Connective Issues

BSMB Newsletter

Registered Charity no. 281399 No. 86, July 2015

Contents

Editorial

Dear BSMB Member

Welcome to the 86th Connective Issues.

'The King is dead, long live the King', 'grey is the new black' and 'plus ça change, plus c'est la même chose' – just three clichés I fumbled with in order to announce the *new* order at BSMB. So, on your behalf, it is my privilege to welcome John Couchman back to lead the BSMB Committee. John's return as our new Chairman heralds new exciting events on the horizon. One standout development is the news that Manchester will host MBE2018. This represents a new opportunity for BSMB and its membership to 'showcase' both high quality research and meeting organisation skills. My memory takes me back to a great success when BSMB last led FECTS in 2002 in Brighton (back in the days when the sun used to shine all summer); I am sure that we will all join forces, as we did then, to support another super UK Matrix meeting.

I also have the pleasure of welcoming Qing-Jun Meng as a new Committee member. Our Committee is still short of one full member though and so if you would like to get involved, please put your name forward.

As ever, I urge you to get registered for the forthcoming BSMB Autumn Meeting, held jointly with the Bone Research Society in Edinburgh, organised on our behalf by Tom van Agtmael. Its mix of themes and exciting programme will surely appeal to all Matrix Biologists and so be sure to attend.

By Andrew Pitsillides
Honorary Secretary

Chairman's Letter

Dear Fellow Matrix Biologists,

This is my first letter as Chairman of the BSMB. It is a pleasure and an honour to take on this role, and I look forward to working with our Committee and membership in the years ahead. Having enjoyed a spell as Honorary Secretary previously, I relish becoming involved once again. Straight away I would like to acknowledge the tremendous service to the BSMB of Ray Boot-Handford, our retiring Chairman. Ray has steered the Society with skill in his usual affable style and sense of humour. We are all aware that the BSMB is in excellent shape because of Ray and his colleagues on the Committee. I shall endeavour to carry on these BSMB traditions, short economical meetings, supporting our younger members, and being a major force in European matrix biology.

On the topic of Europe, the BSMB has plans for the future. Matrix Biology Europe (MBE or FECTS as it was) will celebrate 50 years in 2018. Many of you will know that the BSMB has offered to host MBE2018, and at our recent Committee meeting held in Oxford, the University of Manchester site was chosen as the venue. Although some way off, I hope you will make a note of the dates, July 21-25, 2018. We are now consulting with our sister societies across Europe and we aim to host an excellent conference recognising 50 years of matrix biology in Europe. Moreover, with the excellent ongoing inputs from Jo Adams, our co-opted Committee member, we aim to widen our horizons to include matrix biology societies from across the world. This will be a unique event and we look forward to working with our Manchester colleagues as plans progress. In 2016, the biennial MBE meeting organized by Nikos Karamanos will be held in Athens on 11-14 June.

In the near future the BSMB has a joint meeting with the Bone Research Society in Edinburgh. This will be the third joint meeting with the BRS and no doubt will be as successful and enjoyable as the previous two. Tom van Agtmael is organising the upcoming meeting on behalf of the BSMB and the dates are September 01-03. The line-up of speakers is excellent, and there will be poster sessions and a BSMB "open" session for those with interests outside the main theme. The invited speaker in our open session is Liliana Schaefer, who is Chair of the German Society for Matrix Biology and well known to many of us for her work and collaborative ventures with the BSMB. Details are included in this newsletter. It has been many years since we met in Scotland and I hope to meet you in Edinburgh at this event. In the days running up to our meeting, the Edinburgh International Festival (and accompanying Book festival) will be in full swing, a chance to combine science and culture. Festival details can be found at www.eventsedinburgh.org.uk

We are always interested to hear from members, and regular opportunities to get involved with the society. Please get in touch with questions or suggestions. Best wishes to all BSMB members.

John Couchman*, Chairman BSMB*

BSMB News

Registration open:

On-line registration is open for the:

BSMB 2015 Autumn Meeting held at John McIntyre Conference Centre, Edinburgh on Tuesday 1st to Thursday 3rd September 2015. This is a joint meeting with the Bone Research society, organised by Tom Van Agtmael (BSMB) and Vicky MacRae (BRS) and will focus on the genetics and mechanisms of matrix diseases and approaches to develop therapeutic strategies for these disorders.

The deadline for late breaking abstract submission and bursary application for the meeting is just 1 weeks away, on July 17th.

To register, submit your abstract and to apply for bursaries please visit the meeting website:

http://www.meetings.brsoc.org.uk/brsbsmb2015/default.htm

Please see below for more details.

Visit our growing BSMB twitter site, which has gained many followers. Tweets are useful reminders for important deadlines; can help ensure abstracts are submitted and conferences registration completed in a timely – and cheaper – manner. Interesting research and conference highlights are also tweeted regularly. To follow, search @BSMB1 to find us on twitter.

