



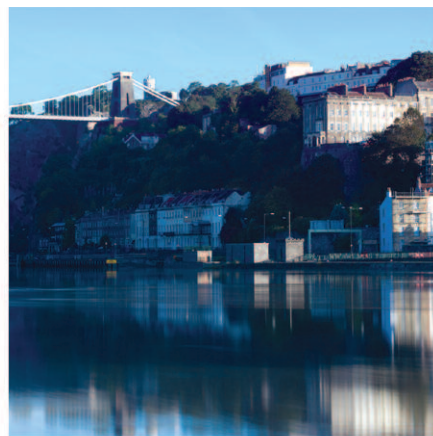
BONE
RESEARCH SOCIETY

ANNUAL MEETING

25 - 27 June 2017

Bristol, UK

FINAL PROGRAMME



Your advantages as a member

The Bone Research Society (BRS), formerly the Bone and Tooth Society, was founded in 1950. The BRS is one of the largest national scientific societies in Europe dedicated to clinical and basic research into mineralised tissues, and is the oldest such society in the world.

Meetings are held annually, attracting a wide audience from throughout the UK and beyond. The presentations are traditionally balanced between clinical and laboratory studies. The participation of young scientists and clinicians is actively encouraged.

- **Reduced fees** for BRS annual meetings
- **Barbara Mawer Travelling Fellowships:** To support travel for NI's to another laboratory. The awards are intended for the learning of new methodology to capacity build and be of benefit for the NI's home institution
- **Neil Mackenzie Public Engagement Awards:** will provide a bursary (£500) to support a new investigator participating in, or developing activities related to, public engagement to enhance awareness of research by members of the Bone Research Society, relating to basic, clinical or translational research in mineralised tissues
- **BRS Snowmass Travel Award:** To provide top-up funding of £750 to an NI who has been selected to attend the ASBMR AIMM meeting
- **New Investigator Awards:** These are awarded to the top ranking abstracts submitted to the annual meeting by New Investigators
- **Travel Bursaries:** Available to any member to support travel to one conference per year providing an abstract has been presented. BRS, national and international conferences apply.

This year we introduced a 'Find a Mentor' scheme for NI members.

- Provides an opportunity to members to become involved in the running of the society through election to the executive committee
- Access to teaching material from BRS meetings.

How much does it cost?

Full membership:
£50 per annum

Student membership
(earning under £20,000):
£25 per annum

*Membership year runs from
1 April to 31 March, payable
via debit/credit card or PayPal
online.*

Join today and your
membership will run until
the end of March 2018.

If you have any queries about membership please email membership@boneresearchsociety.org



Bone Research Society

www.boneresearchsociety.org



The Society (formerly known as the Bone and Tooth Society) is the oldest scientific society in Europe dedicated to further research into clinical and basic science problems related to mineralised tissues. The BRS Annual Meeting attracts a wide audience from throughout the UK and also from continental Europe and further afield. The presentations are traditionally a balance between clinical and laboratory-based studies. The participation of young scientists and clinicians is actively encouraged.

COMMITTEE 2017 / 2018

Miep Helfrich (Aberdeen) (President)
Kate Ward (Southampton) (Secretary)
Bronwen Evans (Cardiff) (Treasurer)
Jim Gallagher (Liverpool) (President-Elect)
Duncan Bassett (London)
Mark Edwards (Southampton)
Celia Gregson (Bristol)
Nick Harvey (Southampton)
Alex Ireland (Manchester)
Kassim Javaid (Oxford)
Michelle Lawson (Sheffield)
Vicky McRae (Edinburgh)

New Investigator Rep:

Katherine Staines (Edinburgh)

MEMBERSHIP ENQUIRIES

Email: membership@boneresearchsociety.org

FUTURE MEETINGS

**BRS Clinical Training Course:
Osteoporosis and Other Metabolic Bone Diseases**
26-28 March 2018
Merton College, Oxford, UK

BRS 2018
27-29 June 2018
Winchester, UK
Deadline for abstracts 9 February 2018

For further details on all BRS activities and events please see www.boneresearchsociety.org



ANNUAL MEETING

25 - 27 June 2017
Bristol, UK

LOCAL ORGANISING COMMITTEE

Celia Gregson (Co-chair)
Jon Tobias (Co-chair)
Emma Clark
James Edwards

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AWARDS

DENT AWARD

Lance Lanyon (Bristol, UK)

NEIL MACKENZIE AWARD

Esther Cummings

NEW INVESTIGATOR AWARDS

New Investigator Awards are awarded prior to the meeting, based on scores achieved during the blind review process of the meeting.

OC2 - Elizabeth Curtis

(Southampton): RXRA promoter DNA methylation at birth is associated with gestational vitamin D supplementation: results from the MAVIDOS trial

OC3 - Sam Olechnowicz

(Oxford): The nuclear receptor PPAR α is a regulator of bone volume and strength

OC4 - Fiona Roberts

(Edinburgh): Does skeletal NPP1 regulate mineralisation and energy metabolism?

OC5 - Katherine Staines

(Edinburgh): The proton pump inhibitor omeprazole inhibits PHOSPHO1 activity and matrix mineralisation in vitro

OC7 - Emma McDermott

(Aberdeen): Osteoclast ruffled border formation: a new perspective

OC8 - Aneka Sowman

(Oxford): AdipoR1 deficiency leads to low bone mass and increased bone adiposity in vivo

OC9 - April Hartley

(Bristol): Sarcopenia is negatively related to osteogenic impacts achieved through habitual physical activity: findings from a population-based cohort of older females

OC11 - Nicholas Fuggle

(Southampton): Relationships between markers of inflammation, grip strength and bone microarchitecture: findings from the Hertfordshire Cohort Study

OC12 - Geoffrey Lee

(Oxford): HMGB1 accelerates regeneration of multiple tissues by transitioning stem cells to G(Alert).

P2 - Beatriz Larraz-Prieto

(Edinburgh): Prevalence of low alkaline phosphatase and ALPL mutations in patients with osteoporosis

P15 - Alice Goring

(Southampton): Evidence for gender-specific vascular signalling in bone

On site awards for Best Poster, Best Oral Communication and Best Poster Pitch to be announced at the end of the meeting.

PROGRAMME OVERVIEW - SUNDAY 25 JUNE

12:00 Registration Opens

13:00 - 14:30 Rosalind Franklin Room
New Investigator Session 'How to succeed in research'

14:30 - 15:10 Rosalind Franklin Room
Muscle and Bone Workshop, Debate: Mechanostat: Fact or Fiction?

