bringing movement to life

orthopaedic research UK

Funding research lies at the heart of all we do

Orthopaedic Research UK

Furlong House
10a Chandos Street
London W1G 9DQ

Tel 020 7637 5789
Email info@oruk.org
www.oruk.org

UK Registered Charity No. 1111657

Vision

To eliminate bone and joint disease

Mission

To improve patients' quality of life by:

1 Funding high quality research in centres of excellence through rigorous independent peer review, ensuring best practice under AMRC guidelines.

2 The advancement of orthopaedic knowledge by dissemination of research results through training and education.

Values

We endeavour to ensure we conduct our business in a professional, transparent and ethical manner, ensuring total confidentiality and excellent service.

We take pride in and are passionate about our charitable work knowing it ultimately is for the benefit of patients.

Contents

A note from the Chief Executive

ORUK is very proud to be one of the leading charities which funds research into all areas of orthopaedics including trauma and chronic conditions affecting bones and joints in people of all ages. I am very pleased that we are making an impact in this field as it severely affects our society and we can make a difference through improved treatment.

Research into curing painful musculoskeletal diseases has never been as vital as it is today. As the population ages more people are suffering from reduced mobility and increased pain from degenerative changes in their joints.

Replacement of damaged joints is a very successful operation but we need to research more into how to regenerate articular tissues rather than replace them. In this way we can provide improved treatment for patients to eliminate pain and restore mobility.

Brian Jones

Chief Executive
Orthopaedic Research UK

About us

We are an independent body dedicated to advancing orthopaedic knowledge. We fund and publicise high quality research related to the musculoskeletal system and organise training events which promote collaboration between orthopaedic surgeons, scientists and engineers.

We were established in 1989 through the vision, skills and determination of one man – the orthopaedic surgeon Ronald Furlong – who pioneered a new form of hip prosthesis and dedicated profits from this success to funding medical research.

Since 2004 the charity has supported over 100 research projects, investing over £7 million and has worked alongside 35 Universities and research centres.

We are a member of the Association of Medical Research Charities (AMRC), and the National Institute for Health Research (NIHR) and follow their best practice guidelines for reviewing research proposals submitted to us to ensure independence and transparency.

Each year we issue two calls for research grant applications which are open to academics and clinicians within UK based research organisations only. Grants vary in size and duration, dependent upon the type of research and stream involved.

Please visit our website for further research grant and event information www.oruk.org

amrc
PEER REVIEW AUDIT 2011

NHS
National Institute for Health Research

Meet our Trustees

Robert Vallings
Chairman

Anthony Andrews

John Edge

Patrick Latham

David Martin

Brian Jones

We depend upon our Board of Trustees to oversee our activities and ensure the organisation meets its objectives as a charity.

Our objectives are the advancement of medical education and research, particularly orthopaedic knowledge, by funding research and training and by encouraging co-operation between surgeons, scientists and engineers working in the field of orthopaedics. This should benefit the general public, so the results of all funded research should be published.

SAC members

Our Scientific Advisory Committee (SAC) meets twice a year to consider research proposals we have received and to make recommendations to our Board of Trustees for funding.

The committee comprises eminent members of the orthopaedic research community.

Funding data

Status & Values

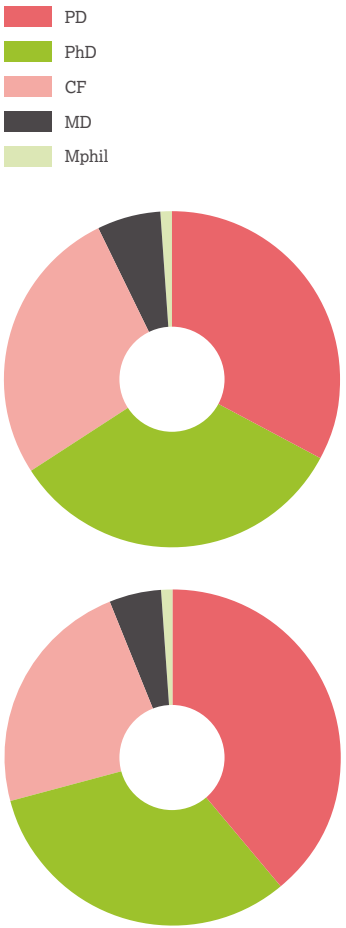
Live	44	£2,899,789.33
Completed	64	£4,482,991.61
Total	**108**	**£7,382,780.94**

£ by Study Stream

PD	£2,901,907.97	39%
PhD	£2,365,301.50	32%
CF	£1,662,106.14	23%
MD	£360,209.33	5%
Mphil	£93,256.00	1%
Total	**£7,382,780.94**	**100%**

Distribution of Study Streams

PD	36	33%
PhD	36	33%
CF	29	27%
MD	6	6%
Mphil	1	1%
Total	**108**	**100%**



PD: Post- Doctoral

PhD: Doctor of Philosophy

CF: Clinical Fellowship

MD: Doctor of Medicine

MPhil: Master of Philosophy

All data valid until February 2014

Research institutions

Institution	Total amount	%	No. of grants
University of Oxford	£1,500,104.16	20.32%	21
University College London	£872,528.62	11.82%	13
Imperial College London	£761,676.50	10.32%	13
University of Cambridge	£625,498.70	8.47%	8
University of Leeds	£372,480.91	5.05%	2
Western Sussex Hospitals NHS Trust	£363,125.00	4.92%	5
King's College London	£297,436.82	4.03%	4
University of East Anglia	£295,306.33	4.00%	4
Queen Mary, University of London	£247,713.00	3.36%	4
University of Birmingham	£159,815.00	2.16%	2
University of Manchester	£156,527.63	2.12%	3
University of Edinburgh	£139,998.00	1.90%	2
Newcastle University	£128,886.80	1.75%	2
Aarhus University	£122,788.67	1.66%	1
Royal Veterinary College	£116,700.00	1.58%	2
Radboud University Nijmegen	£101,809.04	1.38%	1
University of Warwick	£93,930.00	1.27%	1
University of Strathclyde	£89,000.00	1.21%	1
University of Brighton	£88,999.98	1.21%	1
The Rizolli Institute	£83,242.70	1.13%	2
University of Bath	£81,266.99	1.10%	1
Queen's University Belfast	£79,592.00	1.08%	1
St George's University of London	£75,000.00	1.02%	1
Sheffield Children's NHS Foundation Trust	£73,042.00	0.99%	1
Swansea University	£68,549.00	0.93%	1
University of Southampton	£65,766.09	0.89%	1
Cardiff University	£63,416.00	0.86%	2
University of Bristol	£60,000.00	0.81%	1
University of Sheffield	£59,209.00	0.80%	1
North Bristol NHS Trust	£47,657.00	0.65%	1
Royal College of Surgeons of England	£45,000.00	0.61%	1
National Osteoporosis Society	£25,000.00	0.34%	1
Dewsbury & District Hospital	£12,015.00	0.16%	1
London School of Hygiene & Tropical Medicine	£7,500.00	0.10%	1
Grimsby - N. Lincs & Goole Hospitals	£2,200.00	0.03%	1
Total	**£7,382,780.94**	**100%**	**108**

A need for a translational research funding programme

The main activity of Orthopaedic Research UK (ORUK) is to provide funding to centres of excellence to conduct research in the field of orthopaedics and musculoskeletal pathology, in order to benefit patients suffering from such disorders. However, the majority of the research grants awarded to universities will not make it to the market as products, surgical techniques or novel rehabilitation approaches. Therefore, in general, grants are made with no expectation of a financial return and very often with no patient benefit in the short to medium term.

