INVITED SPEAKERS

Nigel Arden

Nigel Arden is Professor in Rheumatic Diseases and Consultant in Rheumatology, University of Southampton Director of Biobank and Musculoskeletal Epidemiology; and Deputy Director NIHR Biomedical Research Unit, University of Oxford.

Professor Arden trained at St Thomas's Hospital, London, where he also completed four years of research into the genetics of osteoporosis. During this time, he gained an MSc in Epidemiology and an MD.

He moved to the South Coast in 1996 and in 1998 spent six months as Visiting Assistant Professor in Epidemiology at the University of San Francisco.

In 2000 he commenced his post as Senior Lecturer in Rheumatology and Honorary Consultant Rheumatologist at Southampton University NHS Trust. In 2008, he commenced an appointment with the University of Oxford to develop a joint research department between the two universities of Oxford and Southampton. He is based jointly at the Medical Research Council Epidemiology Resource Centre, Southampton and the Botnar Research Centre, Oxford; where he continues his research into osteoarthritis and osteoporosis.

He has published 107 research papers and written 5 books in the field of rheumatology. Currently Nigel is a member of the National Osteoporosis Society Scientific Advisory Board; and sits on the EULAR (European League Against Rheumatism) Osteoarthritis Guideline Committee and OARSI (Osteoarthritis Research Society International) Committees for the Treatment of Osteoarthritis and the Use of MRI in the diagnosis of Osteoarthritis.

Sir Michael J Berridge

Michael Berridge is an Emeritus Babraham Fellow at the Babraham Institute in Cambridge. His main area of research interest concerns the role of calcium in cellular control processes with particular emphasis on neural signalling, cardiac contractility and cell proliferation. He became a Fellow of Trinity College in 1972 and was elected a Fellow of The Royal Society in 1984. For his work on second messengers Berridge has received numerous awards and prizes, including The Louis Jeantet Prize in Medicine, The Albert Lasker Medical Research Award, The Heineken Prize, The Wolf Foundation Prize in Medicine and The Shaw Prize. In 1998 he was knighted for his service to science.

Gordon Blunn

Professor Blunn has been the Head of the Centre of Bioengineering at The Institute of Orthopaedics and Muskuloskeletal Science at University College London since 2000. Professor Blunn's experience lies in materials and design of orthopaedic implants. Recent projects include the development of a non-invasive growing prosthesis used to treat bone cancers in children where the prosthesis is able to be extended in a non-invasive manner to keep growth of the affected leg in line with that of the normal limb. Other developments include the use of an Intraosseous Transcutaneous Amputation Prosthesis which has been used in amputees to securely fix the artificial limb to the skeletal bone. Projects such as these require expertise.

Roger Brooks

Dr Brooks is a Senior Research Associate in the Orthopaedic Research Unit, University of Cambridge based at Addenbrooke's Hospital. His research interests include evaluating scaffolds for musculoskeletal tissue engineering, investigating cell responses to particulate materials, inhibiting inflammatory osteolysis and in vitro and in vivo models of bone repair. He is currently funded by the National Institute for Health Research through the Cambridge Biomedical Research Centre Musculoskeletal Program and is involved in a number of projects with industrial partners centred on the repair of bone, cartilage and tendon. He is also involved in several academic collaborations including with the Cambridge Centre for Medical Materials evaluating nanocomposites, biodegradable polymers and a range of bioactive ceramics as implant materials.

Chris Burgoyne

Chris Burgoyne is a Structural Engineer and Head of the Structures Group at the University of Cambridge. He took his PhD at Imperial College where he taught before taking up his current post in 1989. He has interests in the use of new materials such as advanced fibres in structural engineering applications, but has also undertaken research into various aspects of bone mechanics, including the structural behaviour of human ribs, interpretation of fossil bones, and most recently the behaviour of the femoral neck, where it has been shown that it is buckling resistance rather than material strength that is the critical factor.

