

BRS Annual Meeting 2018
27-29 June 2018, Winchester, UK
Invited Speakers

Lynda Bonewald is the Director of the Indiana Center for Musculoskeletal Health. She received her PhD in Immunology/Microbiology from the Medical University of South Carolina, was promoted from Assistant to Full Professor at the Univ. of Texas Health Science Center (1986-2001) and served as director of the Bone Biology Research Program and Vice Chancellor for Research at the University of Missouri-Kansas City (2001-2016). She is now the Director of the Indiana Center for Musculoskeletal Research. She served as president of the American Society for Bone and Mineral Research and the Association of Biomedical Research Facilities, served as Chair of the Board of Scientific Councilors for the NIDCR and served on Council for NIAMS. She has received the "Basic Research in Biological Mineralization Award" from the IADR, the "RIB Award" from Sun Valley, and the prestigious William F. Neuman award from the ASBMR. She is best known for her work in the study of osteocytes and is responsible for tools used by researchers globally to determine osteocyte biology and function. She directed a program project on osteocyte response to mechanical load for 11 years from NIAMS and now directs a program project on muscle-bone crosstalk from NIA.



Mark Bradley received his doctorate from the University of Oxford in 1989, followed by post-doctoral studies at Harvard and returning to the UK as a Royal Society University Research Fellow (University of Southampton). In 1997 he was made a Professor of Combinatorial Chemistry setting up the UK's Centre for Combinatorial Chemistry. In 2005 he moved to the University of Edinburgh, where he is now Director of a £15M Interdisciplinary Research Collaboration in the area of Optical Molecular Imaging (Proteus 2014-2023). He is also PI on a Doctorial Training Centre (60PhD) in Optical Imaging with Entrepreneurship and holds an ERC advanced grant on "SmartMaterials" for cellular control. He has been elected to fellowships of the Royal Society of Edinburgh. In 2011 he was awarded the Chancellors Award – the highest research award of the University of Edinburgh. In 2012 he was awarded an honoree Professorship by Changzhou University, China. He is a co-founder of Ilika Technologies (2004) (which floated on AIMS in 2010), DestiNA Technologies (2010) and Edinburgh Molecular Imaging (2014).



Cyrus Cooper is Professor of Rheumatology and Director of the MRC Lifecourse Epidemiology Unit; Vice-Dean of the Faculty of Medicine at the University of Southampton; and Professor of Epidemiology at the Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford. He leads an internationally competitive programme of research into the epidemiology of musculoskeletal disorders, most notably osteoporosis. His key research contributions have been: 1) discovery of the developmental influences which contribute to the risk of osteoporosis and hip fracture in late adulthood; 2) demonstration that maternal vitamin D insufficiency is associated with sub-optimal bone mineral accrual in childhood; 3) characterisation of the definition and incidence rates of vertebral fractures; 4) leadership of large pragmatic randomised controlled trials of calcium and vitamin D supplementation in the elderly as immediate preventative strategies against hip fracture. He is President of the International Osteoporosis Foundation; Chair of the BHF Project Grants Committee; an emeritus NIHR Senior Investigator; and Associate Editor of Osteoporosis International. He has previously served as Chairman of the Scientific Advisors Committee, International Osteoporosis Foundation; Chairman, MRC Population Health Sciences Research Network; Chairman of the National Osteoporosis Society of Great Britain; past-President of the Bone Research Society of Great Britain; and has worked on numerous Department of Health, European Community and World Health Organisation committees and working groups. He has published extensively (over 900 research papers; h-index=119) on osteoporosis and rheumatic disorders and pioneered clinical studies on the developmental origins of peak bone mass. In 2015, he was awarded an OBE for services to medical research.