15:10 - 16:00 Oral presentations

16:00 - 16:10 Coffee break

16:10 - 17:10 Learning Room 1, 2, 3 and 4 (sessions running concurrently)
Meet the Professor sessions

17:15 - 17:45 The Annexe
Welcome Drinks Reception

17:50 - 21:40 Rosalind Franklin Room
Rare Bone Diseases Workshop and Buffet Supper

PROGRAMME OVERVIEW - MONDAY 26 JUNE

09:00 - 18:00 Registration Open

09:50 - 10:00 Rosalind Franklin Room Welcome and opening remarks

10:00-11:00 Rosalind Franklin Room
Symposium 1: BIG Data – how exploitation of genetic data has led to new insights

11:00 - 11:05 Rosalind Franklin Room Frontiers Journal Update

11:05 - 11:40 Rosalind Franklin Room
Poster pitching

11:40 - 13:00 Maurice Wilkins and James Watson Rooms
Coffee and poster viewing
Posters P1-P20, Posters P31-P79 (odd numbers only) and late breaking posters LBP4 - LBP11

13:00 Lunch

13:25 - 13:55 Rosalind Franklin Room
AGM (BRS Members only)

13:55 - 14:45 Rosalind Franklin Room
Oral communications

14:45 - 15:10 Coffee and poster viewing

15:10 - 16:10 Rosalind Franklin Room
Symposium 2: Blood and Bone – skeletal vasculature and bone remodelling

16:10 - 16:40 Rosalind Franklin Room
Oral communications

16:40 - 16:50 Break

16:50 - 17:20 Rosalind Franklin Room
Oral communications

17:20 - 18:20 Rosalind Franklin Room
Debate: Osteoporosis – Nature or nurture?

19:15 Clifton Pavilion, Bristol Zoo Gardens
Conference Dinner

PROGRAMME OVERVIEW - TUESDAY 27 JUNE

08:15 - 16:30 Registration Open

08:45 - 09:45 Rosalind Franklin Room
Symposium 3: Bugs and Bone

09:45 - 10:15 Rosalind Franklin Room
Oral communications and late breaking abstracts

10:15 - 10:35 Rosalind Franklin Room Poster pitching

10:35 - 11:30 Maurice Wilkins and James Watson Rooms
Coffee and poster viewing
Posters P21-P30 and Posters P32-P78 (even numbers only)

11:30 - 12:30 Rosalind Franklin Room
Symposium 4: About time – how do cellular ageing mechanisms affect the musculoskeletal system?

12:30 - 13:15 Lunch

13:15 - 13:40 Rosalind Franklin Room
Symposium 5: Physical activity and bone

13:40 - 14:20 Rosalind Franklin Room
Charles Dent Lecture: Lance Lanyon

14:20 - 15:00 Rosalind Franklin Room
UCB sponsored symposium lecture: Roland Baron

15:00 - 15:15 Coffee

15:15 - 16:15 Rosalind Franklin Room
Symposium 6: The new face of fat – adipocytes
as novel mediators in bone biology

15:15 - 16:30 Francis Crick Room
Clinical update and cases

16:15 - 16:30 Rosalind Franklin Room Awards

18:00 Rosalind Franklin Room
Public Engagement Event in association with the National Osteoporosis Society
'Physical activity and bone: may the force be with you'

PROGRAMME - SUNDAY 25 JUNE

12:00	The Annexe @ Bristol Science Centre - Registration desk opens <hr/>	16:10 - 17:10	Meet the Professor sessions (running concurrently) Learning Room 1 Session 1: GWAS studies Brent Richards (McGill, Canada) Learning Room 2 Session 2: Cellular senescence Lynne Cox (Oxford, UK) Learning Room 3 Session 3: Assessment of muscle function and sarcopenia Kate Ward (Southampton, UK)
13:00 - 14:30	Francis Crick Room - New Investigator Session: 'How to succeed in research' Chairs: Mark Edwards (Southampton, UK), Katherine Staines (Edinburgh, UK) Speaker: Cyrus Cooper (Southampton, UK) Speaker: James Edwards (Oxford, UK)	17:15 - 17:45	The Annexe - Welcome Drinks Reception <hr/>
14:30 - 15:10	Francis Crick Room - Muscle and Bone Workshop Chairs: Alex Ireland (Manchester, UK), Kate Ward (Southampton, UK) Debate: Mechanostat: Fact or Fiction? For the motion: Nicola Crabtree (Birmingham, UK) Against the motion: Alex Ireland (Manchester, UK)	17:50 - 21:40	Rosalind Franklin Room - Rare Bone Diseases Workshop & Buffet Supper Chair: Kassim Javaid (Oxford, UK)
15:10 - 15:20	P17 - Use of hip DXA to scan identify shape changes associated with hip osteoarthritis, Benjamin Faber (Bristol, UK)	17:50 - 18:00	Introduction to workshop, Kassim Javaid (Oxford, UK)
15:20 - 15:30	P31 - High magnitude vertical impacts are positively related to hip strength in master athletes, Ahmed Elhakeem (Bristol, UK)	18:00 - 18:30	Fibrous dysplasia investigation and management, Kassim Javaid (Oxford, UK)
15:30 - 15:40	P19 - Bone health in boys with Duchenne muscular dystrophy: The dichotomy between bone density and fracture, Nicola Crabtree (Birmingham, UK)	18:30 - 18:50	Buffet supper
15:40 - 15:50	P32 - The ontogeny of human vertebral bone microstructure: implications for mechanical performance, Nic Roberts (Bristol, UK)	18:50 - 19:20	Adult Skeletal Dysplasias, Melita Irving (London, UK)
15:50 - 16:00	LBP4 - Skeletal defects emerge surprisingly early in murine models of secondary dystroglycanopathy, Mark Hopkinson (London, UK)	19:20 - 19:50	Pycnodysostosis, Zulf Mughal (Manchester, UK)
		19:50 - 20:10	Dessert and coffee
		20:10 - 20:18	P2 - Prevalence of low alkaline phosphatase and ALPL mutations in patients with osteoporosis, Beatriz Larraz-Prieto (Edinburgh, UK)
		20:18 - 20:26	P33 - ETS2 Repressor Factor (ERF) – associated craniosynostosis: molecular mechanisms and therapeutic approaches, Angeliki Vogiatzi (Heraklion, Greece)

PROGRAMME - SUNDAY 25 JUNE

20:26 - 20:34 P34 - Generation of the HGD mouse model of alkaptonuria,
Juliette Hughes (Liverpool, UK)

20:34 - 20:42 P25 - Characterizing the epidemiology of hypophosphatasia in a population in the United Kingdom,
Sara Jenkins-Jones (Cardiff, UK)

20:42 - 20:50 P35 - Evaluation of the Utah algorithm for identifying hypophosphatasia to estimate prevalence in the United Kingdom,
Sara Jenkins-Jones (Cardiff, UK)

20:50 - 21:20 Genetics of hypocalcaemia
Fadil Hannan (Liverpool, UK)

21:20 - 21:40 Networking

21:40 Evening concludes

PROGRAMME - MONDAY 26 JUNE

Catering breaks and exhibition in the Annexe.

