Curriculum Vitae

Professor Fergal J. O'Brien

Cert Med Sci, BA, BAI, PhD, CEng, MIEI

Dept. of Anatomy
Royal College of Surgeons in Ireland
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CONTENTS

SUMMARY

Name:	Fergal J. O'Brien
Address (Home):	31 Glencairn Drive, The Gallops, Leopardstown, Dublin 18
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Date of Birth:	5th April, 1976
Place of Birth:	Mullingar, Co. Westmeath, Ireland

Education:

1988-1993:
St. Mary's CBS, Mullingar, Co. Westmeath
1993-1997:
School of Engineering, Trinity College Dublin
1997-2000: PhD Research
Dept. of Mechanical of Engineering, Trinity College Dublin / Dept. of Anatomy, RCSI

Scholarships:

1997 Health Research Board Scholarship
2001 Fulbright Scholarship sponsored by Hewlett Packard

Qualifications:

1997 BA, Trinity College Dublin (TCD)
1997 BAI, TCD
2000 Certificate in Medical Sciences, RCSI
2001 PhD, TCD

Employment:

2001-2002	Postdoctoral Research Fellow: TCD/RCSI
2001-2003	Postdoctoral Research Associate/ Fulbright Scholar: Massachusetts Institute of Technology, USA
2003-2007	Lecturer in Anatomy, RCSI
2004-2009	Lecturer in Biomechanical Engineering (part time), TCD
2006-2007	Senior Lecturer in Anatomy, RCSI
2007-present	Associate Professor, RCSI
2009-present	Adjunct Associate Professor in Biomechanical Engineering, TCD

EDUCATION

2002: Harvard Medical School, Boston, MA
Human Functional Anatomy Course
Intensive 4 month course designed to familiarise medical students with the structure and function of the human body. The course included lectures in human anatomical structure, embryology, biomechanics and human physiology as well as a laboratory component involving prosected demonstration cadavers.

2000: Royal College of Surgeons in Ireland
Certificate in Medical Science
Intensive 2 week full-time course consisting of written and practical work in human anatomy, physiology, molecular biology, pathology and biochemistry. Conferred: January, 2000.

1997- 2000: Royal College of Surgeons in Ireland/ University of Dublin, TCD
PhD Microcracks and the fatigue behaviour of compact bone
Awarded Health Research Board Scholarship to conduct research in the field of bioengineering. This work studied the accumulation of microcracks in bone using a variety of techniques to label and analyse both *in vivo* microcracks and *in vitro* microcracks. The results obtained provide a deeper understanding of the process of microcrack growth and how bone behaves as a material. The project has wide implications in the health care industry in the study of osteoporosis and prosthesis design. A component of the research was carried out in Massachusetts Institute of Technology and Harvard Medical School, Orthopaedic Biomechanics Laboratory in Boston during the summer of 1999. Conferred: July 2001.

1993 – 1997: University of Dublin, Trinity College Dublin
BAI Mechanical Engineering: specialising in manufacturing and materials. (Top 5 placing within mechanical engineering class).
Final year core subjects: computer-aided engineering, mechanics of solids, manufacturing systems, manufacturing technology, failure of materials, tribology, the engineer in society. Conferred: November 1997.
Final year thesis: 'Analysis of fatigue cracks in bone'. Grade: first class honours. This was a project in the field of bioengineering and involved developing a test to initiate fatigue crack growth in bone specimens. As part of the project, the work was presented orally and was awarded the prize for Best Presentation in Mechanical Engineering, 1997.
BA Awarded as part of the engineering programme, subjects included pure mathematics, applied mathematics, numerical methods and statistics. Conferred November: 1997.

EMPLOYMENT AND RESEARCH

2006-present **Associate Professor, Dept. of Anatomy** (Royal College of Surgeons in Ireland)
This is a full time permanent position and involves anatomy lectures, practical classes (dissection) and examinations (written and oral) for 1st and 2nd Medical Year students (5 year and 4 year graduate entry programmes), physiotherapy students, pharmacy students and postgraduate surgical trainees. I have a wide range of administrative responsibilities and sit on a number of academic committees in relation to teaching and exams and also the Committee for the School of Postgraduate Studies and the RCSI Research Executive. I also serve as the Departmental co-ordinator of anatomy teaching for the First Physiotherapy year which involves organising all teaching and examining and regular liaison with the School of Physiotherapy. I have significant experience in curriculum development and was involved extensively in the development and implementation of the new modularised School of Medicine Junior Cycle. As a member of the Junior Cycle Curriculum & Examinations Committee, I was involved in the initial development of the new curriculum and attended all meetings which determined how the modularised Junior Cycle would be taught and the course material which would be included in each module.

2004-present **Adjunct Associate Professor in Biomechanical Engineering (part time)** (Trinity College, Dublin)
This is a part time position and involves teaching and examining students who have enrolled on the All Ireland MSc course in bioengineering run by Trinity College Dublin with the University of Limerick. I am also a Principal Investigator and Member of the Executive (Steering) Committee of the Trinity Centre for Bioengineering and have access to laboratory facilities and supervise postgraduate students registered in TCD.

2001-2003 **Postdoctoral Research Associate/ Fulbright Scholar** (Massachusetts Institute of Technology, Boston, USA)
This position was part of an interdisciplinary research cluster in biomaterials and tissue engineering. Duties involved research in a number of projects in the area of tissue engineering including: development of an artificial graded collagen matrix for use as a bone graft substitute in orthopaedic injuries, measurement of the contractile response of osteoblasts and other cells when seeded to a matrix with the intention of creating new bone. Much of the position was laboratory based but a significant part was a management/ administrative role and involved supervision of MSc, PhD and undergraduate students in a number of different departments. The work was carried out in collaboration with groups in Harvard Medical School, Boston and Cambridge University, United Kingdom.

PRIZES & DISTINCTIONS (Since submission of PhD in 2000)

2011 Appointed a member of Irish Medicines Board Advisory Committee on Medical Devices by the Minister for Health & Children, Mary Harney. Organised and Edited a Special Issue on Tissue Engineering in the *Journal of the Mechanical Behavior of Biomedical Materials*. Represented the Irish scientific community at the 2011 Annual Meeting of the New Champions ('Summer Davos') in Dalian, China. This is the foremost global business gathering in Asia and provides an unparalleled platform for leaders to address the major drivers of growth in the 21st century. 60 young scientists (under 40 years) from around the world were invited to attend.

2010 Elected Treasurer of the Biomedical Engineering Division of Engineers Ireland. Featured as one of ten 'Rising Stars' in research by Science Foundation Ireland in their report – 'Celebrating 10 Years of Discovery'. Top cited article award, Biochemical & Biophysical Research Communications

2009 Featured in an article by the Sunday Independent as one of the 'forty under forty-Whizzkids ready for rebirth of a nation'. One of 3 scientists to be nominated. Promoted to Adjunct Associate Professor of Bioengineering in the Dept. of Mechanical Engineering in TCD. Appointed to the RCSI Research Executive (research steering committee within RCSI, headed by RCSI Deputy CEO, Dr. Terry McWade) as elected head of new Infection, Immunity and Regenerative Medicine Research Cluster. Appointed to Editorial Board of Journal of Biomechanics. Awarded a 2million Euro Starting Independent Researcher Grant by the European Research Council.

2008 Appointed to Executive (Steering) Committee of the Trinity Centre for Bioengineering in Trinity College Dublin. Invited as a Chapter Editor for *'Basic Engineering for Medics and Biologists, An ESEM Primer on Engineering for Medicine'*. The books aims to educate medic/biologists in the basic principles of biomedical engineering.

