Brief biographical note

Dr. Nicholas Dunne is a biomaterials engineer who obtained his Bachelor in Polymer Science and Ph.D. from Queen's University Belfast. Dr Dunne has been an academic since 1998, spending time at Cork Institute of Technology (1998-2000) and Dublin City University (2000-2003), before taking up a full-time position at Queen's University Belfast (2003-present) in the School of Mechanical & Aerospace Engineering. Dr. Dunne has developed a strong, translational research programme with the Biomaterials Research Group at Queen's University Belfast. He focuses on two main areas of research: (1) delivery and management of cement based materials used in hard tissue replacement and (2) development of hierarchical constructs for tissue engineering. To date, Dr Dunne has developed a robust research portfolio through his successful supervision and management of 1 post-doctoral research assistant (PDRA), 7 PhD students, 1 MPhil and 9 MSc students studying for an MSc in Polymer Engineering. Dr Dunne is currently responsible for the supervision, management and funding of 2 PDRA and 8 PhD.

His professional and scientific activity comprises: Dr Dunne has authored over 150-refereed publications in the areas of bone substitute materials and orthopaedics from 1993. He has been an invited speaker at national and international conferences including the UK Society of Biomaterials, European Society of Biomaterials, World Congress of Biomechanics and GRIBOI. He was recently been awarded a prestigious Orthopaedic Research Society/British Orthopaedic Research Society Fellowship (2009) and is currently a recipient of the Royal Academy of Engineering-Leverhulme Senior Research Award (2010). Both awards are recognition that he is one of the leading international authorities on orthopaedic bone cements. He has considerable expertise in the formulation, preparation and delivery of these cement based systems, having developed patented technology, which has distinct advantages over existing technology. He also over 15 years experimental experience; developing technology to measure and predict the pressures generated during cement delivery and prosthesis insertion for a total joint replacement. (DePuy International Prize, 1996). His paper on developing a computational model to predict pressure generation around hip replacement implants won the IMechE Duncan Dowson Prize in 2002 (Proc. IMechE Part H, 214(6), Part H6, 645-58, 2000). He won a best paper award at the European Society of Biomaterials 2007 investigating the antibacterial effects of incorporating chitosan in acrylic bone cement (Journal of Materials Science: Materials in Medicine, 19(4), 1609-15, 2008). Dr Dunne has strong and sustained links with industry, orthopaedic clinicians and theatre staff; he is a technical advisory board and faculty member to orthopaedic and medical device companies, providing independent technical expertise relating to the business needs of these companies. He regularly facilitates training and development of orthopaedic surgeons and theatre staff on matters relating to management and delivery of bone cements in total joint replacement surgery. Dr Dunne was elected Secretary of Northern Ireland Bioengineering Society in 2007 and is presently acting President of the Society, which has a membership of over 100. Dr Dunne is currently guest editor for special issues of the International Journal of Nano and Biomaterials and Journal of Materials Science: Materials in Medicine.

Name , salutation: Senior Lecturer, Nicholas Dunne
Current appointment:
School of Mechanical & Aerospace Engineering,
Queen's University Belfast, Strarnmillis Road,Belfast, BT9 5AH, UK

Educational Background:

- PGCE, School of Education, , Queen's University Belfast, June 2004
- PhD in Enginering, School of Mechanical Engineering, Queen's University Belfast, December 1996
- BSc in Polymer Science, Athlone Institute of Technology, November 1993

Experience:

- Senior Lecturer, Mechanical and Aerospace Engineering, Queen's University Belfast, UK (2008-present)
- Lecturer, Mechanical and Aerospace Engineering, Queen's University Belfast, UK (2003-2008)
- Lecturer, Mechanical and Manufacturing Engineering, Dublin City University, Ireland (2000-2003)
- Lecturer, Mechanical and Manufacturing Engineering, Cork Institute of Technology, Ireland (1998-2000)
- Biomaterials Engineer, DePuy International Ltd., Leeds, UK (1996-1998)

Professional Qualifications:

- Fellow of Institute of Minerals, Materials and Mining (2008)
- Chartered Engineer through Institute of Minerals, Materials and Mining (2000)
- Professional member of Institute of Minerals, Materials and Mining (1998)

Research/clinical interest

Research activity in the field of:

- Delivery and management of cement based materials used in dental and joint replacement surgery, for example glass ionomer, PMMA and calcium phosphate bone cement systems.
- Development of functional graded constructs for tissue engineering using novel materials and innovative technologies.

Present Areas of Research

The ongoing research work is characterized by the following keywords: Polymer/ceramic composites, Scaffolds for medical applications, Interaction tissue-biomaterials, Regenerative medicine & tissue engineering, Bone regeneration, Functional performance improvement, Nanotechnology.

Title of your BIOMMEDD 2010 lecture:

Bone Cements in Orthopaedic Surgery, Can A Leopard Change its Spots?