…and of course you can find out about BSMB on Facebook too! If you are already a follower, spread the word and invite visits.

https://www.facebook.com/BritishSociety

Sharing buttons are installed at the bottom of every BSMB web page for Facebook, Twitter, Linked-in, Google+ page, or even via email. Conferences related to matrix biology will also be promoted through the twitter feed and comments and suggestions are welcome.

Rhiannon Morgan, Andrew Hellewell and Graham Riley

Welcome to New Members!

The following new and returning members are welcomed:

Full members: Catherine Merry (Manchester), Stephen Robinson (East Anglia), Richard Stratton (UCL, London), Joe Swift (Manchester), Nan Yang (Manchester) and Student members: Saima Ahmed (Sheffield), Sumaya Allaith (Liverpool), Susan Aungier (Oxford), Paul Battersby (Cardiff), Adam Esa (Cardiff), Majed Felemban (Newcastle), Despoin Gavriilidou (Imperial, London), Sarah Lindsay (Sheffield), Michael Ng (Oxford), Pernille Søgaard (Oxford), Irene Pla-Navarro (East Anglia), Jamie Soul (Manchester), Anne-Sophie Thorup (QMUL, London), Jordan Wragg (Manchester), Chun-Yao Yang (Oxford) and Christoph Zimmer (Liverpool).

New Committee Member

Qing-Jun Meng, University of Manchester joined our Committee in March 2015 and here is an opportunity to allow Qing-Jun to introduce himself.

I am an Arthritis Research UK Senior Research Fellow based in the Faculty of Life Sciences at the University of Manchester. Research in my group focuses on the role of circadian rhythms in matrix biology and age-related diseases, such as osteoarthritis and fibrosis. I am very excited to be part of the BSMB community. As a Committee member, I am keen to promote matrix biology to the other societies that I am associated with, including the circadian rhythm community and the ageing research networks. As an example, I am actively involved in organizing the 2015 Get Connected International Conference of the Wellcome Trust Centre for Cell Matrix Research. The theme of this year's conference is Chrono-Matrix: the dynamics of cell matrix interactions. I look forward to hearing your news and views on any matrix related topics. Please contact me by email: qing-jun.meng@manchester.ac.uk.

Qing-Jun Meng, New Committee Member

Mark your diary

BSMB Joint meeting with the Bone Research Society
September 1st - 3rd, 2015, Edinburgh
Organised by Vicky MacRae, Stuart Ralston and Tom Van Agtmael

5th FEBS Advanced Lecture Course: Matrix Pathobiology, Signaling and Molecular Targets, Rhodes, Greece,
24th-29th September 2015.
Nikos Karamanos, Committee Chairman

2nd MBE, Athens Greece
11th – 14th June 2016.
Organised by Nikos Karamanos

Request for Nominations

Young Investigator Award 2015

This is a final reminder that the closing date for this year's BSMB Young Investigator Award is the 31st July. Interested parties will find further details about the application process on: http://www.bsmb.ac.uk/awards-index/young-investigator-award/

The generous gift from the late Prof John Scott's estate has established a prize fund to support the YIA. Applications from any BSMB member aged 36 or under at the time of application will be considered.

Graham Riley, BSMB

One BSMB Committee member

Any current member in good standing is eligible. Committee members formulate policy and have a major responsibility for organising BSMB meetings. It is expected that each Committee member will take a major part in planning and organising one BSMB meeting during their tenure, be available to attend most Committee meetings, but also to attend occasional further meetings. Should more nominations than vacancies be received, an election may be held. Nominees should send a CV and supporting statement to the BSMB Secretary, Andy Pitsillides. Appointees become BSMB Trustees. It is recommended that those interested read BSMB Constitution and trustee status (www.bsmb.ac.uk).

Closing date for nominations: 17th August, 2015. Enquiries to Honorary Secretary (apitsillides@rvc.ac.uk or 207 468 5245).

Andy Pitsillides, BSMB Secretary.

'Good news'

BSMB bursaries are still available to graduate student and post-doctoral researchers to participate in 2016 meetings (please contact Tom Van Agtmael for details.

Article: International Journal of Experimental Pathology. Title: "British Society for Matrix Biology - Autumn 2014 Meeting Report"

To share more good news please contact *Kim Midwood.*

Upcoming BSMB Meetings

BSMB Joint meeting with the Bone Research Society September 1st – 3rd, 2015

University of Edinburgh

Organised by Tom Van Agtmael, Vicky MacRae and Stuart Ralston

BSMB's Autumn 2015 meeting (University of Edinburgh), will be our 3rd joint meeting with the Bone Research Society (BRS). Similar to previous combined meetings, this meeting will extend over 3 days (Tuesday lunch-time to Thursday afternoon).