2007 Appointed as a Subject Editor (Tissue Engineering) for the *Journal of the Mechanical Behavior of Biomedical Materials.* Co-author on a paper which won the Genzyme Award for Excellence in Cartilage Research 2007 at the 7th World Congress of the International Cartilage Repair Society. Guest Editor of a Special Issue of *Technology and Healthcare* 'Tissue Engineering for Orthopaedic Applications'. Appointed to Scientific Advisory Board of Orthomimetics Ltd.

2006 Elected to the Steering Committee of the Biomedical Engineering Division of Engineers Ireland.

2005 Elected for the registered title of Chartered Engineer (CEng) by the Institution of Engineers of Ireland. Recommended by IEI Board as potential candidate for award of Chartered Engineer of the Year and subsequently nominated as one of 6 finalists. Following interview and presentation of showcase project was awarded the prize of Chartered Engineer of the Year. Prize included a John Rocha, Waterford Crystal trophy and a cheque for €2500.

2004 Awarded a Science Foundation Ireland, President of Ireland Young Researcher Award (€1.1 million). This award is SFI's most prestigious award and is aimed at providing consistent funding for researchers from around the world to establish

their research in third level institutions in Ireland. The award was presented at a ceremony in Aras an Uachtarain by the President of Ireland, Mrs. Mary McAleese on 13th October 2004. The funding was used to establish a laboratory for bone tissue engineering in RCSI.

2002 Winner, New Investigator Recognition Award for Outstanding Scientific Paper, 48th Annual Meeting of the Orthopaedic Research Society, Dallas, Texas.

2001 Awarded Fulbright Scholarship (sponsored by Hewlett Packard) to conduct research in the area of bone and tissue engineering at Massachusetts Institute of Technology in collaboration with Cambridge University, UK and Harvard Medical School, Boston, MA.

2000 Awarded 1st prize (IRL£2500) in the University of Limerick Biomedical Institute Annual Research Day sponsored by Boston Scientific.

MEMBERSHIP OF PROFESSIONAL ORGANISATIONS

1998 Member of the Institution of Engineers of Ireland (Engineers Ireland)
Chartered Engineer, 2005
Biomedical Division (BED) Committee Member (2006) & BED Treasurer (2010)

2000 Member of Royal Academy of Medicine in Ireland (RAMI)

2003 Member of the Anatomical Society of Great Britain and Ireland

2003 Member of the Irish Fulbright Alumni Association

2003 Member of the European Society for Engineering and Medicine
Council Member, 2004, Executive Board Member, 2006
Newsletter & Website Editor, 2004-2006

2004 Member of the European Society of Biomechanics

2005 Member of the American Society for Bone and Mineral Research

2006 Member of the Orthopaedic Research Society

2006 Member of Tissue Engineering and Regenerative Medicine International Society

SCIENTIFIC JOURNAL REVIEWER

Acta Biomaterialia
African Journal of Biotechnology
Annals of Biomedical Engineering
Bioinorganic Chemistry and Applications
Biomacromolecules
Biomaterials
Biomechanics and Modeling in Mechanobiology
Biomedical Materials
Biotechnology Progress
Cell Proliferation
Chemical Product and Process Modeling
Clinical Biomechanics
Computer Methods in Biomechanics and Biomedical Engineering
Current Stem Cell Research & Therapy
Critical Reviews in Biomedical Engineering
e Cells and Materials Journal
European Journal of Morphology
International Journal of Artificial Organs
International Journal of Biomaterials
International Journal of Surgery
Journal of Anatomy
Journal of Biomechanics
Journal of Biomechanical Engineering`
Journal of Biomaterials Applications
Journal of Biomaterials Science: Polymer Edition
Journal of Biomedical Materials Research
Journal of Dentistry
Journal of the Mechanical Behavior of Biomedical Materials
Journal of Microscopy
Journal of Orthopaedic Research
Journal of the Royal Society Interface
Journal of Tissue Engineering and Regenerative Medicine
Materials Science and Engineering: C- Materials for Biological Applications
Mechanics of Advanced Materials and Structures
Mechanics Research Communications
Medical Engineering & Physics
Molecular Pharmaceutics
Microscopy Research Technique
Osteoporosis International
PLoS One
Proceedings of the IMechE, Part H, Journal of Engineering in Medicine
Process Biochemistry
Stem Cell Research & Therapy
Surface and Coatings Technology
Technology and Healthcare
Tissue and Cell
Tissue Engineering A, B & C
Trends in Biotechnology

EVALUATION WORK FOR CONFERENCES & PROFESSIONAL BODIES

Evaluation work for grant awarding bodies:
National Science Foundation, USA
Canada Research Chairs Program
National Health and Medical Research Council, Australia
European Research Council
Austrian Science Fund
Biotechnology and Biological Sciences Research, UK
Medical Research Council, UK
The Royal Society, UK
Greek Ministry of Education, Lifelong Learning and Religious Affairs
Israel Science Foundation
Enterprise Ireland

Abstract Reviewer/ Scientific Committee Member:
Orthopaedic Research Society Annual Meetings
European Medical & Biological Engineering Conferences,
International Conferences on Mechanics of Biomaterials and Tissues,
Section of Bioengineering Meetings of the Royal Academy of Medicine of Ireland
European Society for Biomaterials
Tissue Engineering and Regenerative Medicine International Society Annual Meetings

Judge/ Interviewer:
Fulbright Programme,
Engineers Ireland Biomedical Research Medal for Outstanding PhD Research
Engineers Ireland Siemens Medal for Innovation

CONFERENCE/WORKSHOP ORGANISATION

Chairman/Event Organiser:
Special Symposium on 'Mechanical behaviour of cells, scaffolds and engineered tissues' at the 2011 TERMIS, Granada, Spain (Co-Chair)
RCSI Research Day, 2011 (Chairman & Academic Co-ordinator)
Engineers Ireland Biomedical Research Medal: 2007-2011 (Chairman/ Event Organiser)
Special Symposium on 'Tissue Engineering for Orthopaedic Applications' at the 3rd European Medical & Biological Engineering Conference, Prague, 2007 (Co-Chair)
5th Annual Conference of the RAMI Section of Bioengineering Meeting, Jan. 1999 (Co-Chair)
1st Joint Conference of RAMI Section of Bioengineering Meeting and British Orthopaedic Research Society, Oct. 1998 (Co-Chair)

Session Moderator
6th Clare Valley Bone Meeting, Clare, South Australia, 2010
Tissue Engineering International and Regenerative Medicine Society Meetings

European Society of Biomechanics Meetings
World Congress of Biomechanics
International Conference on Mechanics of Biomaterials and Tissues
RAMI Section of Bioengineering Annual Meetings
2nd Regensburg Applied Biomechanics- Medicine meets Engineering Meeting 2007

EDITORIALS

Subject Editor (Tissue Engineering) for the *Journal of the Mechanical Behavior of Biomedical Materials.* Since 2007.
Guest Editor (with Prof. Brendan Harley, University of Illinois) of a Special Issue of *Journal of the Mechanical Behavior of Biomedical Materials* on *'Tissue Engineering'* 2011
Book Chapter Editor (with Prof. Brian O'Connell, TCD) 'Biomaterials and Tissue Engineering' In: *Basic Engineering for Medics and Biologists, An ESEM Primer on Engineering for Medicine,* T.C. Lee, P. Niederer (Eds.) IOS Press, Nieuwe Hemweg, (ISBN: 978-1-60750-526-6). 2010
Guest Editor (with Prof. Clive Lee, RCSI) of a Special Issue of *Technology and Healthcare* 'Tissue Engineering for Orthopaedic Applications', 2007.
ESEM News Editor: Newsletter of European Society for Engineering and Medicine. 2004- 2006.
Website Editor, European Society for Engineering and Medicine. 2004- 2007.
Joint Editor of *Proceedings of 5th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine of Ireland*, Jan. 1999.

