary Wolfson funded STEM centre which physically brings together engineers, mathematicians, materials scientists, chemists, stem cell biologists and clinicians. STEM is focused on the integration of cell biology and tissue engineering with particular expertise in the use of materials and bioreactors to promote 3D assembly of stem cells.

SHEFFIELD has a long established culture of interdisciplinary research in engineering and the life sciences. The Centre for Biomaterials and Tissue Engineering promotes interactions between biomaterials, tissue engineering and biomedical engineering, as does the Kroto Interdisciplinary Research Institute (established by the University in 2005 to promote research on the interface between engineering, science and medicine). This Institute now houses some 150 research staff. ***Prof Sheila MacNeil*** has a 30 year academic career at the University of Sheffield in which she has been able to translate tissue engineering of skin and oral mucosa through to clinical benefit by working closely with clinical colleagues in Universities and Hospitals.

YORK's Department of Biology has had recent substantial investment in additional laboratory space and the associated Technology Facility has been equipped with >£7M of state-of-the-art technologies. The Wolfson Suite for Stem Cells and Tissue Engineering has specialised culture rooms for primary work, stem cell culture and dedicated bioreactors and incubators for tissue engineering. ***Dr Paul Genever*** is Head of the Biomedical Tissue Research Group which focuses on the cell and molecular biology of skeletal tissues. This includes the characterisation of signalling mechanisms in mesenchymal stem cells (MSCs) and related skeletal cell types; identifying optimal in vitro growth environments including 3D (co)cultures; identifying regulatory cues that direct differentiation; comparative analyses of different stem cell populations; and exploiting MSCs in bone tissue engineering applications in custom-built implants and osteochondral composites.

The Application Process

Potential candidates within the DTCs in their final year of study will be invited to apply and submit a research proposal for consideration for the award of a Fellowship. In order to further broaden and enrich our intake, applications and proposals from current PhD students and other recently graduated PhD's within two years of graduation, who have studied elsewhere are also sought.

The proposal will be a maximum of 6 pages and will present the strategic need for the work, its relevance, novelty, impact, timeliness, detail of the programme of work and identify what will actually be delivered. The proposal should distinguish between its individual and directed components, the first to be proposed by the candidate and the second developed by the candidate to match the strategic research themes and experimental research platforms of the two DTCs. Importantly, since applicants will not have established a significant research track record at this stage, they will be asked to include a detailed personal development plan (up to 2 additional pages).

When preparing proposals candidates should be aware that the Fellowship has a value equivalent to £200k including salary and associated costs, mentoring and supervision, equipment and consumables.
Applications will be considered and shortlisted by a group made up of representatives of each of the collaborating universities (the Executive). Shortlisted candidates will then present their plans to the Landscape Award Board in a “Dragons den” style setting. Criteria for an award of the Fellowship will be scientific or engineering excellence and potential for candidate development, particularly in translation and large scale multidisciplinary research leadership.

It is important to recognise that, in addition to being judged on the excellence and relevance of their research proposal, candidates for the Fellowships are particularly required to show that they are multidisciplinary in experience and approach, have made demonstrable progress in their research to date, have a clear and practical plan for their personal development and are committed to translational healthcare research and its leadership.

Development of Fellows

The Fellowship can be held at any of the six partner universities but priority will be given where international/industrial collaboration or interdisciplinary work across sites is proposed exploiting distinctive experimental research platforms. Progress will be monitored via six monthly written reports to the Board. Feedback on progress will be delivered with advice and steer given where appropriate.

Fellows will be mentored by an identified member of the Executive. Beginning with a tailored induction programme, planning and timing of the developmental element for each Fellow will be tailored to the individual needs of the Fellow and his/her host institution(s), and designed to meet the timescales of his/her research projects and aspirations.

Eligibility Criteria

Applicants will be in the final stages of their PhD studies or have been awarded their PhD within the previous two years. However, selected candidates should please note that the award will not begin until the applicant’s PhD thesis has been submitted.

EPSRC LANDSCAPE FELLOWSHIP

JOB DESCRIPTION

1. Job purpose

The focus of this appointment is translational research in the engineering of tissue engineering and regenerative medicine and personal development aimed at large scale multidisciplinary research leadership. The appointment is supported by the EPSRC Landscape Award Engineering Tissue Engineering and Regenerative Medicine E-TERM EP/I017801/1

2. Duties and Responsibilities

The post holder will be expected to deliver the research and training and engage in personal development as described in the proposal accompanying their application as reviewed, modified and monitored by the Landscape Fellowship Board and the representative of their host institution in agreement with the Executive.

Research

- Deliver a programme of individual translational research in the engineering of tissue engineering and regenerative medicine.
- Deliver a programme of translational research aligned to the research themes and experimental platforms of the collaborating Doctoral Training Centres.
- Make presentations to industry and academia.
- Publish the outcomes of research in outlets of international standing.
- Promote the work of the EPSRC, the Landscape Award and the collaborating DTCs.