The meeting will focus broadly on the basis of extracellular matrix diseases and the development of therapeutic approaches. The open BSMB session will cover all aspects matrix biology. Noted highlight is the John Scott Young Investigator Award lecture. Further information and to register please see: www.bsmb.ac.uk/forthcoming-meetings/

Tuesday 1st Sept, 2015

Session: Genetics of musculoskeletal disease

Wim Van Hul (Antwerp): Sclerosing bone dysplasias: low prevalence but high relevance

Joyce Van Meurs (Rotterdam): Genetics of osteoarthritis

Wednesday 2nd Sept, 2015

Session: Stem cells & regenerative medicine

Antonella Forlino (Pavia, Italy): Gene-cell therapy approaches in the treatment of osteogenesis imperfecta

Bruno Peault (Los Angeles): Perivascular regenerative cells in development, homeostasis and disease

Session: Intracellular pathways for matrix diseases

Mike Briggs (Newcastle): New insight into the structural and functional properties of matrilin-3; implications for disease mechanisms.

Liliana Schaeffer (Frankfurt): SLRP signalling in the kidney

Session: Scaffolds

Molly Stevens (Imperial College): New materials-based approaches to engineer and study mineralised tissue

Manuel Salmeron-Sanchez (Glasgow): Engineered extracellular matrices for regenerative medicine

Oral Posters

Shorter Presentations (Junior Investigators, Postdocs, students)

Session: John Scott YIA Award lecture

Thursday 3rd Sept, 2015

Session: BSMB and BRS open sessions

Paolo Bonaldo (Padova): Collagen VI is a critical regulator of nerve structure & function

Session: Mineralisation

Colin Farquharson (Edinburgh): Initiation and regulation of skeletal mineralisation

Catherine Shanahan (Kings College: Mechanisms of vascular calcification)

Bursaries and Prizes: A number of BSMB presenter and reporter bursaries are available, as well as prizes for poster and oral presentations.

Social Events

Reception & Poster Viewing: Tuesday 1st September. Wine, beer and nibbles on Tuesday evening (5pm-6:30pm) with posters.

Conference Dinner: Wednesday 2nd September. There will be a 3 course dinner in the South Hall on Wednesday evening at 7:30pm. After dinner the bar will be open for business sand there will be a Ceilidh.

Important Deadlines

Registration closes: August 31 2015

Late Breaking Abstract deadline & Reporter/ Presenter bursary deadline: July 17 2015

Registration Fees

Member	£260
Non-member	£340
Student	£210
Accommodation ensuite	£65/night
Accommodation shared bathroom	£45/ night

Registration fee includes refreshments and reception. Accommodation /breakfast on site.

For more information on any of the above and to register and submit an abstract please visit: www.bsmb.ac.uk/forthcoming-meetings/

BSMB Satellite Meeting London, 7th-8th September, 2015

Advances in tendon research: From bench to bedside

Organised by Hazel Screen, Graham Riley, Peter Clegg, Helen Birch, Dylan Morrissey & Chavaunne Thorpe

A BSMB satellite meeting 'Advances in tendon research – from bench to bedside' will be held in London in September 2015. This meeting will bring together leading scientists and clinicians from across the tendon and musculoskeletal research fields, providing a forum for clinicians, engineers, modellers, industry and biomedical scientists to interact. The conference will begin with workshops to help individuals from different fields develop a basic understanding of the techniques and concepts used in other fields, and subsequent conference sessions will cover cross cutting themes.

An exciting programme of internationally renowned speakers has been confirmed, including Helen Birch (UCL), Michael Kjaer (Copenhagen), Jeff Weiss (Utah) and Jess Snedeker (Zurich). There are also many slots available for short talks and posters. Abstracts on any area of tendon research are encouraged, and all submitted abstracts will be accepted for poster presentations. Abstract deadline is the 24th July 2015.

BSMB members will benefit from reduced registration fee, and presenter bursaries are available for eligible BSMB members. The registration deadline is 31st August 2015. Please see conference website for details: www.bsmb.ac.uk/meetings-index/tendon-qmul-2015/

BSMB Spring 2016 Meeting Chester, April 4th-5th 2016

"The Grey Area – Age and the Extracellular Matrix"

Organised by Simon Tew

The BSMB Spring 2016 meeting "The Grey Area: Age and the Extracellular Matrix" will be held at Chester University on Monday 4th and Tuesday 5th April 2016. The meeting organising committee is Dr Simon Tew, Dr Mandy Peffers, Dr Kevin Hamill and Professor Eithne Comerford.