Posters in the Maurice Wilkins and James Watson Rooms.

Talks in Rosalind Franklin Room.

09:00 Registration desk opens

09:50 - 10:00 **Welcome and opening remarks**
Miep Helfrich (Aberdeen, UK) and
Jon Tobias (Bristol, UK)

10:00 - 11:00 **Symposium 1: BIG Data – how exploitation of genetic data has led to new insights**

Chairs: **Celia Gregson** (Bristol, UK) and
Stuart Ralston (Edinburgh, UK)

IS1 - The EN1 Story: the gains from imputation and whole genome sequencing,
Brent Richards (McGill, Canada)

IS2 - Strategies for casual inference and the use of genetic data to predict successful drug development,
George Davey Smith (Bristol, UK)

11:00 - 11:05 **Frontier's Journal Update**
Davor Vidic

11:05 - 11:40 **Poster pitching** (90 seconds per poster)
Chairs: **Alex Ireland** (Manchester, UK) and
Katherine Staines (Edinburgh, UK)

P1 - ARQ-197, a small-molecule inhibitor of c-Met, reduces tumour burden and prevents tumour-associated bone disease in a murine model of myeloma,
Darren Lath (Sheffield, UK)

P2 - Prevalence of low alkaline phosphatase and ALPL mutations in patients with osteoporosis,
Beatriz Larraz-Prieto (Edinburgh, UK)

P4 - Susceptibility genes for hip osteoarthritis may influence hip shape,
Denis Baird (Bristol, UK)

P6 - Relationships between DNA methylation, femoral neck bone mineral density and grip strength from an epigenome wide association study: the Hertfordshire Cohort,
Elizabeth Curtis (Southampton, UK)

P7 - Valve interstitial cell (VIC)-derived matrix vesicles (MVs) regulate the pathogenesis of Calcific Aortic Valve Disease (CAVD): a role for Annexin-VI?
Lin Cui (Edinburgh, UK)

P8 - The effect of social deprivation on hip fracture incidence in men and women over 14 years across regions in England,
Arti Bhimjiyani (Bristol, UK)

P9 - Effect of applied mechanical loading on skeletal bone blood flow in mice
Stephanie Gohin (London, UK)

P10 - Association between physical activity and scoliosis: A prospective cohort study,
Emma Clark (Bristol, UK)

P11 - Vascular calcification and bone formation: are they the same?
Jessal Patel (London, UK)

P12 - Muscle strength and physical performance from midlife and bone health in early old-age: the MRC National Survey of Health and Development,
Kate Ward (Southampton, UK)

P13 - Deciphering the signalling mechanisms underpinning fibroblast growth factor-2 (FGF-2) mediated osteocytogenesis,
Ekele Ikpegbu (Edinburgh, UK)

P14 - 25-hydroxyvitamin D response to cholecalciferol supplementation in pregnancy is associated with common vitamin D related genetic variants: findings from the MAVIDOS trial,
Rebecca Moon (Southampton, UK)

P15 - Evidence for gender-specific vascular signalling in bone,
Alice Goring (Southampton, UK)

P16 - Multiple myeloma regulates bone marrow adipocyte number, localisation and adipokine secretion,
Emma Morris (Oxford, UK)

PROGRAMME - MONDAY 26 JUNE

- P17** - Use of hip DXA scans to identify shape changes associated with hip osteoarthritis,
Benjamin Faber (Bristol, UK)
- P18** - 18F-FDG PET/CT imaging following insulin treatment and short term cold exposure in mice,
Karla Suchacki (Edinburgh, UK)
- P19** - Bone health in boys with Duchenne muscular dystrophy: The dichotomy between bone density and fracture,
Nicola Crabtree (Birmingham, UK)
- P20** - Bisphosphonates regulate autophagy in vitro and in vivo,
Jack Beard (Oxford, UK)
- LBP4** - Skeletal defects emerge surprisingly early in murine models of secondary dystroglycanopathy,
Mark Hopkinson (London, UK)
- LBP5** - Sex-dependent associations between objectively-assessed physical activity and bone mineral density in community-dwelling older adults,
Lachlan McMillan (Melbourne, Australia)
- LBP6** - Repurposing glutamate receptor antagonists for the prevention of post-traumatic osteoarthritis,
Cleo Bonnet (Cardiff, UK)
-
- 11:40 - 13:00** **Coffee and poster viewing**
- Poster pitches P1-P20
- Posters P31-P79 (odd numbers only)
- Late breaking posters LBP4 – LBP11
-
- 13:00 - 13:55** **Lunch**
- 13:25 - 13:55** **AGM (Rosalind Franklin Room)**
-
- 13:55 - 14:45** **Oral Communications**
Chairs: **Jim Gallagher** (Liverpool, UK) and **Kate Ward** (Southampton, UK)
- 13:55 - 14:05** **OC1** - Genome-wide association analysis identifies CXCR4 gene as predictor of therapeutic response to teriparatide in severe osteoporosis,
Nerea Alonso (Edinburgh, UK)
- 14:05 - 14:15** **OC2** - RXRA promoter DNA methylation at birth is associated with gestational vitamin D supplementation: results from the MAVIDOS trial,
Elizabeth Curtis (Southampton, UK)
- 14:15 - 14:25** **OC3** - The nuclear receptor **PPAR α** is a regulator of bone volume and strength,
Sam Olechnowicz (Oxford, UK)
- 14:25 - 14:35** **OC4** - Does skeletal NPP1 regulate mineralisation and energy metabolism?
Fiona Roberts (Edinburgh, UK)
- 14:35 - 14:45** **OC5** - The proton pump inhibitor omeprazole inhibits PHOSPHO1 activity and matrix mineralisation in vitro,
Katherine Staines (Edinburgh, UK)
-
- 14:45 - 15:10** **Coffee and poster viewing**
-
- 15:10 - 16:10** **Symposium 2: Blood and Bone –skeletal vasculature and bone remodelling**
Chairs: **James Edwards** (Oxford, UK) and **Michelle Lawson** (Sheffield, UK)
- IS3** - Hypoxia signaling, blood vessels and bone,
Geert Carmeliet (Leuven, Belgium)
- IS4** - Skeletal angiogenesis,
Saravana Ramasamy (London, UK)
-
- 16:10 - 16:40** **Oral Communications**
Chairs: **James Edwards** (Oxford, UK) and **Michelle Lawson** (Sheffield, UK)
- 16:10 - 16:20** **OC6** - The adenosine A2B receptor (ADORA2B) drives osteoclast-mediated bone resorption in hypoxia,
Helen Knowles (Oxford, UK)