Teaching

- Development and delivery of research leadership training to the DTCs.

Other Related Activities and Functions

- Engage in personal development and training programmes that are consistent with the Landscape Fellow’s proposal, the views of the Board and those of the hosting institution.
- Undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

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PERSON SPECIFICATION

	Essential	**Desirable**
Education and Qualifications	Degree in engineering, cell biology, biotechnology, bioengineering or another related subject (1) As a minimum, satisfactory progression through the penultimate year of PhD Studies in tissue engineering, regenerative medicine, engineering, cell biology, molecular biology, or another related subject (1,3)	PhD in tissue engineering, regenerative medicine, engineering, cell biology, molecular biology, or another related subject (1)
Experience	Relevant postgraduate research experience in an academic or industrial environment in engineering and/or the life sciences (1,3)	Experience in tissue engineering and regenerative medicine techniques (1,3) Knowledge and understanding of processes and the principles underlying these techniques (1,3) Experience in translational research (1,3) Experience of presenting work at conferences (1,3)
Skills and Abilities	Good laboratory and analytical skills (1,3) Ability to work independently and as part of a team (1,3) Highly self motivated (1,3) Ability to write high quality proposals, project reports and give presentations to large and small groups (1,3) Good IT skills and internet usage (1,3)	Demonstrated leadership skills and potential (1,3) Knowledge of relevant Health & Safety issues including biological safety techniques, practices and sterile procedures (1,3)

	Excellent interpersonal, communication and organisational skills (1,3) Ability to maintain confidentiality at all times (1,3)	
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required (3)	
Other	Willingness to work in a Containment Level 2 cell culture laboratory (1,3) Willingness to cross disciplinary boundaries (1,3) Willingness to travel to industrial and academic collaborators' sites within the UK (3) Commitment to observing the University's Equal Opportunities policy at all times (3)	

Stages in assessment: **1**. application form at shortlisting, **2**. selection test **3**. interview

Conditions of Service

As an indication, the salary for the post at Loughborough University will be Research Grade 6 (£29,972 - £32,750 per annum). This is a fixed-term appointment for a period of 24 months.

Conditions of service for Academic and Related Staff at Loughborough can be found at: http://www.lboro.ac.uk/admin/personnel/documents/acadrelatedcos.pdf

The grade, salary and conditions of service shown apply to Loughborough University only. This will vary according to the institution although the salary paid will be on a similar scale.

Conditions of service for other institutions can be found at:

Keele University: http://www.keele.ac.uk/hr/policiesandprocedures/

University of Leeds: http://www.leeds.ac.uk/hr/

University of Nottingham: http://hr.nottingham.ac.uk/

University of Sheffield: http://www.shef.ac.uk/hr/guidance/contracts/terms.html

University of York: http://www.york.ac.uk/admin/hr/resources/policy/

Informal Enquiries

Informal enquiries are welcomed and should be directed to Professor David Williams by email D.J.Williams2@lboro.ac.uk or on +44 (0)1509 227668. A webinar will be held at **10.00am on Monday 12 December 2011** to give further details of the Fellowships and to respond to questions. Please email Professor Williams to confirm you wish to participate and further details will be forwarded to you.

If candidates have a preferred destination for their Fellowship they are advised to contact the university representative for that institution as below.

Loughborough University:	Prof David Williams email d.j.williams2@lboro.ac.uk +44 (0)1509 227668
Keele University:	Prof Alicia El-Haj email a.j.el.haj@bemp.keele.ac.uk +44 (0)1782 554605
University of Leeds:	Prof John Fisher email j.fisher@leeds.ac.uk +44 (0)113 343 2128
University of Nottingham:	Prof Kevin Shakesheff email kevin.shakesheff@nottingham.ac.uk +44 (0)115 823 2399
University of Sheffield:	Prof Sheila MacNeil email S.Macneil@sheffield.ac.uk +44 (0)114 222 5995
University of York:	Dr Paul Genever email paul.genever@york.ac.uk +44 (0)1904 328649

Applications

A Loughborough University Application form should be completed by all candidates, regardless of preferred destination and should include information that would normally be supplied in a CV. This should be submitted along with the required research proposal (max 6 pages) and personal development plan (max 2 pages) – see "The Application Process" above.

Application forms and accompanying documentation should preferably be forwarded by e-mail to hr@lboro.ac.uk, or by post to Human Resources, Hazlerigg Building, Loughborough University, Loughborough, Leicestershire, LE11 3TU. Please quote reference number **REQ1113040**.

The closing date for receipt of applications is **12 noon on Friday 6 January 2012**. Interviews will take place on **Friday 27 January 2012** at Loughborough University.

Please note that the University's preferred method of communication is via e-mail if you have supplied an e-mail address.