THESIS EXAMINER ROLES

External Examiner

2010

PhD Thesis. Matthew Barron, Michigan Technological University, USA 'The use of a 3D perfusion bioreactor with osteoblasts and osteoblast/endothelial cell co-cultures to improve tissue-engineered bone'

PhD Thesis. Yiwei Qiu, Worcester College, University of Oxford. 'In vitro tendon tissue engineering'

PhD Thesis. Karen Roddy, School of Natural Sciences, Trinity College, Dublin 'Mechanoregulation of joint morphogenesis: investigating the role of muscle-induced mechanical forces in the regulation of differentiation and growth in the avian knee joint'

2009

PhD Thesis. Anuphan Sittichokechaiwut, Department of Engineering Materials, University of Sheffield. 'Dynamic compressive loading for bone tissue engineering'

PhD Thesis. Nihal Engin Vrana, Department of Mechanical and Manufacturing Engineering, Dublin City University. 'Use of PVA cryogelation for tissue engineering: composites, scaffolds formation & cell encapsulation'

2008

PhD Thesis. Amanpreet Kaur Bembey, Department of Materials, Queen Mary, University of London. 'Micro-mechanical properties and composite behaviour of bone'

2007

PhD Thesis. Uel Little, Dept. of Mechanical Engineering, Queen's University Belfast
'Modification and Optimisation of the Biomaterial PCL for Tissue Engineering Applications'

MSc Thesis. Aoife Connolly, Dept. of Mechanical Engineering, UCD
'Tibiofemoral cartilage thickness distribution and its correlation with anthropometric variables'

2005

MSc Thesis. Miriam Tosetto, Dept. of Pharamacology, UCD
'Cell biomaterial interaction: biological responses of chiral polymers and N-isopropylacrylamide-based co-polymer films'

Internal Examiner

2010

PhD Thesis, Rachel Cox, Molecular & Cellular Therapeutics, RCSI
'Cellular and molecular basis of mammary microcalcification'

PhD Thesis, Neeraj Sivadas, School of Pharmacy, RCSI
'Bioengineered microparticles for controlled drug delivery to the lungs'

2007

PhD Thesis, Louise McMahon, Dept. of Mechanical Engineering, TCD
'The effect of cyclic tensile loading and growth factors on the chondrogenic differentiation of bone-marrow derived mesenchymal stem cells in a collagen-glycosaminoglycan scaffold**'**

RESEARCH FUNDING (Updated July 2011)

Health Research Board Project Grant – General. O'Brien FJ (Principal Investigator), Gleeson J. Bone regeneration using stem cell-directed endochondral ossification €298,525. 2011-2014. Grant No. HRA_POR/2011/27

Science Foundation Ireland Research Frontiers Programme. O'Brien FJ (Principal Investigator), Cryan SA, Kelly H, Duffy G. Development of a gene-activated smart scaffold for bone repair. €191,300. 2011-2014. Grant No. 11/RFP/ENM3063

Science Foundation Ireland Research Frontiers Programme. Campbell VA (Principal Investigator), O'Brien FJ (Co-applicant). Development of a cannabinoid-eluting scaffold for orthopaedic tissue engineering strategies. ~ €150,600: 2011-2014.

Enterprise Ireland Commercialisation Fund Commercialisation Plus Phase. O'Brien FJ (Principal Investigator), Gleeson J. Collagen-hydroxyapatite composite scaffolds as bone graft substitutes. €82,010: 2011.

Health Research Board PhD Scholars Programme Grant, 'Diagnostics and Therapeutics in Human Disease' O'Brien FJ (Principal Investigator), Duffy GP (Co-applicant). Investigation of the Therapeutic Potential of Stem Cells derived from Primary Amniocentesis for Orthopaedic Regenerative Medicine. €104,000: 2011-2014.

Health Research Board Summer Studentship. O'Brien FJ (Co-applicant). A pro-angiogenic smart scaffold for regenerative medicine applications. €2000: 2011. Student: Elaine Houlihan, 2nd Year, Medicine, RCSI

Health Research Board Summer Studentship. O'Brien FJ (Co-applicant). Gene-activated smart scaffold for regenerative medicine applications. €2000: 2011. Student: Aine McCarthy, 2nd Year, Medicine, RCSI

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). Investigation of the therapeutic potential of stem cells derived from primary amniocentesis for orthopaedic regenerative medicine. €2,000: 2011. Student: Thomas Law, 2nd Year, Medicine, RCSI

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). Tissue Engineering for Orthopaedic applications: Constructs for Osteochondral Defect Repair. €2,000: 2011. Student: John Lau, 2nd Year, Medicine, RCSI

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). The role of substrate stiffness and flow on cell morphology and focal adhesion expression – a comparison of Bone marrow derived MSC (bMSC) to Amniotic fluid derived MSC (AFSC). €2,000: 2011. Student: Bryce Lowry, 2nd Year, Medicine, RCSI

Marigot Ltd. Research Grant. O'Brien FJ (Principal Investigator). Development and evaluation of a novel product to promote osteogenesis. €30,000: 2011-2012.

Science Foundation Ireland Technology and Innovation Development Award (TIDA). O'Brien FJ (Principal Investigator), O'Gorman D. CollAqua: Development of a cell and growth factor free naturally-derived osteoinductive bone graft substitute. €48,425: 2011-2012.

Health Research Board PhD Scholars Programme Grant, 'Diagnostics and Therapeutics in Human Disease' Duffy GP (Principal Investigator), O'Brien FJ (Co-applicant). Investigation of the angiogenic potential of genetically modified human mesenchymal stem cells. €104,000: 2010-2013.

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). Development and optimisation of osteostimulatory collagen bioglass composites suitable for bone tissue engineering. €1600: 2010. Student: Mariam Al Hussona

Royal College of Surgeons in Ireland Alumni Student Research Programme. O'Brien FJ (Co-applicant). Collagen-based scaffold systems for controlled release of therapeutics to faciliate bone tissue repair. €2,000: 2010. Student: Richard O'Dwyer, BSc(Pharm) MPSI

European Research Council Starting Independent Researcher Grant. O'Brien FJ (Sole Applicant and Principal Investigator). Collagen-based scaffolds for orthopaedic regenerative medicine: applied biomaterials, bioreactor and stem cell technology €1,999,531: 2010-2014.

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. Duffy GP, O'Brien FJ (Co-applicant). Development of a bi-layered cardiac scaffold to enhance the natural cardiac stem cell response in cardiovascular disease and the onset of heart failure. €101,480: 2009-2010.

Enterprise Ireland Commercialisation Fund, Commercialisation Fund Technology Development Phase. O'Brien FJ (Principal Investigator), Partap S, Gleeson J, Duffy G, Kelly H. A collagen scaffold-based system for gene and drug delivery to facilitate bone tissue repair (TheraColl). €395,153: 2009-2012.

Health Research Board PhD Scholars Programme Grant, 'Diagnostics and Therapeutics in Human Disease': O'Brien FJ (Principal Investigator), Duffy GP (Co-applicant). Vascularisation within a collagen-GAG scaffold with human mesenchymal stem cells. €104,000: 2009-2012.