PROGRAMME - MONDAY 26 JUNE

16:20 - 16:30 **OC7** - Osteoclast ruffled border formation: a new perspective,
Emma McDermott (Aberdeen, UK)

16:30 - 16:40 **OC8** - AdipoR1 deficiency leads to low bone mass and increased bone adiposity in vivo,
Aneka Sowman (Oxford, UK)

16:40 - 16:50 **Comfort break**

16:50 - 17:20 **Oral Communications**

Chairs: **Duncan Bassett** (London, UK) and **Mark Edwards** (Southampton, UK)

16:50 - 17:00 **OC9** - Sarcopenia is negatively related to osteogenic impacts achieved through habitual physical activity: findings from a population-based cohort of older females,
April Hartley (Bristol, UK)

17:00 - 17:10 **OC10** - The longevity-related SirT1 enzyme retards inflamm-ageing in vivo,
James Edwards (Oxford, UK)

17:10 - 17:20 **OC11** - Relationships between markers of inflammation, grip strength and bone microarchitecture: findings from the Hertfordshire Cohort Study,
Nicholas Fuggle (Southampton, UK)

17:20 - 18:20 **Debate: Osteoporosis – Nature or nurture?**

Chairs: **Duncan Bassett** (London, UK) and **Miep Helfrich** (Aberdeen, UK)

Nature: Stuart Ralston (Edinburgh, UK)

Nurture: Cyrus Cooper (Southampton, UK)

19:15 - 19:30 **Buses depart for Conference Dinner (Bristol Zoo)**

19:45 **BRS Annual Dinner (Bristol Zoo)**

PROGRAMME - TUESDAY 27 JUNE

Catering breaks and exhibition in the Annexe.

Posters in the Maurice Wilkins and James Watson Rooms.

Talks in Rosalind Franklin Room and Francis Crick Room.

08:45 - 09:45 Symposium 3: Bugs and Bone

Chairs: **Emma Clark** (Bristol, UK) and **Nick Harvey** (Southampton, UK)

08:45 - 09:15 **IS5** - The microbiome and bone,
Claes Ohlsson (Gothenburg, Sweden)

09:15 - 09:45 **IS6** - HIV and bone,
Karen Walker Bone (Southampton, UK)

09:45 - 10:15 Oral Communications and Late breaking abstract

Chairs: **Geert Carmeliet** (Leuven, Belgium) and **Kassim Javaid** (Oxford, UK)

09:45 - 09:55 **OC12** - HMGB1 accelerates regeneration of multiple tissues by transitioning stem cells to G(Alert),
Geoffrey Lee (Oxford, UK)

09:55 - 10:05 **OC13** - Effect of early bisphosphonate treatment on fracture healing: The fracture and bisphosphonate (FAB) study,
Stuart Ralston (Edinburgh, UK)

10:05 - 10:15 **LB1** - Characterisation of Angiopoietin-like 4 (ANGPTL4) as a potential new therapeutic target in osteosarcoma,
Helen Knowles (Oxford, UK)

10:15 - 10:35 **Poster pitching** (90 seconds per poster)
Chairs: **Geert Carmeliet** (Leuven, Belgium) and **Kassim Javaid** (Oxford, UK)

P21 - Extracellular vesicles-derived from mineralising osteoblasts induce stem cell osteogenesis: a new phase in regenerative medicine?
Owen Davies (Loughborough, UK)

P22 - T Score correlation with micro CT measurements of the femoral head in hip fracture,
Linda Skingle (Cambridge, UK)

P23 - A mammalian transcriptomic atlas reveals genes expressed in bone development are also expressed in the aortic valve,
Hiu-Gwen Tsang (Edinburgh, UK)

P24 - A novel role for extracellular signal-regulated kinase (ERK 2) in the control of matricellular protein secretion in osteosarcoma cells,
Gudrun Stenbeck (Uxbridge, UK)

P25 - Characterizing the epidemiology of hypophosphatasia in a population in the United Kingdom,
Sara Jenkins-Jones (Cardiff, UK)

P26 - Does arterial calcification require aerobic glycolysis?
Nabil Rashdan (Edinburgh, UK)

P27 - Bioenergetic characterisation of osteoblastic and chondrocytic cells under basal and stressed conditions through extracellular flux analysis,
Brendan Norman (Liverpool, UK)

P28 - Do blood lipid levels influence bone mineral density? Findings from a Mendelian randomization study,
Jie Zheng (Bristol, UK)

P29 - Cordycepin reduces established bone changes and pain in two animal models of osteoarthritis,
Sadaf Ashraf (Nottingham, UK)

P30 - Mechanical stimuli counteract the deleterious effects of hyperglycemia on the bone quality and fracture healing in diabetic rats,
Ariane Zamarioli (Ribeirão Preto, Brazil)

10:35 - 11:30 Coffee and poster viewing

- Poster P21-P30

- Posters P32-P78 (even numbers only)

PROGRAMME - TUESDAY 27 JUNE

11:30 - 12:30 **Symposium 4: About time – how do cellular ageing mechanisms affect the musculoskeletal system?**

Chairs: **Tim Arnett** (London, UK) and **Bronwen Evans** (Cardiff, UK)

11:30 - 12:00 **IS7** - Cellular senescence and ageing, **Lynne Cox** (Oxford, UK)

12:00 - 12:30 **IS8** - Running on time: the role of circadian clocks in the musculoskeletal system, **Qing-Jun Meng** (Manchester, UK)

12:30 - 13:15 **Lunch**

13:15 - 13:40 **Symposium 5: Physical activity and bone**

Chairs: **Miep Helfrich** (Aberdeen, UK) and **Jon Tobias** (Bristol, UK)

15:15 - 16:15 **Rosalind Franklin Room**
Symposium 6: The new face of fat – adipocytes as novel mediators in bone biology

Chairs: **Vicky McRae** (Edinburgh, UK) and **Claes Ohlsson** (Gothenburg, Sweden)