The meeting will bring together scientists from across the matrix biology and ageing fields and will provide a forum for multidisciplinary discussion on the effects of age and the extracellular matrix and the processes involved in age-related pathologies that affect extracellular matrices. Registration has yet to open but details will appear in the coming months at www.bsmb.ac.uk/forthcoming-meetings/

Preliminary program & invited speakers:

Systemic and molecular affects of ageing

Gordon Lithgow (Buck Institute, USA)

Mike Sherratt (Manchester University)

Muscle & tendon response to age

Charlotte Peterson (Kentucky, USA)

Helen Birch (London, UK)

Ageing & the extracellular environment

Richard Loeser (Chapel Hill, USA)

Sara Wickström (Cologne, Germany)

BSMB Open session

(Junior Investigators and Postdocs)

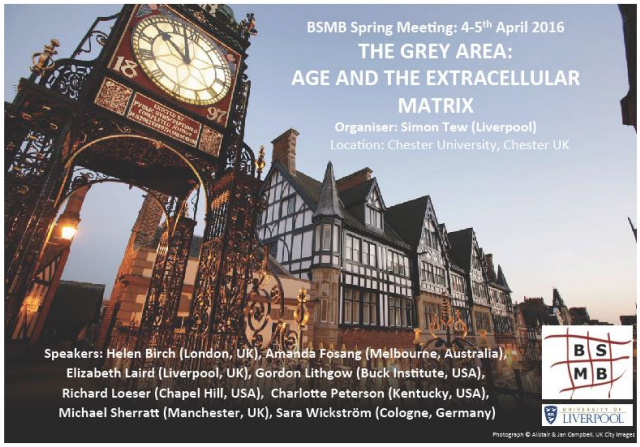
5 slots are available for short talks selected from submitted abstracts and will feature hot topics from any area of matrix biology.

Molecular mechanisms contributing to age-related disease

Amanda Fosang (Melbourne, Australia)

Elizabeth Laird (Liverpool, UK)

The meeting will also include a presentation by the 2016 Fell-Muir Award recipient.



Location

The conference will take place at Chester University's campus, which is located close to Chester city centre. All facilities, including dining and accommodation, are close together on the same site.

Bursaries and Prizes

A number of BSMB presenter and reporter bursaries are available, as well as prizes for poster and oral presentations.

BSMB Conference Bursaries

Tom Van Agtmael

Awarded Feb 2015 – July 2016

BSMB Spring 2015
Reporter: Michal Dudek, Simone Scilabra, Olkesandr Nychyk; Silvia Rosini; Presenter: Lorna Mullan

BSMB Autumn 2015
Andrea Pollard, Taiwo Oguntona
Other Bursaries
Rhiannon Morgan, Mandy Peffers and Stephen Thorpe (Orthopaedic Research Society Meeting), Vivien Coulson (Gordon Proteoglycan), Ian LI (Gordon cartilage) and Alan Godwin (Gordon Elastin)

Dr Tom Van Agtmael,
tom.vanagtmael@glasgow.ac.uk

Meeting reports

Spring 2015 BSMB

"Location, Location, Location: the matrix and the microenvironment"

St. Catherine's College, Oxford

Silvia Rosini (Bristol)
Simone Scilabra (Munich)
Oleksandr Nychyk (UCL) and
Michal Dudek (Manchester)

The Spring 2015 BSMB meeting was held on March 30th and 31st at St. Catherine's College in Oxford. As suggested by its title, "Location, Location, Location: the matrix and the microenvironment", this meeting was focused on the role of ECM microenvironment in health and disease, showing how remodelling of the ECM microenvironment affects cell behaviour. High-profile talks provided great examples of how changes in the composition of the ECM microenvironment regulate different cellular processes, including growth, migration and immune responses. This report will highlight some of the key findings, which were conveyed during the meeting in four main sessions:

1. Cancer: the metastatic niche and the cancer stem cell

The 1st session addressed how ECM remodelling can form metastatic niches via collagen cross-linking enzymes or matricellular proteins. The session opened with a fascinating talk from Janine Erler (Copenhagen) who discussed recently published research (Cox TR et al. Nature 2015) that shows how cancer-free mice, injected with conditioned media from hypoxic breast cancer cells, develop osteolytic lesions in a lysyl oxidase (LOX)-dependent manner. She argued that use of LOX antibodies along with established chemotherapeutic drugs, could lead to new treatments. The relevance of LOX/LOXL family members in promoting tumour cell invasiveness was corroborated by Elena Pasko (Toronto), who talked about recent findings that lysyl oxidase-like 1 (LOXL1) up-regulation in tumour stroma of non-small cell lung cancer (NSCLC) patients is mediated by collagen-integrin alpha11 signalling. She speculated that greater contraction and linearization of collagen fibres, mediated by LOXL1 up-regulation in the tumor stroma, may be able to promote NSCLC migration, invasion and consequent formation of metastatic niches.

Matricellular proteins are also relevant to regulate metastasis. In the next talk, James Hutchenreuther (Ontario) showed that highly metastatic melanoma cell lines lose their invasive properties when injected into syngeneic mice in which connective tissue growth factor (CCN2) expression in fibroblasts has been knocked out.

In the final talk of the session, Giulia Taraboletti (Bergamo) introduced the concept of "re-educating the tumor stroma to normalize its architecture" as a strategy to control tumour progression and to improve the delivery of chemotherapeutics to tumour cells. Her lab recently found a new sequence in the type 3 repeats of TSP-1 (TS3R) able to inhibit angiogenesis by binding and sequestering FGF-2, inducing therefore a "re-normalisation" of vasculature. Since this re-organisation improves delivery of Paclitaxel to tumour, a pharmacophore-based screening of non-peptidic TS3R analogues has been conducted in order to develop new anti-neoplastic therapies.

