The Matrix Letter

Spring 2018
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A Publication of the American Society for Matrix Biology

ASMB 2018: Red Rock

Contents

Letter from the President

Dear ASMB Colleagues,

Greetings! I hope this edition of the ASMB Newsletter finds you well and enjoying the re-emergence of nature this spring. I am always delighted to see which of my plantings from the previous year survived the winter (yes, we do have a relative winter of sorts here in Alabama). Seeing these blooms reminds me of scientific ideas that have lain dormant for too long, either because of insufficient funding or personnel or both. However, as scientists, I think it is in our nature to be optimistic and to persist. Good gardening!

It is indeed a fertile time for matrix biology with the upcoming summer meetings, including the matrix-related Gordon Conferences (for example, Proteoglycans in Homeostasis and Disease July 8-13, 2018 and Signal Transduction by Engineered Extracellular Matrices, July 22-28, 2018) and the Matrix Biology Europe meeting July 21-24 in Manchester, UK to celebrate the 50th anniversary of FECTS meetings. ASMB is honored to be sponsoring a session on Pathobiology and Therapeutics of Fibrosis at MBE 2018. Alexandra Naba, ASMB Councilor and ASMB Twitter master, will also be honored as the Rupert Timpl awardee at the MBE meeting.

Lynn Sakai and the Programming Committee are doing a great job on the upcoming ASMB 2018 Biennial meeting “ECM Microenvironments in Disease, Aging, and Regeneration” to be held October 14-17, 2019 at the Red Rock Casino Resort & Spa in Las Vegas, Nevada. We are pleased to have TERMIS (Tissue Engineering Regenerative Medicine International Society), Matrix Biology Ireland, The Histochemical Society, and The Alport Syndrome Foundation as Guest Societies at the meeting. Building on our past-president’s inspired idea, first implemented at the 2014 ASMB, we will also have 3 Trainee-led Sessions. In the past, these trainee leaders have done outstanding jobs in recruiting excellent speakers and in moderating the sessions. We are honored to have Shyam Kumar Bandari, PhD, UAB, Reut Shainer, PhD, NIDCR, and Davy Vanhoutte, PhD, of Cincinnati Children’s Hospital Medical Center as leaders for the 2018 Trainee-led sessions. We encourage you to attend these sessions and see first-hand the leadership and organizational skills of these young scientists.

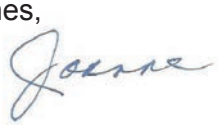
Early bird registration is open until June 25th and remember that the abstract submission fee is waived for ASMB members. So become a member, and register and submit an abstract for the meeting (www.asmb.net)!

ASMB received proposals for the 2019 ASMB workshops and announcements regarding the selection of these proposals will be forthcoming in the next few weeks.

Kudos to Tom Barker and Ashley Brown for their work in organizing the very successful ASMB sponsored session “Harnessing Matrix Biology for Controlling Cell Fate” at the recent Society for Biomaterials meeting in Atlanta in April. Adam Engler also presented the ASMB lecture "Engineering the Extracellular Matrix: Tools and Technologies for Disease Modeling" at the recent ASIP/EB meeting in San Diego. It is extremely important for the field that we get matrix biology incorporated into the programs and mindsets of related scientific societies. The support for matrix biology research in the cardiovascular field by the joint initiative of the Paul G. Allen Frontiers Group and the American Heart Association (see the interview with Tom Skalak, founding Executive Director of The Paul G. Allen Frontiers Group on page 2 of the newsletter) is a wonderful example of the good things that can happen.

Finally, I would like to acknowledge the continued dedication of Dwayne Stupack for his labors in preparing the ***Matrix Letter***. Compiling this issue may be slightly less stressful, thanks to a most generous gift from new ASMB Council member, Emmy Gordon, who donated funds to ASMB to update the publishing software. Dr. Gordon’s thoughtful donation is greatly appreciated! All the best for a productive summer and looking forward to seeing you at Red Rock (Las Vegas) in October.

