Preliminary Program*
*Program is subject to change.

Annual Conference and Exhibition Program

MONDAY, DECEMBER 2, 2019

6:30 AM – 7:00 PM  Registration
Grand Caribbean Pre-Function North

PRE-CONFERENCE WORKSHOPS
Pre-Registration Required. Ticket sessions.

7:30 AM – 3:30 PM  A Celebration of Research Excellence and Achievement on the Occasion Of Tony Mikos’ 60th Birthday
Sponsored by Mary Ann Liebert Inc., Publishers

Grand Caribbean 1/2

Description: Join us for a full-day symposium of invited speakers honoring Dr. Tony Mikos in celebration of his 60th birthday. In the morning session, we will have leaders in tissue engineering selected from Dr. Mikos’ collaborators and former trainees. The afternoon session will be focused on 3D printing experts associated with the Center for Engineering Complex Tissues. The symposium will end with a presentation and remarks by Dr. Tony Mikos. Breakfast, lunch and morning breaks are included in attendee registration.

Session Chair: Elizabeth Cosgriff-Hernandez

Program:
7:30 AM - 8:15 AM  Registration and Breakfast
8:15 AM - 8:30 AM  Welcome and Opening Remarks
8:30 AM– 9:00 AM  Musculoskeletal Tissue Engineering
Mike Yaszemski, Mayo Clinic
9:00 AM – 9:20 AM  Advanced Wound Care
Suzie Riley, Organogenesis Inc.
9:20 AM – 9:40 AM  Drug Refillable Polymer Implants for Chronic and Recurrent Disease
Horst von Recum, Case Western Reserve University
9:40 AM – 10:00 AM  Biomaterials in Regenerative Medicine  
Laura Suggs, University of Texas

10:00 AM - 10:30 AM  Break

10:30 AM - 10:50 AM  Sigilon Therapeutics, Biomaterials and Tissue Engineering in Industry  
Susan Drapeau, Sigilon Therapeutics, Inc.

10:50 AM - 11:10 AM  Delivery of Cells and Proteins for Rotator Cuff Muscle Repair  
Johnna Temenoff, Georgia Tech

11:10 AM – 11:30 AM  Surface Functionalization of Biomaterials for Bone Tissue Regeneration  
Heungsoo Shin, Hanyang University

11:30 AM – 11:50 AM  Biomedical Applications of Emulsion Templating  
Elizabeth Cosgriff-Hernandez, University of Texas

11:50 AM – 12:10 PM  Biomaterials-based Cancer Immunotherapy Platforms for Intratumoral Delivery of Head and Neck Tumors  
Simon Young, The University of Texas Health Science Center

12:10 PM– 12:30 PM  Biomaterials-based strategies for tissue engineering and cancer treatment and engaging undergraduate students in research  
Sue Anne Chew, The University of Texas Rio Grande Valley

12:30 PM - 1:45 PM  Lunch

1:45 PM - 2:10 PM  3D Printing for Engineering Complex Tissues  
John Fisher, University of Maryland

2:10 PM – 2:30 PM  Innovation, Education, and Collaboration through Resource Centers  
Tony Melchiorri, Rice University

2:30 PM– 3:00 PM  Regenerative Medicine: 3D Printing Strategies  
Tony Atala, Wake Forest School of Medicine

3:00 PM - 3:30 PM  Tony Mikos and Closing Remarks

9:30 AM – 3:30 PM  Amplify Your Translational Impact: Considerations For De-Risking Tissue Engineering And Regenerative Medicine Therapies  
Sponsored by ARMI | BioFabUSA & RoosterBio, Inc.

Grand Caribbean 3-5

Many regenerative medicine and applied therapeutic products originate from academic research labs or small companies that have a strong scientific background but may not have the experience for bringing a product to market. Regardless of development stage, knowledge of key considerations in the product development process will streamline technology transfer from the lab to the clinic and ultimately to the market. This workshop will cover early to late phase considerations for de-risking the development of a regenerative medicine product, including scale-up considerations, implementation of quality systems, and navigating the regulatory landscape. The goal of this workshop is to learn from those who already have experience with these issues. The format of the workshop is geared toward a short presentation of “Lessons Learned” from the speakers but focused primarily on lively discussion among the panelists and workshop attendees.

Program:  
9:30 AM – 9:45 AM  Session Introduction  
Taby Ahsan, Vice President, Research & Development, RoosterBio, Inc
Mary Clare McCorry, Director, Technical and Process Development, Advanced Regenerative Manufacturing Institute (ARMI)

9:45 AM – 10:15 AM  
Evolving the Manufacture of Cell-Based Therapies: Lessons Learned and Future Concepts  
Rodney Rietze, CEO, iVexSol

10:15 AM – 11:15 AM  
Scale-up Considerations for Meeting Growing Production Needs  
Moderators: Mary Clare McCorry, ARMI; Taby Ahsan, RoosterBio

Automation of Stem and Progenitor Colony Analysis and Selection with Cell X™ Technologies  
George Muschler, Dir., Reg. Medicine Laboratory, Cleveland Clinic & CSO, Cell X™ Technologies

Technology Strategies for Reducing Development Timelines for hMSC Products  
Jon Rowley, Founder and CPO, RoosterBio

Scale-up Considerations for Productions of Immunotherapies  
Doris A. Taylor, Director, Texas Heart Institute

Panel Discussion and Audience Q&A

11:15 AM – 11:30 AM  
Break & Networking

11:30 AM – 12:30 AM  
Strategies for Navigating the Regulatory Landscape  
Moderators: Richard McFarland, BioFab

20 Years of Skin Substitutes  
Gail Naughton, CSO, Histogen

Biopreservation Solutions as a Case Study for a Global Strategy  
Aby J. Mathew, SVP & CTO, BioLife Solutions, Inc.

Overview of Current FDA Regulatory Pathways  
Becky Robinson-Zeigler, Deputy Chief Regulatory Officer, ARMI

Panel Discussion and Audience Q&A

12:30 AM – 1:00 PM  
Lunch & Networking

1:00 PM – 2:00 PM  
Timely Deployment of Quality Systems  
Moderators: Becky Robinson-Zeigler, BioFab

GMP Strategies for Young Startups  
Adam Jakus, CTO, Dimension Inx

Supply Chain Management and Raw Materials  
Claudia Zylberberg, CEO, Akron

Deployment of Quality Systems at Various Stages of TEMP Development and Production  
Thomas Gilbert, Vice President of Research and Development, Miromatrix

Panel Discussion and Audience Q&A
2:00 PM – 2:15 PM  
**Break & Networking**

2:15PM – 3:15 PM  
**Acquiring Funding to Support Tech Transfer**  
Moderators: Rosemarie Hunziker, BioFab

*Small Business Innovation Research (SBIR) and Small Business Technology Transfer Programs (STTR)*  
Speaker TBD

*Increasing Capital Through Partnership*  
Luke Burnett, CEO, KeraNetics

*Crafting Your Technology Pitch*  
Emily English, CEO, Gemstone Therapeutics

Panel Discussion and Audience Q&A (Speakers)

3:00 PM – 3:15 PM  
**Closing Remarks**

1:00 PM – 3:30 PM  
**Multi-Cellular Engineered Living Systems: Principles, Challenges, And Applications**  
*Sponsored by NSF Center for Emergent Behaviors of Integrated Cellular Systems*

**Grand Caribbean 8-10**

Significant progress in the fields of systems biology, synthetic biology, and developmental biology, combined with recent advances in organoid and induced pluripotent stem cell technologies, have inspired new visions for the design and manufacture of multi-cellular engineered living systems (M-CELS) with useful functionality by design. M-CELS open new possibilities for transformative health and assistive technologies, from biorobotic systems that can be guided by light, to organ-on-chip systems developed as drug screening assays or models of disease. The process of engineering M-CELS is enhanced by understanding how emergent structures naturally arise during developmental processes through mechanical, biochemical and electrical communication. Which aspects of these processes can be circumvented, accelerated or modified according to specification to yield robust, reproducible organoids and microphysiological systems? Computational models that simulate the growth, division, and differentiation of multicellular systems into emergent organization from an initial pluripotent population of cells are an important step in understanding and predicting multicellular systems-level behavior. This interactive workshop will engage participants in conversation about the principles, challenges, and applications of M-CELS.