2. Development

Frank Zaucke (Cologne) gave an insight into the role of matricellular proteins, including collagens, COMP and matrilins, in skeletal development and disease. Gene mutations in these proteins lead to developmental disorders, such as chondrodysplasia. By using human samples from patients affected by chondrodysplasia and murine models deficient for collagen IX, COMP and matrilin-3, he showed the intracellular and extracellular pathways involved in their role in bone growth and in pathogenesis of skeletal dysplasias.

Oleksandr Nychyk (UCL, London) gave an outstanding talk that earned him the oral presentation prize. Our understanding of the role of proteoglycans in the development of the neural tube (NT) is at its beginning, and Oleksandr provided evidence of how different expression patterns of HSPGs and CSPGs can affect NT closure, in addition to a comprehensive list of ECM proteins, namely "matrisome", expressed during the initial phase of neurulation. Simone Scilabra (DZNE Munich) presented his study about the development of a molecule to increase tissue TIMP-3 levels and Kurt Hankenson (Michigan) described the role of R-spondins

in bone formation and in the regulation of Wnt-signaling.

The session terminated with Bjorn Olsen being granted the Fell-Muir award 2015 for his academic achievements. Bjorn Olsen gave an impressive presentation, striking the audience not only for his outstanding discoveries but also for the enthusiasm that still characterizes his research. Olsen's lab has focused its studies on tissue and organ morphogenesis, trying to identify genetic mutations linked with bone developmental disorders, including synpolydactyly and Cleidocranial dysplasia.

3. Inflammation and Immunity

The 2nd day started with a session focusing on inflammation and immunity and opened with a talk by Stephane Heymans (Maastricht) elucidating roles of osteonectin (SPARC) and osteoglycin in inflammation and fibrosis in the failing heart. Osteonectin was found to have advantageous role in acute phase after myocardial infarction but its effects on collagen are detrimental in pressure overload and aging. Conversely, osteoglycin is a marker of cardiac hypertrophy and shows potential as a therapeutic target as its administration through gene therapy prevented cardiac dilatation and dysfunction after myocardial infarction. However, it can also increase adverse cardiac inflammation. Michal Dudek

(Manchester) provided the first evidence of autonomous circadian clock in the intervertebral disc. He showed that IL-1β but not TNFα is able to disrupt the circadian rhythm both in intervertebral discs and articular cartilage and the expression of clock controlled catabolic genes suggesting an additional mechanism for how chronic joint inflammation may contribute to osteoarthritis and disc degeneration. Benjamin Owens (Oxford) showed his results suggesting that IL-23 responsive innate lymphoid cells group 3 may drive TNFα-dependent gp38+ stromal cell activation in inflamed microenvironments during chronic intestinal inflammation. The session concluded with a captivating talk about the 'underappreciated' mucins and their role in lung and intestine immunity by David Thornton (Manchester). David showed results from his group highlighting that the mucus barrier is a significant component of the well-coordinated response initiated against the nematode in the intestine, influenced by the TH2-type cytokines.

4. Targeting extracellular niche in disease

Jack Lawler (Harvard, USA) described the effect of thrombospondin-1 (TSP-1) on VEGF in ovarian cancer cells. Lawler's group used a recombinant version of the type 1 repeats of TSP-1, designated 3TSR, to effectively inhibit tumour growth and to improve survival rate in murine model of ovarian cancer. The effect of 3TSR on cancer progression was mediated through downregulation of VEGF expression and CD36-dependent induction of apoptosis. Yunus Luqmani (Kuwait) then described behavioural responses of estrogen receptor-depleted breast cancer cells to growth factors. He showed that these cancer cell lines have enhanced cell invasion and increased sensitivity to growth factors. The last talk was given by Richard Stratton (UCL, London) on cytokine analysis of dermal interstitial blister fluid in systemic sclerosis patients and gave insights into inflammatory signatures of this complex disease.

Gordon Research Conference, Cartilage Biology & Pathology,

21st-27th March 2015, Hotel Galvez in Galveston, Texas, USA.

Ian Li (University of Liverpool)

When it comes to PhDs you are encouraged to attend conferences, give talks and present posters. It is all in the learning process, the networking and finding your feet in the world of science. So what better way to kick off my international presence than attending the 7th biannual Gordon Research Conference & 1st Gordon Research Seminar in Cartilage Biology and Pathology, co-chaired by Veronique Lefebvre (USA) and Danny Chan (Hong Kong). The conference was held at Hotel Galvez in Galveston, US which makes you feel like you've left work and tricks you into thinking you're not actually at a conference. The main theme was 'promoting translational research in Cartilage Biology.'