Best wishes,



An Interview with Tom Skalak

Tom Skalak is the founding Executive Director of The Paul G. Allen Frontiers Group, launched in 2016. The Frontiers Group seeks to explore new frontiers, re-invent fields in ways that reflect major societal challenges and fundamental scientific curiosity, and bring new knowledge to light with a broad array of partners, making a positive impact on the world. Previously, Tom was Vice President for Research at the University of Virginia, where he led research and innovation programs spanning biosciences, environmental sustainability, physical sciences, engineering, arts, design, and humanities. As a Professor of Biomedical Engineering, Tom's personal research included biomechanics of the cardiovascular system, angiogenesis, computational modeling, systems biology, wound repair, and regenerative medicine. He is a past President of both the American Institute of Medical and Biological Engineering (AIMBE) and the Biomedical Engineering Society (BMES), and an elected fellow of the National Academy of Inventors. Tom kindly agreed to an interview with the ***Matrix Letter.***

ML: Tom, we know that the Paul G. Allen Frontiers Group has a broad interest in advancing frontiers of knowledge and science. Could you provide a bit more detail about the Group's mission and how it relates to bioscience?

TS: We believe that bioscience is still a young field, and is just now approaching an exponential phase of knowledge growth. Paul Allen, our founder, wants to be at the cutting-edge of discoveries in biology, and help accelerate the application of this new knowledge to human health and other applications that make the world better. Achieving this vision requires the courageous exploration of new frontiers, and so we seek out talented pioneers worldwide with the attitudes and ideas to open new directions. We also believe that this role model of exploration is sorely needed at this time on the history of science, as there can be a tendency to stay with more incremental work based on current paradigms. In any young field, a certain amount of curiosity-driven and creative expeditionary forays are extremely valuable.

ML: How does an entity such as the Paul G. Allen Frontiers Group view the sometimes competing and conflicting demands of fundamental versus applied research?

TS: We value both ends of the spectrum. New knowledge is the basis of all new value generation, and often forms the basis for new medical practices and technologies that help patients. In biology, we understand that hard problems will take some time to solve, and thus we have great patience and respect for basic science. On the other hand, if a new platform technology opportunity surfaces, we are able to evaluate and support those as well. We view basic and translational research as useful points on a full virtuous circle linking discovery to application and benefit to society. Once a new idea is applied, it often sends the community back to the lab for new basic questions to be answered. This cycle repeats as science advances.

ML: How did the Paul G. Allen Frontiers Group come to partner with AHA in recognizing the importance of matrix biology, a neglected frontier in bioscience? What were the short and long term goals of this partnership and do you foresee forming other such affiliations?

TS: We were exploring the possibility of solving some very hard unsolved problems in medicine, including cardiovascular disease – which of course requires fundamental understanding of the system in the first place. In considering a number of ideas with scientists of the AHA and its leadership team, we found that we shared an interest in 'information flows in tissues', both within cell phenotypes, cell aggregates within the vasculature, and within the surrounding extracellular milieu. We recognized that in some case the extracellular matrix 'outlives the cells' living within it, so that in cases of tissue injury and repair such as myocardial infarction, the matrix itself could be highly instructive for the cells attempting to repair or remodel the myocardium. As such, the complete information content of the matrix appeared to us as being part of the "dark matter" of bioscience."

THE
PAUL G. ALLEN
FRONTIERS GROUP

Interview, con't

TS: The short-term goal is that the initial Investigators produce novel results that enhance our understanding of the matrix. In the longer term, we might envision following up on this with the AHA or other partners to use the knowledge for designing improve cardiovascular health and/or reparative technologies.

ML: Outreach and education are key mechanisms by which scientists can enable societal change. How can the experience garnered by the Paul G. Allen Frontiers Group help matrix biologists as well as matrix-related societies articulate the importance of matrix biology for health and disease to the public and the broader scientific community?

TS: We hope our *commitment* to this frontier of bioscience – matrix biology – serves as a role model to young scientists and experienced practitioners alike, that it is valuable to '*remain the artist*' at all times, seeking out the uncharted waters and roads that are not taken by others, because this is how new discoveries are made.

Regarding broader societal change and public visibility, this role model is useful for corporations, government agencies, citizens, and NGOs to retain their ability for continuous self-renewal, a quality that is crucial for creating our envisioned future society and achieving a secure, free, and thriving human society for future generations on earth.

https://www.alleninstitute.org/what-we-do/frontiers-group/

ASMB Shows Depth at Society for Biomaterials Meeting

ASMB hosted Concurrent Session 6 at the recent Society for Biomaterials meeting. The session was co-organized by Tom Barker and Ashley Brown, with Dwight Chambers, a a talented MD/PhD student at GA Tech and Emory, filling in for her as co-chair of the session. The session started with an excellent talk by Micheal Smith, who was the invited speaker, with a second PI talk by Todd McDevitt. The student talks were outstanding across the board. ASMB travel award talks by Ricardo Cruz-Acuna (Georgia Tech) and Alyssa Schwartz (U. Mass Amherst) showed strength in the next generation of ASMB researchers, with additional strong talks by Vicky Stefanelli (U. Virginia), Brendon Baker (U. Michigan), and Shengchang Tang (U. Colorado).