**Schedule:**

1:00 PM - 1:05 PM  
Welcome and Introduction  
Roger Kamm, MIT

1:05 PM - 1:35 PM  
In Vitro Platforms for Multi-Cellular Engineered Living Systems  
Roger Kamm, MIT

1:35 PM - 2:05 PM  
Computational Methods in Multi-Cellular Engineered Living Systems  
Melissa Kemp, Georgia Tech

2:05 PM - 2:15 PM  
Break

2:15 PM - 2:45 PM  
Applications of Synthetic Biology in Multi-Cellular Engineered Living Systems  
Ron Weiss, MIT
Genetically Engineered hiPSCs in In Vivo Environments
Valerie Gouon-Evans, Boston University

Discussion
Moderated by Melissa Kemp, Georgia Tech

SCIENTIFIC PROGRAM

4:00 PM – 6:00 PM  Opening Plenary Session:
Welcome Message - TERMIS President and TERMIS-AM Chair
Welcome Message - TERMIS-AM 2019 Conference Co-Chairs
Opening Plenary Panel:
Pain Points for Translating Tissue Engineering Approaches into Clinical Therapies
Moderator: Dr. Taby Ahsan, Vice President of Research & Development, RoosterBio, Inc.
Panelists:
Dr. Anthony Davies, Executive Chairman, Dark Horse Consulting
Dr. Blanka Sharma, Assistant Professor of Biomedical Engineering, University of Florida
Dr. Christopher Gemmiti, VP of Operations, Sentien Biotechnologies, Inc.
Tim Bertram, CEO, InRegen, CEO, Twin City Bio

Grand Caribbean 7

6:00 PM - 8:00 PM  Welcome Reception/Poster Session 1
Kingston Hall  Exhibits

TUESDAY, DECEMBER 3, 2019

7:00 AM – 6:30 PM  Registration
Grand Caribbean Pre-Function North

7:00 AM – 8:00 AM  SYIS Peer Mentor Breakfast & Undergraduate Poster Session
Kingston Hall

8:00 AM – 9:00 AM  Plenary Symposium I: Dr. Joseph Wu
Grand Caribbean 7

9:00 AM – 9:30 AM  Lifetime Achievement Award
Dr. Stephen Badylak
**Scientific Session 1**

**Grand Caribbean 1/2**

**ASMB Guest Symposium: The Extracellular Matrix in Morphogenesis and Repair**

**Session Chairs:** Thomas Barker and Jeffrey Jacot

**Keynote Speaker:** Engineering Integrin Specific Materials for Tissue Repair
10:00 AM – 10:30 AM  Tatiana Segura

**ORAL PRESENTATIONS:**

10:30 AM – 10:45 AM  Presentation Of The Integrin Binding Domain Of Fibronectin Impacts Lung Cells Phenotype
L. Moretti, T. H. Barker;
BME, University of Virginia, Charlottesville, VA.

10:45 AM – 11:00 AM  Synthetic Platelet Microgels Containing Fibrin B Knob Targeting Motifs Enhance Clotting Responses
S. Nandi$^{1,2}$, E. P. Mihalko$^{1,2}$, K. A. Nellenbach$^{1,2}$, Y. Li$^1$, M. Castaneda$^1$, M. G. Harp$^3$, S. Menegatti$^{4,2}$, T. H. Barker$^3$, A. C. Brown$^{1,2}$;
$^1$Joint Department of Biomedical Engineering, North Carolina State University/University of North Carolina - Chapel Hill, Raleigh, NC, $^2$Comparative Medicine Institute, Raleigh, NC, $^3$Department of Biomedical Engineering, University of Virginia, Charlottesville, VA, $^4$Joint Department of Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC.

**RAPID FIRE PRESENTATIONS:**

11:00 AM – 11:05 AM  The Role Of Extracellular Matrix Developmental Age On Cardiac Fibroblast Remodeling Response
L. R. Perreault$^1$, M. C. Watson$^1$, R. C. Bretherton$^1$, L. D. Black III$^{1,2}$;
$^1$Biomedical Engineering, Tufts University, Medford, MA, $^2$Cellular, Molecular, and Developmental Biology Program, Tufts University School of Medicine, Sackler School for Graduate Biomedical Sciences, Boston, MA.

11:05 AM – 11:10 AM  Withdrawn

11:10 AM – 11:15 AM  Methods For Isolation Of Matrix Bound Nanovesicles
L. M. Quijano$^1$, J. D. Naranjo$^1$, S. O. El-Mossier$^1$, C. Pineda$^1$, L. Zhang$^1$, N. Turner$^1$, L. White$^2$, H. Li$^3$, Y. Sadovsky$^3$, S. F. Badylak$^1$;
$^1$McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA, $^2$School of Pharmacy, University of Nottingham, Nottingham,
11:15 AM – 11:20 AM

**6**

Keratin’S Modulation Of Protein Aggregation And Autophagy Pathways May Underlie Its Cytoprotective Effects.

J. Hollars\(^1\), S. Phillips\(^1\), E. Zipay\(^1\), Z. Billings\(^1\), C. Davis\(^2\), R. Youker\(^1\), H. B. Coan\(^1\);
\(^1\)Biology, Western Carolina University, Cullowhee, NC, \(^2\)Pratt School of Engineering, Duke University, Cullowhee, NC.

11:20 AM – 11:25 AM

**7**

Microwell Scaffolds Using Collagen-IV And Laminin-111 Lead To Improved Insulin Secretion Of Human Islets

E. Hadavi;
Fraunhofer Project Center (FPC), University of Twente, Enschede, Netherlands.

11:25 AM – 11:30 AM

**8**

Restoration Of Ovarian Function By Tissue Engineering

M. Shachar Goldenberg\(^1\), S. Felder\(^2\), H. Masasa\(^2\), S. Cohen\(^2\);
\(^1\)The Department of Chemical Engineering, SCE College of Engineering, Ashdod, ISRAEL, \(^2\)Avram and Stella Goldstein-Goren Department of Biotechnology Engineering, Ben-Gurion University of the Negev, Beer-Sheva, ISRAEL.

10:00 AM - 11:30 AM  Scientific Session 1

**Grand Caribbean 3-5**

Strategies for Tissue Microvascularization

Session Chairs: Christopher Bashur and Ngan Huang

**ORAL PRESENTATIONS:**

10:00 AM – 10:15 AM

**9**

Induction Of Designed Micro-vascular Network With 3D Bioprinting

J. Son, S. Hong, H. Kang;
Life Science, UNIST, Ulsan, KOREA, REPUBLIC OF.

10:15 AM – 10:30 AM

**10**

Tuning Of Matrix Proteolytic Degradation And Cell Adhesive Peptide Ligand Concentration Synergistically Enhance 3d Vascular Sprouting

Y. He\(^1\), M. Santana\(^1\), M. Moucka\(^2\), A. Shuaibi\(^1\), M. Pimentel\(^1\), S. Wexler\(^1\), J. Quirk\(^1\), M. Vaicik\(^1\), M. Rashid\(^3\), A. Cinar\(^3\), G. Papavasiliou\(^1\);
\(^1\)Biomedical Engineering, Illinois Institute of Technology, Chicago, IL, \(^2\)Biomedical Engineering, Texas A&M University, Austin, TX, \(^3\)Chemical and Biological Engineering, Illinois Institute of Technology, Chicago, IL.

10:30 AM – 10:45 AM

**11**

Spatial Variations In Degradation, Elastic Modulus, And Cell Adhesion Peptide Ligand Concentration Influence 3d Vascular Sprouting

Y. He, M. Santana, M. Pimentel, G. Papavasiliou;
Biomedical Engineering, Illinois Institute of Technology, Chicago, IL.

10:45 AM – 11:00 AM

**12**

The Role Of Hemodynamics And Viscoelasticity On The Pre-vascularization Of Thick, Bioengineered Tissues

C. J. Stephens\(^1\), E. J. Stowe\(^1\), J. A. Spector\(^2,1\), J. T. Butcher\(^1\);
\(^1\)Nancy E. and Peter C. Meinig School of Biomedical Engineering, Cornell
University, Ithaca, NY, 2Division of Plastic Surgery, Weill Cornell Medical College, Ithaca, NY.

11:00 AM – 11:15 AM  
**13 Neovessel Invasion Through Tissue Interfaces Is Stromal Cell Dependent**  
H. Strobel¹, S. Labelle², L. Krishnan³, J. Dale⁴, A. Rauff², A. M. Poulson, IV², K. Aliaj², J. A. Weiss², J. B. Hoying¹;  
¹Advanced Solutions Life Sciences, Manchester, NH, ²University of Utah, Salt Lake City, UT, ³University of Louisville, Louisville, KY, ⁴University of Louisville, Louisville, KY.

11:15 AM – 11:30 AM  
**14 3d Hydrogel System To Promote Distinct Arterial-venous Specification For Tissue-engineered Vasculature**  
B. Mahadik¹, M. Patsy¹, Z. Keepers¹, R. Frayman², J. Fisher¹;  
¹Bioengineering, University of Maryland, College Park, MD, ²Wake Forest University, Winston-Salem, NC.

10:00 AM - 11:30 AM  
**Scientific Session 1**  
**Grand Caribbean 8-10**  
3D Tissue Engineered Cancer/Disease Models  
**Session Chair:** Subhas C. Kundu  
**Keynote Speakers:**  
10:00 AM – 10:18 AM  
**Biomaterials for 3D In Vitro Cancer Models for Drug Screening**  
Subhas C. Kundu  
10:18 AM – 10:36 AM  
**Robust Organ on Chip Platforms for Modeling Human Diseases**  
Ashutosh Agarwal  
10:36 AM – 10:54 AM  
**Emulating Highly Invasive Diseases with 3D Cell Culture**  
Molly S. Shoichet  
10:54 AM – 11:12 AM  
**Tumor-On-Chip Platforms to Study Heterotypic Cell-Cell Interactions and T Cell Recruitment**  
Shyni Varghese  
11:12 AM – 11:30 AM  
**Tissue Engineered Microenvironment for Screening Novel Cancer Therapeutics**  
Allison P. McGuigan

10:00 AM - 11:30 AM  
**Scientific Session 1**  
**Grand Caribbean 6**  
In Vitro and Translational Studies in Neural and Spine Engineering  
**Session Chairs:** Adele Doyle and Mike Modo  
**Keynote Speaker:**  
**Engineering Rapidly Assembling Pentapeptides for Injectable Delivery (RAPID) Hydrogels for Neural Cell Injection and Differentiation**  
Kyle Lampe  
10:00 AM – 10:30 AM
ORAL PRESENTATIONS:

10:30 AM – 10:45 AM
15 Tissue Nano-transfection Promotes Localized Delivery Of Therapeutics To The Peripheral And/or Central Nervous System Via Minimally Invasive Methods
J. T. Moore¹, N. Higuita-Castro², C. G. Wier³, S. J. Kolb³, I. Valerio⁴, D. Gallego-Perez²;
¹Biomedical Engineering, The Ohio State University, Columbus, OH, ²Biomedical Engineering/Surgery, The Ohio State University, Columbus, OH, ³Neurology, The Ohio State University Wexner Medical Center, Columbus, OH, ⁴Plastic Surgery, The Ohio State University Wexner Medical Center, Columbus, OH.