What sets the GRC and GRS apart from other conferences is the opportunity to talk to researchers on a 1:1 basis, you had access to 192 (at this conference) other scientists; many of whom are experts in this field ranging from cartilage biologists to tissue engineers, from the basic scientist to the drug discovers. This GRC was true to its name with talks being very pioneering and ambitious; the data presented were cutting-edge and unpublished in areas including: chondro-progenitor identification, interactions and crosstalk between cartilage and other tissues in the body and transcriptional processes in development, adulthood and disease. There were many opportunities for discussion, mentorship and networking from

the breakout sessions to the evening meals and lunch. Each person giving you stories, a perspective and help with your own ideas in your own work, and by being in the very early stages of my career was an amazing chance to find my feet in the field and to see my ideas weren't actually that terrible.

The GRS was only a traditional seminar by name, students from all over the world presented some unusual and exciting data from limb development to cell lineage tracing of joint morphogenesis. The focus was mainly giving students the opportunity of meeting each other to form future collaborations and career talks, it's not every day you get the chance to get a career development chat from Philippe Soriano (Mount Sinai). To add to this, winning one of the outstanding poster presentation prizes topped off an interesting and engaging conference. The next GRC and GRS in 2017 will be held in Europe, I highly recommend any young investigator to attend the GRS and the GRC for the experience and atmosphere of community and collaboration.

(Hotel Galvez, Galveston)

Orthopaedic Research Society Meeting 2015 Las Vegas, USA (three meeting reports)

Rhiannon Morgan (Liverpool)

This annual meeting was held at the MGM Grand in Las Vegas, 28th-31st March 2015. As a renowned multi-discipline conference, it was attended by a plethora of clinical orthopaedic surgeons and researchers. The conference offered sessions for specific research interest groups, new investigator networking meetings, poster walking tours, workshops and basic science courses, and a multitude of lectures. General trends included musculoskeletal disease and kinematics at a whole joint and cellular level, regenerative and surgical reparative therapy, diagnostic and quantitative imaging and musculoskeletal tissue engineering. Over 2000 posters were presented across 4 different poster sessions.

Being interested in osteoarthritis (OA) and clinical orthopaedic diagnostic imaging, I tailored my time around sessions based on cellular aspects of joint disease, especially those discussing post-traumatic OA and the inflammatory mediators involved, and on the quantitative diagnostic imaging seminars.

The Quantitative Magnetic Resonance (MR) imaging workshop focused on research applications and aspects that could be translated to the clinic. Many anatomical structures can be quantitatively imaged providing insight into tissue biochemistry, structure and function. MR sequences used in research were compared to more traditional imaging methodologies, and their translation into clinical diagnostics was discussed. Sharmila Majumdar described quantitative imaging bone; when examining cortical bone porosity using peripheral quantitative computed tomography (pQCT), a good correlation to the trabecular bone number, a morphometric bone measurement analysed by MRI, was found. With analysis of vertebral bone fractures, a lower trabecular bone number positively correlated to an increase in fracture incidence. The volume of bone (BV) within the total bone volume (TV) represents the apparent bone fraction. A reduction in trabecular number, apparent bone fraction and decreased cartilage thickness associated with cartilage and bone loss, actually correlated with an increase in subchondral bone density. Meniscal tears were also associated with reduced apparent bone fraction and trabecular number. Intervertebral disc (IVD) research, discussed by Won Bae, is currently looking to find objective biomarkers for early degeneration; many signal changes on MR images have been associated with factors such as proteoglycan loss, water loss, disc degeneration or herniation. Biochemical imaging with glycosaminoglycan (GAG) chemical exchange saturation transfer (gagCEST), is a new contrast mechanism demonstrated to be sensitive to chemical exchanges of GAG protons with water. A reduction in GAG content can be detected, and has been associated with intervertebral

disk (IVD) degeneration. Quantitative ultra-short echo time (UTE) MR imaging allows direct assessment of the cartilaginous end plate (CEP). The CEP is notoriously difficult to image non-invasively, and damage to this structure can severely compromise the IVD and bone marrow health. This method uses ultra-short pulse sequences allowing signal to be detected much earlier than conventional MRI; useful when tissues with short T2 relaxation components such as cartilage and menisci, are imaged. However, more information is needed to assess how CEP abnormalities directly affect the IVD, and how they compare to functional changes. UTE MRI of menisci, as described by Matthew Koff, can be useful in evaluating meniscal repair. Meniscal T2* relaxation times using UTE MRI correlated well with quantitative multi-photon microscopy, and were sensitive to zonal and temporal differences in tissue structure and composition. Meniscal repair resulted in changes to cartilage and meniscal integrity.