David Burr

David B Burr is Professor of Anatomy and Cell Biology and Professor of Biomedical Engineering at Indiana University. Dr Burr studies the response of bone to mechanical stimuli, pharmaceutical treatments for osteoporosis, cartilage and bone repair in arthritis, and the biomechanics of stress fractures. He is the author of more than 200 peer-reviewed articles, 23 book chapters and four books on the structure, mechanics and fracture of bone.

Dr Burr is Past-President of the American Association of Anatomists, and Past-President of the Orthopaedic Research Society. He won the Borelli Award from the American Society of Biomechanics in 2008 and the Gideon A. Rodan Excellence in Mentorship Award from the ASBMR in 2010. He is an Associate Editor for *Bone,* and the *J of Musculoskeletal and Neuronal Interactions*, and serves on the editorial boards for *J of Biomechanics, Osteoporosis International, Calcified Tissue International,* and *J of Bone and Mineral Metabolism*.

Patrick Case
Consultant Senior Lecturer in Orthopaedic Surgery and Pathology at the University of Bristol

Bruce Caterson
B.Sc. Hons. (1971) & Ph.D (1976) in Biochemistry from Monash University, Victoria, Australia. Postdoc – Professor in USA from 1975-1995 (in Alabama, West Virginia & North Carolina) and now 16 years in UK in Cardiff. Currently, Professor of Biochemistry, School of Biosciences & Associate Director of Musculoskeletal Research, School of Medicine, Cardiff University, Wales, UK.
Research Interests: Anything to do with the structure, function & metabolism of connective tissues in health & disease; especially musculoskeletal tissues and more recently stem cells & tissue regeneration/repair.
Service: 1993 - President, Orthopaedic Research Society & 1988-1996 Board of Directors, Orthopaedic Research Society (USA); 2000-2002 President, Society for Back Pain Research (UK); 2004-2007 President, British Orthopaedic Research Society; 2002-2009 Chairman, British Society for Matrix Biology.
Honours: 1987 - Benedum Distinguished Scholar Award in Bioscience and Medicine at West Virginia University (USA); 1998 - *Kappa Delta Elizabeth Winston Lanier Award for Outstanding Orthopaedic Research* from the American Academy of Orthopaedic Surgeons and Orthopaedic Research Society (USA);2009 - *Barry Preston Award* for contributions to Australian & New Zealand Matrix Biology; 2011 - *Fell-Muir Award* for outstanding contributions to British Matrix Biology.
Publications: Total 195 (168 Full Papers & 27 Reviews/Book Chapters).

Chantal Chenu
Chantal Chenu is a Senior Lecturer in Bone Cell Biology at the Royal Veterinary College in London. After graduating from the University of Lyon with a degree in Biochemistry, she conducted her PhD research in David Roodman's laboratory in San Antonio, Texas on osteoclast differentiation from bone marrow. She then joined Pierre Delmas' INSERM group in Lyon, where her work focused on the biochemical and functional characterization of several bone matrix proteins. She became an independent researcher with INSERM in 1991, investigating the role of the nervous system in the control of bone development and turnover. She was a co-founder of the French Society on Biology of Mineralised Tissues in 1997. She moved to the Royal Veterinary College in 2003, where her research has focused on the regulatory and repair mechanisms of bone. Her recent research, funded by the Wellcome Trust, is aimed at investigating the control of bone mass in relation to energy metabolism, with a particular interest on the role of the energy sensor AMP-activated protein kinase (AMPK). Chantal Chenu has served on the Editorial Board of Journal of Bone and Mineral Research and is a member of the Faculty of 1000 Medicine.

Juliet Compston
Juliet Compston is Professor of Bone Medicine and Honorary Consultant Physician at the University of Cambridge School of Clinical Medicine, a position she took up in 2003. Her research is focused on the pathophysiology of osteoporosis and the cellular and structural mechanisms by which pharmacological interventions preserve bone mass and reduce

fracture risk. She has conducted studies into the pathophysiology of bone disease in a number of disorders, including postmenopausal osteoporosis, post-transplantation osteoporosis and cystic fibrosis. Recently her research has focused on fractures in obese postmenopausal women.