10:45 AM – 11:00 AM
16 Enriching For Distinct Subtypes Of Mouse Embryonic Stem Cell Derived V1 Interneurons
N. White, S. Sakiyama-Elbert;
Biomedical Engineering, University of Texas at Austin, Austin, TX.

11:00 AM – 11:15 AM
305 T Cells Regulate Il-4 Within Acellular Nerve Allograft Repaired Nerves To Promote Regeneration Of Myelinated Axons
D. Pan, D. A. Hunter, S. Mackinnon, M. Wood;
Washington University in St Louis, Saint Louis, MO.

11:15 AM – 11:30 AM
18 Assessment Of A Peripheral Nerve Extracellular Matrix Derived Hydrogel For Improving Functional Recovery Following Nerve Reconstruction
T. J. Meder, B. N. Brown, C. Skillen, L. Marchal, V. Yupanqui, T. Prest;
Bioengineering, University of Pittsburgh, Pittsburgh, PA.

11:30 AM – 12:15 PM
TWIG Meetings:

Grand Caribbean 1/2
Scaffolds, Matrices & Biomaterials

Grand Caribbean 3-5
Cardiovascular/Angiogenesis/Blood

Grand Caribbean 6
Neural & Spine

11:30 – 1:00 PM
Lunch (on own)

11:30 AM - 1:00 PM
SYIS Student Meet Mentor Lunch

Grand Caribbean 11/12

11:30 AM – 2:00 PM
TERMIS-AM Council Meeting & Lunch

St. Croix 3

1:00 PM - 2:30 PM
Scientific Session 2

Grand Caribbean 1/2
3D Bioprinting in Engineering Tissues and Organs I

Session Chairs: Lijie Grace Zhang and Vassilios Sikavitsas

ORAL PRESENTATIONS:
1:00 PM – 1:15 PM 19
Processing Temperatures For The Development Of Polymeric Formulations For Extrusion-based Three-dimensional Printing With Growth Factors
G. L. Koons, P. D. Kontoyiannis, L. Diaz-Gomez, A. J. Melchiorri, A. G. Mikos; Bioengineering, Rice University, Houston, TX.

1:15 PM – 1:30 PM 20
The Effect Of Peptide-tethering Bioinks On The Differentiation Of Human Dental Pulp Stem Cells In The Bioprinted Dental Construct
J. Park¹, G. Gillispie¹, J. Copus¹, W. Zhang², A. Atala¹, J. Yoo¹, P. Yelick², S. Lee¹;
¹Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston-Salem, NC, ²Department of Orthodontics, Tufts University, Boston, MA.

1:30 PM – 1:45 PM 21
3d Bioprinting A Contractile Ventricle Using Human Stem Cell-derived Cardiomyocytes
A. Lee¹, J. Bliley¹, D. Shiwarski¹, J. Tashman¹, A. Hudson², A. W. Feinberg²; ¹Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, ²Biomedical Engineering, Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA.

1:45 PM – 2:00 PM 22
3d Bioprinted Dermoepidermal Human Skin Equivalent As An Experimental In Vitro Model For The Evaluation Of Antibacterial Topical Treatments
A. Suarez-Arnedo, S. Londoño, J. A. Serna, J. Cifuentes, L. N. Muñoz, J. C. Cruz, C. Muñoz-Camargo; Department of Biomedical Engineering, Universidad de los Andes, Bogota, COLOMBIA.

RAPID FIRE PRESENTATIONS:

2:00 PM – 2:05 PM 23
Development Of An Air-brush Hand-held Biopen For Skin Tissue Biofabrication.
C. Chocarro-Wrona¹, G. Jimenez¹, J. Marchal Corrales¹, L. Moroni², D. N. García³; ¹Embriology and Human Anatomy, University of Granada, Granada, SPAIN, ²MERLN Institute for Technology Inspired Regenerative Medicine, Maastricht University, Maastricht, NETHERLANDS, ³Applied Physics, University of Santiago de Compostela, Santiago de Compostela, SPAIN.

2:05 PM – 2:10 PM 24
Assessment Of A Universal Printing Technology For Biphasic Scaffolds Containing Decellularized Bone And Cartilage Matrix
S. M. Gruber¹, S. Murab², P. W. Whitlock², J. C. Lin³; ¹Biomedical Engineering, University of Cincinnati, Cincinnati, OH, ²Orthopaedic Surgery, Cincinnati Childrens Hospital Medical Center, Cincinnati, OH, ³Orthopaedic Surgery, COM Orthopaedic Surgery, Cincinnati, OH.

2:10 PM – 2:15 PM 25
A 3D Printed Hybrid Nasal Cartilage With Functional Electronic Olfactory
Epithelium
Y. A. Jodat;
Department of Medicine, Harvard Medical School, BWH, Cambridge, MA.

2:15 PM – 2:20 PM  26
Development Of A Universal Bioink Technology For Multi-modality Bioprinting Compatibility And Support Of Multiple Tissue Construct Types
A. Skardal;
Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston-Salem, NC.

2:20 PM – 2:25 PM  27
A Comparative Study Of 3d Bioprinting Strategies For Biomedical Applications
J. Park, S. J. Crotts, K. M. Petersen, S. J. Hollister;
Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA.

2:25 PM – 2:30 PM  28
J. Baena;
CEO, Regemat3D, Granada, SPAIN.

1:00 PM - 2:30 PM  Scientific Session 2
Grand Caribbean 3 - 5  Translating Microphysiological Systems Technology to Preclinical Drug Development and Disease Modeling I
Session Chair: George Truskey
Keynote Speaker: 29
1:00 PM – 1:30 PM  Drug Efficacy And Safety Determination In Drug-dosed Human-on-a-chip Systems
J. J. Hickman1,2;
1NanoScience Technology Center, University of Central Florida, Orlando, FL,
2Hesperos, Inc, Orlando, FL.

ORAL PRESENTATIONS:
1:30 PM – 1:45 PM  30
Integrated Human Multi-tissue Platform For Preclinical Modeling Of Drug Toxicity And Disease
K. Ronaldson-Bouchard, K. Yeager, D. Tavakol, G. Vunjak-Novakovic;
Biomedical Engineering, Columbia University, New York, NY.

1:45 PM – 2:00 PM  31
Microfluidic Enabled In Vitro Analysis Of The PK/PD/Efficacy Relationship For Preclinical Testing Of Oncology Compounds
D. Singh1, A. Bray1, P. Golby1, S. Deosarkar2, C. Scott2, T. Kostrzewski1;
1CNBio, Welwyn garden city, UNITED KINGDOM, 2AstraZeneca, Waltham, MA.

2:00 PM – 2:15 PM  32
Cardiac Amyloidosis On A Chip
G. Tansik1,2, A. Alassaf1, J. Musi1, G. Sharma3, V. Mayo1, R. Prabhakar3, A.
2:15 PM – 2:30 PM  
Differentiation And Characterization Of HiPSC-cortical Neurons And Their Application To Drug Evaluation In CNS Disease Models  
K. Autar\textsuperscript{1}, X. Guo\textsuperscript{1}, N. Akanda\textsuperscript{1}, A. Goswami\textsuperscript{1}, M. Jackson\textsuperscript{2}, J. W. Rumsey\textsuperscript{2}, C. Long\textsuperscript{2}, J. Hickman\textsuperscript{1};  
\textsuperscript{1}University of Central Florida, Orlando, FL, \textsuperscript{2}Hesperos, Inc., Orlando, FL.