Health Research Board Clinical Research Training Fellowship. Lyons F, O'Brien FJ (Co-applicant). The in vivo response of engineered collagen-calcium phosphate scaffolds combined with bone morphogenic protein for orthopaedic regenerative medicine. €151,428: 2009-2011.

Irish Research Council for Science, Engineering and Technology: INSPIRE: - Marie Curie International Mobility Fellowship. Hoey D, Jacobs C, O'Brien FJ (Co-applicant). Mechanosensitive primary cilia in osteogenic differentiation of stem cells due to loading. €243,888: 2009-2012.

Health Research Board Summer Studentship. O'Brien FJ. Cellular Spatial Distribution of Scaffolds Cultured in a Flow Perfusion Bioreactor. €1600: 2009. Student: John Gibbons, BEng, 1st Year, Medicine, RCSI

Enterprise Ireland Commercialisation Fund, Commercialisation Fund Technology Development Phase. Gleeson J, Levingstone T, O'Brien FJ (Co-applicant). Polyphasic collagen-based composite scaffolds for osteochondral defect repair. €400,242: 2009-2012

Health Research Board PhD Scholars Programme Grant, 'Diagnostics and Therapeutics in Human Disease': Lee TC (Principal Investigator), O'Brien FJ (Co-applicant). Changes in the ultrastructural design features of osteoporotic bone. €104,000: 2008-2011.

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. O'Brien FJ (Principal Investigator), Gleeson J. Novel osteoinductive composite scaffolds for BMP delivery for bone tissue repair. €84,679: 2008-2009.

Science Foundation Ireland Research Frontiers Programme. Kerrigan S, O'Brien FJ (Co-applicant), Foster T. Molecular mechanisms underlying staphylococcal induced osteomyelitis. €186,600: 2008-2011.

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). Development of a "living" construct for use in regenerative medicine. €2,000: 2008. David Ajayi, 2th Year, Pharmacy, RCSI:

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. Gleeson J, O'Brien FJ (Co-applicant). Polyphasic collagen-based composite scaffolds for osteochondral defect repair. € 81,668: 2008-2009.

Science Foundation Ireland Supplementary Equipment Grant . Harmey J, O'Brien FJ (Co-applicant), Stallings R, Jefferies C, Henshall D, O'Tuathaigh C. In vivo and in vitro imaging system spectrum series. €332,931

Science Foundation Ireland Supplementary Equipment Grant . O'Brien FJ (Principal Investigator), Kelly D, Campbell VA, Harmey J, Jefferies C. Digital epifluorescence microscope with high resolution camera system and image analysis workstation. €74,997

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. Kelly D, O'Brien FJ (Co-applicant), Mulhall K. Design and development of a novel device to

control the fabrication, confined compression and *in situ* delivery of cell-seeded collagen gel scaffolds. €99,640: 2008-2009.

Enterprise Ireland Commercialisation Fund Technology Development Phase (TDP). O'Brien FJ (Principal Investigator), Gleeson J. Collagen-hydroxyapatite composite scaffolds as bone graft substitutes. €410,841: 2007-2010.

Health Research Board Project Grant – General. O'Brien FJ (Principal Investigator), McNamara L. Bone tissue mineralization during osteoporosis. €313,229. 2007-2010.

Royal College of Surgeons in Ireland, Research Committee Summer Studentship. O'Brien FJ (Co-applicant). An investigation into the effect of collagen and GAG content on pore size and permeability in collagen-glycosaminoglycan scaffolds. €1,600: 2007. Student: Brian Hayes, 3rd Year, Medicine, RCSI.

Science Foundation Ireland UREKA Supplement Student Summer Placement. O'Brien FJ (Principal Applicant), The influence of annealing on the pore size of collagen-GAG scaffolds. €5000: 2007. Student: Aidan Magee, 3rd Year, Medicine, RCSI

Science Foundation Ireland Research Frontiers Programme. O'Brien FJ (Principal Investigator), Campbell VA, Farrell E, Prendergast PJ. Induction of *in vitro* angiogenesis by marrow stromal cells on collagen glycosaminoglycan scaffolds for orthopaedic tissue engineering. €175,500: 2007-2010.

Science Foundation Ireland Research Frontiers Programme. Kelly D, O'Brien FJ (Co-applicant), Campbell VA. The influence of biophysical stimuli on tissue differentiation and matrix synthesis in vitro. €171,750: 2007-2010.

Science Foundation Ireland Research Frontiers Programme. McNamara L, O'Brien FJ (Co-applicant), Campbell VA. Is the bone tissue mineralization process altered during osteoporosis? €179,311: 2007-2010.

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. Kelly D, O'Brien FJ (Co-applicant), Robinson A. A novel device to control in situ the thermal gelation and concentration of cell-seeded hydrogels. €92,945: 2007-2009.

Science Foundation Ireland Industry Research Partnership Supplement Application. O'Brien FJ (Principal Applicant). Computational modelling of the pore structure, permeability and mechanical behaviour of collagen-GAG scaffolds for bone tissue engineering. €210,000: 2007-2009.

Science Foundation Ireland UREKA Supplement Student Summer Placement. O'Brien FJ (Principal Applicant), Immunohistochemical analysis of osteoblast differentiation on collagen-GAG scaffolds. €5000: 2006. Student: Rachel Brady, 3rd Year, Science, UCD

Health Research Board Summer Studentship. O'Brien FJ. Transglutaminase crosslinking of collagen-GAG scaffolds. €1600: 2006. Student: Hardeep Hundal, BE, 3rd Year, Medicine, RCSI

Science Foundation Ireland Research Frontiers Programme. O'Brien FJ (Principal Investigator), Dickson GR. The development of a novel bone graft substitute. €139,900: 2006-2009.

Enterprise Ireland Commercialisation Fund, Proof of Concept Phase Grant. O'Brien FJ (Sole Applicant & Principal Investigator). Collagen-hydroxyapatite composite scaffolds as bone graft substitutes. €68,913: 2006-2007.

Embark, Irish Research Council for Science, Engineering and Technology, Postgraduate Scholarship Scheme. O'Brien FJ (Principal Applicant), Plunkett N. Collagen-calcium phosphate scaffolds for bone tissue engineering. €80,914: 2005-2008.

Royal College of Surgeons in Ireland, Research Committee Grant. Daly J, O'Brien FJ (Co-applicant). Development of a bone graft substitute: molecular analysis of osteogenesis by human osteoblasts on a three dimensional collagen scaffold. €90,000: 2005-2008:

Health Research Board Basic Research Grant. Campbell VA, O'Brien FJ (Co-applicant), Prendergast PJ. Tissue engineering of cartilage and bone in a hypoxic environment. €155,000: 2005-2008.

Health Research Board Summer Studentship. O'Brien FJ. Osteogenic activity of BMP-7 on osteoblast-like cells in collagen-glycosaminoglycan scaffolds. €1600: 2005.
Student: Khaled Al Mansoori, BSc, 4th Year, Medicine, RCSI:

Science Foundation Ireland President of Ireland Young Researcher Award. O'Brien FJ (Sole Applicant and Principal Investigator). Tissue engineering for orthopaedic applications: the use of collagen scaffolds for the development of bone graft substitutes €1.1 million: 2004-2009.

Health Research Board Equipment Grant. O'Brien FJ (Principal Applicant), Lee TC, Rackard SM. Automatic tissue processor for histology applications. €27,528: 2004-2007.

Health Research Board Basic Research Grant. O'Brien FJ (Principal Applicant), Lee TC, Rackard SM. The role of microcracks in targeted bone remodeling and their relationship with bone fragility and osteoporosis. €112,800: 2004-2007.