We have therefore recently introduced a new funding programme called the translation research funding (TRF) call. The primary aim of this call is to promote the innovation process to ensure that the money invested in research is given the best opportunity to translate into meaningful outcomes and improve IP identification, so that the discoveries will be given the best chance of becoming a novel treatment, product or service.

Designing a translatable idea is a complex process and involves many players. This should be carried out through collaboration between all the stakeholders, which is key in determining a successful outcome. All parties must align their agendas and goals to deliver benefits for patients.

The Association of Medical Research Charities (AMRC) has placed emphasis into actively encouraging collaboration between charities and industry to maximise the chances of generating an impact in healthcare. This is because they correctly recognise the fact that industry is at the forefront of 'innovation' – a key element needed to survive in a competitive business environment.

The TRF call is therefore designed to capture those proposals that demonstrate strong IP characteristics, which have been submitted through a collaborative engagement of various partners, which may include: researchers, industry and/or other charities and professional bodies. The proposals need to possess the following qualities:

- must have an organisational partner, providing joint/match funding for the proposed research
- be based on robust preliminary research
- address a clear clinical need/ defined patient group
- support the development of treatments that are likely to be safe and acceptable to patients and clinicians
- have a clear and sensible commercialisation plan
- have a clear route through clinical trials to market
- be associated with strong IP

We believe the TRF call would enable us to improve and demonstrate the impact on healthcare, an area on which the charity commission and AMRC are focusing.

1 Adolescent hip disease: biomarkers, morphology and PROMS in a longitudinal study

UCL

Researchers Mr Andreas Roposch, Prof Justin Cobb, Dr Milad Masjedi, Prof Margaret Hall-Craggs, Dr Richard Abel and Mr Aresh Hashemi-Nejad

Institution University College London and Imperial College London

Study Stream Clinical fellowship

Duration 24 months

Grant amount £99,817

Focus Biomechanics, computational modelling, deformities, paediatric

Mr Andreas Roposch

1. What is the basic problem that you are trying to address?

In adolescents who have hip disease that originated in childhood, the disease is defined purely by X-ray criteria. Because radiographic features cannot be directly perceived by patients, we need to find other ways to understand and define adolescent hip disease. One approach is to define it by outcomes that patients can recognize. Outcomes that patients can perceive directly are more meaningful when counselling affected patients about their prognosis or the need for treatment. This research will determine how X-ray findings correlate the real 3D structures as revealed by MRI, and how these correlate with pain, function, disability and quality of life. The research will determine in particular what findings in childhood will lead to mild and severe hip disease in adolescence/young adulthood.

2. What is the estimated incidence of this particular problem in the general population?

Congenital hip dysplasia occurs in 40-60/1000 newborns and, despite of treatment, it will lead to adolescent hip disease of mild or severe grade. It is a major cause of debilitating hip disease in adulthood. It underlies up to 9% of all primary hip replacements and up to 29% of those in people aged 60 years and younger. 46% of patients who had DDH in childhood had a primary hip arthroplasty done by the age of 43 years and 25% of the remaining patients suffered from osteoarthritis.

3. What are the aims and objectives of this research study?

We will determine what it means for affected adolescents to have hip disease, in terms of pain and disability originating from the hip; physical functioning; and in terms of quality of life.

We assembled and examined a group of 88 children with this condition in 2006 (“2006 cohort”) and we will examine these patients 7 years later in order to understand how much their function, pain, and quality of life has changed with increasing age.

With the 3D evidence we will develop a more powerful predictor of adolescent hip disease generating a new classification. This will drive better decisions in affected children, helping to minimize problems when they are teenagers and throughout adult life.

4. Is this research going to solve the problem?

Yes; the research will give us insights about how children with hip dysplasia change when they grow up and what can be expected when they are adolescents. This information is not available elsewhere.

5. What are the long-term benefits to patients with this problem?

The results of this study can be used to counsel parents of children with DDH at a young age about what can be expected when the children grow older.

The results will clarify how adolescents with certain X-ray changes of the hip cope in terms of functioning, pain and general wellbeing.

The results will inform about the development of risk-tailored care pathways, especially in the transition from childhood to adult services, for which there are currently no agreed services in place across NHS Trusts.

2 Biochemical Markers for the Identification of Individuals at Risk of Developing Osteoarthritis

Researchers Mr Antony Palmer, Mr Sion Glyn-Jones, Dr Philippa Hulley and Professor Andrew Carr

Institution University of Oxford

Study Stream Clinical fellowship

Duration 24 months

Grant amount £22,740

Focus Bone biology, hip, osteoarthritis treatment, soft tissue biology, sports medicine

Mr Antony Palmer
© Royal College of Surgeons

1. What is the basic problem that you are trying to address?

An increasing number of preventative strategies are proposed for the treatment of osteoarthritis, however, their effectiveness is dependent on the ability to detect disease at the earliest possible stage. Once individuals develop pain there is often irreversible joint damage. Novel MRI sequences may be able to detect early disease, however, this technique is expensive and not widely available. Each scan takes approximately 30-60 minutes and not everybody is able to have an MRI scan, for example, it is contraindicated in individuals with metal implants or claustrophobia. The images are also time-consuming and challenging to interpret. As a result, we are trying to develop a blood test or urine test to detect early osteoarthritis.

2. What is the estimated incidence of this particular problem in the general population?

Due to a wide range of different definitions, it is difficult to determine the true incidence of osteoarthritis, however, estimates suggest that up to 8.5 million people in the UK are affected by joint pain that may be attributed to this disease (Arthritis Care). Our research project primarily focuses on hip osteoarthritis given recent advances in this field. We now know that 30% of the general population have a hip shape that increases their risk of developing osteoarthritis. Unfortunately we are not yet able to predict which of these people will actually develop the disease and this is one of the aims of our research project.

3. What are the aims and objectives of this research study?

Our first aim is to develop a risk stratification tool for the development and progression of osteoarthritis. We plan to create a screening tool based on the results of a questionnaire and a blood/urine test. Individuals at high risk would be counselled appropriately and potentially offered further investigation, such as an MRI scan. They may also be identified as candidates for novel preventative strategies, such a pharmaceutical agents or even keyhole surgery to modify joint biomechanics. Our second aim is to determine whether a blood/urine test can be used to measure the effectiveness of different treatments.

4. Is this research going to solve the problem?

We will achieve our aims by measuring particles (biomarkers) in the blood/urine that are released when cartilage is damaged. Our centre is currently performing research to understand how hip shape predicts osteoarthritis using novel MRI techniques to detect the earliest disease. We will collect blood/urine at the same time as the MRI scans to investigate whether biomarkers correlate with pain and cartilage damage. We believe that biomarkers will always be raised when there is cartilage degeneration, hence the potential value as a screening tool. Using a cohort of patients who are receiving treatment for hip pain, we will also investigate whether treatment success is reflected in changes in biomarker levels. Biomarkers may therefore be used to compare the effectiveness of future osteoarthritis treatments.

5. What are the long-term benefits to patients with this problem?

This research will facilitate the development of preventative strategies for osteoarthritis. It will assist the development of a urine/ blood test that can be used as a screening tool so that disease may be detected early when it is potentially reversible. The test may also become a means of measuring treatment effectiveness for the increasing number of proposed osteoarthritis therapies.