The blend of excellent student talks and two stellar established investigator talks led to a great session. The session was exceptionally well-received. Several attendees approached the session co-organizer (and ASMB councilor) Tom Barker to proclaim that it was quite possibly the best session of the meeting. Supporting this sentiment, attendance was very strong with around 70 attendees for the entire session. The success paves the way for continued growth of the ASMB/SfB partnership.

Matrix Interactions

ASMB News and Announcements in Brief

Collagens at the Dawn of Metazoa

The Billy Hudson group at Vanderbilt University Medical Center recently published an Opinion-Review in the Journal of Cell Science conceptualizing the triple helix of collagens as a protein structure of fundamental importance in building the extracellular matrix that enabled animal multicellularity and tissue evolution.

https://doi.org/10.1242/jcs.203950

ASMB continues Special Offer for ISMB Members Attending 2018 Biennial Meeting

We are grateful to have a strong partner in the International Society for Matrix Biology. In appreciation of their continued support, we are pleased to offer ISMB members the discounted ASMB member rate at the 2018 Biennial Meeting. For complete details, email the ASMB business office in advance of registering for the meeting.

Find us at: info@ASMB.net

Ehler Danlos Symposium Returns

The **Second International Symposium** on the Ehlers-Danlos Syndromes will convene September 26-29, 2018 in Ghent, Belgium (Ghent is Belgium's best kept secret according to the Lonely Planet). Through a combination of invited speakers and presentations selected from submitted abstracts, it will provide an up to the minute review of the understanding about clinical diagnosis, variable expression, genetic approaches to diagnosis, treatment, and manage ment for the full spectrum of the different types of Ehlers Danlos.

Chairs: Fransiska Malfait, University of Ghent, Peter H. Byers, University of Washington

For more details and registration details:

https://www.ehlers-danlos.com/2018-eds-ghent/

Upcoming Events

June 24-29, 2018
Gordon Conference on Signaling By Adhesion Receptors
University of New England, Biddeford, ME, USA
https://www.grc.org/signaling-by-adhesion-receptors-conference/2018/

July 8-13, 2018
Gordon Conference on Proteoglycans
Proctor Academy
Andover, New Hampshire, USA
https://www.grc.org/proteoglycans-grs-conference/2018/

July 21-24, 2018
Matrix Biology Europe
Manchester, UK
http://www.confercare.manchester.ac.uk/events/mbe2018/

July 22-27, 2018
Gordon Conference on Signal Transduction by Engineered Extracellular Matrices
Proctor Academy, Andover, NH, USA
https://www.grc.org/signal-transduction-by-engineered-extracellular-matrices-conference/2018/

October 14-17, 2018
American Society for Matrix Biology,
Red Rock (Las Vegas), NV, USA
http://www.asmb.net

Download the Full Program Draft * Call for Abstracts

http://www.asmb.net/scientific-program

ASMB offers travel awards for selected talks, diversity applicants, and on-site poster presentations. This year, ASMB is pleased to have two guest societies offer travel awards as well. Both the Histochemical Society and the Alport Syndrome Foundation will be offering travel awards through the ASMB abstract system. Apply for travel awards when you submit an abstract!

A Novel Mouse Model of Spontaneous Intervertebral Disc Degeneration

Makarand Risbud

Millions of people world-wide suffer intervertebral disc degeneration and associated low back and neck pain. Recent studies measuring the global burden of diseases ranked low back pain as the 1st, and neck pain as the 4th condition for years lived with disability. These staggering statistics highlight the pressing need for better understanding the mechanisms of disc degeneration and developing new treatment strategies for back pain.

However, such efforts are impeded by the availability of small research animal models that mimic natural disease progression in humans. A team of researchers led by Dr. Makarand V. Risbud, James. J. Maguire Jr. Professor of Spine Research at Thomas Jefferson University in Philadelphia discovered that the SM/J mouse strain exhibits early onset, spontaneous disc degeneration characterized by changes in resident cell fate and matrix fibrosis, as well as compromised biomechanical properties of the spinal motion segments that closely portray human pathology.