15:15 - 15:45 **IS10** - Role of Wnt signaling in adipocytes, **Fredrik Karpe** (Oxford, UK)

15:45 - 16:15 **IS11** - Adipocytes and bone, **Will Cawthorn** (Edinburgh, UK)

16:15 - 16:30 **Awards**

IS9 - Exercise and bone strength, **Katherine Brooke-Wavell** (Loughborough, UK)

13:40 - 14:20 **Charles Dent Lecture**

Chairs: **Miep Helfrich** (Aberdeen, UK) and **Jon Tobias** (Bristol, UK)

Quest for the Mechanostat, **Lance Lanyon** (Bristol, UK)

14:20 - 15:00 **UCB sponsored symposium lecture**

Chair: **Stuart Ralston** (Edinburgh, UK)

Bone modeling vs remodeling in the adult skeleton: Treatment effects and impact on bone strength, **Roland Baron** (Harvard, USA)

15:00 - 15:15 **Coffee**

15:15 - 16:30 **Francis Crick Room**
Clinical update and cases

Chairs: **Ashok Bhalla** (Bath, UK) and **Sarah Hardcastle** (Bristol, UK)

15:15 - 15:27 Fracture liaison service national audit, **Kassim Javaid** (Oxford, UK)

15:27 - 15:37 **CC1** - Hungry bone syndrome post-parathyroidectomy, **Rachel Cooper** (Truro, UK)

15:37 - 15:47 **CC2** - Hypophosphatasia associated with acute meningo-encephalo-Myelitis, **Benjamin Jacobs** (Stanmore, UK)

15:47 - 15:57 'London Buses and Osteogenesis Imperfecta', **Shane Clarke** (Bristol, UK)
Mereo Sponsored

15:57 - 16:07 **LBCC3** - A profound lack of vitamin D: harnessing the potential of genomics, **Kassim Javaid** (Oxford, UK)

16:07 - 16:19 NOGG Update & NICE Quality Standards, **Celia Gregson** (Bristol, UK)

16:19 - 16:29 **LBCC2** - A 3-generation family with autosomal dominant hypophosphatasia, **Katie Moss** (London, UK)

PROGRAMME - TUESDAY 27 JUNE

18:00

Rosalind Franklin Room
**Public Engagement Event in association
with the National Osteoporosis Society**
**'Physical activity and bone: may the
force be with you'**

Exercise and osteoporosis: what patients
want to know,

Sarah Leyland

(National Osteoporosis Society)

Relationships between day-to-day
physical activity as measured by
accelerometers and bone health,

Jon Tobias (Bristol, UK)

How regular hopping can make your
bones stronger,

Katherine Brooke-Wavell

(Loughborough, UK)

POSTERS

- P1 ARQ-197, a small-molecule inhibitor of c-Met, reduces tumour burden and prevents tumour-associated bone disease in a murine model of myeloma**
Darren Lath^{1,2}, Holly Evans^{1,2}, Matthew Fisher¹, Jenny Down^{1,2}, Lawson Michelle^{1,2}, Andrew Chantry^{1,2,3}
¹Oncology and Metabolism, University of Sheffield, Sheffield, UK, ²Mellanby Centre for Bone Research, University of Sheffield, Sheffield, UK, ³Department of Haematology, Sheffield Teaching Hospitals, NHS Foundation Trust, Sheffield, UK
- P2 Prevalence of low alkaline phosphatase and ALPL mutations in patients with osteoporosis**
Beatriz Larraz-Prieto¹, Katie Myers¹, Ricardo Usategui-Martin², Stuart H Ralston¹, Nerea Alonso¹
¹Rheumatology and Bone Disease Unit, CGEM-IGMM, University of Edinburgh, Edinburgh, UK, ²Molecular Medicine Unit, Department of Medicine, University of Salamanca, Salamanca, Spain
- P3 Abstract withdrawn**
- P4 Susceptibility genes for hip osteoarthritis may influence hip shape**
Denis Baird^{1,2}, Jennifer Gregory³, Benjamin Faber¹, Richard Aspden³, Claudiu Giuraniuc³, Fiona Saunders³, Rebecca Barr³, Jonathan Tobias¹
¹Musculoskeletal Research Unit, School of Clinical Sciences, University of Bristol, Bristol, UK, ²MRC Integrative Epidemiology Unit, University of Bristol, Bristol, UK, ³Arthritis and Musculoskeletal Medicine, Institute of Medical Sciences, University of Aberdeen, Aberdeen, UK
- P5 SirT1-deficient intervertebral discs display degenerative morphology and decreased size in vivo**
Daniel Herrero Charrington, Pradeep Sacitharan, James Edwards
Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, UK
- P6 Relationships between DNA methylation, femoral neck bone mineral density and grip strength from an epigenome wide association study: the Hertfordshire Cohort**
Elizabeth Curtis¹, Philip Titcombe¹, Mark Edwards^{1,2}, Sheila Barton¹, Pei-Chien Tsai³, Elaine Dennison¹, Jordana Bell³, Tim Spector³, Ana Valdes⁴, Christopher Bell^{1,5,6}, Nicholas Harvey^{1,6}, Cyrus Cooper^{1,6,7}
¹MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK, ²Department of Rheumatology, Portsmouth Hospitals NHS Trust, Portsmouth, UK, ³Department of Twin Research and Genetic Epidemiology, King's College, London, UK, ⁴Division of Rheumatology, Orthopaedics, and Dermatology, University of Nottingham, Nottingham, UK, ⁵Institute of Developmental Sciences, University of Southampton, Southampton, UK, ⁶NIHR Southampton Biomedical Research Centre, University of Southampton and University Hospital Southampton NHSFT, Southampton, UK, ⁷NIHR Oxford Musculoskeletal Biomedical Research Unit, University of Oxford, Oxford, UK
- P7 Valve interstitial cell (VIC)-derived matrix vesicles (MVs) regulate the pathogenesis of Calcific Aortic Valve Disease (CAVD): a role for Annexin-VI?**
Lin Cui¹, Nabil Rashdan¹, Dongxing Zhu¹, Elspeth Milne¹, Paul Ajuh², Gillian Milne³, Miep Helfrich³, Kelvin Lim⁴, Sai Prasad⁴, Daniel Lerman⁴, Alex Vesey⁵, Marc Dweck⁵, David Newby⁵, Colin Farquharson¹, Vicky Macrae¹
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- P8 The effect of social deprivation on hip fracture incidence in men and women over 14 years across regions in England**
Arti Gauvri Bhimjiyani¹, Jenny Neuburger^{2,3}, Yoav Ben-Shlomo⁴, Celia Gregson¹
¹School of Clinical Sciences, University of Bristol, Bristol, UK, ²Nuffield Trust, London, UK, ³London School of Hygiene and Tropical Medicine, London, UK, ⁴School of Social and Community Medicine, University of Bristol, Bristol, UK
- P9 Effect of applied mechanical loading on skeletal bone blood flow in mice**
Stephanie Gohin¹, Behzad Javaheri¹, Amy Fisher², Andrew Pitsillides¹, Mark Hopkinson¹, Chantal Chenu¹
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P10 Association between physical activity and scoliosis: A prospective cohort study

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P11 Vascular calcification and bone formation: are they the same?