Figure 1 (top): Right hip radiograph illustrating abnormal hip morphology (cam lesion femoroacetabular impingement) characterised by a raised alpha angle

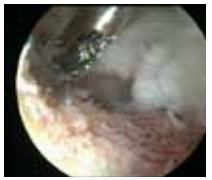


Figure 2 (centre): Arthroscopic debridement of the cam lesion to recontour the femoral head-neck junction. This is a proposed strategy for preventing the development and progression of osteoarthritis

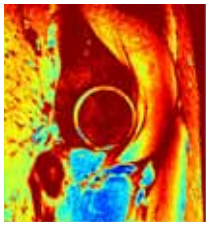


Figure 3 (bottom): Physiological MRI (dGEMRIC) of the hip (sagittal view) showing early degenerative change of the superior acetabulum

3 HIF-regulating scaffolds for osteochondral regeneration

Researchers Mr Dheraj Kumar Taheem, Dr Eileen Gentleman and Dr Gavin Jell

Institution King's College London

Study stream PhD

Duration 36 months

Grant amount £75,000

Focus Biomaterials, osteoarthritis treatment, tissue engineering

Dr Eileen Gentleman

1. What is the basic problem that you are trying to address?

The soft cartilage that covers the ends of bones and aids in smooth joint movement can be damaged, leading to problems whilst carrying out normal activities such as walking and climbing stairs. Once damaged, cartilage usually cannot heal itself, which could lead to osteoarthritis. Unfortunately, surgeries to repair damaged cartilage are sometimes unsuccessful or do not completely fix the problem. For this reason, we are trying to develop a new way to repair damaged cartilage by replacing it with living bone-cartilage plugs, created in the laboratory, that heal to the bone underneath and look and work like normal tissue. Importantly, we are focusing on re-creating an important feature of cartilage - that it has low oxygen levels - as we know that the lack of oxygen stimulates stem cells to become cartilage cells and helps them to create normal healthy cartilage tissue.

2. What is the estimated incidence of this particular problem in the general population?

The exact number of people who damage their cartilage, creating cartilage lesions, is unknown. This is because symptoms vary among patients and sometimes do no arise for a long period of time after the initial injury. Osteoarthritis, which is thought to develop as a result of cartilage lesions which do not heal (among other factors), affects over 40% of people over the age of 70.

3. What are the aims and objectives of this research study?

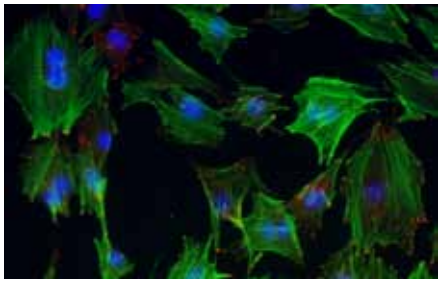
The goal of this project is to use bone marrow-derived stem cells embedded within 3D scaffolds to create living bone-cartilage plugs in the laboratory that will both look and work like healthy bone and cartilage. We plan to achieve this by chemically modifying the scaffolds that trap the cells. This will create the effects of a low oxygen environment on one side, which will stimulate the cells to form cartilage, and a normal oxygen environment on the other, which will encourage them to form bone. We will then use biology and engineering techniques to determine how closely the tissue we have created in the laboratory matches healthy, normal bone and cartilage.

4. Is this research going to solve the problem?

The bone-cartilage plugs we create in the laboratory have the potential to eventually repair cartilage lesions and prevent osteoarthritis in some patients. However, thoroughly evaluating the constructs to understand if they will work takes time and will require further experiments, including testing in animals.

5. What are the long-term benefits to patients with this problem?

By creating living pieces of cartilage combined with bone in the laboratory, we may be able to surgically repair cartilage lesions and prevent patients from developing osteoarthritis. Recreating the specific conditions, particularly the levels of oxygen, is vital in ensuring that the correct type of tissue is formed, and should allow the plugs to heal to the bone underneath. We do not plan to offer the plugs we will create here to patients as part of this programme, but if we are successful at creating these tissues in the laboratory, we will try them in animals. If our tissue plugs can repair damaged cartilage in animals' joints, they could eventually be offered to some patients.



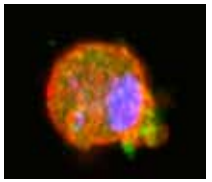


Figure 1 (top):
Mouse osteoblast cells cultured on titanium dioxide surfaces with controlled surface energy. Focal adhesions are appear red, whilst the actin cytoskeleton is stained green.

Figure 2 (above left):
A bone-marrow mesenchymal stem cell encapsulated in a thiolated hyaluronic acid (HA-SH) and poly(ethylene glycol) diacrylate (PEGDA) hydrogel. The cells were stained with fluorescence dyes to show the cell membrane (red), the nucleus (blue) and vinculin (green), a membrane protein involved in cell attachment. These images were obtained using a two-photon fluorescence microscope.

Figure 3 (above right):
Erasmus student Baptiste Pollin carrying out an immunostaining technique in the department.

4 Can activation of lysyl oxidase-like 1 induce repair of osteoarthritic cartilage?

Prifysgol Abertawe
Swansea University

Researchers Dr Yadan Zhang, Dr Ilyas M Khan and Professor Charles W Archer

Institution Swansea University

Study stream Post-Doc

Duration 18 months

Grant amount £68,549

Focus Osteoarthritis treatment, tissue engineering

The team, left to right, in the 'hot desk' area of the new £23 million pound Institute of Life Sciences Building (ILS2 at Swansea University:

Ben Morgan (PhD student)
Dr Yadan Zhang (research scientist)
Dr Ilyas Khan (Group Leader)

1. What is the basic problem that you are trying to address?

We are trying to understand why osteoarthritic (OA) joints of patients rarely recover. It has been known for many years that cartilage from OA patients does make an attempt to repair itself and in doing so it becomes immature. However, OA cartilage can't go back to its normal mature state very readily because the factors that enable this transition are not present at the same levels as they were in young adults. The immature cartilage is less resilient than normal mature adult cartilage and will eventually fail, leading to a vicious cycle of immature repair and failure, until all the cartilage is eroded. We discovered the identity of the missing factors and also the identity of a gene, LOXL1, these factors activate whose major function is to modify collagen, the major structural protein of cartilage.

2. What is the estimated incidence of this particular problem in the general population?

Osteoarthritis is the leading cause of disability in the UK, it is estimated that one third of adults over the age of fifty suffer from some form of osteoarthritis.

3. What are the aims and objectives of this research study?

This application tests if activation of a gene, LOXL1, repairs osteoarthritic cartilage.

4. Is this research going to solve the problem?

Our preliminary data suggests that activation of a gene LOXL1 significantly improves the cartilage from osteoarthritic patients. Collagens are the proteins that provide the scaffold-like structure that holds our cartilage together. The collagen in osteoarthritic patients is being constantly made but without LOXL1 can't form the correct scaffold-like structure, this is why diseased joint rarely recover. By deliberately activating LOXL1, the remaining collagen can be knitted together to repair the cartilage and restore function.

5. What are the long-term benefits to patients with this problem?

There are currently no effective medicines for people suffering from osteoarthritis. Our work has shown that repair of collagen in diseased joints is possible, and therefore provides hope that function can be restored.