Professor Compston is a past President of the Bone and Tooth Society of Great Britain, as well as a past Chairman and President of the International Society of Bone Morphometry. She is currently a member of the Board of the International Osteoporosis Foundation (IOF) and its Committee of Scientific Advisors, and a Trustee of the Medical Board of the National Osteoporosis Society. She is Chair of the European Union Osteoporosis Consultation Panel and of the UK National Osteoporosis Guidelines Group.

Professor Compston is Associate Editor of the *Journal of Bone and Mineral Research* and a member of the Editorial Board of several peer-reviewed journals including *Bone*, *Osteoporosis International, Calcified Tissue International* and the *Journal of Clinical Densitometry*. She has published over 300 original research papers and reviews.

In 2006, Professor Compston was awarded the National Osteoporosis Society Kohn Foundation Award, and in 2009, the International Bone and Mineral Society John G Haddad Jr Award and the ASBMR Frederic C Bartter Award.

John Currey

John Currey is emeritus Professor of Biology at the University of York, UK.
He was educated at Oxford, where he had a firm grounding in evolutionary matters, which remain a great interest of his. He moved into biomechanics almost by accident (he can still remember having his hand on the door to leave when the engineer to whom he was talking said 'Why don't you test it?).
Since then he has had a constant interest in the mechanics of bone and other hard tissues like mollusc shells, first in Oxford, then till his retirement and after at York, except for a year in Cleveland Ohio, where he was taught what little formal biomechanics he has learnt by Al Burstein.

Jean-Marie Delaisse

Dr Delaisse entered the bone field in 1979, at the Institute of Cellular Pathology (Brussels) directed by C. de Duve. His research, inspired by the lysosomal concept, aimed first at identifying the proteinases solubilizing the bone matrix, and broadened later to the role of proteinases in regulation of bone remodeling before and after the main bone solubilization step. In 1995, Dr Delaisse moved to the Center of Clinical and Basic Research / Nordic Bioscience (Copenhagen) to continue this research as CSO. In 2003, he moved to the University of Southern Denmark (Odense), where he became Professor of Clinical Cell Biology, and investigates the remodeling mechanism of adult human bone, paying special attention to the supracellular organization of the remodeling area.

James Edwards

James Edwards, D. Phil., graduated from, University of Oxford before studying with Dr. Gregory Mundy at the University of Texas, and helped found the Vanderbilt Centre for Bone

Biology, Nashville. He currently holds a faculty position at the Institute of Musculoskeletal Sciences, University of Oxford, studying ageing mechanisms in normal and pathological musculoskeletal tissues. Over the past 16 years he has pursued an interest in cellular pathology and bone biology within laboratories across the UK, Australia and America. Over this time he has won several awards, including the ASBMR Outstanding Contribution to the Pathophysiology of Osteoporosis Award and numerous Young Investigator Awards. He is co-chair of the ASBMR Committee for Young Investigators and serves on the editorial board of *Frontiers in Endocrinology of Ageing*. His work encompasses molecular mechanisms of bone cell interactions to advanced pre-clinical models including cancer-induced bone disease and age-related bone loss. His current studies focus on the role of lifespan-controlling factors, such as the sirtuin gene family, in the loss of skeletal integrity with age, identifying common regulatory links and potential therapeutic targets between the mechanisms which control longevity and the deterioration of the musculoskeletal system.

Peter Fratzl

Peter Fratzl is director at the Max Planck Institute of Colloids and Interfaces in Potsdam, Germany, and honorary professor of physics at Humboldt University, Berlin, and at Potsdam University. He received an engineering degree from the Ecole Polytechnique in Paris, France (1980), and a doctorate in Physics from the University of Vienna, Austria (1983). Before moving to Potsdam in 2003, he has been holding professor positions in materials physics at the Universities of Vienna and Leoben in Austria and been director of the Erich Schmid Institute of materials science of the Austrian Academy of Sciences.