Irish-American Fulbright Commission: Fulbright Scholarship. O'Brien FJ (Sole Applicant) Orthopaedic biomaterials and tissue engineering. IR£10,000:2001-2003.

Successful multi-PI grants on which I was co-applicant

Health Research Board PhD Scholars Programme Grant, ‘Diagnostics and Therapeutics in Human Disease’. €5 million: 2007-2012.

RESEARCH GROUP AND HIGHER DEGREE SUPERVISION

CURRENT RESEARCH TEAM

Postdoctoral Researchers

2011-2016

Adolfo Lopez Noriega, BPharm, PhD 'A collagen scaffold-based system for gene and drug delivery to facilitate bone tissue repair (TheraColl)'. Funded by Enterprise Ireland

2010-2015

Caroline Curtin, BSc, PhD 'Osteoinductive and angiogenic smart scaffolds for bone tissue regeneration' Funded by European Research Council

Ryan McCoy, MEng, PhD 'Bone tissue engineering using a novel flow perfusion bioreactor' Funded by European Research Council

2010-2012

Ciara Murphy, BSc 'Scaffold and stem cell therapies for bone tissue regeneration' Funded by European Research Council

2009-2012

David Hoey, BA, BAI, PhD 'Mechanosensitive primary cilia in osteogenic differentiation of stem cells due to loading.' Funded by IRCSET & Marie Curie (FP7)

2009-2012

Tanya Levingstone, BEng, PhD 'Polyphasic collagen-based composite scaffolds for osteochondral defect repair'. Funded by Enterprise Ireland

2007-2011

Sonia Partap, BEng, PhD 'Tissue engineering for orthopaedic applications: the use of collagen scaffolds for the development of bone graft substitutes'. Funded by Science Foundation Ireland.

2007-2012

Orlaith Brennan, BA, MSc, PhD 'CollAqua: Development of a cell and growth factor free naturally-derived osteoinductive bone graft substitute.' Funded by Science Foundation Ireland.

2006-2012

John Gleeson, BA, BAI, PhD 'Collagen-hydroxyapatite composite scaffolds as bone graft substitutes'. Funded by Enterprise Ireland

Postgraduate Researchers

PhD Students

2011-2014

Rosanne Raftery, BSc, MSc, 'Development of a gene-activated smart scaffold for bone repair' Funded by SFI.

Alan Ryan, BEng 'Devopment of a collagen-based scaffold for vascular repair' Funded by European Research Council.

Cai-Lloyd Griffith, BSc, **'**Investigation of the therapeutic potential of stem cells derived from primary amniocentesis for orthopaedic regenerative medicine' Funded by HRB PhD Scholars Training Programme.

Claire Brougham, BEng, MEngSci, 'A collagen-GAG-fibrin composite scaffold for use as a tissue engineered heart valve' Funded by Dublin Institute of Technology.

2010-2013

Elaine Quinlan, BSc, MSc 'A collagen scaffold-based delivery system for tissue repair' Funded by European Research Council

Conn Hastings, BSc, 'Promoting neovascularisation in ischemic tissues' Funded by HRB PhD Scholars Training Programme

2009-2012

Tara McFadden, BSc 'Induction of in vitro angiogenesis by mesenchymal stem cells on collagen scaffolds for orthopaedic regenerative medicine' Funded by HRB PhD Scholar Training Programme

Erica Tierney, BSc 'Osteoinductive and angiogenic smart scaffolds for bone tissue regeneration'. Funded by European Research Council

Amos Matsiko, BEng, 'Polyphasic collagen-based composite scaffolds for osteochondral defect repair' Funded by Enterprise Ireland

2008-2011

Amro Widaa, BSc, MSc, 'Molecular mechanisms underlying staphylococcal induced osteomyelitis'. Funded by Science Foundation Ireland.

Peter Mauer, BE, 'Changes in the ultrastructural design features of osteoporotic bone'. Funded by HRB PhD Scholar Training Programme

MSc Students

2010-2011

Rossa Miller, BA, BAI 'Optimisation of a multilayered scaffold to improve its potential for osteochondral defect repair' Funded by TCD Taught Masters Programme in Bioengineering.

Niamh Porteous, BEng, **'**Optimising stem cell delivery and survival using cell encapsulation' Funded by TCD Taught Masters Programme in Bioengineering.

Jane Reidy, BA, BAI, **'**Collagen-based scaffolds for delivery of novel angiogenic peptide' Funded by TCD Taught Masters Programme in Bioengineering.

Alan Ryan, BEng, **'**Comparative analysis of a series of collagen- based scaffolds for bone tissue repair' Funded by TCD Taught Masters Programme in Bioengineering.

Allison Cudworth, BEng 'Optimisation of material compositions for tissue engineered collagen-GAG heart valve constructs' Funded by TCD Taught Masters Programme in Bioengineering.

Nian Shen, BEng 'Optimisation of a freeze drying mould for tissue engineered collagen-GAG heart valve constructs' Funded by TCD Taught Masters Programme in Bioengineering.

Sharon Joseph, BEng 'Alginate microcapsules combined with collagen-based scaffolds for growth factor delivery' Funded by TCD Taught Masters Programme in Bioengineering.

Barry Stenson, BA, BAI 'Development of a naturally-derived osteoinductive bone graft substitute' Funded by TCD Taught Masters Programme in Bioengineering.

MD Students

Emmet Thompson, MB BCh BAO (Hons) LRCPI LRCSI 'In vivo evaluation of polyphasic collagen-based composite scaffolds for osteochondral defect repair' Funded by European Research Council

MCh Students

Ian Hutchinson, MB, BCh, BAO 'An in vitro analysis of collagen composite scaffolds for targeted repair of the calcified cartilage layer of an osteochondral defect' Funded by RCSI

Undergraduate Researchers

2011

Elaine Houlihan, 2nd Year, Medicine, RCSI 'A pro-angiogenic smart scaffold for regenerative medicine applications' Funded by Health Research Board Summer Studentship.

Aine McCarthy, 2nd Year, Medicine, RCSI 'Gene-activated smart scaffold for regenerative medicine applications' Funded by Health Research Board Summer Studentship.

Thomas Law, 2nd Year, Medicine, RCSI 'Investigation of the therapeutic potential of stem cells derived from primary amniocentesis for orthopaedic regenerative medicine'. Funded by Royal College of Surgeons in Ireland, Research Committee Summer Studentship.

John Lau, 2nd Year, Medicine, RCSI 'Tissue Engineering for Orthopaedic applications: Constructs for Osteochondral Defect Repair' Funded by Royal College of Surgeons in Ireland, Research Committee Summer Studentship.

Bryce Lowry, 2nd Year, Medicine, RCSI 'The role of substrate stiffness and flow on cell morphology and focal adhesion expression – a comparison of bone marrow derived MSCs to amniotic fluid derived MSCs' Funded by Royal College of Surgeons in Ireland, Research Committee Summer Studentship.

RESEARCH GROUP ALUMNI

Postdoctoral Researchers

2010

Matthew Haugh, BA, BAI, PhD 'Cellular responses to substrate stiffness in scaffolds for tissue engineering' . Funded by Science Foundation Ireland.

Grainne Cunniffe, BA, PhD 'Angiogenic smart scaffolds for bone tissue regeneration' Funded by Science Foundation Ireland & European Research Council.