Synovial membrane stem cells to repair/ reverse knee OA: from bench to clinic. Ichiro Sekiya gave a 'spotlight' talk in the Knee OA repair session, on the Sunday afternoon. Mesenchymal stem cell (MSC) numbers have been found to increase within synovial fluid after meniscal injury, and continue to increase over time. Increased MSC numbers also correlate with radiological OA grade. On examination of these MSCs, their gene profiles were comparable to synovial MSCs (S-MSCs) rather than bone marrow MSCs (BM-MSCs). Intra-articular administration of S-MSCs promoted meniscal regeneration. It was then hypothesised that the synovium acts as a reservoir for MSCs that assist in intra-articular repair. Analysis of S-MSCs found that they have high chondrogenic potential in vivo, produce more ECM than adipose or muscle MSCs, and proliferate at a higher rate than BM-MSCs. S-MSCs were injected into human osteochondral defects and the defects filled within 3 years; regenerated tissue did not have the same integrity as cartilage, but was comparative to that produced by chondrocyte implantation or microfracture. S-MSCs transplanted into microminipigs with meniscal rupture were found to induce synovial tissue formation within the tear. This increased vascularisation within the avascular zone of the meniscus and promoted healing of meniscal tear (Nakagawa et al. 2015).

PTOA: studies in preclinical models: Early inhibition of pro-inflammatory cytokines prevents post-traumatic arthritis. Steven Olson discussed the dramatic pro-inflammatory cytokine increases observed within the first 24 hours of injury. Synovitis contributes to this cytokine cascade, and worsens with increasing injury and fracture severity. MRL/MPJ superhealer mice were used to investigate this cytokine reaction; a 700-fold increase in IL-1 was observed within 4 hours of injury. Anti-IL-1 and anti-TNF-α agents were administered either via an immediate intra-articular (IA) injection or systemically 4 weeks post-injury. Anakinra, an IL-1 receptor antagonist (IL-1Ra), administered IA immediately after injury, gave results most comparable to non-injured controls (Furman et al. 2014). Similar effects were also noted with IA use of a thermally-responsive elastin-like polypeptide (ELP) drug depot containing IL-1Ra, supporting the importance of IL-1 in the acute inflammatory phase of joint injury.

Furman et al. (2014) Targeting pro-inflammatory cytokines following joint injury: acute intra-articular inhibition of interleukin-1 following knee injury prevents post-traumatic arthritis. Arthritis Research & Therapy 16:R1 34.

Nakagawa Y et al. (2015) Synovial mesenchymal stem cells promote healing after meniscal repair in microminipigs. Osteoarthritis and Cartilage In press.

Mandy Peffers (Liverpool)

Orthopaedic Research International (ORS) was held in MGM Grand Conference Centre in Las Vegas, USA from 28-31 March 2015. The conference boasts over 3,000 biologists, engineers, clinicians and surgeons coming together to with the aim to communicate their science across disciplines.

The meeting encompassed a broad swathe of orthopaedic related science from structural insights into intermolecular interactions to animal models and therapeutic solutions. In addition, there included a ORS Translational Research Symposium, the ORS/OREF Basic Science Course and ORS Clinical Research Forum as well as numerous workshops; both

practical such an excellent presentation by Chris Little on animal models and those organized by The Journal of Orthopaedic Research to help authors improve the quality of their journal manuscripts and increase their chances of getting published. In addition a number of networking events were organised for new investigators.

In addition, the International Symposium on Ligaments and Tendons (ISL&T)-XIV preceded the ORS meeting. This intensive one day meeting on 27th March consisted of a 12 hour programme. The meeting was attended by over 150 delegates ranging from PhD students to world leading international researchers, giving a platform for those at all stages of their career. There was a mix of clinical lectures, keynote lectures and 5 minute podium presentations and a poster session. Sarah Rooney received the Savio-Woo Young Researcher Award for her work on the response of rat supraspinatus tendon and muscle to exercise. In an interesting and useful addition to the programme poster presenters gave a one minute 'pitch' for their posters. The UK contingent presenting here represented groups from the University of Liverpool, Queen Mary, University of London, University of Glasgow.

For the ORS conference some of the research themes emerging from the meeting are discussed here. There were a number of themes for each daily session. On Saturday 28th March topics included bone disease, biology and repair, hip disease, advanced articular cartilage imaging techniques, cell differentiation fibrosis and cancer, osteoarthritis and cartilage, stem cells and tissue repair. Highlights included an excellent talk by Michael Albro (Imperial, London) in which he discussed how endogenous stores of TGF β maintained the integrity and viability of articular cartilage in response to physiological and excessive dynamic mechanical loading. Another excellent presentation by Nidhi Bhutanis' group, Stanford University addressed how distinct patterns of 5hmC acquisition mark chondrogenic differentiation. Using a novel technique involving 5hmC enriched DNA library preparation and next generation sequencing they demonstrated a steady increase in 5hmC over the course of chondrogenesis both in-vivo and in-vitro. There was a genome-wide increase in 5hmC in the promoter and gene body over the course of differentiation, with 5hmC increases associated with genes and networks critical for chondrogenesis locus specific increases in 5hmC were evident key chondrogenic genes including Sox5, 6, 9 and Col2 α 1. This suggested a critical function for 5hmC in chondrogenic differentiation highlighting the significance of DNA methylation and its modifications in skeletal development.