Peter Fratzl's lab studies the relation between (hierarchical) structure and mechanical behaviour of biological materials, such as mineralized tissues, extracellular matrix, or plant cell walls, as well as bio-inspired composite materials. This is complemented by medically oriented research on osteoporosis and bone regeneration. Peter Fratzl has published more than 350 papers in journals and books, mostly on interdisciplinary materials science topics. He received several international awards for his work including the Max Planck Research Award 2008 from the Humboldt Foundation (together with Robert Langer, MIT) and the Leibniz Award 2010 of the German Science Foundation. In 2010, he was awarded an honorary doctorate from the University of Montpellier, France, and since 2007 he is foreign member of the Austrian Academy of Sciences.

Mary Goldring

Professor Goldring is Senior Scientist in the Research Division of the Hospital for Special Surgery and Professor of Cell and Developmental Biology, Weill Cornell Medical College in New York. Previously, she was principal investigator of research groups at the Massachusetts General Hospital and Beth Israel Deaconess Medical Center at Harvard Medical School, Boston, MA. Major contributions include the identification of the molecular mechanisms involved in matrix remodeling in osteoarthritis and development of in vitro models for studying human chondrocyte biology. Current work involves relating findings in mouse models of OA to aspects of the human disease. Her research is supported by grants from NIA and NIAMS. She is Co- Editor of *Arthritis & Rheumatism* and Associate Editor of *Journal of Cellular Physiology, Arthritis Research and Therapy* and *Journal of Orthopedic Research.* She is 3rd Vice President of the ORS and a member of the Board of Directors of

OARSI and has served on study sections for NIH, the Arthritis Foundation, OREF, and NASA and organizing committees of the 2005 and 2007 Cartilage Gordon Conferences.

Nick Higgins
Consultant Radiologist, University of Cambridge

John Kanis
Professor John A. Kanis is Emeritus Professor in Human Metabolism, and Director, World Health Organization Collaborating Centre for Metabolic Bone Diseases, University of Sheffield, UK. He is the President of the International Osteoporosis Foundation. Professor Kanis' research interests are largely related to disorders of skeletal metabolism including osteoporosis, Paget's disease of bone, hyperparathyroidism, renal osteodystrophy and neoplasia affecting the skeleton. Contributions to research include cell biology, histomorphometry of bone, assessment and treatment of bone disorders, guideline development, health technology assessment, epidemiology and health economics. He is the Editor of Osteoporosis International and serves on the editorial board of several journals. He is the author of more than 800 papers, chapters and books on bone disease and metabolism. His current major interest is in the development of risk assessment algorithms and the formulation of practice guidelines in many regions of the world.

Richard Keen
Consultant Rheumatologist and Honorary Senior Lecturer in Metabolic Bone Disease.
Dr Richard Keen graduated from St Mary's Hospital, London, UK in 1988. After general medical posts in London and Sheffield he started professional training in rheumatology, and during this time developed his specialist interest in osteoporosis. He is now Director of the Metabolic Bone Disease Unit at the Royal National Orthopaedic Hospital, Stanmore, UK. He also holds a honorary senior lecturer appointment at the Institute of Orthopaedics and Musculoskeletal Science, University College London, London.

Andy Pitsillides
Andy is a Professor in Skeletal Dynamics with interests spanning several areas of cell: matrix biology in the skeletal system. With growing emphasis on early mechano-dependent embryonic events, some of his research aims to establish how joints develop and how skeletal tissues adapt their structure. With a BSc and PhD (1988) awarded whilst at the Kennedy Institute, he later characterised synovial cell function in hyaluronan synthesis and described a novel role for nitric oxide in bone cells' mechanoadaptive response. He is Board Member of the London Matrix Group and British Society for Matrix Biology, Executive Editor of Cell Biochemistry and Function and Executive Committee Member of International Society for Hyaluronan Sciences.