1:00 PM - 2:30 PM  
Scientific Session 2  
Grand Caribbean 8-10  
In Situ Regeneration of Complex Tissues by Recruitment of Endogenous Stem Cells  
Session Chair: Chang Lee  
Keynote Speakers:  
1:00 PM – 1:30 PM  
Biomaterials Design Strategy for In Situ Tissue Regeneration  
Sang Jin Lee  
1:30 PM – 2:00 PM  
Roles of Substance-P in Tissue Repair  
Hyun Sook Hong  
2:00 PM – 2:30 PM  
SDF-1 Responsive Cartilage Progenitors Migrate to Fibrocartilage Injuries and Stimulate Healing  
Chathuraka T. Jayasuriya

1:00 PM - 2:30 PM  
Scientific Session 2  
Grand Caribbean 6  
Frontiers in Biocomposites for Cell Modulation  
Session Chairs: Sue Anne Chew and Serena Danti  
Keynote Speakers:  
1:00 PM – 1:30 PM  
Osteoinductive Emulsion Inks for 3D Printed Bone Grafts  
Elizabeth Cosgriff-Hernandez  
1:30 PM – 2:00 PM  
PHA-Based Composites for Cell Modulation  
Ipsita Roy  
2:00 PM – 2:15 PM  
Composite Scaffolds with Continuous Gradients for Bone Regeneration  
Carlos Mota  
2:15 PM – 2:30 PM  
Polyurethane-Based 3D Structures as Model for Bone Cells Behavior  
Silvia Farè

2:30 PM – 3:00 PM  
TWIG Meeting:  
Grand Caribbean 1/2  
Biofabrication and Bioreactors
2:30 PM - 3:00 PM  
**Coffee Break**  
*Kingston Hall*

3:00 PM - 4:30 PM  
**Scientific Session 3**  
*Grand Caribbean 1/2*  
**Skin, Wound Healing, and Inflammation**

**Session Chairs:** Aaron Morris and Wendy Liu

**ORAL PRESENTATIONS:**

3:00 PM – 3:15 PM

34  
**Integration Of Bioprinted Skin In Full-thickness Wounds Promotes Epidermal Barrier Formation And Normal Collagen Organization**  
*A. M. Jorgensen*¹, M. Varkey¹, C. Clouse¹, A. Gorkun¹.².³, J. Molnar¹.⁴, S. Lee¹, J. Yoo¹, A. Atala¹, S. Soker¹;  
¹Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston-Salem, NC, ²FSBSI Institute of General Pathology and Pathophysiology, Moscow, RUSSIAN FEDERATION, ³Institute for Regenerative Medicine, Sechenov First Moscow State Medical University, Moscow, RUSSIAN FEDERATION, ⁴Department of Plastic and Reconstructive Surgery, Wake Forest School of Medicine, Winston Salem, NC.

3:15 PM – 3:30 PM

35  
**A Fibronectin-derived Peptide, Engineered To Resist Endo- And Exo-peptidases, Enhances Cell Survival In Vitro, And Speeds Healing And Reduces Scarring In Vivo**  
*R. A. Clark*, A. Prasad, F. Lin;  
NeoMatrix Therapeutics, Stony Brook, NY.

3:30 PM – 3:45 PM

36  
**Bioactive Silk Dressing For Accelerated Wound Healing**  
*D. Ghosh*¹, S. Godeshala², M. Bejarano³, S. G. Patil³, H. Muralikrishnan², D. DiCaudo⁴, J. Kilbourne⁶, K. Rege²;  
¹Biological Design, Arizona State University, Tempe, AZ, ²Chemical Engineering, Arizona State University, Tempe, AZ, ³Biomedical Engineering, Arizona State University, Tempe, AZ, ⁴Department of Plastic and Reconstructive Surgery, Wake Forest School of Medicine, Winston Salem, NC.

3:45 PM – 4:00 PM

37  
**Effects Of Covalent Nanosilver Incorporation On Platelet-like Particle Properties**  
*E. Chee*, S. Nandi, E. Mihalko, K. Nellenbach, L. Morrill, J. Sollinger, A. Brown;  
Joint Department of Biomedical Engineering at NCSU and UNC- Chapel Hill, North Carolina State University, Raleigh, NC.

**RAPID FIRE PRESENTATIONS:**

4:00 PM – 4:05 PM

38  
**Microphysiological Body-on-a-chip System To Evaluate Transdermal Drug Delivery And Toxicity**  
*C. P. Pires de Mello*¹, C. McAleer², C. Carmona-Moran³, C. Oleaga³, A. Riu⁴, R. Note⁴, S. Teissier⁴, J. Langer⁵, J. J. Hickman¹;
Improving Third Degree Burn Wound Healing By Using Non-enzymatic Detachment Of Keratinocyte Sheets Cultured On Temperature Responsive Dishes
S. Alharbi1,2, Y. Niimi3, D. Wiener4, H. Hawkins1, R. Cox1, V. Popov1, A. Osada3, H. Sakurai3, D. Herndon1,5, D. Prough1, P. Enkhbaatar1,5;
1University of Texas Medical Branch, Galveston, TX, 2King Abdulaziz University, Jedddah, SAUDI ARABIA, 3Tokyo Women’s Medical University, Tokyo, JAPAN, 4Texas A&M University, Collage Station, TX, 5Shriners Hospitals for Children, Galveston, TX.

Assessment Of UBM Products In A Porcine Third-degree Burn Model
S. V. Murphy, C. Clouse, R. Nelson, C. Scott, A. M. Jorgensen, A. Atala;
Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston Salem, NC.

Lxw7 Functionalized Ecm Scaffolds Loaded With Endothelial Progenitor Cells Potentiate Neovascularization And Promote Diabetic Ischemic Wound Healing
S. He1,2, T. Walimbe3, H. Chen1, K. Gao1,2,4, D. Hao1,4, P. Kumar1,4, R. Liu5, D. L. Farmer1,4, K. Lam5, J. Zhou2, A. Panitch3, A. Wang1,3,4;
1Department of Surgery, Surgical Bioengineering Laboratory, UC Davis, Sacramento, CA, 2Department of Plastic Surgery, The Third Xiangya Hospital, Central South University, Changsha, CHINA, 3Department of Biomedical Engineering, UC Davis, Davis, CA, 4Institute for Pediatric Regenerative Medicine, Shriners Hospitals for Children, Sacramento, CA, 5Department of Biochemistry and Molecular Medicine, UC Davis, Sacramento, CA.

Primary Human Skin Cells Self-organize To Form Layered, Pigmented, Spherical Organoids
A. M. Jorgensen1, A. Gorkun1,2,3, S. Lee1, J. Yoo1, A. Atala1, S. Soker1;
1Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston-Salem, NC, 2FSBSI Institute of General Pathology and Pathophysiology, Moscow, RUSSIAN FEDERATION, 3Sechenov First Moscow State Medical University, Moscow, RUSSIAN FEDERATION.

Therapeutic Intradermal Delivery Of Exosome-encapsulated Curcumin Using Dissolvable Microneedle Arrays For Enhanced Treatment Of Inflammatory Skin Diseases
E. P. Yalcintas1, S. S. Yerneni2, J. D. Smith3, S. Averick4, P. G. Campbell2, B. O. Ozdoganlar1,2,5;
1Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, 2Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, 3Integrated Innovation Institute, Carnegie Mellon University, Pittsburgh, PA, 4Neuroscience
3:00 PM - 4:30 PM  Scientific Session 3
Grand Caribbean 3-5  New Approaches to Cardiovascular Repair and Regeneration I

Session Chairs: Yi Hong and Laura Suggs

Keynote Speaker: In Situ Transformation of Synthetic Scaffolds into Autologous Arterial Conduits
Yadong Wang

3:00 PM – 3:30 PM

ORAL PRESENTATIONS:

3:30 PM – 3:45 PM 44
Engineering Arterial Substitutes that Recapitulate Vessel Microstructure
D. Miranda-Nieves¹, S. Malladi², C. Tarabanis³, D. Wong³, C. Haller³, E. L. Chaikof³;
¹MIT, Cambridge, MA, ²University of Toronto, Toronto, ON, CANADA, ³BIDMC, Boston, MA.

3:45 PM – 4:00 PM 45
Fibrin-modulating Nanogels For Treatment Of Disseminated Intravascular Coagulation
E. Mihalko, K. Nellenbach, M. Sandry, N. Mininni, A. Brown;
North Carolina State University, Raleigh, NC.

4:00 PM – 4:15 PM 46
Jagged1 Presenting Cell Surrogate Biomaterials For Notch Signaling
K. Zohorsky¹, S. Lin², K. Mequanint²;
¹Biomedical Engineering, Western University, London, ON, CANADA, ²Chemical and Biochemical Engineering, Western University, London, ON, CANADA.

4:15 PM – 4:30 PM 47
ECM-associated IL-33: A Mechanism By Which Fibrosis And Tissue Restoration Are Regulated
M. C. Cramer¹, J. L. Dziki², G. S. Hussey², H. R. Turnquist³, S. F. Badyal¹;
¹Bioengineering, University of Pittsburgh, Pittsburgh, PA, ²Surgery, University of Pittsburgh, Pittsburgh, PA, ³Immunology, University of Pittsburgh, Pittsburgh, PA.

3:00 PM - 4:30 PM  Scientific Session 3
Grand Caribbean 8-10  Engineering Implants for the Treatment of Endocrine/Metabolic Diseases

Session Chairs: Jessica Weaver and Maria Coronel

Keynote Speaker: Vascularizing Device for Pancreatic Sslet Encapsulation
Omid Veiseh

3:00 PM – 3:30 PM

ORAL PRESENTATIONS:
3:30 PM – 3:45 PM

48
Engineering An Oxygen-generating Microbeads Scaffolds For Islet Transplantation Within An Extrahepatic Site

3:45 PM – 4:00 PM

49
An Engineered Fail-safe Approach For Pancreatic Cell-Replacement Therapy
M. Izadifar1,2, M. Massumi1,2, A. Nagy1,2;
1Institute of Medical Science, University of Toronto, Toronto, ON, CANADA, 2Lunenfeld-Tanenbaum Research Institute, Sinai Health System, Toronto, ON, CANADA.