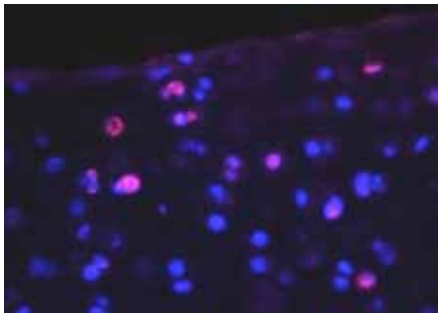


Figure 1 (top):
Dr Ilyas Khan examines a plastic dish holding cartilage samples used in an ORUK funded study to determine if damage to cartilage can be stabilised or reversed.

Figure 2 (centre):
Dr Zhang who has over ten years of lab experience teaches new PhD student Ben Morgan lab techniques.

Figure 3 (bottom):
Cells in cartilage normally do not divide, however inducing cells to divide is a pre-requisite to healing as it is these cells that will produce the new matrix that repair injured or osteoarthritic cartilage. In this image cells in cartilage have been stimulated to divide using a combination of growth factors, dividing cells are labelled purple and non-dividing cells are blue.

5 Designing a robust process for clinical translation of tissue engineered bone to bone ligament replacements

Researchers Dr Jennifer Paxton, Professor Liam Grover, Dr Alastair Campbell-Ritchie and Mr Edward Davis

Institution University of Birmingham and University of Nottingham

Study stream Post-doctoral

Duration 24 months

Grant amount £80,000

Focus Tissue engineering, knee, biomaterials

1. What is the basic problem that you are trying to address?

Every year many individuals damage ligaments usually while undertaking a sporting activity. Ligament rupture typically requires that the patient undergo invasive surgical reconstruction. A range of options is open to the surgeon, which can include the use of synthetic materials or tissue that is taken either from the patient or a dead body. At present, these methods of reconstruction are not ideal. Tissue taken from the patient must be harvested and this can cause serious pain and instability in the donor structures. Synthetic materials that are used in reconstruction have an unacceptably high incidence of osteoarthritis. Even when successful, surgical regeneration using these methods rarely results in a perfect repair and many athletes and sports people at the top of their game rarely fully recover their athletic ability after reconstruction (Michael Owen and Alan Shearer). The technology to be developed here would aim to resolve the problems associated with current ligament repair methodologies.

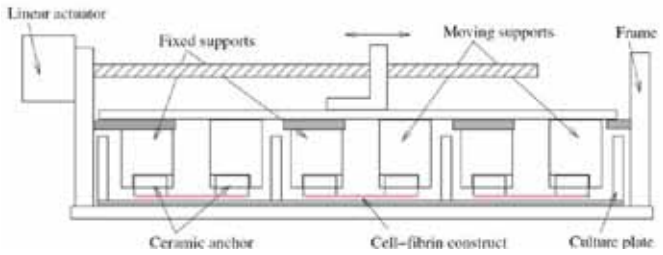


Figure 1:
A schematic diagram displaying the design of the bioreactor and the position of the constructs for mechanical conditioning.
A new bioreactor was designed and built during the initial stages of the project. This allows ligament constructs to be formed in situ and for mechanical conditioning to be applied as soon as the constructs are formed.

Figure 2:
Brushite cement anchors used as bone-mimicking tissue supports during formation of the bone-to-bone ligament constructs.

2. What is the estimated incidence of this particular problem in the general population?

The incidence of ligament damage in the developed world is high. Considering only the anterior cruciate ligament, there are 100,000 ruptures in the US per year (0.05% of the population). Since this technology could be applied to a range of other ligament and tendon ruptures (reattachment of the achilles tendon, rotator cuff repair), it is reasonable to assume that this technology could be of benefit to a significantly higher proportion of the population.

3. What are the aims and objectives of this research study?

We have developed a method to grow ligaments in culture dishes in our laboratory. Although we have had some extremely encouraging results, we have found that how quickly we can grow the ligaments, and how strong they are depends strongly on the cell types and materials that we use. Clearly, to be of benefit in humans, it is important that we can grow human tissues using human cells in a predictable way. In the proposed work, we have two main objectives. The first is to develop a method to grow human tissue using human cells, using the work that we have already undertaken with animal cells to guide us. Second, we will develop a bioreactor system that will allow us to grow human tissues in a precisely defined mechanical environment. By the end of the study, we will have structures that can be used for pre-clinical trials in humans.

4. Is this research going to solve the problem?

This research will provide an essential step for translating this highly promising technology to the clinic. We feel that ultimately this technology will solve the problems that are associated with current methods of surgical reconstruction of diseased and damaged ligaments.

5. What are the long-term benefits to patients with this problem?

The long-term benefits of this technology to patients and the NHS would be substantial. It should provide an improvement on the efficacy of currently available ligament regeneration technologies that cause significant pain as a result of the harvesting procedure and the high long-term chances of developing osteoarthritis following reconstruction. If this technology is able to reduce the number of complications associated with reconstruction, it should also provide a cost benefit to the NHS by reducing the need for revision surgeries or further medical treatments.

6 Electrical Stimulation Optimisation for Bone Healing

Researchers Dr Sarah Cartmell and Mr Richard Balint

Institution University of Manchester

Study stream PhD

Duration 24 months

Grant amount £50,000

Focus Biomaterials, bone biology

Mr Richard Balint and Dr Sarah Cartmell

1. What is the basic problem that you are trying to address?

The basic problem that we are addressing is improving current methods to treat bone fracture. In particular, two very difficult to heal bone fractures: non-unions and large size defects. Non-unions, as the name suggests, are fractures where the natural union (healing) of the bone does not happen due to some reason, let that be the age of the patient or some genetic cause. Large size defects, similar to non-unions, are defects that cannot heal through natural means, but this time due to the shear size of the missing bone segment. Large size defects can occur as a result of serious bone fractures or for example, if a large section of the bone had to be removed for surgical reasons (for example because a bone tumour had to be removed).

2. What is the estimated incidence of this particular problem in the general population?

Every year around 2.4% of the population suffers a fracture. One tenth of these result in a non-union or large size defect, which means the NHS has to treat approximately 150,000 non-unions and large size defects per year. This is a very high number.

3. What are the aims and objectives of this research study?

Tissue engineering is a novel technology that promises to tackle these problems. In tissue engineering we are aiming to grow tissues using cells taken from the patient. The tissue once grown can then be implanted back into the patient to replace missing, damaged or diseased tissue.

In hospitals throughout the UK electrical stimulation is currently applied to facilitate bone healing with proven benefits for patients. As electrical stimulations is known to work in the clinical setting, we believe it could also be used in aid of engineering bone tissue, creating better quality implants faster. Thus we are aiming to develop electrical stimulation into a useful tool for tissue engineering.

4. Is this research going to solve the problem?

This research project alone cannot make the problem of non-unions and large size defects go away, but it will contribute significantly to the process. Together with other scientific studies currently undertook, we believe our work will help develop engineered tissue into a useful, cost-effective and widely available medical tool.

5. What are the long-term benefits to patients with this problem?

Patients with non-unions and large size defects suffer daily from severe pain, seriously reduced mobility and a diminished quality of life. Though current therapies can offer a full recovery, they do not always work. They may also require bone to be removed from another part of the patient's body and re-implanted into the defect, which results in more pain and a prolonged healing process. Our treatment has the potential to offer a full recovery from these diseases with greater reliability and do so with a faster healing time.

Applying for funding

General Research Funding (GRF)

We have a four stage process for reviewing applications for the General Research Funding (GRF) call.