Steve Cummings is a general internist and epidemiologist who has designed and led several large multicenter studies, such as the Study of Osteoporotic Fractures, and pivotal trials, including FIT trial of alendronate and the FREEDOM trial of denosumab. He has made pivotal contributions to understanding risk factors for hip fractures and proving the efficacy and safety of most of the treatments for osteoporosis used in clinical practice. He has received ASBMR's Bartter Award for Excellence in Clinical Research in Osteoporosis and has been elected to the U.S. National Academy of Medicine of the National Academies of Science. His current work focuses on prevention of fractures in patients with medical conditions, such as Parkinson's Disease, and the biology of aging bone and muscle.



Serge Ferrari is Professor of Medicine at the Geneva Faculty of Medicine and Head of the Clinical Service and Research Laboratory of Bone Diseases at the Department of Internal Medicine Specialties, Geneva University Hospital, Switzerland. Professor Ferrari obtained his medical degree from the Geneva Faculty of Medicine in 1989. He trained in internal medicine and pathophysiology at Geneva University Hospital, and subsequently as a research and clinical fellow in bone diseases and endocrinology at Beth Israel Deaconess Hospital in Boston, USA. Professor Ferrari was nominated Instructor in Medicine at Harvard Medical School in 2000 and received a six years Professorship grant from the Swiss National Science Foundation in 2001. Professor Ferrari is Chair of the Council of Scientific Advisors and a member of the Executive Committee of the International Osteoporosis Foundation (IOF), Past-President of the Swiss Bone and Mineral Society, and current Vice-President of the Swiss Association against Osteoporosis. He has been a member of the editorial board of several scientific journals including the *Journal of Bone Mineral Research*, *Osteoporosis International* and *Bone*, and the editor-in-chief of *BoneKey*. He received the Olaf Johnell science award from the IOF in 2016. Professor Ferrari has published over 200 articles and book chapters in the field of osteoporosis and bone and mineral metabolism.



Celia Gregson is a Consultant Senior Lecturer in Musculoskeletal Medicine and Arthritis Research UK Clinician Scientist at the Musculoskeletal Research Unit, University of Bristol and is an Honorary Consultant Orthogeriatrician at the Royal United Hospital in Bath. She qualified in Medicine from the University of Nottingham. Following physician training she completed a MSc in Epidemiology from the London School of Hygiene and Tropical Medicine and then a PhD at the University of Bristol funded by a Wellcome Trust clinical research training fellowship. She set up and runs the UK DINAG consortium (DXA-databases to Identify Novel Anabolic Genes). She worked at the MRC Lifecourse Epidemiology Unit at the University of Southampton before taking up her current Arthritis Research UK Clinician Scientist fellowship.

Her research interests include the epidemiology and genetics of osteoporosis and fractures, high bone mass disorders, the role bone plays in the pathogenesis of osteoarthritis, the impact of social deprivation on fracture incidence and outcomes, the effect of neurological diseases on musculoskeletal health, and the cross-talk between muscle, fat and bone.

Celia chairs the Royal College of Physicians Falls and Fragility Fracture Audit Programme Scientific and Publications Committee and is a member of their Fracture Liaison Service Database Advisory Group. She co-chairs the BGS falls and bone health specialist interest group, is a member of the National Joint Registry research committee, and past committee member for the Bone Research Society.



Mark Hanson is the founding Director of the Institute of Developmental Sciences at the University of Southampton (opened by HRH The Princess Royal in 2007) and British Heart Foundation Professor of Cardiovascular Science (from 2002). On moving from UCL to Southampton in 2000 he established the Developmental Origins of Health and Disease (DOHaD) Centre in the Faculty of Medicine and was one of the founders and past President of the International DOHaD Society. He has been awarded honorary fellowships of the Royal College of Obstetricians and Gynaecologists and the Royal College of Paediatrics and Child Health, and many academic medals and titles.

Mark's research concerns several aspects of development and health, ranging from how the environment during development (before and after birth) can affect the later risk of chronic non-communicable diseases, to population studies aimed at the early identification of risk so that timely preventative interventions can be made. With colleagues he is exploring the epigenetic processes which underlie such risks, and which may serve as valuable early life biomarkers. Work is ongoing on these problems in both developed and developing countries in many parts of the world.