The SM/J mice showed changes in nucleus pulposus (NP) matrix morphology and composition at an early age. These changes were distinctive of a fibrocartilaginous phenotype marked by an overall increase in collagens, with concomitant decrease in proteoglycan content.

Importantly, as the GAG-rich NP matrix is critical for normal biomechanical function, these changes were associated with elevated disc stiffness and compromised biomechanical properties.

In addition to the aberrant changes in matrix, SM/J mice showed increased NP cell death and loss of well-established NP cell phenotypic markers. This suggested that the surviving cells altered their molecular identity. Furthermore, SM/J mice showed increases in expression of hypertrophic chondrocytic markers such as MMP13 and Collagen X. Altogether, our data clearly establish that SM/J strain is an ideal experimental model to study pathological mechanisms underlying spontaneous disc degeneration.

The study was published in ***Matrix Biology*** and funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) grants AR055655 and AR064733, and a philanthropic gift from Crawford Foundation.

Reference:

H. Choi, S. Tessier, E.S. Silagi, R. Kyada, F. Yousefi, N. Pleshko, I.M. Shapiro, M. V. Risbud, A novel mouse model of intervertebral disc degeneration shows altered cell fate and matrix homeostasis, Matrix Biol. (2018). doi:10.1016/j.matbio.2018.03.019

Figure Legend. Midcoronal section of the intervertebral disc of 17-week old SM/J mouse showing advanced degeneration. *Credit: Hyowon Choi and Steven Tessier, Thomas Jefferson University.*

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Concurrent Sessions

Proteoglycans • Collagens • Elastic Fiber Proteins • Structure & Assembly of ECM
ECM of Inflammation Infection & Immunity • ECM of Aging • Cardiovascular ECM
Skin Basement Matrix, Wound Healing and Disease • Tumor Microenvironment
ECM Receptors • Heritable Disorders of Connective Tissue

Guest Sessions

TERMIS, Histochemical Society, Alport Syndrome Foundation, Matrix Biology Ireland

Plenary Sessions:

Genetic Disorders, Novel Technologies, Extracellular Signaling, ECM in Health and Disease

Plus: ***Keynote speaker David Lyden, Career Mentoring Breakfast, Women Mentoring Women, Trainee-Run Sessions, Gala Banquet***

From the Cover: *Seven Magic Mountains*

by Swiss Artist Ugo Rondinone.

Located only 15 minutes south of Las Vegas in the Mojave Desert, the 9m (~30ft) tall monoliths created in 2016 rise from the desert landscape like rainbow-colored totems. They will be on display through the end of 2018.

http://sevenmagicmountains.com/

(The Editor offers a different interpretation of the artwork: *Attempting to model the cell surface, the artist captures the majesty of Ig and FN-III domains well, emphasizing spatial relations in surface presentation. Glycans are de-emphasized and clear liberties are taken with the structure of integrin and DDR1; the choice of rock as a medium is perfect for the surrealist molecular structures.*)

Getting to Red Rock

Las Vegas McCarran International Airport

https://www.mccarran.com/Transportation.

Receives direct flights from across North America, Europe and Asia. The airport, located very close to the Las Vegas Strip, offers those seeking classic Las Vegas Night Life easy access.

To reach Red Rock Resort, a ~20 minute ride by cab or shuttle to the western edge of the city will be required. The Red Rock Casino and Resort also offers a free shuttle service to and from McCarran. ***https://redrock.sclv.com/Hotel/Amenities/ShuttleFAQ.aspx.*** The resort features mountain panoramas, though the strip is visible in the distance from one side of the hotel. Given that McCarran handles about 1 million passengers each week, it is unlikely that one might not find an inexpensive flight to Las Vegas.

For those wanting an adventure, **Interstate 15** connects **Salt Lake City** to LasVegas via a 7 hour drive that passes the amazing Bryce Canyon & Zion National Parks. This is true American "painted desert."

I-15 also connects San Diego and Los Angeles to Las Vegas (the drive is about 4-5h), permitting arrival at LAX, SNA, SAN, or ONT as viable airports. October is, generally speaking, an outstanding time to drive in the desert, with temperate days and very clear nights full of stars. Those with a car may also wish to head south of Las Vegas, visiting the Hoover Dam and the 'North Rim' of the Grand Canyon.

The Matrix, and more, at ASMB 2018.

Faculty Position Department of Department of Pathology University of Alabama at Birmingham

The Department of Pathology at the University of Alabama at Birmingham (UAB), in collaboration with the NCI designated UAB Comprehensive Cancer Center, is rapidly expanding its active research program in the area of cancer pathobiology. We are therefore inviting applications for a tenured or tenure-track faculty position at the Assistant, Associate or Full Professor level (PhD, MD, MD/PhD) depending on experience, research and scholarly accomplishments. Although applications in all areas of cancer pathobiology research are welcome, specific areas of interest include:

-Basic and translational research in ovarian, breast or GI cancers
-Research focused on the link between obesity, metabolism, bioenergetics and cancer
-Cancer and bone
-Cancer epidemiology (molecular focus preferred)

Successful candidates will have a demonstrated record of originality and productivity in research and scholarly activity, existing or outstanding potential for consistent extramural funding, and an interest in graduate and medical education. UAB is a dynamic, collaborative research institution with state of the art facilities, excellent graduate programs, and a commitment to post-doctoral education. Appointment will be in the Department of Pathology, in the Division of Molecular and Cellular Pathology
For further information:

https://uab.peopleadmin.com/postings/3724

UAB is an Equal Opportunity/Affirmative Action Employer committed to fostering a diverse, equitable and family-friendly environment in which all faculty and staff can excel and achieve work/life balance irrespective of, race, national origin, age, genetic or family medical history, gender, faith, gender identity and expression as well as sexual orientation. UAB also encourages applications from individuals with disabilities and veterans.

Post Doctoral Program in Cancer Therapy and Therapeutics UCSD Moores Cancer Center

Three two-year funded positions are currently available for US citizens or permanent resident in the **CT2 Program** at the UCSD Moores Comprehensive Cancer Center. Candidates will be seeking training in translational aspects of tumor biology that may include drug development, diagnostics or imaging. The comprehensive fellowship program combines original laboratory research with coursework. Successful candidates will receive training that will leave them well prepared to address regulatory hurdles, clinical trial design and core concerns of translational research.

For further information, interested candidates should see:
https://medschool.ucsd.edu/research/moores/education/ct2/Pages/application.aspx
Alternatively, you may email *dstupack@ucsd.edu*

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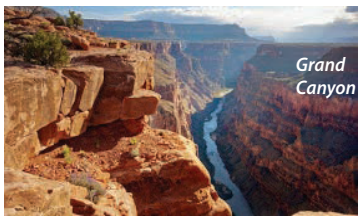

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For further information, interested candidates should see:

https://medschool.ucsd.edu/research/moores/education/ct2/Pages/application.aspx

Alternatively, you may email *dstupack@ucsd.edu*

Contribute Content to the *Matrix Letter*

The Matrix Letter includes both news items and research-directed content that fosters the mission of the ASMB:

...to promote basic, translational, and clinical research on the extracellular matrix (ECM), cell-ECM interactions, and ECM-based therapies and devices, and to support the growth and professional development of the ECM research community...

Connecting ASMB researchers with each other based on their research focus is the ultimate goal.

The ***Matrix Letter*** currently publishes the following categories of content;

Mini-Reviews: The Mini-review features the contributions of a particular lab in the context of a field. Often written by students, postdoctoral fellows or young faculty, the minireview runs about 1.5 pages, with a single scientific illustration and/or a lab photo, and 10 or fewer references.

Essays & Opinions: The purpose of a Matrix Essay is to promote a new or breaking hypothesis in the field of Matrix biology, with the expressed purpose of garnering supporting evidence and collaborators from the greater ASMB membership. Matrix essays are about one running page and may include a single illustration and up to 10 references.

Letters: A letter to the editor should be short and succinct, and will focus on alerting the ASMB membership to recent advances or concerns in our, and related, fields. A letter to the editor is limited to 200 words and three references.

Images: Submissions of particularly aesthetically pleasing or educational images that you are willing to share with the membership. Include a caption explaining the image.

Reference Format

1) Lewis R, Ravindran S, Wirthlin L, Traeger G, Fernandes RJ, McAlinden A. Disruption of the developmentally-regulated Col2a1 alternative splicing switch in a transgenic knock-in mouse model. ***Matrix Biol.*** 31:214-26, 2012.

We welcome your contributions.
ASMB@faseb.org