4:00 PM – 4:15 PM

50
A Bioengineered Artificial Interstitium Supports High Density Islet Cell Transplantation Without Immunosuppression In Nonhuman Primates
J. Janecek1, N. Pheil2, B. Willenberg3, T. O’Brien4, M. Graham1;
1Department of Surgery, University of Minnesota, Saint Paul, MN, 2CellSafe Life Sciences, Skokie, IL, 3Department of Internal Medicine, University of Central Florida, Orlando, FL, 4Veterinary Population Medicine, University of Minnesota, Saint Paul, MN.

4:15 PM – 4:30 PM

51
A New Multibore Hollow Fiber Device For Macroencapsulation Of Islets Of Langerhans
K. Skrzypek1, J. Visser2, P. De Vos2, D. Stamatialis1;
1Bioartificial organs, University of Twente, Enschede, NETHERLANDS, 2Pathology and medical biology, Groningen UMC, Groningen, NETHERLANDS.

3:00 PM - 4:30 PM

Scientific Session 3

Grand Caribbean 6
The Next Generation of Clinical Product Manufacturing: Where Will They Come from and Who Will Train Them?

Session Chairs: Dr Julie Allickson, Dr. Christina Celluzzi

Keynote Speakers:

3:00 PM – 3:30 PM
NIIMBL: Educating and Training a World-Class Biopharmaceutical Workforce
John Balchunas

3:30 PM – 4:00 PM
Academic Clinical Translation Facilitating Bedside Therapies in Regenerative Medicine
Julie Allickson

4:00 PM – 4:30 PM
"K to Gray" Training for Tissue Engineered Medical Product (TEMP) Manufacturing
Mary Q. Stewart

3:00 PM - 4:30 PM

Scientific Session 3

Grand Caribbean 11/12
Business Plan Competition – Presentation of Full Business Plan Proposals
Session Chairs: Pedro Costa and Suzanne Tabaa

Presenting Finalists:

Bio Vitro
Matthew Ishahak

CardioMetry
Ben Swanson

Cell X Technologies
Venkata Mantripragada

Ratner Biomeidcal
Jay Nair

4:30 PM – 5:00 PM
**Grand Caribbean 1/2**
TWIG Meeting:
Skin, Wound Healing and Inflammation

4:30 PM - 6:30 PM
**Kingston Hall**
Exhibit Viewing/Reception/Poster Session 2

6:00 PM – 7:00 PM
**St. Croix 3**
2020 SAC Meeting
WEDNESDAY, DECEMBER 4, 2019

6:15 AM - 7:30 AM 5K Fun Run SYIS Activity
Starting Point: Loews Sapphire Falls - Main Entrance

7:00 AM – 6:30 PM Registration Open
Grand Caribbean Pre-Function North

7:00 AM – 8:00 AM TWIG Chairs Meeting
St. Croix 3

8:00 AM – 9:00 AM Plenary Symposium I: Dr. Milica Radisic
Grand Caribbean 7

9:00 AM – 9:30 AM Senior Scientist Award: Farshid Guilak
Grand Caribbean 7
Educational Awards: Natasha Maurmann

9:30 AM - 10:00 AM Coffee Break
Kingston Hall

10:00 AM - 11:30 AM Scientific Session 4
Grand Caribbean 1/2 3D Bioprinting in Engineering Tissues and Organs II

Session Chairs: James Hoying and Sang Jin Lee

ORAL PRESENTATIONS:

10:00 AM – 10:15 AM

52 *In Vivo MRI Of 3d Bioprinted Cartilage Contracts*
M. Amoroso¹, M. Montelius², P. Apelgren³, K. Säljö¹, L. Strid Orrhult³, P. Gatenholm³, L. Kölby¹;
¹Department of Plastic Surgery, Institute of Clinical Sciences, Göteborg, SWEDEN, ²Department of Radiology, Institute of Clinical Sciences, Göteborg, SWEDEN, ³Department of Chemistry and Chemical Engineering, Chalmers University of Technology, Göteborg, SWEDEN.

10:15 AM – 10:30 AM

53 *Bioprinting An In Vitro Head And Neck Cancer Model Using A Decellularized Extracellular Matrix Bioink*
J. Kort-Mascort¹, O. ElKashty², S. Flores-Torres¹, J. Munguia-Lopez¹, T. Jiang¹, S. D. Tran², J. M. Kinsella¹;
¹Bioengineering, McGill University, Montreal, QC, CANADA, ²Dentistry, McGill University, Montreal, QC, CANADA.
10:30:AM – 10:45 AM

54

Thermal Inkjet Printing Elicits Activation Of The Nf-kb Pathway In Primary And Cancer Cells
L. H. Solis, B. P. Oropeza, A. Campbell, S. N. Hosseini, T. Boland;
The University of Texas at El Paso, El Paso, TX.

10:45 AM – 11:00 AM

55

A Dual Crosslinking Approach To Improve The Mechanical Properties And Stability Of Cell-laden Printable Collagen-Based Constructs
N. S. Kajave, T. Schmitt, T. Nguyen, V. Kishore;
Biomedical and Chemical Engineering and Sciences, Florida Institute of Technology, Melbourne, FL.

RAPID FIRE PRESENTATIONS:

11:00 AM – 11:05 AM

56

3D Bioprinted Renal Tissue Constructs Using A Novel Photo-crosslinkable Kidney ECM-derived Bioink
G. Carreno-Galeano, M. Ali, J. Yoo, S. Lee, A. Atala;
Wake Forest Institute for Regenerative Medicine, Wake Forest School of Medicine, Winston-Salem, NC.

11:05 AM – 11:10 AM

57

A Poly(N-isopropylacrylamide)-Based Thermogelling Bioink For Extrusion Bioprinting
A. M. Navara, Y. Kim, A. G. Mikos;
Bioengineering, Rice University, Houston, TX.

11:10 AM – 11:15 AM

58

A 3d Bioprinted Vascularized Omentum Model For Ovarian Cancer Metastasis
J. Fu, M. Ferrer, M. Song;
NCATS, NIH, Rockville, MD.

11:15 AM – 11:20 AM

59

Biofabrication Of A Breast Cancer Microenvironment For In Vitro Modelling Cancer Process.
O. Ruiz¹, E. López-ruiz¹, J. Marchal Corrales¹, L. Moroni², D. N. García³;
¹Embriology and Human Anatomy, University of Granada, Granada, SPAIN,
²MERLN Institute for Technology Inspired Regenerative Medicine, Masstrich University, Masstrich, NETHERLANDS,
³Applied Physics, University of Santiago de Compostela, Santiago de Compostela, SPAIN.

11:20 AM – 11:25 AM

60

Bioprinting Methods To Automate Biofabrication And Improve Regenerative Capacity For Implantable Tissue Engineered Muscle Repair Constructs
R. Bour¹, B. Shepherd², S. Presnell², W. Hess¹, C. Latvis¹, P. Sharma¹, S. Peirce³, G. Christ⁴;
¹University of Virginia, Charlottesville, VA, ²Organovo, San Diego, CA,
³Departments of Biomedical Engineering and Plastic Surgery, University of Virginia, Charlottesville, VA,
⁴Departments of Biomedical Engineering and Orthopaedic Surgery, University of Virginia, Charlottesville, VA.
11:25 AM – 11:30 AM  
61  
3D Printed Composite Scaffold Enhances Bone Healing In Rat Critical-sized Calvarial Defect  
A. Akkouch1, L. Hong2, M. Sweat3, A. K. Salem4, B. A. Amendt5;  
1Orthopaedic Surgery, WMU Homer Stryker M.D. School of Medicine, Kalamazoo, MI, 2The University of Iowa, Iowa City, IA, 3Department of Anatomy and Cell Biology, The University of Iowa, Iowa City, IA, 4College of Pharmacy, The University of Iowa, Iowa City, IA, 5College of Dentistry, The University of Iowa, Kalamazoo, MI.

10:00 AM - 11:30 AM  
Scientific Session 4  
Grand Caribbean 3-5  
Translating Microphysiological Systems Technology to Preclinical Drug Development and Disease Modeling II  
Session Chair: James Hickman  
Keynote Speaker: Engineered Models of Brain Function and Disease  
Roger Kamm

10:00 AM – 11:30 AM  
ORAL PRESENTATIONS:

10:30 AM – 10:45 AM  
62  
A Multi-tissue Chip For The Modeling Of Osteoarthritis Pain  
Z. Li1, Z. Lin1, M. Romero-Lopez2, B. O'Donnell3, P. G. Alexander1, S. B. Goodman4, B. Bunnell, PhD5, M. S. Gold6, H. Lin1, R. S. Tuan1;  
1Orthopaedic Surgery, University of Pittsburgh, Pittsburgh, PA, 2Orthopaedic Surgery, Stanford University, Stanford, CA, 3Center for Stem Cell Research & Regenerative Medicine, Tulane University, New Orleans, LA, 4Orthopaedic Surgery, Stanford University, Stanford, CA, 5Center for Stem Cell Research & Regenerative Medicine, Tulane University, New Orleans, PA, 6Pittsburgh Center for Pain Research, University of Pittsburgh, Pittsburgh, PA.

10:45 AM – 11:00 AM  
63  
An In Vitro Functional Assay To Predict And Study In Vivo Skeletal Muscle Stem Cell Engraftment Outcomes  
B. Xu, S. Davoudi, A. P. McGuigan, P. M. Gilbert;  
University of Toronto, Toronto, ON, CANADA.