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P12 Muscle strength and physical performance from midlife and bone health in early old-age: the MRC National Survey of Health and Development

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P13 Deciphering the signalling mechanisms underpinning fibroblast growth factor-2 (FGF-2) mediated osteocytogenesis

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P14 25-hydroxyvitamin D response to cholecalciferol supplementation in pregnancy is associated with common vitamin D related genetic variants: findings from the MAVIDOS trial

Rebecca Moon^{1,2}, Nicholas Harvey^{1,3}, Cyrus Cooper^{1,3,4}, Stefania D'Angelo¹, Elizabeth Curtis¹, Sarah Crozier¹, Sheila Barton¹, Sian Robinson^{1,3}, Keith Godfrey^{1,3}, Nikki Graham⁵, John Holloway⁵, Nicholas Bishop⁶, Stephen Kennedy⁷, Aris Papageorghiou⁷, Inez Schoenmakers^{8,9}, Robert Fraser¹⁰, Saurabh Gandhi¹⁰, Ann Prentice⁸, Hazel Inskip^{1,3}, M Kassim Javaid⁴

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P15 Evidence for gender-specific vascular signalling in bone

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P16 Multiple myeloma regulates bone marrow adipocyte number, localisation and adipokine secretion

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- P17 Use of hip DXA scans to identify shape changes associated with hip osteoarthritis**
Benjamin G Faber¹, Denis Baird¹, Celia L Gregson¹, Jenny S Gregory², Rebecca J Barr², Richard M Aspden², John Lynch³, Michael C Nevitt³, Nancy E Lane⁴, Eric Orwoll⁵, Jon H Tobias¹
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- P18 18F-FDG PET/CT imaging following insulin treatment and short term cold exposure in mice**
Karla Suchacki, Adriana Tavares, Carlos Alcaide Corral, Nicholas Morton, William Cawthorn
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- P19 Bone health in boys with Duchenne muscular dystrophy: The dichotomy between bone density and fracture**
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- P20 Bisphosphonates regulate autophagy in vitro and in vivo**
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- P21 Extracellular vesicles-derived from mineralising osteoblasts induce stem cell osteogenesis: a new phase in regenerative medicine?**
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- P22 T Score correlation with micro CT measurements of the femoral head in hip fracture**
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- P23 A mammalian transcriptomic atlas reveals genes expressed in bone development are also expressed in the aortic valve**
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- P24 A novel role for extracellular signal-regulated kinase (ERK 2) in the control of matricellular protein secretion in osteosarcoma cells**
Amir Jassim, Gudrun Stenbeck
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- P25 Characterizing the epidemiology of hypophosphatasia in a population in the United Kingdom**
Sara Jenkins-Jones¹, Craig Currie^{1,2}, Ioannis C Tomazos³, Bonnie MK Donato³, Nick Bishop⁴, Richard Eastell⁴
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- P26 Does arterial calcification require aerobic glycolysis?**
Nabil Rashdan, Vicky MacRae
 Developmental Biology, The Roslin Institute and Royal (Dick) School of Veterinary Studies, Edinburgh, UK
- P27 Bioenergetic characterisation of osteoblastic and chondrocytic cells under basal and stressed conditions through extracellular flux analysis**
Brendan Norman, Peter Wilson, Mohd Osman, Norman Roberts, Lakshminarayan Ranganath, James Gallagher
 Musculoskeletal Biology I, Institute of Ageing & Chronic Disease, University of Liverpool, Liverpool, UK
- P28 Do blood lipid levels influence bone mineral density? Findings from a Mendelian randomization study**
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- P29 Cordycepin reduces established bone changes and pain in two animal models of osteoarthritis**
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- P30 Mechanical stimuli counteract the deleterious effects of hyperglycemia on the bone quality and fracture healing in diabetic rats**
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- P31 High magnitude vertical impacts are positively related to hip strength in master athletes**
Ahmed Elhakeem¹, Jessica Coulson², Kimberly Hannam¹, Kevin Deere¹, Alex Ireland², Mathew Piasecki², April Hartley¹, Usama Al-Sari¹, William Fraser³, Jamie McPhee², Jon H Tobias¹
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- P32 The ontogeny of human vertebral bone microstructure: implications for mechanical performance**
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- P33 ETS2 Repressor Factor (ERF) – associated craniosynostosis: molecular mechanisms and therapeutic approaches**
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- P34 Generation of the HGD mouse model of alkaptonuria**
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- P35 Evaluation of the Utah algorithm for identifying hypophosphatasia to estimate prevalence in the United Kingdom**
Sara Jenkins-Jones¹, Craig Currie^{1,2}, Ioannis C Tomazos³, Bonnie MK Donato³, Richard Eastell⁴
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- P36 Abstract withdrawn**
- P37 Abstract withdrawn**
- P38 Bone marrow adipose tissue: a novel regulator of metabolic and skeletal health?**
William Cawthorn
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- P39 Heparin modulates runx2a gene expression to regulate biomineralization of bone in zebrafish**
Yu Jiang, Youjia Xu
Department of Orthopedics, The Second Affiliated Hospital of Soochow University, Suzhou, China
- P40 Abstract withdrawn**
- P41 Everyday physical activities in older people with compression vertebral fractures (VFs): a systematic review and meta-analysis**
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P42 Prevalence of obesity, osteopenia and osteoporosis in adults with cerebral palsy

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P43 A method to analyse the development of osteolytic lesions in mice using in vivo micro-computed tomography (CT) and rigid image registration

Holly Evans^{1,2}, Simon Tazzyman^{1,2}, Julia Paton-Hough^{1,2}, Paul Metherall³, Andrew Chantry^{1,2}, Michelle Lawson^{1,2}

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P44 Abstract withdrawn

P45 Osteitis condensans ilii: Differential diagnosis and management

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P46 The musculoskeletal benefits of gait speed maintenance in older men and women