Each proposal is scored based on the following assessment criteria:

a) Scientific structure of the research proposal

b) Feasibility of aims, objectives and novelty claims

c) Background to investigation

d) Methodology

e) Project timeline and deliverables

f) Requested budget, facilities and resources of the host institute

g) Relevance to orthopaedics and musculoskeletal systems

h) Research impact

i) Research risk, originality

j) Adequate demonstration of good research value for the benefit of patients

Those proposals that receive top scores by the external reviewers will then be forwarded to the SAC, which acts as our internal review panel.

Stage 1: Scientific Advisory Committee (SAC) Preliminary Review

Using the ORUK link applicants submit their Expressions of Interest (EoI) for scrutiny by our SAC committee. The maximum length of the EoI should be no more than 700 words (including references). The scientific content and quality of the EoI are carefully assessed by the SAC using a grading system, and those that are successful at this stage will be invited to submit a full proposal. The EoI can be submitted in an un-blind format.

Those not within the remits are rejected at this stage. This may be for a number of reasons: the project may not be related to orthopaedics, the study may be taking place outside the UK or the applicant may be requesting for more money than the specific call allows. Successful applicants are invited to submit their full proposal. bringing movement to life

Stage 2: External Review

Successful applicants from Stage 1 are invited to submit their full proposal application. The full proposal must be blinded. Applicants MUST ensure that there is no mention of the names of individuals (researcher/supervisor/collaborator), institutions/places/partner organisation or any other terms or descriptions that could reveal their identity to the external reviewers (Sections 2-7). Applicants also need to blind papers published by them that have been referenced in the proposal (Section 7). In addition, all attachments apart from the CVs must be blinded. Short CVs of all the individuals involved with the project (principal investigator, co-investigator(s), and researcher) must be submitted.

The blind proposals are sent to at least three external reviewers. These reviewers may have been suggested by the applicant. The external reviewers are asked to use a scoring system to rate the scientific quality of the proposal.

Stage 3: SAC Secondary Review

The SAC then convenes and views the full proposals and the opinions of the external reviewers. The SAC ranks those approved proposals, using a scoring system similar to that used by the external reviewers, and makes recommendations to the Board of Trustees.

Stage 4: Board of Trustees Review

The Board of Trustees reviews the assessment by the SAC and approves their recommendation, subject to the terms and conditions of the standard academic agreement.

Study streams

All study streams (PhD, MD, Post-Doc, and Clinical Fellowship) are invited to submit their applications.

ORUK grant contribution

Orthopaedic Research UK's contribution towards a GRF project is 100%. Applicants are invited to submit their research proposals without any collaborator or partner organisation should they wish to do so.

Study stream	Maximum duration (months)	Total cost	Cost (per annum)
PhD	36	£75,000	£25,000
MD	24	£60,000	£30,000
Post-Doc	24	£100,000	£50,000
Clinical Fellowship	24	£100,000	£50,000

Applying for funding

Translational Research Funding (TRF)

We have a four stage process for reviewing applications for the Translational Research Funding (TRF) call.

Each proposal is scored based on the following assessment criteria:

a) Scientific structure of the research proposal

b) Feasibility of aims, objectives and novelty claims

c) Background to investigation

d) Methodology

e) Project timeline and deliverables

f) Requested budget, facilities and resources of the host institute

g) Support from the partner organisation

h) Clinical impact

i) Research risk, originality and commercial opportunity

j) Adequate demonstration of good translational value for the benefit of patients

Those proposals that receive top scores by the external reviewers will then be forwarded to the SAC, which acts as our internal review panel.

Stage 1: Scientific Advisory Committee (SAC) Preliminary Review

Using the ORUK link applicants submit their Expressions of Interest (EoI) for scrutiny by our SAC committee. The maximum length of the EoI should be no more than 700 words (including references). The scientific content and quality of the EoI are carefully assessed by the SAC using a grading system, and those that are successful at this stage will be invited to submit a full proposal. The EoI can be submitted in an un-blind format.

Moreover, those not within the remit are rejected at this stage. This may be for a number of reasons: the project may not be related to orthopaedics, the study may be taking place outside the UK, the project doesn't have a partner organisation or the applicant may be asking for more money than the specific call allows. Successful applicants are invited to submit their full proposal. bringing movement to life

Stage 2: External Review

Successful applicants from Stage 1 are invited to submit their full proposal application. The full proposal must be blinded. Applicants MUST ensure that there is no mention of the names of individuals (researcher/supervisor/collaborator), institutions/places/partner organisation or any other terms or descriptions that could reveal their identity to the external reviewers (Sections 2-8). Applicants also need to blind papers published by them that have been referenced in the proposal (Section 9). In addition, all attachments apart from the CVs must be blinded. Short CVs of all the individuals involved with the project (principal investigator, co-investigator(s), and researcher) must be submitted. Moreover, an un-blind profile of the partner organisation must also be submitted.

The blind proposals are sent to at least three external reviewers. These reviewers may have been suggested by the applicant. The external reviewers are asked to use a scoring system to rate the scientific quality of the proposal.

Stage 3: SAC Secondary Review

The SAC then convenes and views the full proposals and the opinions of the external reviewers. The SAC ranks those approved proposals, using a scoring system similar to that used by the external reviewers, and makes recommendations to the Board of Trustees.

Stage 4: Board of Trustees Review

The Board of Trustees reviews the assessment by the SAC and approves their recommendation, subject to the terms and conditions of the standard academic agreement.

Study streams

All study streams (PhD, MD, Post-Doc, and Clinical Fellowship) are invited to submit their applications.

ORUK grant contribution

The maximum ORUK contribution towards a TRF project is 75%. We would however prefer partner organisations to contribute to the cost of the project by match funding.

Study stream	Maximum duration (months)	Total cost	Cost (PA)	Maximum ORUK contribution (PA)	Minimum partner organisation contribution (PA)
PhD	36	£75,000	£25,000	£18,750	£6,250
MD	24	£60,000	£30,000	£22,500	£7,500
Post-Doc	24	£100,000	£50,000	£37,500	£12,500
Clinical Fellowship	24	£100,000	£50,000	£37,500	£12,500

Complete list of funded research projects

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
1	401	University of Oxford	PhD (36 months)	*Factors contributing to chrondoplasia in degenerate rotator cuff disease* Dr Hannah Cornell, Dr Philippa Hulley and Professor Andy Carr	£74,900
2	402	King's College London	PhD (36 months)	*Hydroxyapatite as a scaffold carrying BMPs for enhanced osseoinductivity* Dr Sofie Rebeling, Dr Sanjukta Deb and Professor Lucy Di Silvio	£62,436
3	403	University of Cambridge	MD (12 months)	*Carbonate substituted hydroxyapatite: is resorption responsible for increased bioactivity?* Mr Gavin Spence and Professor Neil Rushton	£35,140
4	404	Queen Mary, University of London	PhD (36 months)	*Development of a self-assembly technique for drug deliverable HA coating for Ti based implants* Dr Elnaz Ajami and Professor Xiao Guo	£54,800
5	405	University of Cambridge	PhD (36 months)	*Characteristics of the HA coated implants using high resolution imaging* Dr Patrick Marti and Professor Serena Best	£73,780
6	406	Imperial College London	PhD (36 months)	*Preclinical testing and design of shoulder prosthesis* Professor Anthony Bull and Dr Dominic Southgate	£80,590
7	407	Newcastle University and Imperial College London	PhD (36 months)	*Modelling of finite element analysis of shoulder implants* Professor Garth Johnson and Dr Milad Masjedi	£69,741
8	408	Imperial College London	Clinical Fellow (12 months)	*Three dimensional digitisation of the bones of the human elbow* Professor Srinath Kamineni	£52,995
9	409	University of Oxford	PhD (24 months)	*Blood Flow in the Femoral Head* Professor David Murray and Dr Richie Gill	£106,536
10	411	Dewsbury & District Hospital	Clinical Fellow (12 months)	*Primary total hip arthroplasty using HAC coated endoprosthesis: A study of 655 cases* Mr Raghu Raman	£7,850