Mark was a founding director of a hospital research lab-based educational programme for adolescents, LifeLab, in Southampton (opened by HRH The Countess of Wessex in 2014). LifeLab is a collaborative initiative between the University of Southampton, University Hospital Southampton NHS Trust and local schools. It aims to promote health and science literacy in school students through context-specific curriculum material and a visit to the LifeLab facility in the hospital, giving them hands-on experience of current research tools, the opportunity to meet biomedical scientists and engaging them with state-of-the-art science, under the heading of "Me, My Health and My Children's Health". LifeLab has received significant media coverage and was shortlisted for the BBSRC Innovators Award in 2012 and a Times Higher Education Award in 2015.

Mark plays a leading role in a range of public health and policy initiatives. He co-chaired the Science and Evidence Working Group for the WHO Director-General's Commission on Ending Childhood Obesity (published Jan 2016); he was lead author for a chapter on pre-conception health in the Chief Medical Officer's Annual Report for 2014 (published November 2015); he is a consultant to WHO and has organised technical meetings in Geneva on child development, the developmental effects of environmental chemicals and the life course approach to healthy ageing. He is the Chair of the Working Group on Adolescent, Pre-conception and Maternal Nutrition for FIGO. This group published its recommendations in 2015 and is now working to define specific guidelines in a range of settings globally, working with a team of regional ambassadors established by the group. The group's work has attracted significant external funding and publications, and led to the signing of an MOU between FIGO and the Chilean Ministry of Health in 2017.

Mark has published 250 scientific papers and 122 invited reviews. He is also much involved in the wider public understanding of science through public lectures and popular science books. His recent books include *Mismatch – the lifestyle diseases timebomb* (2006), *Principles of Evolutionary Medicine* (2009; second edition 2016), *Fat, Fate and Disease* (2012) and *Nutrition and Lifestyle for Pregnancy and Breastfeeding* (2015) all published by Oxford University Press.



Nicholas Harvey is Professor of Rheumatology and Clinical Epidemiology at the University of Southampton, UK, having originally trained in medicine at the Universities of Oxford and Cambridge. He is Vice-Chair of the International Osteoporosis Foundation Committee of Scientific Advisors, and he co-leads an MRC programme focused on the lifecourse epidemiology of bone and joint disease, at the MRC Lifecourse Epidemiology Unit. His work incorporates a lifecourse approach to the characterization of the epidemiology and determinants of osteoporotic fracture from cradle to grave, elucidation of underlying mechanisms, and development of novel interventions. He has won national/international prizes, such as the National Osteoporosis Society Kohn Award, is an investigator on >£50m grant funding, has published over 160 peer-reviewed articles, and is a member of many national/international committees, including as Musculoskeletal Lead for UK Biobank Imaging Enhancement, and as a member of the ASBMR Professional Practice Committee.



Markus Heller is a Professor of Biomechanics in the Department of Mechanical Engineering at the University of Southampton (since 2012). He currently serves as President of the German Society of Biomechanics, is a council member of the European Society of Biomechanics (ESB), and serves as Specialty Editor of Biomechanics for *Frontiers In Bioengineering And Biotechnology*. His research has been awarded numerous prestigious awards and applies engineering principles to develop accurate and validated computational models of the mechanics of the extremities, which help us to understand the subject specific loading conditions and assess the risk of mechanical overload of the skeleton. In doing so, his team aim to establish the scientific basis for the development and implementation of innovative, biomechanically driven concepts for maintaining skeletal health and function throughout the lifespan.



Kassim Javaid, after completing medical training at Charing Cross and Westminster Medical School, Kassim specialized in adult rheumatology at the Wessex Deanery. During that time, he completed a PhD examining the maternal determinants of intra-uterine bone growth as part of an ARC Clinical Fellowship at the University of Southampton followed by a travelling fellowship and worked with the OA group in UCSF to study the role of vitamin D and bone in lower limb OA. Since his return to the UK, he has been appointed as Honorary Consultant Rheumatologist and is the Associate Professor in Metabolic Bone disease at the University of Oxford. His research interests include the role of epidemiology of musculoskeletal diseases focusing in secondary fracture prevention and rare bone diseases (www.rudystudy.org).