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P47 A novel method for identifying radiographic baseline risk of osteoarthritis using an anisotropy-based texture analysis algorithm: data from the Osteoarthritis Initiative

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P48 Horrendous pain surely not osteoarthritis (HPOA)

Annabel Suarez, Tommy Lwin, Ben Faber, Edward Harris, Andrew Stanton

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P49 Circulating levels of bone regulatory factors Dickkopf-1, Osteocalcin, Osteoprotegerin and Sclerostin are associated with whole-body bone mineral density in older men and women

Jessica Coulson¹, Bagley Liam¹, Barnouin Yoann^{1,2}, Bradburn Steven¹, Gillian Butler-Brown³, Helena Gapeyeva⁴, Jean-Yves Hogrel³, Thomas Maden-Wilkinson⁵, Andrea Maier^{6,7}, Carel Meskers⁸, Chris Murgatroyd¹, Marco Narici⁹, Mati Paasuke⁴, Lorra ine Sassant¹⁰, Sarianna Sipila¹¹, Lauri Stenroth¹¹, Jamie S McPhee¹

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P50 The effect of age and puberty on proximal femur shape

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P51 Investigation of relationships between hip bone mineral density and hip shape in adolescent and adult females

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POSTERS

P52 Differential effects of aging on fracture resistance between female and male BALB/c mice

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P53 Model of Support for Fracture Liaison Service Development

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P54 Prostaglandin (PG) E2 and I2 synthases in resident bone cells

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P55 Characteristics of a population of postmenopausal women on a long-term bisphosphonate holiday

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P56 The roles of AKT and NHERF-1 in osteoarthritis

Thomas Griffin-Walker, Katherine McKenna, David Samy, Mairi Blair, Su Yin Yong, Rachel White, Richard Aspden, Fiona Saunders

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P57 Vertebral Fractures in children with chronic inflammatory and/or disabling conditions: the SNAP study

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P58 Body mass index across adulthood and spine shape in early old age in a UK birth cohort

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P59 Cytokine and Hormonal Regulation of Bone Marrow Immune Cell Wnt10b Expression

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P60 Drinking green tea alleviates alveolar bone resorption in ligature-induced periodontitis in mice

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P61 Longitudinal differences in bone development in adolescent male athletes: The PRO-BONE study

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P62 Abstract withdrawn

P63 A case of osteonecrosis of the jaw in paget's disease of bone

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P64 Satoyoshi syndrome: an unusual cause of osteomalacia

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POSTERS

P65 Gut microbiota and bone metabolism

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P66 Running on time: the role of the circadian clocks in the musculoskeletal system

Qing-Jun Meng

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P67 Fracture toughness of cancellous bone as a function of BV/TV and its microarchitecture

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P68 Abstract withdrawn

P69 The relationship between circulating adiponectin and leptin with bone mineral density (BMD), arterial calcification and stiffness: a cross-sectional study in post-menopausal women

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P70 Missed opportunities: What the FRAX?

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P71 Principal component-derived bone density phenotypes and genetic regulation of the pediatric skeleton

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P72 Modelling Stickler syndrome in zebrafish

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P73 Marine organism-derived extracts for bone growth: the discovery of novel osteogenic compounds

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P74 Ionic mechanisms in adipogenic differentiation of osteoblastic cells treated with ghrelin

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P75 Modelling osteoarthritis and other adult skeletal conditions in zebrafish

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P76 Incubation at physiological temperature promotes ovine osteoblast proliferation and activity

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P77 Brittleness phenotype of TallyHO mice does not worsen with duration of type 2 diabetes

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POSTERS

P78 Systemic administration of rosiglitazone stimulates apoptosis of osteocytes, interfering in the development of induced periapical lesions in mice

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P79 The entheses of the rotator cuff, bone mineral density (osteoporosis) and occupations

Charlotte Henderson, Francisco Curate

CIAS - Research Centre for Anthropology and Health, Department Life Sciences, University of Coimbra, Coimbra, Portugal

LBP8 Temporal gene expression patterns between developing embryonic mouse lower limb bones and calvaria indicate co-operation of mineralisation-associated proteins and phosphatases during skeletal biomineralisation

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LBP9 Abstract withdrawn

LBP10 Abstract withdrawn

LBP11 New method for quantitative polarised light microscopy of laser-ablation machined sections of bones and joints

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LATE BREAKING POSTERS

LBP4 Skeletal defects emerge surprisingly early in murine models of secondary dystroglycanopathy

Mark Hopkinson, Behzad Javaheri, Susan Brown, Andrew Pitsillides

Comparative Biomedical Sciences, Royal Veterinary College, London, UK

LBP5 Sex-dependent associations between objectively-assessed physical activity and bone mineral density in community-dwelling older adults

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LBP6 Repurposing glutamate receptor antagonists for the prevention of post-traumatic osteoarthritis

Cleo Bonnet, Sophie Gilbert, Deborah Mason

Arthritis Research UK Biomechanics and Bioengineering Centre, Cardiff University, Cardiff, UK

LBP7 Investigation of 3D femoral bone mineral density in women with hip fracture, frailty-matched women without hip fracture, and their daughters

Monika Kondratowicz¹, Polly Barnes², Daniel Chappell², Karen Blesic², Kenneth Poole²

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KEY SUPPORTERS

We are extremely grateful to the following organisations for their support:

AMGEN

Amgen is committed to unlocking the potential of biology for patients suffering from serious illnesses by discovering, developing, manufacturing and delivering innovative human therapeutics. A biotechnology pioneer since 1980, Amgen has reached millions of patients around the world and is developing a pipeline of medicines with breakaway potential.

CONSILIENT

At Consilient Health we are passionate about developing and supplying prescription medicines that provide benefits to Patients and Prescribers and the NHS. This is achieved through building strong partnerships with our manufacturing, distribution and pharmacy partners.

We offer one of the widest ranges of oral contraceptives in the UK, offering high quality products and significant savings for the NHS, complemented by comprehensive support programmes for both medical professionals and patients.

We launched our first Bone Health product in 2014 having identified an unmet need for prescribers and patients to have access to licenced medicines within the vitamin D therapeutic area.