Jonathan Reeve
Dr Reeve qualified in Medicine at Oxford and received further training at Guy's, the Hammersmith and Northwick Park. His research career began with Norman Veall, the 'father' of Nuclear Medicine, as a MRC Research Fellow at Northwick Park Hospital and Clinical Research Centre (CRC) Harrow, following an informal discussion of the mathematical

modelling of calcium metabolism. At CRC he did the first clinical trial of teriparatide (parathyroid hormone), whose structure had recently been confirmed by John Potts and colleagues. This revealed it to have a strong bone building effect. After the MRC closed the CRC, he moved to Cambridge in 1994. He led the 30+ centre European Prospective Osteoporosis Study (EPOS) from 1993 with Alan Silman, which contributed to the much used FRAX tool for assessing fracture risk in osteoporosis. With Nigel Loveridge he also led a programme of research on the cellular and structural determinants of hip fracture risk, which led to collaboration with Chris Burgoyne and Tom Beck on the role of elastic instability (buckling) of the femoral neck cortex in this fracture. Study of the femoral osteocyte also began in 1994, first with its death and later with studies of secreted sclerostin, in collaboration with Socrates Papapoulos and colleagues. His current research interests include the genetic causes of fracture (as part of the GEFOS consortium) which grew out of EPOS and the EPIC-Norfolk study. He is a past Secretary and President of the Bone Research Society.

Graham Russell

Graham Russell (R G G Russell) graduated with first-class honours in Biochemistry from Cambridge University in 1962 and subsequently gained his PhD working in the MRC Unit in Leeds. After a fellowship in Switzerland he completed his medical degree at Oxford University. Following appointments at Bern University and then Harvard, he became Professor and Head of the Department of Human Metabolism and Clinical Biochemistry at Sheffield University in 1977. Under his leadership that department became established as a major international centre for the study of basic and clinical research into bone diseases. His research interests are in skeletal biology and disease, and he is author of more than 500 publications. In particular, his early work with Herbert Fleisch in Switzerland led to the discovery of the biological effects of bisphosphonates, and to their eventual successful clinical use in the treatment of bone disorders, including Paget's disease, cancer metastases in bone, and osteoporosis. His group later discovered how bisphosphonates act within cells as inhibitors of the mevalonate pathway.

He has held many prestigious offices, including the Presidency of the International Bone & Mineral Society (1998-2002), and he was a founding Trustee and subsequent Chairman of the Council of Management of the National Osteoporosis Society (UK). He was the Heberden Orator of the BRS in 1993 and was the recipient of the John Johnson Award of the Paget's Foundation (USA) in 1997. He has received the W F Neuman award of the American Society of Bone and Mineral Metabolism, the Gaillard award of the IBMS, and in 2008 he was elected a Fellow of the Royal Society of London (FRS).

From 2001-7 he was the Norman Collisson Professor of Musculoskeletal Sciences at Oxford University, and the first Director of the Botnar Research Centre. He is continuing his research as Professor of Musculoskeletal Pharmacology in Oxford and in the Mellanby Centre at Sheffield University.

Molly Stevens

Molly Stevens is currently Professor of Biomedical Materials and Regenerative Medicine and the Research Director for Biomedical Material Sciences in the Institute of Biomedical Engineering at Imperial College. She joined Imperial in 2004 after a Postdoctoral training in the field of tissue engineering with Professor Robert Langer in the Chemical Engineering

Department at the Massachusetts Institute of Technology (MIT). In 2010 she received the Polymer International-IUPAC award for creativity in polymer science, the Rosenhain medal and the Norman Heatley Prize for Interdisciplinary research from the Royal Society of Chemistry. She has also recently been recognised by the TR100, a compilation of the top innovators, under the age of 35, who are transforming technology - and the world with their work. Her group is focussed on both high quality fundamental science and translation for human health. Research in regenerative medicine within her group includes the directed differentiation of stem cells, the design of novel bioactive scaffolds and new approaches towards tissue regeneration. She is the co-founder of RepRegen and InTiGen.