11:00 AM – 11:15 AM  
64  
Modular Tissue Engineering Of Bone Microenvironment As An Extravasation Model  
V. Mayo1, A. C. Bowles2, L. E. Wubker1, D. Correa3, A. Agarwal4;  
1Biomedical Engineering, University of Miami, Miami, FL, 2Pathology, Orthopaedics, University of Miami, Miami, FL, 3Orthopaedics, University of Miami, Miami, FL, 4Pathology, Biomedical Engineering, University of Miami, Miami, FL.

11:15 AM – 11:30 AM  
65  
Characterization Study Of Fabricated Alginate-pectin Composite Foams By Control Of Pectin Content  
G. Oh1,2, M. Kim1,2, W. Jung1,2, S. Kim3,4;
10:00 AM - 11:30 AM  Scientific Session 4
Grand Caribbean 8-10  Biomaterials and Regeneration I

Session Chairs: Jeffrey Jacot and Donghui Zhu

Keynote Speaker:  
66 Development Of Zinc And Its Alloys As Biodegradable Metals
Y. ZHENG
Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing, CHINA.

10:00 AM – 10:30 AM

ORAL PRESENTATIONS:

10:30 AM – 10:45 AM
67 Sema3C: A Novel Coupling Factor In Bone Remodeling Mediated By Microstructured Titanium Surfaces
J. Deng¹, E. M. Lotz¹, D. J. Cohen¹, Z. Schwartz¹², B. D. Boyan¹³; ¹Biomedical Engineering, Virginia Commonwealth University, Richmond, VA, ²University of Texas Health Science Center at San Antonio, San Antonio, TX, ³Georgia Institute of Technology, Atlanta, GA.

10:45 AM – 11:00 AM
68 Reabsorbable Biografts For Tympanic Perforation Repair
A. S. Immich¹, P. Pennacchi², R. L. Boemo³, S. S. Maria-Engler², L. H. Catalani²; ¹Federal University of Santa Catarina, Blumenau, BRAZIL, ²University of São Paulo, São Paulo, BRAZIL, ³Hospital Joana de Gusmão, Florianópolis, BRAZIL.

11:00 AM – 11:05 AM
69 Kidney Regeneration With Biomimetic Vascular Scaffolds Based On Vascular Corrosion Casts
J. Huling, S. Min, D. Kim, I. Ko, J. Kim, A. Atala, J. Yoo; WFIRM, Winston Salem, NC.

RAPID FIRE PRESENTATIONS:

11:05 AM – 11:10 AM
70 Cellular Micromechanical Environment In 3d-printed Scaffolds
M. I. Page, C. M. Puttlitz; Colorado State University, Fort Collins, CO.

11:10 AM – 11:15 AM
224 Ti6al4v Lattice Structure Via Extrusion Based 3d Printing For Bone Substitute
P. K. Srivas, P. Pal, P. Dasguch, S. Dhara; School of Medical Science & Technology, IIT Kharagpur, Kharagpur, INDIA.
11:15 AM – 11:20 AM 72
Engineering Pulmonary Valve Tissue Sheets From Human Umbilical Cord Perivascular Cells And Electrospun Polyurethane
S. Parvin Nejad1,2, J. P. Santerre1,2,3, C. A. Caldarone4,5, C. A. Simmons1,2,6;
1Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, ON, CANADA, 2Translational Biology and Engineering Program, Ted Rogers Centre for Heart Research, Toronto, ON, CANADA, 3Faculty of Dentistry, University of Toronto, Toronto, ON, CANADA, 4Division of Cardiovascular Surgery, Department of Pediatrics, Hospital for Sick Children, Toronto, ON, CANADA, 5Congenital Heart Surgery, Heart Center Clinic, Texas Children’s Hospital, Houston, TX, 6Department of Mechanical & Industrial Engineering, University of Toronto, Toronto, ON, CANADA.

11:20 AM – 11:25 AM 73
Off-the-Shelf Biomimetic Graphene Oxide-Collagen Hybrid Scaffolds Wrapped with Osteoinductive Extracellular Matrix for the Repair of Cranial Defects in Rats
S. Liu;
Department of Orthopaedics, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, CHINA.

11:25 AM – 11:30 AM 225
Biocompatibility Of Pt57.5Cu14.7Ni5.3P22.5 Bulk Metallic Glass In Orthopaedic Applications.
T. R. Kyriakides1, a. loye2, S. Lee3, j. schroers4;
1pathology and biomedical engineering, yale university, New Haven, CT, 2biomedical engineering, yale university, New Haven, CT, 3pathology, yale university, New Haven, CT, 4mechanical engineering, yale university, New Haven, CT.

10:00 AM - 11:30 AM  Scientific Session 4
Grand Caribbean 6  Multi-Cellular Engineered Living Systems: Ethics and Societal Impacts
Session Chair: Roger Kamm

Keynote Speakers:

10:00 AM – 10:30 AM  Title TBD
Megan Palmer

10:30 AM – 11:00 AM  Multi-Cellular Engineered Living Systems: Ethics and Societal Impacts
Insoo Hyun

11:00 AM – 11:30 AM  Title TBD
Karmella Haynes

11:30 AM – 1:00 PM  Lunch (on own)
11:30 AM – 1:00 PM  Women in TERM Networking Event: Strategies For Negotiating
Grand Caribbean 11/12  Luncheon will be provided
1:00 PM - 2:30 PM  
**Scientific Session 5**  
*Grand Caribbean 1/2*  
Biomaterial, Scaffold and Cellular Strategies to Control Tissue Elasticity

**Session Chairs:** Christopher Bashur and Anand Ramamurthi

**Keynote Speaker:**  
Elastin-Based Biomaterials for Regenerative Medicine  
Sarah Heilshorn

1:00 PM – 1:30 PM  
**ORAL PRESENTATIONS:**

**1:30 PM – 1:45 PM**  
75  
Multifunctional Gene Silencing Nanotherapeutics For Elastic Matrix Regenerative Repair  
S. Carney¹, N. Sharma¹, A. Ramamurthi²;  
¹Dept of Biomedical Engineering, Case Western Reserve University, Cleveland, OH, ²Dept of Biomedical Engineering, Cleveland Clinic, Cleveland, OH.

**1:45 PM – 2:00 PM**  
76  
The Maturation And 3D Organization Of The Novel D-HuSk-hCPC-based Cardiac Bioconstruct Is Improved In Vitro By Mechanical Stimulation  
I. Belviso¹, A. Sacco¹, V. Romano¹, G. Putame², G. Ricci³, M. Cammarota³, D. Massai³, D. Nurzynska³, C. Schiraldi³, A. Catzone⁴, F. Schonauer¹, C. Maiello⁵, S. Montagnani¹, F. Di Meglio¹, C. Castaldo¹;  
¹Public Health, University of Naples "Federico II", Naples, ITALY, ²Mechanical and Aerospace Engineering, Politecnico di Torino, Turin, ITALY, ³Experimental Medicine, Università della Campania "Luigi Vanvitelli", Naples, ITALY, ⁴Anatomical, Histological, Forensic Medicine and Orthopedic Science, University of Rome La Sapienza, Rome, ITALY, ⁵Cardiovascular Surgery and Transplant, Monaldi Hospital, Naples, ITALY.

2:00 PM – 2:15 PM  
77  
Enzymatic Crosslinking Of Dynamic Thiol-norbornene Click Hydrogels.  
H. Nguyen, C. Lin;  
Department of Biomedical Engineering, Indiana University-Purdue University Indianapolis, Indianapolis, IN.

**RAPID FIRE PRESENTATIONS:**

**2:15 PM – 2:20 PM**  
78  
Stem Cell-Derived Extracellular Nanovesicles For Vascular Elastic Matrix Regenerative Repair  
S. S. Thampi, A. Ramamurthi;  
Biomedical Engineering, Cleveland Clinic, Cleveland, OH.

**2:20 PM – 2:25 PM**  
79  
Hydrogel Based Controlled Delivery Of 17ß-estradiol Towards Obesity Management  
P. Pal, R. Maranon, A. Janorkar;  
biomedical materials science, university of mississippi medical center, Jackson, MS.

**2:25 PM – 2:30 PM**  
80  
Development Of A New Biomaterial Through The Coaxial Electrosprinning Technique For Use As A Skin Substitute
1:00 PM - 2:30 PM  Scientific Session 5
Grand Caribbean 3-5  Respiratory, Urologic and Gastrointestinal Engineering

Session Chairs: Ricardo Gottardi and Andreas Kaasi

Keynote Speaker: In Vitro Evaluation of Scaffold Cell Recruitment and Migration for In Situ Vocal Fold Tissue Engineering
Luc Mongeau

1:00 PM – 1:30 PM
Oral Presentations:

1:30 PM – 1:45 PM
82
Reinforced Electrospun Trachea Patch Containing Cell Adhesion Or Antimicrobial Compounds For In Vivo Trachea Repair
J. M. Townsend¹, M. E. Hukill¹, K. Fung², D. G. Ohst³, J. K. Johnson³, R. Weatherly⁴, M. Detamore¹;
¹University of Oklahoma, Norman, OK, ²University of Oklahoma Health Sciences Center, Oklahoma City, OK, ³Nanofiber Solutions, Hilliard, OH, ⁴Children’s Mercy Hospital, Kansas City, KS.