ELI LILLY

Lilly is a global healthcare leader that unites caring with discovery to make life better for people around the world. We were founded more than a century ago, by a man committed to creating high-quality medicines that meet real needs and today we remain true to that mission in all our work. Across the globe, Lilly employees work to discover and bring life-changing medicines to those who need them, improve the understanding and management of disease, and give back to communities through philanthropy and volunteerism. To learn more about Lilly, please visit us at: www.lilly.co.uk

INTERNIS

Founded in 2010, Internis is a UK specialty pharmaceutical company engaged in the development and commercialisation of highly effective and innovative new medicines aimed at the treatment and prevention of a range of common bone disorders, such as osteoporosis and vitamin D3 deficiency.

KYOWA KIRIN

Kyowa Kirin International PLC is a specialty pharmaceutical company engaged in the development and commercialisation of prescription medicines for the treatment of unmet therapeutic needs in major markets. Headquartered in Galashiels, Scotland, it is a subsidiary of Kyowa Hakko Kirin Co., Ltd., the Japan-based global specialty pharmaceutical company. Sales and marketing of its portfolio of products are handled by commercial subsidiaries in the UK, US, France, Germany, Spain, Italy and other EU countries. Website: www.kyowa-kirin.com.

MEREO

Mereo is a UK-based specialty biopharma company established to acquire and develop innovative products that may not have otherwise been developed within large pharma or big biotech. These companies have become under increasing pressure to streamline R&D therefore creating opportunities for Mereo.

Mereo's aim is to become a leading biopharma company focussed on speciality and rare diseases with significant unmet needs.

Mereo's initial portfolio is in respiratory, endocrinology and metabolic bone disease. Each of which has proof of efficacy data and address large unmet needs in either speciality or rare disease.

The company has advanced the respiratory and endocrinology products into Phase 2 and Phase 2b with data expected towards the end of the year and BPS 804 for Osteogenesis Imperfecta is about to start its Phase 2b study in adults. There is also an active search for new products.

UCB

UCB, Brussels, Belgium (www.ucb.com) is a global biopharmaceutical company focused on the discovery and development of innovative medicines and solutions to transform the lives of people living with severe diseases of the immune system or of the central nervous system. With more than 7,700 people in approximately 40 countries, the company generated revenue of € 4.2 billion in 2016. UCB is listed on Euronext Brussels (symbol: UCB). Follow us on Twitter: [@UCB_news](https://twitter.com/UCB_news).

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We are extremely grateful to the following organisations for their support:

ALEXION

Alexion is a global biopharmaceutical company focused on developing and delivering life-transforming therapies for patients with devastating and rare diseases. Patients with these life-threatening diseases often have no effective treatment options, and they and their families suffer with little hope. Our goal is to deliver medical breakthroughs where none currently exist. We are driven because we know people's lives depend on our work.

AMGEN

See under Key Supporters.

BRUKER

Offering the largest range of Preclinical Imaging systems, with an unmatched 9 in-vivo modalities, Bruker is committed to supporting the scientific community with high-end instruments dedicated to disease research, translational science and Molecular Imaging.

Benefitting from more than 5 decades of passionate innovation, Bruker customers enjoy a vast portfolio of possibility; from a single source they have endless opportunities for combining multiple modalities for seamless workflow and higher productivity. Our non-invasive in-vivo imaging modalities are designed to deliver greater scientific insight based on animal-centric solutions.

CONSILIENT

See under Key supporters.

ELI LILLY

See under Key Supporters.

INTERNIS

See under Key Supporters.

NATIONAL OSTEOPOROSIS SOCIETY

At the National Osteoporosis Society, we understand that fractures can have shocking effects on day-to-day life. We are committed to helping people with osteoporosis live the lives they want to lead and we work every day to prevent future fractures. As the only UK-wide charity dedicated to ending the pain and suffering caused by osteoporosis we are here for anyone affected by the condition, providing help and support for people with osteoporosis now.

VERTEC SCIENTIFIC

Vertec are a leading UK distributor of diagnostic imaging and radiotherapy systems. They have sold and supported Hologic DXA in the UK since 1986 and have made it into the market leader in the UK.

Hologic invented DXA and have continued to develop it into a multi-faceted imaging tool providing the widest range of accessible applications, culminating in the new Horizon system. The range is very wide: Body Mass Index, Visceral Adipose Tissue studies, android/gynoid ratio, cardiac calcification scoring, Body Composition Analysis, single energy femur scan for evaluation of a typical femur fracture assessment and high definition mode for vertebral fracture assessment.

The concept that drives the Horizon is that it must be future proof with capabilities to meet evolving applications.

Horizon is backed up by Vertec's customer focus which includes skilled applications specialists and service engineers to make sure you get the best from what we supply.

Bone Research Society Events

BONE RESEARCH SOCIETY CLINICAL TRAINING COURSE

OSTEOPOROSIS

& OTHER METABOLIC BONE DISEASES

MERTON COLLEGE, OXFORD, UK 26-28 MARCH 2018

This annual 3-day residential training course provides trainees in medical specialties such as rheumatology, endocrinology, care of the elderly, gastroenterology, orthopaedics, respiratory medicine and clinical chemistry with the knowledge and understanding to manage patients with osteoporosis and other metabolic bone diseases.

The course focuses on practical issues relating to patient management and is strongly recommended for any trainee who foresees that patients with these disorders will form a significant part of their workload in future.

Specialist nurses in osteoporosis and falls will also find this course valuable, as well as newly qualified consultants or others wishing to update their knowledge.



FACULTY

Bo Abrahamsen (Holbæk)
Cyrus Cooper (Southampton & Oxford)
Adam Darowski (Oxford)
Kassim Javaid (Oxford)
Richard Keen (London)
Tash Masud (Nottingham)
Nicky Peel (Sheffield)
Mike Stone (Cardiff)
Jon Tobias (Bristol)

BONE RESEARCH SOCIETY ANNUAL MEETING 2018

27-29 JUNE 2018, WINCHESTER, UK



ABSTRACT DEADLINE:

9 February 2018

Local organising committee

CO-CHAIRS:

Nick Harvey & Kate Ward
Claire Clarkin
Cyrus Cooper
Richard Oreffo

PROGRAMME HIGHLIGHTS as at May 2017

SYMPOSIA AND OTHER SESSIONS TO INCLUDE:

- Ageing
- Early life origins of disease
- Global burden of osteoporosis and sarcopenia
- Imaging: from mice to men
- Tissue engineering and regenerative medicine: from bench to clinic
- Clinical cases

WORKSHOPS:

- Muscle and bone
- Rare bone diseases
- New Investigators

OTHER:

- Charles Dent Lecture
- Public engagement event

For more information please visit our website or email events@boneresearchsociety.org



Bone Research Society

www.boneresearchsociety.org



The Bone Research Society is extremely grateful to the following organisations who have supported the meeting:

