

Connective Issues



BSMB Newsletter

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Prof John Couchman (Chair), Prof Andrew Pitsillides (Secretary),
Dr Tom van Agtmael (Treasurer), Prof George Bou-Gharios, Dr Sophie Gilbert,
Ms. Jade Gumbs (student rep), Dr Qing-Jun Meng, Dr Andrew
Hellewell (PD rep), Dr Simon Tew, Dr Linda Troeberg & Dr James Whiteford

Registered Charity no. 281399

No. 88, June 2016

Contents

2	Editorial <i>Andy Pitsillides</i>
2	Chairman's letter <i>John Couchman</i>
3	BSMB News	
	Registration open	
	'Twitter and Facebook' <i>Andrew Hellewell with Graham Riley</i>
	Welcome to New Members <i>Tom Van Agtmael</i>
	Announcement from Wellcome Centre for Cell-Matrix Research, Manchester	
	New BSMB Committee Member	
4	Mark your diary!	
4	Request for Nominations	
	BSMB Honorary Secretary	
	Two BSMB Committee members	
	Young Investigator Award 2016	
6	Good News	
6	Upcoming BSMB Meetings	
8	BSMB Conference Bursaries <i>Qing Jun Meng</i>
8	Meeting Reports	
15	Current BSMB committee	
16	Flyer: BSMB Oxford, 2017 meeting <u><i>Register now</i></u>

Editorial

Welcome to an overdue Connective Issues; our 89th. I thought it'd be interesting for me to decipher why I needed to introduce this 89th issue in belated terms, and to distil it down to a single word. I thought of many that might also apply, but decided upon the word '*bureaucracy*'. I wonder what *real* proportion of our time (being entered into yet another 'time allocation survey' or similar) should be attributed to this activity, and what proportion remained for research & teaching - revenue generating activities - don't blame me for this terminology either. Perhaps I was thinking in these terms, having just read an article in The Times Higher, entitled: Bureaucracy: why won't scholars break their paper chains? <https://www.timeshighereducation.com/features/bureaucracy-why-wont-scholars-break-their-paper-chains/2020256.article>.

Anyway, I digress from BSMB issues and would suggest that this delay has worked out in my favour, in some respects. It allows me to share new breaking developments:

- To announce that Prof. Cay Kielty, Manchester will be BSMB's recipient of the Fell-Muir Award, 2017. To hear about her research, you should...
- Register: for BSMB Spring 2017 meeting in Oxford organised by Linda Troeberg, where you can join in a festival of 'Matrix proteoglycans, active participants in cell-ECM communication'. You should also consider
- Standing for election: as we seek new BSMB Committee members and a new Honorary Secretary in the coming months. These are opportunities to help shape BSMB's future?
- Finally, please join me in welcoming all new BSMB members

By Andrew Pitsillides, Honorary Secretary

Chairman's Letter

Dear BSMB members:

After a tumultuous 2016, I would like to start by wishing all our members a happy, healthy and productive New Year. Perhaps 2017 will bring fewer surprises, more matrix biology funding and a long, hot summer. We can hope anyway! Congratulations are certainly due to the Wellcome Center for Cell-Matrix

Research who have successfully renewed their Centre status until 2021 and will continue to be a major force in our field. The BSMB looks forward to hosting the Matrix Biology Europe conference in Manchester in July 2018. With that in mind, I would like to ask our members to actively support our Society, not least in the area of membership. Please think about your colleagues, students and fellows who may not be members currently, but who are active in matrix biology. New blood is always welcome and as our current members know, the BSMB is a very collegial, open and friendly environment in which to meet new friends and colleagues and share data. We would like to have a strong membership and participation in our upcoming meetings, with the added advantage that members receive a discount on registration fees for our meetings after a qualifying period. Moreover, subject to our regulations (available on our website), travel funding is available for members to attend our meetings and other meetings in the matrix biology arena. BSMB membership fees are very inexpensive and surely represent good value as we, in turn, endeavour to support all our members, particularly those who are more junior. A thriving membership base is the key to our ability to organise and host our meetings. Think of any area of vertebrate or invertebrate biology, whether it be development, immune or musculoskeletal function, tissue repair, cancer, vascular disease, arthritis, aging to name a few, and proteoglycans are sure to be of relevance and importance. With this in mind, the many aspects of proteoglycan biology and function are the theme for our spring meeting. Details are included later in this newsletter. An excellent array of speakers has agreed to attend and we look forward to another excellent meeting. Moreover, we have arranged a satellite meeting on the day following our main meeting. We shall host the Nordic Proteoglycan Workshop, bringing many colleagues from Sweden, Norway and Denmark to Oxford. The schedule is nearly complete and includes some new and wide ranging aspects of proteoglycan biology. The Nordic area has long been known for pioneering work in polysaccharide and proteoglycan research, so we are very pleased that a number of our colleagues from

this area will attend, providing new opportunities for us to network and forge collaborations. Please register soon for the meeting and workshop (April 03-05). There is no additional registration fee for the workshop satellite, which is open to all attendees of the main BSMB meeting.

Finally, our grateful thanks go to Kim Midwood and Simon Tew for their many contributions to the BSMB Committee. Many will remember the very successful meetings organised by Kim in spring 2015 (Oxford) and by Simon in spring 2016 (Chester). They have rotated off the committee on completion of their terms of office, and I would like to acknowledge their enthusiastic support of the BSMB. We look for members to join the Committee, it is an enjoyable and rewarding experience. I would be pleased to discuss the role of Committee members with any potentially interested member. Please get in touch!

Best regards and Happy New Year!
John Couchman, Chairman BSMB.

BSMB News

Registration open:

On-line registration is open for the:

BSMB Spring 2017 meeting held at St Catherine's College, Oxford on 3rd and 4th April, 2017. The meeting is organized by Linda Troeberg, and will focus on how extracellular matrix proteoglycans modulate cell physiology in health and disease.

For further information and to register, please visit <http://www.bsmb.ac.uk/meetings-index/about-the-meeting/>.

Deadline for abstract submission is 13th March 2017 for bursary applications is 1st March 2017 and Early bird registration ends 9th March 2017

To register, submit your abstract and to apply for bursaries please visit the meeting website: <http://www.bsmb.ac.uk/meetings-index/about-the-meeting> *More details below.*

Follow us on Twitter and Facebook for all the latest BSMB news. This includes

important updates on upcoming BSMB meetings and related matrix meetings. We are also active before meetings in promoting upcoming speakers, and during the meetings with information and discussion. Please feel free to tweet interesting research and conference highlights. Comments and suggestions are welcome. To follow, search @BSMB1 to find us on twitter or BSMB on facebook. Spread the word and invite visits.

Sharing buttons are installed at the bottom of every BSMB web page for Facebook, Twitter, LinkedIn, Google+ page, or even via email.



Andrew Hellewell and Graham Riley

Welcome to New Members!

Full Members (since June, 2016)
Matthew Dalby (Glasgow)
and *Student members*
Venkatesh Mallikarjun (Manchester)
Greg Markby (Edinburgh).

Announcement from the Wellcome Centre for Cell-Matrix Research, University of Manchester

Prof. Karl Kadler (Centre Director) is delighted to announce that Wellcome status has been renewed for another 5 years. The Wellcome Centre for Cell-Matrix Research (WCCMR) has been renewed, to 2021 and is now entering a new 5-year period of collaboration, recruitment, and hosting fellow cell-matrix scientists (at all levels) as visitors.

The WCCMR is one of 15 Wellcome Centres* that cover biomedical research, the medical humanities, social societies and translational research. The renewal brings together 20 academic staff, 9 support staff, and a community of postdocs and postgraduate students whose research is focused in three new themes of ChronoMatrix, ImmunoMatrix and MechanoMatrix, and a new overarching initiative in fibrosis.

The renewal funds new equipment in multi-scale imaging (including super-resolution and electron microscopy), biomolecular analysis,

and biomechanics for analysis of cell-matrix structure and interactions. This opens up new opportunities for visitors, collaborations, and recruitment, at all levels. The WCCMR will be continuing our annual GetConnected! conference (further information to follow).

WCCMR are also revamping their website, therefore in the meantime please contact Karl Kadler (karl.kadler@manchester.ac.uk) for information.

*<https://wellcome.ac.uk/news/wellcome-centre-awards>

Karl Kadler,
Professor of Biochemistry, WCCMR

New BSMB Committee Member

James Whiteford is a Senior Lecturer at The William Harvey Research Institute, Queen Mary University of London and has an interest in the syndecan family of HSPGs and their roles in angiogenesis and inflammation.

James has been at QMUL for 6 years after spending time at the University of Copenhagen.



Mark your diary

BSMB Spring 2017 Meeting

Oxford, April 3rd-4th 2017

Matrix proteoglycans – active participants in cell-ECM communication

Organised by Linda Troeberg

BSMB Autumn 2017 Meeting

Queen Mary

(Mile End campus)

University of London

4th and 5th of September 2017

'Translating the Matrix'

Organised by James Whiteford

Request for Nominations

BSMB Honorary Secretary

The current Honorary Secretary completes his term of office at the April 2017 BSMB meeting. We have, therefore, begun the search for his successor. The Honorary Secretary is one of BSMB's 3 Officer posts (along with Chair and Honorary Treasurer). The incumbent is responsible for the overall running of the BSMB, and works closely with the Chair in the managing the Society's functions and responsibilities. A synopsis (prepared by a previous and modified by the current incumbent) of the various roles of the Secretary is outlined below. Together with the Committee, the Secretary assists with formulating policy and has important roles in liaising with BSMB meeting organisers and the organisation of BSMB Committee meetings and the Annual General Meeting.

The Honorary Secretary shall not normally hold that office for a term of more than three years. In any case, he/she shall not hold that office for more than six consecutive years, but they shall be eligible for election to any other office in the Society. The term of office will begin at the April 2017 BSMB meeting. It is an expectation that the Secretary will be available to attend a very high proportion of BSMB Committee meetings and conferences through his/her term of office. It is anticipated that the new Secretary will attend the April 2017 meeting to take office.

Nominations for this post can be made by any two current members of the BSMB. Nominations, together with the written consent of the proposed nominee should be forwarded by e-mail to the Chairman, Prof. John Couchman, john.couchman@bric.ku.dk by Friday 10th February, 2017.

In the event of more than one nomination, a ballot of the membership by e-mail will be held. To this end, it would be helpful if nominees can send a brief (one page) CV together with a short statement outlining their aspirations for the Society should they be elected.

Chairman, Prof. John Couchman

Synopsis

The post is likely suited to someone with BSMB Committee experience and prior insight into the inner workings of the Society. In a nutshell, it's the Secretary's job to make sure that the Society runs. That might sound intimidating, but the great thing about this role is that it places you at the heart of the Society and you are assisted in delivering most of the role's responsibilities by the committee members. There are many and varied aspects to keeping things on track. Including:

- *Producing the bi-annual newsletter, making sure that all the key components are included;*
- *Managing the BSMB interfaces, such as interactions with the International Journal of Experimental Pathology, with publication of our abstracts, meeting reports and Fell-Muir prize Reviews. Proof reading abstracts and reports, editing them into the correct format and later checking the printed proofs, are probably not the most exciting parts of the job, but are certainly necessary.*
- *Serving as a point of contact for the Society of Biology, to which we are affiliated.*
- *Assisting the BSMB Chair and Treasurer in delivering their responsibilities. There are regular Committee meetings to plan BSMB activities for the years ahead and the Secretary's role is to keep these on track and prepare the agenda and minutes.*
- *Responding to member's enquiries. With the development of our excellent Website by Graham Riley and colleagues, this*

responsibility is diminishing but sometimes issues are raised and these need to be dealt with sensitively and this usually involves coordinating a Society 'voice' with the other 2 BSMB Officers.

- *Running the BSMB Annual General Meeting and reporting annual developments to the membership. And finally*
- *Enjoying the camaraderie of the many BSMB committee and ordinary members at meetings. This has always easily made these tasks worthy of completion and a pleasure to perform.*

Two BSMB Committee members

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: 18th August, 2017. Enquiries to Andrew Pitsillides or John Couchman.

Young Investigator Award 2017

This is the 3rd announcement of the 2017 BSMB Young Investigator Award. Interested parties will find 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.

Closing date: 30th June, 2017.
Graham Riley, BSMB

'Good news'

In Press. Recent Reviews from the last two Fell-Muir award recipients, Bjorn Olsen and Karl Kadler and our Young Investigator Award recipients, Vivien Coulson-Thomas and Blandine Poulet, as well as Meeting Reports and Abstracts from our meetings in Edinburgh, Chester and Cardiff will have recently, or will soon appear in International Journal of Experimental Pathology.

BSMB bursaries are available to graduate student and post-doctoral researchers to participate in 2017-18 meetings (please contact Qing-jun Meng for details).

Article: Meeting Report and Abstracts from the Spring and Autumn, 2016 BSMB meetings, the last two recipients of the Fell-Muir Award, Bjorn Olsen and Karl Kadler, and the most recent YIA recipients, Blandine Poulet and Vivien Coulson-Thomas are all published or in press in International Journal of Experimental Pathology.

To share good news contact *Kim Midwood*.

Upcoming BSMB Meetings

***BSMB Spring 2017 Meeting
Oxford, April 3rd-4th 2017***

***Matrix proteoglycans – active
participants in cell-ECM
communication***

Organised by Linda Troeberg

Registration is now open for the BSMB Spring 2017 meeting at St Catherine's College, Oxford on Monday April 3rd and Tuesday 4th April 2017. The meeting is organized by Linda Troeberg, and will focus on how extracellular matrix proteoglycans modulate cell physiology in health and disease. Invited speakers will highlight novel technologies for proteoglycan analysis, as well as the emerging roles of proteoglycans in inflammation, ageing and disease pathogenesis. For further information and to register, please visit <http://www.bsmb.ac.uk/meetings-index/about-the-meeting/>.

For the past few years, an annual Nordic Proteoglycan workshop has been held in one of the Nordic countries. This year, however, and for the first time, the BSMB is delighted to host the Nordic Proteoglycan Workshop on Wednesday 5th April 2017 at the nearby Kennedy Institute of Rheumatology in Oxford. Everyone registered for the BSMB meeting is invited to attend this satellite meeting at no extra registration cost – please indicate your attendance upon registration for the BSMB meeting and book an additional night's accommodation (£78 bed and breakfast at St Catherine's College) if required. A range of topics will be covered that provide extra value for participants and open up new opportunities for networking with our Nordic colleagues.

Additionally, a workshop on glycobiology in cancer, sponsored by the Biochemistry Society, is being held in Oxford on Thursday 6th April. It's going to be an exciting week of proteoglycan meetings in Oxford!

<https://www.biochemistry.org/Events/tabid/379/MeetingNo/WS021/view/Conference/Default.aspx>

Programme:

Monday 3rd April 2017 (St Catherine's)

Session 1: Matrix proteoglycans in health & disease

Ralph Sanderson (Alabama, USA):
Heparanase regulation of exosome secretion, function and chemoresistance.

John Whitelock (New South Wales, Australia)
Proteoglycans: Dynamic complex molecules supporting tissue and organ architecture whilst promoting biological diversity.

Session 2: Matrix proteoglycans in ageing

Vera Gorbunova (Rochester, USA):
Hyaluronan and stem cell maintenance in the naked mole rat

Dulce Papy-Garcia (Paris, France):
The heparan sulfate chaperon role in tauopathy: Conformational insights.

Fell-Muir award winner

Cay Kiely

Tuesday 4th April 2017 (St Catherine's)

Session 3: New technologies to decode the glycome

Jeremy Turnbull (Liverpool):

Next generation heparins: Targeting proteoglycan functions for therapeutic benefit.

Toin van Kuppevelt (Radboud, Netherlands):
Sequencing of glycosaminoglycans.

Session 4: Open session:

Short talks selected from submitted abstracts to feature hot topics from any area of matrix biology.

Session 5: Matrix proteoglycans in immune system regulation

Andreas Kungl (Graz, Austria):

Glycans and proteoglycans as functional mediators in chemokine biology

Anthony Day (Manchester, UK):

TSG-6: a versatile modulator of glycosaminoglycan structure and function.

Dudley Strickland (Maryland, USA):

Role of LRP1 in regulating vascular matrix.

Nordic Proteoglycan Workshop satellite meeting

Wednesday 5th April 2017 (Kennedy Institute of Rheumatology, Oxford)

Speakers include Lena Kjéllen, Marion Kusche-Gullberg, Jin-Ping Li, Gunnar Pejler, James Whiteford, Sissel Beate Rønning and Linda Troeberg.

Social events

Wine Reception & Poster Viewing: Reception with posters on Monday evening (3rd April).

Conference dinner: The 3-course conference dinner will be held at St Catherine's College Hall on the Monday evening, with the cost included in the registration fee. After dinner, the ever-popular St Catz bar will be open, and the famous Turf Tavern is only a 5-minute walk away.

Bursaries

Presenter and reporter bursaries will be available for eligible BSMB members: please see BSMB website for details (<http://www.bsmb.ac.uk/bursaries-page/>) and email your applications to Qing-Jun Meng (qing-jun.meng@manchester.ac.uk) by 1st March 2017. Successful applicants will be notified by 5th March 2017.

Prizes

Prizes will be awarded for oral and poster presentations.

Important deadlines

Application for presenter & reporter bursaries: 1st March 2017

Early bird registration ends: 9 March 2017

Abstract submission deadline: 13 March 2017

Registration closes: 27 March 2017

Registration fees

BSMB members £200

BSMB student members £150

Non-members £250

Student non-members £180

Please note that these are early-bird fees, which will increase by £50 after March 9th.

Registration fee includes refreshments, drinks reception (Mon 3rd), conference dinner (3rd), en-suite accommodation at St Catherine's College (3rd), and breakfast & lunch (4th). If you require accommodation for nights other than Monday 3rd April, please contact linda.troeberg@kennedy.ox.ac.uk.

For more information, to register and submit an abstract please visit:

<http://www.bsmb.ac.uk/meetings-index/about-the-meeting/>

BSMB Spring Meeting: 3-4 April 2017

Matrix proteoglycans
active participants in cell-ECM communication

Confirmed speakers: Ralph Sanderson (Alabama, USA), Dudley Strickland (Maryland, USA), Andreas Kungl (Graz, Austria), Jeremy Turnbull (Liverpool, UK), Vera Gorbunova (Rochester, USA), Anthony Day (Manchester, UK), Dulce Papy-Garcia (Paris, France), Toin van Kuppevelt (Radboud, Netherlands).

Additional speakers selected from abstracts

Venue:
St Catherine's College, Oxford

Organiser:
Linda Troeberg (Kennedy Institute, Oxford)

BSMB Autumn 2017 Meeting 'Translating the Matrix'

**Queen Mary
(Mile End campus)
University of London
4th and 5th of September 2017**

Organised by James Whiteford

The BSMB Autumn Meeting will be held at Queen Mary University of London on the 4th and 5th of September 2017, at the Mile End campus and its theme is 'Translating the Matrix'.

The conference will include 5 sessions; **Matrix Pharmacology, Drug delivery, Novel matrix therapeutic targets, a Translational** workshop (featuring representatives from the Funding bodies and Pharma) and the traditional **Open Session**. The meeting is being supported by The British Journal of Pharmacology with the aim of generating a themed issue relating to the ECM, translational Medicine and Pharmacology

Bursaries & prizes:

Presenter and reporter bursaries will be available, and there will be prizes for poster and oral presentations. BSMB members will benefit from a reduced registration fee.



BSMB Conference Bursaries Awarded (Jan 2016-Jan 2017)

BSMB Autumn 2016

Stephen Thorpe (QMUL, London), Hamish Gilbert (Manchester) and Daniel Rowson (QMUL, London).

Other Bursaries

Silvia Rosini, Bristol (ASMB Meeting, Florida) and Despina Gavriilidou, Imperial London, Pia Pernille Sogaard, Oxford and Nan Yang, Manchester (all MBE conference, Athens)

Dr Qing Jun Meng, BSMB

qing-jun.meng@manchester.ac.uk

Meeting reports

**BSMB Autumn 2016 meeting
Cardiff University**

***"The Art of Communication:
Signalling Cascades in
Mechanotransduction"***

**Organised by Sophie Gilbert and
Emma Blain**

**by Daniel Rowson, Hamish Gilbert
and Stephen Thorpe**

The 2016 autumn meeting of the BSMB was held on the 5th and 6th of September 2016 in the capital city of Wales, Cardiff. Hosted by the Arthritis Research UK Biomechanics & Bioengineering Centre at the School of Biosciences, Cardiff University, the meeting's theme was mechanotransduction and signalling. What better place to host a meeting focused on mechano-biology/mechanotransduction of cells and their matrix! The meeting was organised by Dr Sophie Gilbert and Dr Emma Blain and was generously supported by The Company of Biologists, Olympus, PeproTech, Biochemical Society, StarLab, VWR and Merck Millipore. 74 delegates attended from across the UK with many international speakers; 40 Posters were presented and poster prizes awarded to Giulia de Rossi (QMUL), Madeline Smith (Bristol) and Michal Dudek (Manchester).

Madeline Smith and Michal Dudek were also awarded prizes for their talks.



The conference dinner was held at the iconic Principality Stadium (previously Millennium Stadium) and included plenty of energetic Welsh Ceilidh dancing, and delicious Welsh lamb washed down with plenty of wine....

The opening session on subcellular signal transduction was chaired by Matt Barker & David Young, with Jan Lammerding (Cornell, USA) opening the meeting by addressing some of his group's mechanotransduction research relating to the lamins and emerin, before presenting some of his more recent findings relating to cancer cell migration. Beautiful videos of cells squeezing through tight spaces showed us how nuclear mechanics and composition regulate cell migration/nuclear damage in cancer cells. Importantly, Jan reported that highly migratory cells with soft nuclei pay a price for this ability to move through tight spaces, with cells acquiring damage to their nuclei and chromatin as they squeeze through tight gaps. The subsequent two talks from early career researchers again focused on the role of the nucleus in mechanotransduction. Hamish Gilbert (Manchester) proposed cellular mechanisms for protection against high strain cycle, including nuclear decoupling and initiation of chaperone proteins. Stephen Thorpe (Queen Mary University, London) discussed how stem cell differentiation state modulates lamin AC localisation and phosphorylation in response to cyclic tensile strain. Sarah Cartmell (Manchester) continued with a presentation on mechanobiology/mechanotransduction, taking a more translation viewpoint. Sarah's talk described, among other topics, mathematical modelling of fluid flow perfusion

bioreactors in order to achieve a more detailed idea of the microenvironment presented to cells during tissue engineering procedures. The first session was ended following 15 short (90 seconds) poster talks designed to highlight the contents of their posters. These talks were delivered with great enthusiasm, encouraging delegates to grab a coffee and Welsh Cake / Bara Brith and head to the posters!

The 2nd session chaired by Anthony Nash and Clare Hughes, began with a fascinating talk by Kristian Franze (Cambridge) who presented some elegant work on mechanical control of neuronal growth in the developing brain. Kristian explained how axonal growth dynamics are governed not only by biochemical signalling gradients, but by mechanical gradients too. Elegant in vivo models demonstrated neurons following mechanical gradients following the softer substrate. We next heard how zebra fish could be used as a model of skeletal ageing, with Erika Kague (Bristol) reporting similarities found between age-related spinal deformities in both fish and humans. Carole Proctor combined previous experimental evidence with computational modelling to assess the effect of mechanical loading and parathyroid hormone circadian rhythm on bone remodelling. The timing of intervention is suggested to be very important in treating age-related bone loss. Session two was closed by Chrissy Hammond (Bristol) with a great talk demonstrating how zebrafish, with genetically modified coloured cells, can be used as a tool to aid understanding of the mechanics governing cellular and tissue development in vivo.

BSMB 2016 Young Investigator Award, The



John Scott Lecture was awarded to Thomas Cox (Copenhagen, Denmark) who delivered a comprehensive review of his career to date, including the role of lysyl oxidase (LOX) in metastatic cancer progression. Importantly, Thomas discussed how his findings had led to preclinical validation that targeting this enzyme could prevent metastasis of cancer cells to the bone niche.

Session three explored coupling of mechanical signals across the cell membrane and was chaired by Michal Dudek & Ray Boot-handford. Martin Knight (Queen Mary University, London) started the proceedings discussing how the primary cilia, traditionally thought to act as a direct mechanosensor, may function to modulate cellular response to both mechanics and inflammation; but that this function was downstream of the initial mechanosensing. Martin's insightful talk paved the way for two more talks by Daniel Rowson and Clare Thompson who discussed primary cilia function in tendon cells and



chondrocytes, respectively. Martin Schwartz (Yale, USA and Manchester) finished the session with a talk on how the underlying matrix of vascular endothelial cells directs the mechano-response. Cells on fibronectin, but not collagen, were found to increase their pro-inflammatory response in response to fluid flow. Martin presented work on the elucidation of the signalling pathway involved using genetically modified integrin receptors.

The open session chaired by Clare Thompson and Qing-Jun Meng included, as ever, an interesting variety of topics. Michal Dudek (Manchester) discussed how the circadian clock was regulated in the intervertebral disc, with IL1 β capable of disrupting the clock. Camellia Tusan

(Southampton) reported that colonies of cells sense the concentration and mechanics of their substrate/ECM, in a similar manner to single cells. The theme of ECM and mechanotransduction was carried on in a great talk by Joe Swift (Manchester) who spoke about how mechanical inputs lead to changes in ECM secretion by cells, and how this was misregulated in senescence. Derek Warren (Kings College, London) presented the fascinating observation that migratory vascular smooth muscle cells deposit membrane as, what appears to be, a migrational cue for following cells. Madeleine Smith (Bristol) continued with the vascular smooth muscle cell theme, presenting on how cAMP is able to prevent the migration and proliferation of vascular smooth muscle cells (through a cytoskeleton remodelling pathway), without impeding endothelia cell proliferation/migration. This work suggests administration of cAMP upstream of cytoskeletal remodelling could be used as a therapeutic target to prevent restenosis after angioplasty. The final talk of the session was delivered by Guillermo Bauza Mayol (Swansea) who discussed the presence of chondroprogenitors within mature cartilage. Guillermo's research aims to develop biomaterials to encourage chondroprogenitor migration to sights of cartilage damage.

The final session was chaired by Cleo Bonnet and Debbie Mason and covered the topic of mechanotransduction in pathology. Laoise McNamara (NUI, Galway) delivered a stimulating talk on her research into the mechanobiology of bone (in health and disease), which has led to the identification of targets which could be used to help develop treatments for osteoporosis. Giulia de Rossi (Queen Mary University, London) reported on the involvement of syndecan-4 in VEGF driven angiogenesis, identifying a pathological involvement of syndecan-4 during cancer and neovascular age-related macular degeneration. Katie Sime (Cardiff) continued the vasculopathology theme with a talk on how adipose tissue is altered during inflammatory arthritis. Katie's model could be used to understand the abnormal body composition phenotypes which occur during inflammatory arthritic disease. The final talk of the meeting was given by Paul Evans (Sheffield) and kept within the theme of

vascular pathology. Paul had worked to map regions of high and low fluid shear stress within arteries, allowing cells to be taken from these mechanically defined regions. Subsequent experiments showed alterations in the phenotype of cells acquired from these differ regions of mechanical stress, with low shear stress regions (areas where atherosclerosis occurs) having increased expression of GATA4 and TWIST1.

In summary, this autumn meeting was a very successful and well run cross-disciplinary conference bringing together researchers across the whole spectrum of mechanobiology and signalling. The meeting was closed by the BSMB chairman Prof John Couchman, with special thanks to Sophie Gilbert for organising a brilliant conference!

London Matrix Group Meeting 2016 Autumn

James Whiteford

‘Our Autumn Symposium ‘Getting to Grips with the Matrix’ on October the 5th, 2016 was a great success (image top right). Once again we welcomed attendees from all over the South East of England and are very grateful to the Speakers for travelling to share their work with us. We had four really exceptional keynote talks from Prof Nick Brown (Cambridge University), Dr Silvia Rodrigues Mendes Ferreira (KCL), Prof David Hulmes (University of Lyon) and Prof John Couchman (University of Copenhagen) covering a range of aspects of matrix biology. In addition there were also six exceptional short talks from the younger members of the London Matrix Biology community. The standard and quality of all six talks was fantastic and special thanks must go to Dr Jill Norman on having the hardest job of the day in having to award the best talk prize. After a titanic battle the prize went to Victoria Juskaite from ICL. On behalf of the committee I would like to thank all of the speakers and attendees for a wonderful day and we look forward to seeing you next time.’



American Society for Matrix Biology (ASMB) Biennial Meeting Florida, USA 13-16 Nov 2016

Silvia Rosini (Bristol)

The 7th Biennial ASMB meeting was held on November 13-16, at Hilton Hotel in St. Petersburg, Florida. “The ECM Microenvironment: a Regulatory Force in Ageing and Disease” meeting focused on the role of the extracellular matrix in the pathophysiology of ageing, a strongly emerging area of interest. The programme is the result of an accurate planning by Prof. Joanne Murphy-Ullrich, and the Programme Committee. It showed high-quality talks that dissected the study of ECM architecture and the role of its components in ageing-related diseases. Moreover, it explored the potentials of ECM as a scaffold in regenerative medicine, the roles of ECM niches in cell differentiation and how to instruct the ECM in development and disease.

The conference was organized in parallel sessions and preceded by a pre-programme that included guest symposia sponsored by the Tissue Engineering Regenerative Medicine International Society-Americas (TERMIS-AM) and the CCN society.

In the TERMIS-AM symposium Dr Brown (North Carolina State University) introduced us the potential use of fully synthetic platelet-like particles (PLPs), in haemostasis and in wound healing. We learned that PLPs are synthesized by conjugating highly deformable microgels (pNIPAm-AAc μ gels) with fibrin-specific nanobodies on the surface (Brown A.C. et al. Nature Materials 2014). Professor Stegemann (University of Michigan) developed an alternative approach to generate microbeads by encapsulating progenitor cells in collagen-based hydrogels

via an oil-and-water emulsification process. This technology can be applied successfully in bone mineralization and in vascular repair. (Rioja A. et al. Acta Biomaterialia 2016, Annamalai R. T. et al. Cytotherapy 2016)

The CCN session developed around the ECM components as “foes” in skin and cartilage. It was shown CCN1 and CCN2 are elevated respectively in aged human skin and in melanoma metastasis (Prof. Quan T., University of Michigan, and Hutchenreuther J., Western Ontario). Also, Dr Young M. (NIH) showed that targeting CCN4 causes less bone mineralization, cartilage formation but an elevated resistance to developing Osteoarthritis.

Outstanding talks were presented by awardees about how the inside-out and outside-in signals can affect cell behaviour and exacerbation of diseases. The Junior Investigator Awardee Dr Tagliabracci V. (University of Texas) presented the novel area of phosphoproteomics in the extracellular space: he found that FAM20C, a golgi casein-kinase, is responsible for Serine phosphorylation of a pool of secreted proteins. (Tagliabracci et al. Cell 2015). The Iozzo Award Winner Prof. Barker T. (University of Virginia) demonstrated that Thy-1 is necessary for fibroblasts sensing of matrix stiffening changes, through an integrin-mediated mechanism and that could potentially reflect a loss of sensing in fibrotic states (Fiore et al. JCB 2015). The Senior Investigator Awardee Prof. Iozzo R. (Thomas Jefferson University) gave novel insights of proteoglycans functions (as Decorin) in regulating autophagy.

The ISMB Distinguished Investigator Awardee Prof. Tryggvason (Karolinska Institute) showed the importance of Laminins 521 and 421 in pancreatic islet expansion; these discoveries could open new perspectives in the transplant field.

The Keynote Lecture was held by Prof. Campisi J. (Buck Institute for Research on Ageing) who is widely recognized for her contributions in deciphering why ageing is the largest risk factor for developing diseases as cancer. She introduced the term SASP (Senescence-Associated Secretory Phenotype) as a feature of many senescent cells. SASP includes a large number of

secreted cytokines, chemokines, growth factors, and proteases with a dual role in regulating cell mechanisms and disease progression. Her talk evinced that removal of senescent cells in the site of tumour in animal models is beneficial. On the other hand, senescent cells could help in wound healing (Demaria et al. Dev Cell 2014).

Novel proteomic approaches to study ECM were introduced. Dr Schiller (Helmholtz Zentrum) presented an untargeted multi-dimensional proteome, used to track the enrichment of proteins in specific sub-fractions of normal and fibrotic tissues. Prof. Overall (University of British Columbia) shed light on novel proteolytic regulation of inflammatory networks via terminal amine isotopic labelling of substrates (TAILS) N-terminomics.

Prof. Schwarzbauer J. (Princeton University) commemorated the loss of Prof. Chiquet-Ehrismann Ruth for her great contribution in matrix biology, by showing us how is possible to instruct the ECM in development and disease. The conference gave also the opportunity to PhD students and Post-Docs to present interesting data during the poster sessions. The “Career Development” and the “Women mentoring women” breakfasts were key to share ideas about how to develop career paths together with Senior Investigators.

The conference was fulfilled with the banquet at the Salvador Dalí Museum that gave us the chance to know better about his vision of time and optical perception through his “ageless” paintings.

2nd MBE conference Athens, Greece 11-14 June 2016.

Three bursaries were awarded to attend this meeting. Reports from two recipients,

Pia Sogaard (Oxford) Nan Yang (Manchester) are provided

Pia Pernille Sogaard (Oxford)

The 49th Matrix Biology Europe (former FECTS) meeting was held from the 11th - 14th June 2016 in Athens. The meeting was

organised by Nikos Karamanos and was attended by more than 200 scientists from around the world. The excellent scientific programme encompassed 39 invited lectures and 47 additional selected talks.

Renato Iozzo gave the meeting's first plenary lecture, presenting a novel role for decorin and endorepellin in controlling autophagy through interaction with VEGFR2. This was followed by a poster session and a reception at the roof terrace of the venue, The Royal Olympic Hotel, which offered impressive views to the Acropolis.

The second day of the meeting started with a plenary lecture from John Couchman on how regulation of TRPC Ca²⁺ channels is a major, common mechanism by which vertebrate and invertebrate syndecans control cell adhesion and migration. This was followed by Karl Kadler presenting how the circadian clock affects tissue homeostasis through regulation of collagen secretion and turn-over. After this, two parallel workshops explored "Proteoglycans in health and disease" and "Collagen modifications: role in matrix quality/quantity and disease".

After a lunch/poster session, François-Xavier Maquart gave a talk on the matrikine, NC1, which is derived from Col XIX and elicits anti-tumoural effects *in vitro* and *in vivo* through binding to $\alpha v \beta 3$ and suppressing FAK/PI3K/AKT/mTOR pathway. The second plenary lecture of this session was given by Alberto Rossi on the importance of epigenetics in control of hyaluronan metabolism. Hereafter two parallel workshops covered "Enzymatic control of matrix function in health and disease" and "Epigenetics, systems biology and stem cell niche". The day ended with two plenary lectures: First Alexander Nystroem gave the Rupert Timpl Award Lecture on the role and therapeutical relevance of increased TGF β -signaling as a secondary disease mechanism in dystrophic epidermolysis bullosa. This was followed by Irit Sagi giving a talk that emphasised ECM remodelling as an integral part of pathological signalling, and demonstrated that different MMPs, despite their high degree of homology, cause distinct morphological changes to collagen rich matrix.

The third day of the meeting began with a lecture from Martin Humphries presenting

how loss of adhesions as cells round up prior to mitosis is controlled by inactivation of CDK1 via Wee1 phosphorylation. Hereafter Joachim Spatz gave a talk on collective migration of epithelial sheets, discussing how choice of leader cells relies on transmission of cellular tension between cells and local stress accumulation. This was followed by workshops on "Cell adhesion, signalling and tumour environment" and "Tissue engineering from a matrix perspective" and finally by a lunch/poster session. After this, a trip to the new Acropolis Museum offered an opportunity to stretch the legs and learn about the fascinating ancient history of Athens.

In the afternoon, Liliana Schaefer gave a talk on how biglycan regulates the balance in production of IL-1 β by activating distinct signalling pathways through TLR4 or TLR2, which inhibits or relieves inhibition on production of IL-1 β respectively.

Hereafter the background of the Dick Heinegard European Young Investigator Award was introduced and the 6 candidates; Nikolaos Afratis (Greece), Collin Ewald (Switzerland), Edward R. Horton (UK), Albin Jeanne (France), Zsuzsa Jenei-Lanzl (Germany) and Luca Monti (Italy) all gave great talks as their contribution to the competition.

Hereafter a poster session preceded the conference dinner at the roof top of the venue, where we besides a great meal and good company, could enjoy a spectacular display of thunder and lightning over the ancient ruins of the Acropolis. The last day of the conference was initiated with a talk by Reinhard Fässler on integrin signalling revealing KANKL2 as a novel focal adhesion protein. Jeremy Turnbull hereafter gave an interesting talk on next generation heparin therapeutics. After workshops on "Cell/matrix interactions in matrix biology and pathology" and "Advances in matrix disease mechanisms and pharmacological targeting", the last 3 plenary lectures were given by Dimitrios Kletsas, Vincent Hascall and Anthony Day.

The meeting was concluded with an award ceremony where Edward Horton (UK) was announced as the winner of the Dick Heinegard European Young Investigator

Competition, and 3 Awards for Excellence in Matrix Biology were given to Pearl Lee (Australia), Melanie Menare (France) and Maria Francesca Secchi (Italy).

The meeting included many more exciting and informative talks than mentioned here, and together with the poster sessions, which offered a great opportunity to discuss both my own and others research, the meeting was a both enjoyable and rewarding experience. I am very grateful for the support from BSMB to attend this meeting.

2nd MBE conference Athens, Greece 11-14 June 2016.

Nan Yang (Manchester)

The second Matrix Biology Europe (MBE) Conference, held in Royal Olympic Hotel, Athens-Greece is the most important matrix conference in Europe this year. This conference brought all young and senior researchers together, to present their outstanding studies in the Matrix Biology field. I was very glad to become one of them and thanks to the bursary from the British Society for Matrix Biology.

This conference was actually a three-day event (started on Saturday afternoon and finished on Tuesday afternoon), held by Prof Nikos K. Karamanos from University of Patras, Greece. The scientific program began with an Opening Lecture from Dr Renato V. IOZZO (Thomas Jefferson University, USA), which was focus on 'Novel proteoglycan functions in regulating autophagy and angiogenesis'. Dr. Iozzos Lab discovered proteoglycans (decorin and perlecan) play a key role in regulating autophagy, specifically in endothelial cells. These data provide a novel perspective that proteoglycan expression, and subsequently autophagy, may be an effective chemotherapeutic target to treat tumour. Further program included eleven Plenary Lectures, eight Parallel Workshops (each contains several Invited Lectures and Selective Talks), the Rupert Timpl Award Lecture, the Dick Heinegard European Young Investigator Award, and one Plenary Workshop. There are also five poster sessions as well, and all the talks and posters nearly cover every aspect of Matrix Biology.

Collagen modifications: role in matrix quality/quantity and disease

Collagen is one of the major extracellular matrix components. A few talks and posters highlighted collagen regulation of extracellular matrix, from various perspectives. E.g. Dr Bonaldo (Italy) reviewed Collagen VI is a key matrix protein at the crossroad of skeletal muscle and peripheral nerves. Dr Petaisto (Finland) reported that Collagen XVIII regulates energy metabolism and brown adipose tissue function. A Plenary talk from Prof Kardler (UK) revealed an important role of circadian clock in regulating collagen secretion and turnover, suggesting a novel view on understanding matrix related cellular process.

Epigenetics, Systems Biology and Stem Cell Niche

Genome-wide several genes related to extracellular matrix are controlled by NFkB pathway or histone modification. Such as Prof Passi (Italy) addressed the epigenetic control of hyaluronan synthases, and extracellular matrix composition. Besides a few interesting topics, the study from Prof Gotte's lab (Germany) identified microRNA miR-142-3p inhibits breast cancer cell invasiveness and stem cell properties by targeting integrin- α V, KLF4 and multiple cytoskeletal elements. Also down-regulation of miR-142-3p after irradiation indicates its potential role in the response to radiotherapy.

Cell adhesion, signalling and the tumour environment

Most connective tissue disorders e.g Dystrophic epidermolysis bullosa (DEB) are modified by secondary disease mechanisms. Dr Nystrom (Germany) presented an increased TGF β signalling in wounded DEB skin, which could potentially be a target to treat connective tissue disorders. Regarding the importance of cell adhesion, some exciting data from Prof Humphries (UK) showed CDK1, the master regulator of the cell cycle, which inhibition is the trigger to initiate adhesion remodelling prior to mitosis.

Tissue engineering from a matrix perspective

With development of new techniques, Dr Fradette (Canada) presented the use of mesenchymal cells from various origins, e.g. adipose tissue and bone marrow, to generate

tissue-specific substitutes. This new approach provides excellent mechanical and therapeutic properties for a wide range of regenerative medicine applications. Another interesting talk was from Prof Whitelock (Australia), described the extracellular matrix heparan sulfate proteoglycan, Perlecan, could be a dynamic heterogeneous biological molecule in tissue engineering projects.

Cell/matrix interactions in matrix biology and pathology.

Integrins are transmembrane receptors that mediate extracellular matrix and cell-cell interactions. Prof Fassler's lab (Germany) highlighted the important role of integrin tail-associated proteins, e.g. Kank2, in regulating integrin-mediated intracellular signalling pathways. Most of the talks were focus on the discovery of novel target to treat clinical disease. Such as Dr Savani (USA) identified CD44 can be targeted to treat TLR4-mediated lung injury. Dr Qing-Jun Meng (UK) showed BMAL1 KO in cartilage tissues predisposes ageing and osteoarthritis-like phenotype. All these findings provide new perspective to understand matrix biology and pathology.

Summary

To conclude, the 2nd MBE conference was a great opportunity for us to present our work, and communicate with other researchers from the matrix field. As the audiences of this conference were from different areas of Matrix Biology, their comments and suggestions are very helpful for our future work. Therefore, I would like to encourage every matrix researcher to attend next MBE conference.

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BSMB Spring Meeting: 3-4 April 2017

Matrix proteoglycans

active participants in cell-ECM communication

Confirmed speakers: Ralph Sanderson (Alabama, USA), Dudley Strickland (Maryland, USA), Andreas Kungl (Graz, Austria), Jeremy Turnbull (Liverpool, UK), Vera Gorbunova (Rochester, USA), Anthony Day (Manchester, UK), Dulce Papy-Garcia (Paris, France), Toin van Kuppelvelt (Radboud, Netherlands).

Additional speakers selected from abstracts

Venue:

St Catherine's College, Oxford

Organiser:

Linda Troeberg (Kennedy Institute, Oxford)