Sundeep Khosla is the Dr Francis Chucker and Nathan Landow Research Professor of Medicine and Physiology and a Mayo Foundation Distinguished Investigator. He also serves as Director of the Center for Clinical and Translational Science and Dean for Clinical and Translational Science at Mayo Clinic. Dr Khosla received his A.B. degree from Harvard College and his M.D. from Harvard Medical School. He was subsequently a resident in Internal Medicine and a fellow in Endocrinology at the Massachusetts General Hospital. In 1988 he moved to Mayo Clinic, where his research interests include mechanisms of age-related bone loss and sex steroid regulation of bone metabolism. Dr Khosla has served as Chair of the NIH SBDD Study Section, on the Council of the National Institute on Aging, and as President of the American Society for Bone and Mineral Research. He is currently serving on the Council of NIAMS. Dr Khosla has received numerous awards and honors for his work, including the Frederic C. Bartter Award for Clinical Investigation and the William F. Neuman Award for Outstanding Scientific Contributions from the American Society for Bone and Mineral Research (ASBMR), the presentation of the Louis V. Avioli Plenary Lecture at the ASBMR annual meeting, the Outstanding Clinical Investigator Award and Plenary Lecture from the Endocrine Society, and election to the ASCI and AAP. Dr Khosla currently serves as the Editor-in-Chief of *Bone*, has served as Associate Editor of the *Journal of Bone and Mineral Research* and as a member of the editorial boards for the *Journal of Clinical Investigation*, *Journal of Bone and Mineral Research*, *Journal of Clinical Endocrinology and Metabolism*, *Bone*, and *Endocrine Reviews*.



Karen Lillycrop is Professor of Epigenetics and Principal Investigator (transcriptional regulation and epigenetics) and Deputy Head of Biological Sciences at the University of Southampton.

Janet Lord is Professor of Immune Cell Biology and director of the Institute for Inflammation and Ageing at Birmingham University and is also director of the MRC-Arthritis Research UK Centre for Musculoskeletal Ageing Research. She is a theme lead in the recently awarded NIHR BRC in Inflammation. Her primary research focus is in the effect of ageing upon immune function and how this limits the ability of older adults to resolve inflammation and predisposes them to chronic inflammatory disease such as Rheumatoid arthritis. She also researches the link between chronic systemic inflammation and physical frailty in old age and chronic disease. In this context Professor Lord has a particular interest in the role played by stress (physical and psychological) and the altered HPA axis in modulating immunity and frailty in old age and following an injury such as hip fracture. In 2013 she was awarded the Lord Cohen of Birkenhead medal for her outstanding research in human ageing by the British Society for Research in to Ageing. She was elected a Fellow of the Academy of Medical Sciences in 2015. She has published over 200 original papers and reviews.



Christa Maes is Associate Professor at the KU Leuven in Belgium and Group leader of the Laboratory of Skeletal Cell Biology and Physiology (SCEBP), which is part of the Skeletal Biology and Engineering Research Center (SBE). The overall goal of SBE's integrated basic, applied and clinical research plan is to advance cartilage, bone and joint repair and regeneration.

Christa Maes graduated as Bio-engineer in Cell- and Gene Technology and next obtained a PhD in Medical Sciences at the Faculty of Medicine of the KU Leuven, studying the role of angiogenic factors of the VEGF family in bone with Geert Carmeliet. She performed part of her postdoctoral studies in the lab of Theresa Guise (Indiana University) and worked with Henry Kronenberg at Harvard Medical School in Boston, optimizing novel transgenic mouse models for osteoblast lineage cell visualization and tracing in developing and healing bones. Christa set up her own laboratory at the KU Leuven with the support of an ERC Starting Grant awarded in November 2011.

During her career Christa obtained national and international fellowship support and her work was awarded several awards, including from the ASBMR, the IBMS, the Dutch bone society (NVCB), Gordon Conferences and the NYAS. She received the 2006 PhD Excellence Award of the Belgian Society for Cell and Developmental Biology, the 2011 Annual Lecture Award of the Belgian Endocrine Society, and the 2013 ECTS Iain T Boyle Award. Christa is active in the international bone community; she co-chaired the IBMS Young Investigator Committee, organizing scientific and career development workshops for junior researchers, and is one of the lead organizers of the Herbert Fleisch workshops held in 2014 and 2016, and coming up in 2019 in Brugge (Belgium). She is a member of the ASBMR Membership Engagement and Education Committee, and serves as Associate Editor of the Journal of Bone and Mineral Research.



Sumeet Mahajan is a Professor in Molecular Biophotonics & Imaging in Chemistry with a joint appointment in the Institute for Life Sciences at the University of Southampton. His group works at the life science interface. The overarching aim of the research in his group is to develop new spectroscopy and imaging techniques and apply them to extract chemical and structural information from biological systems to understand disease processes for early, faster or more sensitive diagnosis and therapy. He was trained in Chemistry and Biomedical Engineering at the prestigious Indian Institutes of Technology (IIT) Kanpur and Bombay, respectively, followed by 5 years of pre-doctoral research experience developing sensors and analytical methods for monitoring toxic chemicals. His doctoral work at Southampton was on developing nanostructures for optical applications to detect DNA mutations while as a postdoc he researched photonic applications of nanomaterials and developed non-linear spectroscopic techniques at the Cavendish Laboratory, University of Cambridge. In 2010 after being awarded a cross-disciplinary EPSRC fellowship he setup his independent program in the area of Biospectroscopy hosted by the Department of Genetics at the University of Cambridge. Subsequently he moved to Southampton in 2012 and was awarded the prestigious ERC grant in 2014 to develop next generation chemical imaging techniques for biomedical applications. Prof Mahajan has published ~80 papers in international journals and leads his research group at Southampton in ILS consisting of chemists, physicists, biologists and engineers developing, applying and translating photonic technologies to focus areas such as skeletal repair and regeneration.



Ivan Martin studied Biomedical Engineering at the University of Genova where he obtained his PhD in 1996. Between 1996 and 1999 he was a postdoctoral associate at Harvard/MIT. He joined the Departments of Surgery and of Biomedicine at the University of Basel in 1999 as Director of the Tissue Engineering Research Group. In 2007 he was appointed Professor for Tissue Engineering. From 2004 to 2009 he was the first president of the European section of the Tissue Engineering Regenerative Medicine International Society (TERMIS). He is currently member of the editorial boards of 5 international journals and of the 'Mesenchymal stem cell committee' of the International Society for Cellular Therapy (ISCT). His group includes scientists from the biological, engineering and clinical fields, dedicated to develop solid scientific basis for innovative translational strategies in regenerative medicine. In this field he is author of more than 250 peer-reviewed papers on international journals and inventor on 10 patent applications. The developed science and technology have been translated into several clinical trials for cell-based cartilage and bone repair, and into the founding of a spin-out company for the commercialization of tissue culture bioreactors (Cellec Biotek AG).



Eugene McCloskey is Professor in Adult Bone Diseases in the Academic Unit of Bone Metabolism and Mellanby Centre for Bone Research at the University of Sheffield. In addition to clinical work, he is also the past president of the Bone Research Society and the current Sheffield Director of the MRC ARUK Centre for Integrated research in Musculoskeletal Ageing (CIMA). He has published over 360 peer-reviewed publications, book chapters and reviews and is an acknowledged authority in the fields of vertebral fracture definition, osteoporosis epidemiology and treatment, fracture risk assessment and bone health in cancer. He contributed to the development of the FRAX tool and the subsequent guideline from the National Osteoporosis Guideline Group. He is on a number of editorial boards and is a member of committees within organisations including the Boards of IOF and ESCEO. In 2016, he was awarded the IOF Medal of Achievement, presented annually to recognise an individual researcher who has significantly advanced the field of osteoporosis through original and outstanding scientific contributions.