1:45 PM – 2:00 PM
83
Purification Of Anti-fibrotic Compounds From Ecklonia Cava And Application Of Pcl/phlorotannin Endotracheal Tube For Anti-stenosis In Rabbit Model
M. Jeong¹,2, S. Heo¹,2, T. Kim¹,2, H. Lee²,3, W. Jung¹,2;
¹Department of Biomedical Engineering & Center for Marine-Integrated Biomedical Technology (BK21Plus), Pukyong National University, Busan, KOREA, REPUBLIC OF, ²Marine-Integrated Bionics Research Center, Pukyong National University, Busan, KOREA, REPUBLIC OF, ³Department of Otolaryngology-Head and Neck Surgery, Kosin University College of Medicine, Busan, KOREA, REPUBLIC OF.

2:00 PM – 2:15 PM
84
A Simple Strategy To Develop Compliant Collagen-derived Materials For Urinary Tissue Engineering Applications
S. Sharma¹, J. Hui², S. Rajani², A. Singh³;
¹Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, ²Biomedical Engineering, Johns Hopkins University, Baltimore, MD, ³Urology and Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD.

2:15 PM – 2:30 PM
85
Remodeling Of The Tumor Microenvironment Architecture And Its Effect On Cancer Progression In 3d Organoids
A. Dominijanni, M. Devarasetty, S. Soker;
Wake Forest University Institute for Regenerative Medicine, Winston Salem, NC.
1:00 PM - 2:30 PM  Scientific Session 5
Grand Caribbean 8-10  Translating TERM to the Market
Session Chairs:  Dr. Pedro Costa, Dr. James Yoo
SYIS Session Chair:
Keynote Speakers:
1:00 PM – 1:30 PM  Title TBD
Julie Allickson
1:30 PM – 2:00 PM  Title TBD
Gloria Matthews

Oral Presentations:
2:00 PM – 2:15 PM  86
Production Assistance For Cellular Therapies (PACT) Program: Scope And Services For The Academic And Industry Applicants
A. El Fiky, R. Anderson, L. Ibenana, R. Lindblad;
PACT, The Emmes Company, LLC, Rockville, MD.
2:15 PM – 2:30 PM  87
Commercializing Cellular Therapy
K. A. Buytaert-Hoefen;
PAREXEL, Lakewood, CO.

1:00 PM - 2:30 PM  Scientific Session 5
Grand Caribbean 6  Regenerative Rehabilitation: Combining Tissue Engineering and Cellular Therapies with Applied Biophysics to Optimize Outcomes
Session Chairs:  Dr. Stephen Badylak, Dr. Robert Guldberg
SYIS Session Chair:
Keynote Speakers:
1:00 PM – 1:10 PM  Introduction to/Overview of Regenerative Rehabilitation
Nick Willett
1:10 PM – 1:30 PM  Utilizing Electrical Stimulation to Create the Optimal Environment for Neural Regeneration Following Stroke
Paul George
1:30 PM – 1:50 PM  Reverse Dynamization: Optimizing Bone Regeneration by Mechanical Stimulation
Vaida Glatt
1:50 PM – 2:10 PM  Comprehensive Evaluation of VML Injury and Repair in Biologically Relevant Animal Models: A Prerequisite to Improved Regenerative Rehabilitation
George J. Christ
2:10 PM – 2:30 PM  
The Influence of Mechanical Loading Upon ECM-Mediated Functional Tissue Restoration  
Stephen Badylak

2:30 PM - 3:00 PM  
Coffee Break

2:30 PM – 3:00 PM  
TWIG Meetings

Grand Caribbean 3-5  
Respiratory, Urologic, & Gastrointestinal

Grand Caribbean 8-10  
Commercialization & Regulation

3:00 PM - 4:30 PM  
Scientific Session 6

Grand Caribbean 1/2  
Immunomodulatory Strategies in Tissue Engineering and Regenerative Medicine

Session Chairs: Dr. Alice Tomei, Dr. Evan Scott

SYIS Session Chair:

Oral Presentations:

3:00 PM – 3:15 PM  
238  
Localized Immune Modulation Of Pancreatic Islet Allografts Via Synthetic Biomaterials  
M. Coronel¹, J. Weaver¹, M. Hunckler¹, E. Yolcu², H. Shirwan², A. Garcia¹;  
¹Georgia Institute of Technology, Atlanta, GA, ²University of Louisville, Louisville, KY.

3:15 PM – 3:30 PM  
88  
Immunoengineered Hydrogel Platform To Induce Tolerance In Type 1 Diabetes  
F. Zisi Tegou¹,², D. Velluto², F. Gonzalez Badillo¹,², A. Tomei¹,²;  
¹Biomedical Engineering, University of Miami, Coral Gables, FL, ²Diabetes Research Institute, Miller School of Medicine, University of Miami, Miami, FL.

3:30 PM – 3:45 PM  
91  
Matrix Bound Nanovesicles As A Novel Therapeutic Option For Treating Rheumatoid Arthritis  
R. J. Crum, G. S. Hussey, S. F. Badylak;  
McGowen Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA.

3:45 PM – 4:00 PM  
90  
Tissue-engineered Stromal Reticulum To Study Lymph Node Fibroblastic Reticular Cell Networks In Autoimmune Diabetes  
F. Gonzalez Badillo¹,², S. Wright¹,², M. Scully¹,², N. DeAngelis¹,², F. Zisi Tegou¹,², L. Harwell¹,², A. A. Tomei²,¹;  
¹Department of Biomedical Engineering - University of Miami, Coral Gables, FL,
In Vivo Tissue Engineered Diagnostic Sites For Prognosis And Treatment Monitoring In Autoimmunity
A. H. Morris, K. R. Hughes, R. S. Oakes, T. Kasputis, L. D. Shea; Biomedical Engineering, University of Michigan, Ann Arbor, MI.

Treatment Of Systemic Immune Dysregulation Following Severe Trauma With Synthetic Nanoparticle Antibodies
C. Vantucci¹, J. Liu¹, R. E. Guldberg², K. Roy¹; ¹Georgia Institute of Technology, Atlanta, GA, ²Georgia Institute of Technology, Eugene, OR.

Scientific Session 6
Grand Caribbean 3-5
Bridging Regenerative to Transplant Medicine: A Proposal by The American Society of Transplantation Regenerative Medicine Community of Practice

Session Chairs: Dr. Ipsita Banerjee, Dr. Giuseppe Orlando
SYIS Session Chair:
Keynote Speakers:
3:00 PM – 3:30 PM Engineering Progenitors Cells into Insulin-Producing Cells Cristina Nostro

3:30 PM – 4:00 PM Organ Repair: Harnessing Regenerative Medicine and Preservation Technologies to Increase the Donor Pool Korkut Uygun

4:00 PM – 4:30 PM Kidney Regeneration: A Perspective from Renal Development and Cancer Astgik Petrosyan

Biomaterials for Central Nervous System Diseases and Regeneration with Focus on Imaging and Bio-Inspired Strategies

Session Chairs: Dr. Mirek Janowski, Dr. Stephanie Seidlits
SYIS Session Chair:
Keynote Speakers:
3:00 PM – 3:30 PM Image-Guided Delivery of Biomaterials for Neurological Applications Piotr Walczak

3:30 PM – 4:00 PM Neural Regenerative Rehabilitation For Traumatic Brain Injury G. R. Bjorklund, G. Mousa, J. A. Kleim, S. E. Stabenfeldt;
Oral Presentations:

4:00 PM – 4:15 PM  
95  
Local Delivery Of Flavopiridol Repairs Rat Spinal Cord Injury By Regulation Of Astrocytes And Inflammation  
H. Ren¹, H. Ouyang², J. Gao²;  
¹Guangzhou Medical University, Guangzhou, CHINA, ²Zhejiang University, Hangzhou, CHINA.

4:15 PM – 4:30 PM  
96  
An IPSC-derived Electroconductive 3D Platform For Modeling Epileptic Networks  
K. Kiaee, Y. Aliashrafi Jodat;  
Medicine, Harvard Medical School, Cambridge, MA.

3:00 PM - 4:30 PM   
Grand Caribbean 6  
Biomaterials and Regeneration II

Session Chairs:  
Dr. Kelvin Yeung, Dr. Donghui Zhu

SYIS Session Chair:  

Keynote Speaker:  

3:00 PM – 3:30 PM  
97  
Controlled Delivery Of Magnesium Ions Enables In-situ Bone Regeneration  
Z. Lin, K. Yeung;  
Orthopaedics and Traumatology, The University of Hong Kong, Pokfulam, HONG KONG.

Oral Presentations:

3:30 PM – 3:45 PM  
98  
Cd86 + And/or Cd206 + Macrophages Are Determinants Of Implant Outcome Across Species  
M. Kulkarni, B. Brown;  
Department of Bioengineering, McGowan Institute for Regenerative Medicine, PITTSBURGH, PA.

3:45 PM – 4:00 PM  
99  
MicroRNA-200c Incorporated 3D-Printed Bio-Scaffolds Enhance Bone Regeneration  
M. T. Remy¹, A. A kkouch¹, L. He¹, M. E. Sweat¹, F. Qian¹, X. Song¹, Z. Guo², Y. Zhang², B. A. Am endt¹, L. Hong¹;  
¹University of Iowa, Iowa City, IA, ²Department of Neurosurgery, Shanghai Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, CHINA.