On Sunday sessions included knee bone necrosis, tendon/ligament cell biology, repair and tissue engineering, progenitor cells, knee OA repair. Joseph Paquet (Paris) gave a fascinating talk on how oxygen tension regulates mesenchymal stem paracrine function. They demonstrated that there was a shift of the hMSCs cytokine signature induced by O2 tension, near anoxia. Thus challenging some of the functions currently attributed to hMSCs, specifically, the immunomodulative properties observed under normoxic conditions.

Themes included on Monday were biglycan in bone healing, mediators of joint repair, ageing and OA and tendon and ligament mechanics. Marian Young (Bethesda, USA) gave an excellent keynote presentation on how small leucine-rich proteoglycans are fine tune regulators of skeletal function.

The final day included sessions on tendon and ligament collagen structure and function and cartilage matrix biology. Suneel Apte (Cleveland, USA) gave a spotlight lecture on extracellular matrix assembly, proteolytic turnover and its contribution to degenerative and inflammatory diseases.

The impressive poster sessions spanned a plethora of topics and over 2000 posters over two sessions which stimulated much discussion and an exciting 'buzz' in the massive conference hall. Poster walking sessions were organised in order to get the most from these session which can be quite daunting due to varied content and numbers of posters.

The 2016 meeting crosses the USA continent to Orlando, Florida and will be held 5-8 March.

Stephen Thorpe (QMUL, London)

The ORS annual meeting has been one of the premier meetings for those in the field of musculoskeletal research for over 60 years. This year's meeting was held at the MGM Grand in Las Vegas, Nevada from Saturday March 28th to Tuesday March 31st. Given the large size of this conference with approx. 3,000 attendees, over 2,000 posters and up to 5 parallel podium sessions across a wide variety of topics, it is not possible to provide a detailed report on the conference as a whole. However I will provide a summary of the highlights as I saw them.

To begin, I will provide some background on my interests. I am a postdoctoral research assistant at Queen Mary University of London in the lab of Professor David Lee. I am an engineer working in stem cell mechanotransduction and cartilage tissue engineering, and the multidisciplinary nature of the ORS meeting provides an excellent forum to showcase my research. This year I was presenting a poster entitled Endocannabinoid Anandamide and Fatty Acid Amide Hydrolase Inhibitor URB597 prevent Interleukin-1β induced cartilage degradation while enhancing mesenchymal stem cell chondrogenesis".

Day 1 of the meeting began at 8 am with an excellent Research Interest Group on Mechanobiology and Inflammation in Cartilage. This was run by Christopher Chen (Texas, USA) and Alan Grodzinsky (MIT, USA). These sessions are slightly more informal than typical podium sessions as everyone sits around tables and a lot of time is made available for discussion after each talk. These talks focussed on the role of mechanobiology in mediating inflammatory pathways involved in cartilage degradation and repair. Qain Chen (Brown University) presented interesting work on the interplay between microRNAs and hedgehog signalling in the mechanical regulation of chondrocyte hypertrophy, identifying hedgehog interacting protein as a key mediator.

I then attended a very useful New Investigator Networking Session on Strategic Lab and Time Management. This included talks for senior male and female academics on how best to manage time and ensure you focus on the correct areas, which is pertinent for any of us struggling with work life balance.

The New Investigator Recognition Award (NIRA) sessions followed which include some of the best research papers at the meeting, with a number of notable papers on hedgehog, Wnt and TGF signalling in MSC differentiation. We finished the day with some Queen Mary and Liverpool collaboration at Cirque de Soleil!

Day 2 began with an excellent session on Tendon and Ligament Cell Biology followed with a session on Progenitor Cells which included some interesting work on hypoxia from the labs of Herve Petite (Paris) and Wan-Ju Li (Wisconsin, USA). The afternoon brought the first poster session where we enjoyed a drink while chatting over our posters. I was fortunate enough to meet Christine Le Maitre (Sheffield) who is doing complimentary endocannabinoid work.

Day 3 brought a second poster session which brought more of the same high quality work with a range of posters on mechanical stimulation of cells for cartilage repair.

The final day brought some of the most interesting sessions for me. The morning started with an excellent session on Cartilage Matrix Biology with an interesting presentation by Hannah Heywood (QMUL, London) on the role of sirtuins in cartilage repair, and an excellent overview of the role of ECM assembly and proteolytic turnover in degenerative and inflammatory disorders by Suneel Apte (Cleveland). This was followed by another session on chondro-progenitors and chondrogenesis and an excellent final session on cartilage mechanobiology. One key theme highlighted by work from Diane Wagner's lab (Notre Dame) and Robert Mauck's lab (University of Pennslyvania) was on the role of purinergic signalling in the response of MSCs to mechanical stimulation and its subsequent effects on genome regulation of cell fate.

I would like to thank the BSMB for providing the opportunity to travel to and attend this meeting where I have built and maintained some important collaborative links and showcased my research.

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