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
11	413	University of Oxford and Salisbury and District Hospital	Clinical Fellow (36 months)	*Radiostereometic (RSA) analysis of 2 uncemented stems* Professor David Murray, Professor Andy Carr, Dr Richie Gill, Mr Graham Rushforth	£101,0905
12	414	Worthing & Southlands NHS Trust	Clinical Fellow (12 months)	*Furlong Fellowship in Lower Limb Arthroplasty* Mr Kerry Acton and Mr John Edge	£84,300
13	414a	Worthing & Southlands NHS Trust	Clinical Fellow (12 months)	*Furlong Fellowship in Lower Limb Arthroplasty* Mr Richard Hargrove and Mr John Edge	£63,225
14	415	RNOH Stanmore (UCL) and Royal Free Hospital	Clinical Fellow (12 months)	*Does hip resurfacing cause immune dysfunction?* Mr Alister Hart and Professor David Marsh	£50,000
15	416	University of Oxford	Post-Doc (24 months)	*Knee replacement kinematics* Professor David Murray and Dr Richie Gill	£93,526
16	417	University of Oxford	Post- Doc (36 months)	*Osteoclastogenic responses of patients with metal-on-metal prostheses* Dr Guillaume Mabilleau Dr Afsie Sabokbar, Professor David Murray and Dr Richie Gill	£150,208
17	418	University of Cambridge	Post-Doc (24 months)	*Drug delivery from the Furlong H-A-C Hip* Deborah Ireland, Dr Roger Brooks and Professor Neil Rushton	£121,650
18	419	University of Southampton	Post-Doc (12 months)	*Validate volumetric shape of femur using FEA, MRI, CT* Professor Mark Taylor, Mr John Shepperd	£65,766
19	420	Imperial College London	Clinical Fellow (6 months)	*Quantification of the Biomechanics of the arthroplasty and their relationship to functional outcome* Mr Vijayaraj Kannan and Professor Justin Cobb	£24,926
20	421	Imperial College London	Clinical Fellow (12 months)	*3-D Preoperative planning system* Professor Justin Cobb	£26,024

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
21	423	Imperial College London	Clinical Fellow (12 months)	*Integrity of the repaired rotator cuff: A roentgen stereophotogrammetric analysis with ultrasound comparison* Dr Toby Baring, Professor Andrew Amis and Mr Roger Emery	£53,000
22	424	Imperial College London	Clinical Fellow (36 months)	*Shockwave treatment for infected prostheses, an experimental study* Dr Moustafa Hafez and Mr Richard Coombs	£97,641
23	425	Imperial College London	Clinical Fellow (12 months)	*Computer Assisted Hip Arthroplasty* Mr Vijayaraj Kannan and Professor Justin Cobb	£50,000
24	426	University of Bath	Post-Doc (24 months)	*Fabrication and compatibility testing of a new generation of structural bioceramic bone graft substitutes* Dr Irene Turner and Professor Tony Miles	£81,266
25	427	University of Cambridge	MPhil (24 months)	*Reinforcing Hydroxyapatite with Carbon Nanotubes* Professor N. Rushton and Dr Osa Emohare	£93,256
26	429	University College London (RNOH)	Clinical Fellow (24 months)	*Whole blood metal ion levels, immune responses and chromosomal analysis in patients with MoM and MoPe hip articulations* Mr Baljinder Dhinsan, Mr Ben Spiegelberg and Professor Tim Briggs	£120,000
27	430	University of Leeds	Post-Doc (36 months)	*Tribology of bearing surfaces for hip prosthesis* Professor John Fisher, Dr Louise Jennings, Dr Alsion Galvin and Dr Mazen Al-Hajjar	£292,480
28	431	University College London	PhD (36 months)	*Electrohydrodynamic deposition of nano-sized calcium phosphate* Professor Mohan Edirisinghe and Dr Jie Huang	£90,000
29	432	Imperial College London	Clinical Fellow (12 months)	*Relationship between metal wear debris speculation and immune dysfunction in patients* Mr Alister Hart	£70,0000
30	433	Imperial College London	Clinical Fellow (24 months)	*Mapping metal nano particles in human tissues exposed to MoM hip replacement wear debris* Mr Alister Hart	£74,000

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
31	434	Imperial College London	PhD (24 months)	*Computer assistance in early knee disease* Dr Farhad Iranpour-Boroujeni and Professor Justin Cobb	£69,500
32	435	Imperial College London	MD (24 months)	*Minimally invasive navigated reduction and fixation of acetabular fractures* Mr Amgad Nakhla and Professor Justin Cobb	£63,000
33	436	Imperial College London	PhD (24 months)	*Navigated hip arthroplasty: image-free or CT based?* Mr Vijayaraj Kannan and Professor Justin Cobb	£40,000
34	437	University of Oxford	Post-Doc (24 months)	*Effect of cobalt chrome nanoparticles on bone volume and microarchitecture* Dr Guillaume Mabilleau and Dr Afsie Sabokbar	£30,000
35	438	The Rizolli Institute	Post-Doc (12 months)	*A comparative study of metal ion analysis with MoM hip resurfacing and 28mm MoM THR: data at medium-term* Professor Antonio Moroni	€50,000
36	439	The Rizolli Institute	Post-Doc (12 months)	*A radiostereometric study of the effect of hydroxyapatite coating of the lag screw of the intramedullary hip screw on the fixation achieved in osteoporotic trochanteric fractures* Professor Antonio Moroni	€50,000
37	440	University of Strathclyde	Post-Doc (24 months)	*Finite element computer models of the load transfer characteristics in normal and pathological wrists* Dr Magnus Gislason and Professor Sandy Nicol	£89,000
38	441	University of Oxford	Clinical Fellow (24 months)	*Furlong scholars for a Tropical Orthopaedic Clinic* Miss Verona Beckles, Mr Paul Harnett and Professor Chris Lavy	£75,901
39	442	University of Oxford	Clinical Fellow (12 months)	*The aetiology of tibia vara in Malawaian children and outcome following corrective surgery* Mr Robert Freeman and Professor Chris Lavy	£13,575
40	443	University of Aarhus	PhD (24 months)	*Long term clinical outcome of revision hip surgery* Professor Kjeld Søballe and Mette Sørensen	£140,000
41	444	University College London	Clinical Fellow (12 months)	*Study and osteogenesis of the tibia: use of vibration therapy* Dr Ian Clark and Professor David Marsh	£23,048