2009-2010

Siti Ismail, DVM, MVSc, PhD 'Development of a bi-layered cardiac scaffold to enhance the natural cardiac stem cell response in cardiovascular disease and the onset of heart failure.' Funded by Enterprise Ireland

2007-2009

Elaine Byrne, BA, PhD 'Induction of *in vitro* angiogenesis by marrow stromal cells on collagen glycosaminoglycan scaffolds for orthopaedic tissue engineering'. Funded by Science Foundation Ireland.

2007-2008

Conor Buckley, BA, BAI, PhD 'A novel device to control in situ the thermal gelation and concentration of cell-seeded hydrogels'. Funded by Enterprise Ireland.

2005-2007

Eric Farrell, BSc, PhD 'Tissue engineering of bone using mesenchymal stem cells and collagen scaffolds'. Funded by Science Foundation Ireland and Programme for Research in Third Level Institutions (PRTLI Cycle 3).

Michael Jaasma, BSE, MS, PhD 'Development and implementation of a pulsatile flow perfusion bioreactor for bone tissue engineering'. Funded by Science Foundation Ireland.

2007-2008

Christian Jungreuthmayer, PhD 'Computational modelling of the pore structure, permeability and mechanical behaviour of collagen-GAG scaffolds for bone tissue engineering' Funded by SFI & Siemens Austria

Postgraduate Researchers

PhD Students

2007-2011

Frank Lyons, MB BCh BAO MSc, 'In vivo response of a tissue engineered bone graft produced using collagen-glycosaminoglycan scaffolds'. Funded by Science Foundation Ireland and HRB Clinical Research Training Fellowship. (PhD awarded, June, 2011).

2006-2010

Ciara Murphy, BSc, 'Osteogenesis of a new generation collagen scaffold using marrow stromal cells and osteoblasts'. Funded by Science Foundation Ireland. (PhD awarded, June, 2010).

Michael Keogh, BSc, MSc, 'Molecular analysis of osteogenesis by human osteoblasts on a collagen scaffold' Funded by RCSI. (PhD awarded, November 2010).

2006-2009

Grainne Cunniffe, BA. 'Investigation of a collagen nano-HA scaffold with potential for bone tissue engineering' (jointly supervised with Dr. Glenn Dickson, Dept. of Trauma

and Orthopaedic Surgery, Queen's University Belfast). Funded by Science Foundation Ireland. (PhD awarded, February, 2010).

Amir Al-Munajjed, BE, MSc, 'The development of a novel collagen-calcium phosphate bone graft substitute'. Funded by Science Foundation Ireland. (PhD awarded, November 2009).

2005-2009

Mohamed Alhag, B.Dent.Sci, MDent, 'Evaluation of MSC-Seeded Collagen GAG Scaffold as a bone graft alternative', Funded by Science Foundation Ireland and Programme for Research in Third Level Institutions (PRTLI Cycle 3). (PhD awarded, April 2010).

Niamh Plunkett, BE, 'Tissue engineering of bone using bioreactors and collagen scaffolds'. Funded by Irish Research Council for Science, Engineering and Technology (IRCSET) and Science Foundation Ireland. (PhD awarded, Dec. 2009).

2004-2009

Claire Tierney, BSc, 'Design and fabrication of scaffolds with the optimal GAG and collagen content to promote cell attachment, proliferation and bone formation'. Funded by Science Foundation Ireland. (PhD awarded, Nov. 2009).

2004-2008

Matthew Haugh, BA, BAI, 'The development of novel scaffolds for tissue engineering with a range of structural and mechanical properties'. Funded by Science Foundation Ireland. (PhD awarded, July, 2009).

2003-2007

Oran Kennedy, BA, BAI, PhD 'The effect of bone turnover on bone quality and material properties' (jointly supervised with Prof. Clive Lee, Dept. of Anatomy, RCSI and Prof. David Taylor, Trinity Centre for Bioengineering). Funded by Programme for Research in Third Level Institutions (PRTLI Cycle 3). (PhD awarded, February, 2008).

Orlaith Brennan, BA, MSc, PhD 'Bone quality and its relationship with bone fragility and osteoporosis'. Funded by Health Research Board. (PhD awarded, Nov., 2008).

2001-2004

Sahar Mohsin, MBBS, M Med Sci, PhD 'The Microstructure of Bone -three dimensional growth and interaction with fatigue microcracks' (jointly supervised with Prof. Clive Lee, Dept. of Anatomy, RCSI). Funded by RCSI. (PhD awarded, June, 2005).

MCh Students

2009-2010

Amgad Medani, MBBS, MRCSI 'Effects of zoledronic acid with collagen GAG scaffolds on osteoblastic activity'

2008-2009

Stephen Kieran, MB, BCh, BAO, MRCSI, 'In vivo response of a tissue engineered bone graft produced using collagen-based scaffolds' (MCh awarded, June, 2010).

MSc Students

2009-2010

Karen Flannery, BA, BAI 'The effect of crosslinking technique on the mechanical properties of a novel Type 1: Type 2 collagen scaffold' Funded by TCD Taught Masters Programme in Bioengineering.

Niamh Walsh, BEng **'**Effect of lyophilisation freezing rate on novel collagen hydroxyapatite scaffolds for tissue engineering' Funded by TCD Taught Masters Programme in Bioengineering.

2008-2009

Johannes Schmid, BEng, 'Optimisation of a novel biomimetic scaffold for bone healing'. Funded by TCD Taught Masters Programme in Bioengineering.

Sarah-Louise Gill, BSc, 'Induction of in vitro angiogenesis by mesenchymal stem cells on scaffolds for orthopaedic regenerative medicine' Funded by REMEDI Taught Masters Programme in Regenerative Medicine.

2006-2009

Vincent McDonagh, BSc, 'The material properties of fresh human bone'. Funded by RCSI (part-time MSc).

2007-2008

Rachel Lee, BEng, Engineering the physical properties of a bone graft substitute. Funded by TCD Taught Masters Programme in Bioengineering. (MSc awarded, February, 2009).

2006-2007

Kevin O'Connor, BA, BAI 'The influence of osteoporosis and bisphosphonate treatment on the properties of trabecular bone' Funded by TCD Taught Masters Programme in Bioengineering. (MSc awarded, February, 2008).

2004-2006

Ruth Walsh, BA, BAI, 'Design and fabrication of collagen-GAG scaffolds with varied scaffold architecture for bone tissue-engineering'. Funded by Science Foundation Ireland. (MSc awarded, June, 2008).

Kevin Fei Tan, Dip (Biological Science), MB 'The use of osteogenic factors to promote the formation of bone on collagen-GAG constructs' (jointly supervised with Dr. Jacqueline Daly, Dept. of Anatomy, RCSI). Funded by RCSI. (MSc awarded, June, 2007).

2005-2006

Eoin McGrotty, BA, BAI 'The effects of osteoporosis on the tensile strength of ovine single trabeculae' Funded by TCD Taught Masters Programme in Bioengineering. (MSc awarded, February, 2007).

2004-2005

Deirdre Kelleher, BSc, 'Investigation into the effects of osteoporosis on trabecular bone: bone quality assessment of cored vertebral bone' Funded by TCD Taught Masters Programme in Bioengineering. (MSc awarded, February, 2006).

2003-2004

Mary Waller, BSc, MSc, 'The material properties of collagen GAG scaffolds for use in tissue engineering' (jointly supervised with Prof. Patrick Prendergast, Trinity Centre for Bioengineering). Funded by PRTLI Cycle 3. (MSc awarded, Oct. 2005).

2004

Ramy Zaki, BA, BAI, MSc 'Microcrack behaviour in drug treated and in osteoporotic bone'. Funded by TCD Taught Masters programme in bioengineering. (MSc awarded, July, 2005).