Ken Poole is an academic rheumatologist at the University of Cambridge, applying novel imaging techniques to investigate human bone diseases and treatments. His team focus on osteoporotic fractures and osteoarthritis by studying bone structure and function in health and disease. With Graham Treece and Andrew Gee from the University Engineering department, Ken developed a way of assessing the 3D structure of bone structure in life called Cortical Bone Mapping (CBM), based on clinical Computed Tomography (CT). The team have used clinical CT as well as histology and microCT to discover that there are defined patches of focal osteoporosis in older people's femurs that predispose them to hip fracture. They have also precisely mapped the focal improvements in the hips and spine of osteoporotic women treated with PTH1-34, anti-RANK ligand and anti-sclerostin antibodies as well as those doing intensive exercise. In prospective studies, Ken's and his team have shown that CBM measurements not only predict hip fracture slightly better than the gold standard (DXA) but also accurately predict total hip replacement for osteoarthritis. His NIHR-funded PHOENIX team currently identifies and treats >10% of Addenbrooke's Hospital CT-attenders (who are undergoing routine CT for any clinical reason) through opportunistic identification of undiagnosed osteoporosis and vertebral fractures. Other publications since his PhD thesis (2006, Clare College Cambridge) include a successful RCT using zoledronate to prevent bone loss after stroke and a study of osteocytes as the master regulators of bone formation via sclerostin (cited more than 650 times). His review articles have focused on CT imaging of bone, hip osteoarthritis, teriparatide treatment and the management of osteoporosis. Clinically, Ken works alongside Dr Gavin Clunie, and he developed the COBRA database to identify more than 350 patients with specialist and rare bone diseases that are treated within their large NHS rheumatology practice at Addenbrooke's Hospital. More than 60 of these patients have now undergone whole Genome Sequencing and NIHR Rare Diseases Bioresource for detailed phenotyping. <http://www.med.cam.ac.uk/poole/>



Anke Roelofs completed her MSc in Medical Biology at the University of Groningen in the Netherlands in 2003 *cum laude* and her PhD at the Botnar Research Centre at the University of Oxford in 2007. After a number of post-doctoral research posts, she was appointed Lecturer at the University of Aberdeen in 2012, where she is part of the Arthritis and Regenerative Medicine laboratory within the Aberdeen Centre for Arthritis and Musculoskeletal Health. Her current research focusses on the study of the endogenous mesenchymal stromal cell lineages and their niches in the joint in health, after joint trauma, and in disease such as osteoarthritis.



Philipp Schneider has a PhD in the field of Bioengineering and as Lead of the Structure Function Group at the Institute for Biomechanics at ETH Zürich, started to develop new high-resolution 3D bone imaging methods. Since 2013, Philipp is Associate Professor in Biomedical Imaging at the University of Southampton (UoS) and set up several multidisciplinary collaborations between Engineering, Biology and Medicine, and recently, became Academic Director of the μ -VIS X-ray Imaging Centre. Philipp and team are developing and applying multi-scale and correlative biomedical imaging approaches, specifically exploring the use of 3D X-ray-based and electron microscopic techniques in domains where quantitative 3D imaging techniques have not yet been established, such as palaeontology or for soft tissues. For instance, Philipp and team are active in a collaborative clinical, research and enterprise stream at UoS, where in a partnership between industry, Medicine and Engineering a novel micro-computed tomographic system has been developed, optimised for soft tissues. Moreover, in collaboration with partners at University Hospital Southampton, they undertake translational efforts to integrate engineering knowledge into pre-/clinical applications, to increase bone fracture risk prediction or for early diagnosis of colorectal cancer, informed by high-resolution 3D *in vivo* and *ex vivo* imaging of hard and soft tissues.