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
42	445	London School of Hygiene and Tropical Medicine	Clinical Fellow (12 months)	*Pilot study for the development of a patient reported outcome measure (PROM) for child with musculoskeletal impairments in Malawi* Dr Yasmin Alavi, Dr C Gilbert and Professor Chris Lavy	£7,500
43	446	University of Cambridge	MD (24 months)	*A study into a novel method of impaction bone grafting* Mr Iain McNamara, Professor Serena Best and Professor Neil Rushton	£83,000
44	447	University of Cambridge	PhD (24 months)	*Evaluating cell function on Hydroxyapatite-Multiwalled Carbon Nanotubes Surfaces* Dr Osa Emohare, Dr Roger Brooks, Dr Serena Best and Professor Neil Rushton	£74,000
45	448	University of Oxford	PhD (24 months)	*In vitro model of distraction osteogenesis* Miss Cynthia Chang and Dr Philippa Hulley	£24,447
46	449	University of East Anglia	Post-Doc (24 months)	*The role of specific metalloproteinases in Dupuytren's disease* Dr Janine Morris, Professor Ian Clark and Mr Adrian Chojnowski	£76,726
47	450	The Radboud University Nijmegen Medical Centre	PhD (36 months)	*Prediction of fracture risk with metastatic lesion* Ms Loes Deriks, Professor Nico Verdonschot and Dr Esther Tanck	€120,000
48	451	University College London	PhD (36 months)	*Exploring the microstructure and mechanical properties of CoCrMo orthopaedic alloys* Mr Bhairav Patel and Professor Mohan Edirisinghe	£94,000
49	452	University of Oxford	Post-Doc (36 months)	*Elucidating the roles of pyrophosphate metabolism and ANKH, key factors in the regulation of calcification in health and disease* Dr Peter Cain, Dr Yun Zhang, Dr Jim Dunford, Professors Paul Wordsworth, Graham Russell and Professor Andy Carr	£155,527
50	453	University of Warwick	PhD (24 months)	*The role of platelet rich plasma in accelerating the healing of intracapsular fractures of the proximal femur* Mr Xavier Griffin, Mr Matt Costa and Professor Damian Griffin	£93,930

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
51	454	Worthing and Southlands NHS Trust	Clinical Fellow (12 months)	*Furlong Fellowship in Lower Limb Arthroplasty* Mr Nirav Shah and Mr John Edge	£84,300
52	455	University of Cambridge	Post-Doc (24 months)	*Drug delivery from the Furlong H-A.C Hip* Dr Priya Kalia, Dr Roger Brooks and Professor Neil Rushton	£105,349
53	456	University of Manchester	Post-Doc (12 months)	*Mechanisms underlying cellular sentence in degeneration of the intervertebral discimplications for novel repair strategies* Dr Sarah Heathfield and Professor Judith Hoyland	£46,527
54	457	University of Brighton	PhD (36 months)	*Nanostructured, biocompetent biomaterials for early diagnosis & treatment of osteoporotic fractures* Mr Lubinda Mbundi and Professor Matteo Santin	£89,000
55	458	University of Oxford	PhD (36 months)	*Correlating mechanical properties and matrix biology of articular cartilage in the knee* Ms Monica Armengol and Dr Richie Gill	£73,129
56	459	Western Sussex Hospitals NHS Trust	Clinical Fellow (12 months)	*Furlong Fellowship in Lower Limb Arthroplasty* Mr Nirav Shah and Mr John Edge	£84,300
57	460	University of Oxford (Furlong-BOTA Fellowship)	PhD (24 months)	*The patho-aetiology of hip osteoarthritis* Mr Geraint Thomas and Mr Sion Glyn-Jones	£44,299
58	461	University College London	PhD (18 months)	*Functional smart deposition of nano-sized calcium phosphate for medical applications* Mrs Gillian Munir, Dr Jie Huang and Professor Mohan Edirisinghe	£30,000
59	462	Western Sussex Hospitals NHS Trust	Clinical Fellow (12 months)	*Furlong Fellowship in Lower Limb Arthroplasty* Mr George Joseph and Mr Nirav Shah	£47,000
60	463	University of Bristol	PhD (36 months)	*Could physiologically relevant orthopaedic ions cause indirect DNA and chromosome damage to human embryonic stem cells across a trophoblast cell barrier?* Miss Anna Rogers and Dr Patrick Case	£60,000

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
61	464	Imperial College London	PhD (36 months)	*Injectable cellular constructs from human mesenchymal stem cells for translational bone tissue engineering* Miss Anastasia Georgion and Professor Sakis Mantalaris	£60,000
62	465	Queen Mary, University of London & University College London	PhD (36 months)	*The use of antimicrobial nanomaterials as coatings for the next generation of prostheses* Mr Kaveh Memarzadeh, Dr Rob Allaker and Dr Jie Huang	£60,000
63	466	University of Sheffield	PhD (36 months)	*Porous metal implants for enhanced bone in-growth and stability* Mr William van Grunsven, Dr Gwendolen Reilly and Dr Russell Goodall	59,209
64	467	Queen Mary, University of London	PhD (36 months)	*Complex mechanical loading of cell-seeded constructs can lead to functional repair of cartilage defects* Ms Erica Di Federico and Professor Julia Shelton	£60,000
65	468	University of Manchester	PhD (36 months)	*Effect of mesenchymal stem cell ageing on the efficacy of musculoskeletal tissue engineering / regeneration strategies* Miss Kimberley Swinton, Dr Stephen Richardson and Professor Judith Hoyland	£60,000
66	469	University of Edinburgh	PhD (36 months)	*Optimising fixation in osteoporotic bone fractures* Mr Alisdair MacLeod, Dr Pankaj Pankaj and Professor Hamish Simpson	£60,000
67	470	University of Oxford	PhD (36 months)	*Bone activity of vitamin D2 vs. D3* Mr Ali Zarei and Dr Afsie Sabokbar	£60,000
68	471	Royal Veterinary College	Post-Doc (24 months)	*Optimising shoulder replacement by selecting ideal target bone for fixation* Dr Mittal Shah, Professor Andrew Pitsillides and Professor Roger Emery	£80,000
69	472	University of Birmingham	Post-Doc (24 months)	*Development of tissue engineered ligaments with titanium spring reinforcement* Dr Neeraj Jumbu, Dr Rachel Sammons and Dr Liam Grover	£79,815

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
70	473	King's College London & University College London	Post-Doc (24 months)	*Development of a 'bioconnecting' nanoscomposite scaffold for hard and soft tissue repair and regeneration* Dr Priya Kalia, Professor Lucy Di Silvio and Dr Jie Huang	£80,000
71	474	University College London	Post-Doc (24 months)	*Investigation of interlocked bioactive coating for orthopaedic applications* Dr Rafique Nangrejo and Professor Mohan Edirisinghe	£40,000
72	475	Cardiff University	Post-Doc (24 months)	*Why is post-traumatic arthritis more common than primary arthritis in the ankle?* Dr Emma Blain and Professor Victor Duance	£24,000
73	476	Cardiff University	Post-Doc (12 months)	*The Relationship between Alignment, Function and Loading in Total Knee Replacement: In-Vivo Analysis of a Unique Patient Population* Mr Andrew Metcalf and Dr Cathy Holt	£39,416
74	477	University of Edinburgh	Clinical Fellow (24 months)	*The effect of Staphylococcus aureus alpha and gamma toxins on in situ bovine and human chondrocytes* Dr Innes D M Smith and Professor Hamish Simpson	£79,998
75	478	University of Oxford	Post-Doc (24 months)	*Modelling mechanical signalling at the bone-tendon interface* Dr Philippa Hulley	£80,000
76	479	University of Oxford	Clinical Fellow (12 months)	*Investigation into synovial fluid markers of disease activity in knee osteoarthritis* Mr Chethan Jayadev, Professor Andrew Price and Dr Philippa Hulley	£40,000
77	480	Queen's University Belfast	Post-Doc (24 months)	*A Minimally Invasive Solution for the Treatment of Spinal Fractures* Dr Nicholas Dunne, Professor Fraser Buchanan, Professor Serena Best & Professor Ruth Cameron	£80,000
78	481	University of Oxford	Post-Doc (12 months)	*Is HLA-B27 expression abnormal in Ankylosing Spondylitis joints?* Ms Kirsty McHugh and Dr Paul Bowness	£39,944
79	482	Sheffield Children's NHS Foundation Trust	Clinical Fellow (24 months)	*Acute response of bone to vibration in boys who have previously fractured* Ms Rachel Harrison and Professor Nick Bishop	£71,540