Undergraduates

2010

Frank Prendergast, , 4th Year, Pharmacy, RCSI, 'To Investigate the effect of Desferrioxamine on Chondrogenesis and Osteogenesis by Human Mesenchymal Stem Cells.'
Claire Devine, 4th Year, Pharmacy, RCSI, 'Optimizing encapsulation efficiencies of DFO and BSA in PLGA microparticles'
Mariam Al Hussona, 2nd Year, Medicine, RCSI,'Development and optimisation of osteostimulatory collagen bioglass composites suitable for bone tissue engineering'
Richard O'Dwyer, BSc(Pharm) MPSI, 1st Year, Medicine, RCSI, 'Development and optimisation of osteostimulatory collagen bioglass composites suitable for bone tissue engineering'
Young Hwa Soon, 3rd Year, Medicine, RCSI, 'Determination of cell size and integrin expression levels on hMSC and MC3T3-E1 cell lines'
Naude Du Plessis, 1st Year, Medicine, RCSI, 'Pre-vascularisation of a collagen-GAG scaffold in vitro using rat endothelial cells and rat bone marrow stem cells'
Shane Murphy, BComm, 2nd Year, Medicine, RCSI. 'Optimised lyophilisation techniques to facilitate the production of collagen-HA scaffolds with significantly larger pore sizes'.

2009

John Gibbons, **BEng,** 1st Year, Medicine, RCSI, 'Cellular Spatial Distribution of Scaffolds Cultured in a Flow Perfusion Bioreactor'
Rachel Sing Wei NGE, 1st Year, Medicine, RCSI, 'Pore size analysis of a novel collagen based composite scaffold'
David Ajayi, 4th Year, Pharmacy, RCSI: 'Effect of pore size on osteoblast activity in collagen-glycosaminoglycan for bone tissue engineeringe'
Maryanne Siu, 1st Year, Medicine, RCSI, 'Optimization of transfection efficiency of ratMSCs seeded on collagen-hydroxyapatite scaffolds for use in tissue regeneration'
Thanujaa Subramaniam, 1st Year, Medicine, RCSI, 'Investigating Type-I collagen adhesion of staphylococcus aureus'
Carmen Herraez Coll, 4th Year, Engineering, Hanzehogeschool Groningen, The Netherlands, 'Investigating the effect of mean pore size on mineralisation in collagen-glycosaminoglycan scaffolds'
Samer Abujaber, 3rd Year, Medicine, RCSI, 'Collagen biomaterials for orthopaedic regenerative medicine'
Marie Kennedy, 4th Year, Pharmacy, RCSI, 'Effects of collagen type & acid type on the physical properties of collagen scaffolds used in bone tissue engineering'

2008

David Ajayi, 2th Year, Pharmacy, RCSI: 'Development of a "living" construct for use in regenerative medicine'
Jakob Liedl, 4th Year, Engineering, University of Regensburg, Germany: Characterisation of Collagen-GAG scaffolds crosslinked at different temperatures
Jean Engela, 2nd Year, Medicine, RCSI: 'Development of a designer scaffold for bone repair'
Sultan Alqadiri, 3rd Year, Medicine, RCSI: 'Tissue engineering using collagen-glycosmaminoglycan scaffolds for bone regeneration'
Aisha Rustom, 3rd Year, Medicine, RCSI: 'Tissue engineering using collagen-glycosmaminoglycan scaffolds for bone regeneration'

2007

Moza Al Noaimi, 3rd Year, Medicine, RCSI: 'Tissue engineering using collagen-glycosmaminoglycan scaffolds for bone regeneration'

Nicole Fischer, 4th Year, Engineering, University of Regensburg, Germany: 'Permeability of scaffolds for bone tissue engineering'

Fergal Mulcahy, BSc, 4th Year, Pharmacy, RCSI: 'Microstructural characterisation of collagen-GAG scaffolds for tissue engineering'

Brian Hayes, 3rd Year, Medicine, RCSI: 'An investigation into the effect of collagen and glycosaminoglycan (GAG) content on mean pore size and permeability in collagen-glycosaminoglycan scaffolds'. Funded by RCSI, Research Committee Summer Studentship.

Zeeshan Ijaz, 3rd Year, Medicine, Medical University of Bahrain. 'The influence of pore size on cell behaviour in collagen-GAG scaffolds'. Funded by Science Foundation Ireland.

Aidan Magee, BA, 3rd Year, Medicine, RCSI: 'The influence of annealing on the pore size of collagen-GAG scaffolds'. Funded by SFI UREKA Supplement Student Summer Placement.

Cian Mac a' Bháird, 4th Year, Engineering, Trinity College Dublin: 'A novel computational method for measuring pore size in scaffolds for tissue engineering'. Funded by Science Foundation Ireland.

Eadaoin O'Cathain, 3rd Year, Medicine, RCSI: The effect of crosslinking on the pore structure of collagen scaffolds for tissue-engineering.

Tim Weber, 4th Year, Engineering, University of Regensburg, Germany: 'The development of a novel collagen-calcium phosphate bone graft substitute'.

Tonya Welsh, 3rd Year, Medicine, RCSI: 'Dissecting the molecular mechanisms underlying osteomyelitis' Funded by Health Research Board.

2006

Ling Wei Lee, 4th Year, Pharmacy, RCSI: 'Investigation into different seeding methods on novel scaffolds for tissue engineering'

Cornelia Altenbuchner, 4th Year, Engineering, University of Regensburg, Germany: 'Transglutaminase crosslinking of collagen-GAG scaffolds'

Kristine Arnljot, 3rd Year, Medicine, RCSI: 'Effects of dynamic fluid flow on osteoblast activity within a collagen-GAG scaffold'

Rachel Brady, 3rd Year, Science, UCD 'Immunohistochemical analysis of osteoblast differentiation on collagen-GAG scaffolds' Funded by SFI UREKA Supplement Student Summer Placement.

Zeeshan Ijaz, 2nd Year, Medicine, Medical University of Bahrain. 'Design and fabrication of scaffolds with the pore architecture to promote cell attachment and proliferation and bone formation'

Hardeep Hundal, 3rd Year, Medicine, RCSI 'Transglutaminase crosslinking of collagen-GAG scaffolds.' Funded by Health Research Board, Summer Student Scholarship.

Aspazia Aspa Spyrou, 3rd Year, Medicine, RCSI: 'Tissue engineering using collagen-glycosmaminoglycan scaffolds for bone regeneration'

Tom Zwart, 4th Year, Engineering, Hanzehogeschool Groningen, The Netherlands 'Micro-tensile testing of single trabeculae'

2005

Khaled Al Mansoori, BSc, 4th Year, Medicine, RCSI: 'Osteogenic Activity of BMP-7 on Osteoblast-like cells in Collagen-Glycosaminoglycan Scaffolds'. Funded by Health Research Board, Summer Student Scholarship.
Eoin McCarthy, 1st Year, Science, TCD: 'Preparation of bone samples for X-ray diffraction and backscattered electron imaging' Funded by Centre for Human Proteomics, RCSI, Summer Student Scholarship
Lise de Jonge, 4th Year, Engineering, Hanzehogeschool Groningen, The Netherlands 'Micro-tensile testing of single trabeculae'

2004

Cathy Fleming, 3rd Year, Experimental Physics, UCD: 'Osteoporosis, a new approach: the role of bone quality, microcracks and remodeling' Funded by RCSI.
Caitriona Monaghan, 1st Year, Science, TCD: 'Design of a system to test whole vertebral bodies from an ovine model of osteoporosis'. Funded by RCSI.