Jonathan Tobias

Jonathan Tobias is Professor of Rheumatology at the University of Bristol, and consultant rheumatologist at North Bristol Trust. Following undergraduate studies in medicine at Cambridge University and London University from where he qualified in 1984, he completed MD and PhD theses in bone biology in 1990 and 1994, at St George's Hospital Medical School in London. He moved to the University of Bristol in 1995, and since 2008 has been based at the Musculoskeletal Research Unit at the Avon Orthopaedic Centre, Southmead Hospital. He manages a diverse research programme into the causes and treatment of osteoporosis, directs bone research within the Avon Longitudinal Study of Parents and Children, and has over 90 original peer-reviewed research publications in the bone field. He also has extensive clinical experience in treating patients with osteoporosis, and in running DXA-based osteoporosis diagnostic services. He has served on the editorial boards of *Journal of Bone and Mineral Research* and *Calcified Tissue International,* and on the Research and Education committee of the British Society for Rheumatology, the programme committee of the National Osteoporosis Society, and the research committee of the Arthritis Research UK. He is currently president of the Bone Research Society.

Toni Vidal-Puig

Dr Vidal-Puig obtained his medical degree from Valencia Medical School (Spain) before training in clinical endocrinology at Granada Medical School (Spain), where he obtained his PhD based on clinical and physiological studies of the relationship between insulin resistance and hyperandrogenism. The award of the Paul Dudley White Fellowship from the American Heart Association funded post-doctoral training at Harvard University, supporting his work with Dr David Moller and Prof Jeffrey Flier at the Beth Israel Hospital. Having published several key papers on the genetics and expression of PPARg in human disease states and been appointed Instructor in Medicine at Harvard, Dr Vidal-Puig further broadened his scientific horizons with experience in mouse transgenesis and knockout techniques in Prof Brad Lowell's group. In 2000 he moved to the University of Cambridge to establish his own laboratory and embark on the development of a programme based on genetically modified mouse models of metabolic diseases.

Dr Vidal-Puig is currently the Professor of Molecular Nutrition and Metabolism at Cambridge University and Honorary Consultant in Metabolic Medicine at Addenbrooke's Hospital, Cambridge. He is Deputy Director of the MRC Centre for Obesity and Related Diseases and Director of the Cambridge Phenomics Centre, a state-of-the-art centre that applies multidisciplinary approaches to murine phenotyping. His programme of research focuses on the molecular mechanisms of lipid-induced insulin resistance and on developing strategies

to prevent the deleterious effects of lipids, specifically by modulating fatty acid oxidation and thermogenic mechanisms.

Richard Villar

Richard Villar is a consultant orthopaedic surgeon at the Cambridge Lea Hospital, Cambridge, UK. He is a specialist in surgery of the young adult hip. He has been undertaking hip arthroplasty for more than 15 years and has been performing hip arthroscopic surgery since 1988. In this latter field he wrote one of the first world texts on the subject and publishes and lectures extensively. He treats many premier national and international athletes. In addition to his clinical commitments, Mr Richard Villar has been the Assistant Editor of the British Journal of Bone and Joint Surgery, for whom he now produces a monthly podcast, and also runs a comprehensive Fellowship programme. He has been an elected member of the Council of the British Orthopaedic Association, an assessor for the General Medical Council and a Founding Member of the International Society for Hip Arthroscopy. Richard Villar has extensive overseas interests and lives near Cambridge in the United Kingdom. His leisure activities include mountaineering (he is a trained International Mountain Leader), Nordic skiing and classical guitar.

Keith Willett

Professor Keith Willett was appointed as the first National Clinical Director for Trauma Care on 1 April 2009.

He has extensive experience of trauma care and medical management and is Professor of Orthopaedic Trauma Surgery at the University of Oxford and continues to work as Honorary Consultant Orthopaedic Trauma Surgeon at the John Radcliffe Hospital, Oxford.

Keith is the co-founder of the unique consultant delivered Oxford Trauma Service established in 1993. In 2003 he founded the Kadoorie Centre for Critical Care Research and Education focusing on outcomes of treatment in the injured patient, and established the Oxford Trauma Research Group.

Keith has an extensive research portfolio and has published research relating to the care of the multiply injured patient, acetabular and pelvic fractures, fractures in the elderly, limb fracture surgery, fracture biomechanics, accident prevention and clinical outcome studies of orthopaedic trauma surgery techniques.