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
80	483	Royal Veterinary College	Post-Doc (24 months)	*Identification of Optimal Clonal Subpopulations Within Bone Marrow Derived Mesenchymal Stem Cells for Bone and Cartilage Repair* Mr Wasim Khan, Professor David Marsh and Dr Jay Dudhia	£36,700
81	484	University of Sheffield & The National Osteoporosis Society	PhD (24 months)	*The effects of obesity on bone structure and strength* Dr Jennifer Walsh and Professor Richard Eastell	£50,000
82	485	University College London	Post-Doc (24 months)	*The Effect of Head Size, Torsion, Surface Finish and Material Composition on the Corrosion of Modular Tapers in Large Head Metal on Metal Total Hip Replacements* Dr Anna Panagiotidou, Professor Gordon Blunn, Mr John Skinner, Professor Alister Hart	£79,967
83	486	University of Cambridge	Post-Doc (12 months)	*In vitro investigation of plasma sprayed zinc substituted hydroxyapatite* Dr David Shepherd, Professor Serena Best and Dr Roger Brooks	£39,323
84	487	University of East Anglia	Post-Doc (24 months)	*Dietary-derived diallyl disulphide as a chondroprotective agent in osteoarthritis* Miss Sarah Gardner, Professor Ian Clark, Professor Aedin Cassidy and Professor Simon Donell	£79,319
85	488	University of Manchester	PhD (24 months)	*Optimised electrical stimulation for bone tissue engineering* Mr Richard Balint and Dr Sarah Cartmell	£50,000
86	489	University of East Anglia	MD (24 months)	*Role of Metal Ions in Metal on Metal Hip Arthroplasty* Mr Darren Ebreo, Professor Simon Donell and Professor Ian Clark	£59,924.33
87	490	Queen Mary, University of London & University of East Anglia	PhD (36 months)	*The role of high frequency loading in the treatment of tendinopathy* Miss Chineye Princess Udeze, Dr Hazel Screen, Dr Dylan Morrissey and Dr Graham Riley	£72,913
88	491	St George's, University of London	PhD (36 months)	*The management of early stage degenerative disease of the hip joint. Evaluation of synthetic labro-chondral graft implantation* Mr Francesco Strambi, Mr Richard Field and Dr Andrea Fontana	£75,000

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
89	492	University of Oxford	PhD (36 months)	*Protecting tendon from lifestyle-induced epigenetic and metabolic alterations* Miss Zuzana Kalivodova and Dr Philippa Hulley, Dr Mark Thompson and Dr Raewyn Poulsen	£75,000
90	493	University of East Anglia & Queen Mary, University of London	Post-Doc (18 months)	*Is IL6 a target for therapy of tendinopathy?* Miss Eleanor Jones, Dr Graham Riley, Mr Simon Donell and Dr Hazel Screen	£79,337
91	494	University College London	Post-Doc (12 months)	*TAEA deposition of multifunctional nanoCalcium Phosphate with controlled release of drugs for skeletal tissue repair* Dr Gillian Munir, Dr Jie Huang and Dr Junwang Tang	£39,936
92	495	University of Leeds	Clinical Fellow (24 months)	*Understanding the biology of bone fracture healing: The role of immunoregulatory and regenerative cells as basis of poor prognostic biomarker development* Mr Hiang Boon Tan, Mr Hiang Boon Tan, Dr Elena Jones, Dr Frederique Ponchel, Professor Peter Giannoudis	£80,000
93	496	North Bristol NHS Trust	Post-Doc (12 months)	*Developing a dual-action titanium surface to deter bacteria and enhance osteoblastogenesis* Dr Jason Mansell and Professor Ashley Blom	£47,657
94	497	University of Birmingham	Post-Doc (24 months)	*Designing a robust process for clinical translation of tissue engineered bone to bone ligament replacements* Dr Jennifer Paxton and Dr Liam Grover	£80,000
95	498	Cardiff University	Post-Doc (18 months)	*Can activation of lysyl oxidase-like 1 induce repair of osteoarthritic cartilage?* Dr Yadan Zhang, Dr Ilyas M Khan and Professor Charles W Archer	£68,549
96	499	King's College London	Post-Doc (18 months)	*Stem cell based bone engineered vascular grafts* Dr Priya Kalia and Professor Lucy Di Silvio	£80,000
97	500	The Royal College of Surgeons of England	Clinical Fellow (36 months)	*Surgical Speciality Leads* Professor Matt Costa and Professor Amar Rangan	£45,000

No	ORUK ref.	Institution	Study Stream (Duration)	Research Project Title	Amount
98	501	University of Oxford	MD (24 months)	*Understanding mechanisms of pain and neuronal regulation in tendinopathy* Benjamin Dean, Dr Sarah Franklin and Professor Andrew Carr	£60,000
99	502	King's College London	PhD (36 months)	*HIF-regulating scaffolds for osteochondral regeneration* Dheraj Kumar Taheem, Dr Eileen Gentleman and Dr Gavin Jell	£75,000
100	503	University College London	PhD (36 months)	*The Use of PEEK in Uncemented Shoulder Arthroplasty* Miss Sara Ajami, Dr Melanie Coathup and Professor Gordon Blunn	£75,000
101	504	University of Oxford	PhD (36 months)	*Optimising high tibial osteotomy for the treatment of early OA* Dr Cameron Brown, Professor Andrew Price and Dr Amy Zavatsky	£75,000
102	505	Newcastle University	MD (24 months)	*Is CD64 level an effective test for the early diagnosis and management of joint replacement infection?* Mr Kenneth Rankin and Mr Mike Reed	£59,145
103	506	University of Oxford	Clinical Fellow (24 months)	*Biochemical Markers for the Identification of Individuals at Risk of Developing Osteoarthritis* Mr Antony Palmer, Mr Sion Glyn-Jones, Dr Philippa Hulley and Professor Andrew Carr	£22,740
104	507	University College London Imperial College London	Clinical Fellow (24 months)	*Adolescent hip disease: biomarkers, morphology and PROMS in a longitudinal study* Mr Andreas Roposch, Professor Justin Cobb, Dr Milad Masjedi and Mr Aresh Hashemi-Nejad	£99,817
105	508	University College London	Post-Doc (24 months)	*Will the Intravenous Administration of Mesenchymal Stem Cells Modified to Migrate to the Bone Marrow Increase Bone Formation in Osteoporosis?* Dr Melanie Coathup, Prof Gordon Blunn, Dr Jia Hua and Professor Allen Goodship	£100,000
106	509	University of Oxford	Post-Doc (24 months)	*Does dysfunctional autophagy underlie both ageing-related and mechanical deterioration of cartilage in osteoarthritis* Dr James Edwards, Professor Andrew Price, Dr Sarah Snelling and Dr Mark Thompson	£100,000