RESEARCH GROUP AWARDS

2011

Amro Widaa, Donegan Medal for Outstanding Presentation, Biomedical Sciences Section of Royal Academy of Medicine in Ireland Annual Meeting. *The identification of a novel drug target in the treatment of bone infection.* Dublin, Ireland, June 2011.

Tara McFadden. Front cover illustration for April 2011 issue of JOM for her work demonstrating in vitro microvessel formation on a collagen-GAG scaffold observed using a multi photon imaging system.

David Hoey. Outstanding Trainee (Junior Investigator) Presentation, 4th New York Skeletal Biology and Medicine Meeting. *A role for the primary cilium in fluid flow-mediated osteogenic differentiation of human mesenchymal stem cells*, New York, April 2011.

Amos Matsiko. Best Poster Presentation by a Postgraduate Student. Annual Royal College of Surgeons in Ireland Research Day. *Characterisation of a novel collagen-hyaluronic acid scaffolds for cartilage defect repair: Influence of mean pore size* RCSI, April 2011.

Tara McFadden. Best Overall Student Presentation. 17th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *In vitro vasculogenesis in a collagen-GAG scaffold using endothelial cells alone and in a coculture with human MSCs.* Galway, Ireland, January 2010.

2010

Amro Widaa. 1st Prize in commented poster category. Biomedical Sciences Section of Royal Academy of Medicine in Ireland Conference. *The effects of staphylococcus aureus on osteoblasts in osteomyelitis*. Dublin, Ireland, June, 2010.

John P. Gleeson. Bronze Medal for Best Overall Paper. 16th Annual Conference of the section of Bioengineering of the Royal Academy of Medicine in Ireland. *Characterisation of a novel collagen hydroxyapatite (CHA) scaffold for bone tissue engineering*. Dublin, Ireland, January 2010.

Ciara Murphy. Best Student Oral Presentation. 16th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Larger pores increase osteogenesis in tissue engineered collagen-glycosaminoglycan scaffolds*. Dublin, Ireland, January 2010.

Erica Tierney. 2nd prize in commented poster category. 16th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Osteoinductive smart scaffolds for bone tissue regeneration.* Dublin, Ireland, January 2010.

Amos Matsiko. 3rd prize in commented poster category., 16th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Characterisation of 3D collagen-based matrices for cell-mediated chondrogenesis.* Dublin, Ireland, January 2010.

Grainne Cunniffe. Finalist. Engineers Ireland Biomedical Research Medal. *Gene-activated collagen-nanohydroxyapatite composite scaffolds for bone tissue regeneration.* Dublin, Jan 2010.

2009

John P. Gleeson. Roche Researcher of the Year Award 2009 Nominee. Inaugural Roche Researcher of the Year Award. *ChondroColl: Tissue Engineering Scaffolds for Osteochondral Defect Repair*. Dublin, Ireland, Nov 2009.

Frank Lyons. 1st prize for the best orthopaedic paper presentation, Joint Surgical Symposium of the XIX Waterford Surgical Meeting in conjunction with the Surgical Section of the Royal Academy of Medicine in Ireland. *Comparative healing response of bioengineered bone graft substitutes using novel scaffolds alone vs. stem cell seeded scaffolds vs. biologic coated scaffolds, assessed using in vivo models*. Waterford, Ireland, Oct. 2009.

Frank Lyons. Clinical Research Training (CRT) Fellowship Award. Health Research Board. *The in vivo response of engineered collagen-calcium phosphate scaffolds combined with bone morphogenic protein for orthopaedic regenerative medicine*. July.

Grainne Cunniffe. Most innovative use of materials. Northern Ireland Biomedical Engineering Society (NIBES) *Development of a nanoHA-Collagen composite Scaffold for bone regeneration* Belfast, NI. April, 2009.

Frank Lyons. Best Conference Paper Award, Orthopaedic Category Sylvester O'Halloran Surgical Scientific Meeting 'In vivo healing response of novel scaffolds for orthopaedic regenerative medicine. Limerick, Ireland, Mar. 2009

John P. Gleeson Royal College of Surgeons in Ireland (RCSI) Invention DisclosurE Award (IDEA) Prize and €5000. RCSI Research Day 2009. *Layered collagen-based scaffold suitable for osteochondral defect repair.* Dublin, Ireland, Apr. 2009. Shared with Tanya Levingstone and Fergal O'Brien.

Amir Al Munajjed. 2nd prize for best overall paper in the mature research category, 15th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *In vivo evaluation of novel mineralized collagen scaffolds*. Limerick, Ireland. Jan. 2009

2008

Paul Burns. Gold Medal for Best Paper, 49th Meeting of the Irish Otolaryngology /Head and Neck Society. *In vivo response of a tissue engineered bone graft produced using collagen-glycosaminoglycan and hydroxyapatite scaffolds* Co. Fermanagh, NI. Sep. 2008.

Grainne Cunniffe. 2nd prize for best student oral presentation, Northern Ireland Bioengineering Society Spring Meeting. *Investigation of a nanoHA – collagen composite scaffold,* Belfast, NI. April, 2008

Claire Tierney. 1st prize for best paper in the mature research category, 14th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Optimisation of collagen-GAG scaffold for use in bone tissue engineering* Sligo, Ireland, Jan. 2008

2007

Eric Farrell. Genzyme Award for Excellence in Cartilage Research 2007, 7th World Congress of the International Cartilage Repair Society, *Tracking bone marrow stromal cells with iron labeling,* Warsaw, Poland, Oct. 2007. Shared with co-authors.

Orlaith Brennan. First prize (Oral Presentation). Annual Royal College of Surgeons in Ireland Research Day. *BMD measurements do not predict bone fracture risk in an ovine model of OP*. April 2007

Michael Keogh. Third Prize (new research). 13th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Molecular analysis of osteogenesis by human osteoblasts on a three dimensional collagen-GAG scaffold.* Co. Fermanagh, NI. Jan. 2007.

Orlaith Brennan. Second prize (mature research). 13th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Bone architecture and mineralisation as determinants of fracture risk.* Co. Fermanagh, NI. Jan 2007.

2006

Orlaith Brennan. Third prize (Postgraduate research). Annual Royal College of Surgeons in Ireland Research Day. *Mechanical and histomorphometric variations in osteoporotic trabecular bone.* April 2006.

Orlaith Brennan. Second prize (Mature Research) 12th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *Mechanical and histomorphometric variations in normal and osteoporotic trabecular bone.* Galway, Jan 2006.

Oran Kennedy. Third prize (Mature Research) 12th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *The effect of osteoporosis on compact bone*. Galway, Jan. 2006.

Matthew Haugh. Finalist. Engineers Ireland Biomedical Research Medal. Development of a biological scaffold with mechanical properties suitable for bone tissue engineering. Dublin, May 2007

2005

Oran Kennedy. Second prize (best overall oral presentation). 7th Annual meeting of the British Association for Human Identification. *Increased bone turnover and porosity in osteoporosis: the effect on bone quality*. Dublin, April 2005.

Oran Kennedy. Second prize (best overall oral presentation). Annual Royal College of Surgeons in Ireland Research Day. *Bone Quality and Remodelling*. March, 2005.

Oran Kennedy. Second prize (best student oral presentation) 11th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland. *The contribution of bone turnover to reduced bone quality in osteoporosis.* Dublin, Jan 2005.

2004

Oran Kennedy. First prize (best oral presentation in biological sciences). Microscopical Society of Ireland Annual Conference. *Bone for life: osteoporosis, bone quality, microcracks and remodelling.* Dublin, October 2004.

REFERENCES

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