Rapid Fire Presentations:

4:00 PM – 4:05 PM  
100  
Bioengineering An Extra-hepatic Prevascularized Pouch For Subsequent
Islet Transplantation Using Vegf-loaded Polylactide Capsules
D. Kubies¹, A. Pátíková², M. Kumorek¹, E. Wawrzynska¹, A. Vojtíšková², J. Krejčí²;
¹Dept. of Bioactive polymers, Institute of Macromolecular Chemistry, Czech Academy of Sciences, Prague, CZECH REPUBLIC, ²Dept. of Diabetes, Institute for Clinical and Experimental Medicine, Prague, CZECH REPUBLIC.

4:05 PM – 4:10 PM  

101  
Comparative Analysis Of The Regenerative Capacity Of Osteogenic Platforms In The Treatment Of A Rodent Mandibular Defect
A. J. Bow¹, S. Newby¹, B. K. Jackson², K. Alghazali², C. Griffin², S. Hecht³, A. S. Biris², D. E. Anderson¹, S. E. Bourdo², M. Dhar¹;
¹Large Animal Clinical Sciences, University of Tennessee, Knoxville, Knoxville, TN, ²Center for Integrative Nanotechnology Sciences, University of Arkansas at Little Rock, Little Rock, AR, ³Small Animal Clinical Sciences, University of Tennessee, Knoxville, TN.

4:10 PM – 4:15 PM  

102  
Efficient Differentiation Of Human ES And IPS Cells Into Cardiomyocytes On Biomaterials Under Xeno-free Conditions
A. Higuchi¹, A. Higuchi²;
¹Department of Chemical & Materials Engineering, National Central University, Jhong-Li, TAIWAN, ²Center for Emergent Matter Science, Riken, Saitama, JAPAN.

4:15 PM – 4:20 PM  

103  
Effects Of Surface Pretreatments On 3D Polycaprolactone/nanopolyglycolic Acid Scaffolds For Tissue Engineering Of Human Auricular Cartilage
Q. Yu¹, R. Clements², R. D. Childs¹, J. Shleestak², W. Landis³, F. Reinauer², T. Wolfram², S. Grom³, N. Isogai⁵, A. Murthy¹;
¹Akron Children's Hospital, Akron, OH, ²Kent State University, Kent, OH, ³University of California San Francisco, San Francisco, CA, ⁴Karl Leibinger Medizintechnik GmbH & Co. KG, Muhlheim, GERMANY, ⁵Kindai University, Osaka, JAPAN.

4:20 PM – 4:25 PM  

104  
Development Of Topographical Microstructures Onto Fish Scale Collagen Scaffold To Manufacture A Tissue-engineered Oral Mucosa Equivalent
A. Suzuki¹, Y. Kodama², I. Yamaguchi², H. Kuwae³, K. Miwa³, E. Hoshikawa¹, K. Haga¹, J. Mizuno³, K. Izumi¹;
¹Biomimetics, Niigata University, Niigata, JAPAN, ²Taki Chemical Co., Ltd., Japan, Hyogo, JAPAN, ³Research Organization for Nano and Life Innovation, Waseda University, Tokyo, JAPAN.

4:25 PM – 4:30 PM  

105  
Apoptosis-mediated Decellularization Approaches For Lung Tissue Engineering
Y. Song¹, M. Maynes², D. Visosevic², K. Daramola², C. Schmidt²;
¹Biomedical Engineering, University of Arkansas, Fayetteville, AR, ²Biomedical Engineering, University of Florida, Gainesville, FL.
Grand Caribbean 11/12  

Tissue Engineering and TERMIS Leadership Session: The Importance of Scientific Rigor & Integrity

hosted by Mary Ann Liebert, Inc., Publishers

Panelists:  
Dr. Antonios Mikos  
Rice University

Dr. Molly Shoichet  
University of Toronto

Dr. John Fisher  
University of Maryland

Sophie Reisz, Editorial Director  
Mary Ann Liebert, Inc., Publishers

4:30 PM - 6:30 PM  
Exhibit Viewing/Reception - Poster Session 3
Kingston Hall

7:00 PM - 10:00 PM  
Conference Dinner
Grand Caribbean Pre-Function South/Cayman Court

Thursday, December 5, 2019

7:00 AM – 3:15 PM  
Registration Open
Grand Caribbean Pre-Function North

8:00 AM – 9:00 AM  
Plenary Symposium I: Dr. Vera Tiesler
Grand Caribbean 7
9:00 AM – 9:45 AM  Grand Caribbean 7
Young Investigator Award: Dr. Jason Wertheim
Mary Ann Liebert, Inc. Outstanding Student Award: Dr. Adam Jorgensen
Innovation/Commercialization Award:
Gordana Vunjak-Novakovic, University Professor, Columbia University
Milica Radisic, Professor & Canada Research Chair, University of Toronto
Boyang Zhang, Assistant Professor, McMaster University
Kacey Ronaldson, Post-doctoral Associate, Columbia University
Yimu Zhao, PhD Candidate, University of Toronto

9:45 AM - 10:00 AM  Kingston Hall
Coffee Break

10:00 AM - 11:30 AM  Grand Caribbean 1/2
Scientific Session 7
New Approaches to Cardiovascular Repair and Regeneration II
Session Chairs: Dr. Clotilde Castalado, Dr. Franca Di Meglio
SYIS Session Chair:

Oral Presentations:

10:00 AM – 10:15 AM  106
Treatment Of Abdominal Aortic Aneurysm Using Biomimetic Scaffolds Composed Of Human Smooth Muscle Progenitor Cells
N. F. Huang¹, J. Mulorz², C. Alcazar³, C. Hu³, M. Shayan¹, Y. Wen⁴, B. Chen⁵, P. S. Tsao²;
¹Cardiothoracic Surgery, Stanford University, Stanford, CA, ²Cardiovascular Medicine, Stanford University, Stanford, CA, ³Veterans Affairs Palo Alto Health Care System, Palo Alto, CA, ⁴Gynecology, Stanford University, Stanford, CA, ⁵Obstetrics and Gynecology, Stanford University, Stanford, CA.

10:15 AM – 10:30 AM  107
Ready-made Microvessels Integrate Into The Infarcted Coronary Vasculature Promoting Perfusion, Remuscularization And Function
S. Nunes Vasconcelos;
IBBME, University Health Network, University of Toronto, Toronto, ON, CANADA.

10:30 AM – 10:45 AM  108
Tissue-engineered Pediatric Pulmonary Valve In Growing Lamb Model
Z. Syedain, R. Bianco, R. T. Tranquillo;
University of Minnesota, Minneapolis, MN.

10:45 AM – 11:00 AM  109
Anisotropic Nanofibrous Cardiac-specific Extracellular Matrix Scaffold For Cardiac Tissue Engineering
W. Jia¹, D. Sharma¹, G. Wang¹, J. Zhang², T. Kamp², F. Zhao¹;
¹Biomedical Engineering, Michigan Technological University, Houghton, MI, ²University of Wisconsin-Madison, Madison, WI.
11:00 AM – 11:15 AM
Extracellular Matrix Hydrogel Therapy For Intracoronary Infusion
M. T. Spang, G. Sandoval, T. S. Lazerson, S. Bhatia, C. Luo, K. Osborn, P. Cabrales, F. Contijoch, R. R. Reeves, A. N. DeMaria, K. L. Christman; University of California, San Diego, La Jolla, CA.

11:15 AM – 11:30 AM
The Role Of Monocytes In Endothelium Regeneration
R. J. Smith, Jr.1, B. Nasiri2, D. D. Swartz3, S. T. Andreadis1;
1Biomedical Engineering, SUNY Buffalo, Amherst, NY, 2Chemical Engineering, SUNY Buffalo, Amherst, NY, 3ONY Biotech, Amherst, NY.

10:00 AM - 11:30 AM
Scientific Session 7
Grand Caribbean 3-5
Stem Cell-Based Articular Cartilage Engineering
Session Chairs: Dr. Hang Lin, Dr. Robert Mauck
SYIS Session Chair: Clark Hung

Keynote Speakers:
10:00 AM – 10:30 AM
Title TBD
Clark Hung

10:30 AM – 11:00 AM
Chondroinductive Materials for Cartilage Regeneration
Michael Detamore

Oral Presentations:
11:00 AM – 11:15 AM
Engineering Cartilage From Aged Mscs: In Vitro Modeling Of Osteoarthritis
N. Wang, R. S. Tuan, H. Lin;
Orthopedics department, University of Pittsburgh, Pittsburgh, PA.

11:15 AM – 11:30 AM
Automated And Quantitative Assessment Of Clonal Cell Populations Derived From Human Articular Cartilage For Selection And Expansion In Vitro To Improve Cartilage Cell Therapy Products
V. Mantripragada1, E. Carson2, O. Krebs3, G. Muschler1;
1Biomedical Engineering, Cleveland Clinic, Cleveland, OH, 2Biomedical Engineering, Case Western Reserve University, Cleveland, OH, 3Cleveland Clinic, Cleveland, OH.

10:00 AM - 11:30 AM
Scientific Session 7
Grand Caribbean 8-10
Tools for Imaging and Assessment of Engineered Tissues and Biomaterials
Session Chairs: Dr. Eric Brey, Dr. Marcella Vaicik
SYIS Session Chair: Clark Hung

Oral Presentations:
10:00 AM – 10:15 AM
114
In Vivo Mapping Of Immune Cell Infiltration Into Extracellular Matrix Hydrogel In A Rat Model Of Stroke Using $^{19}$F Magnetic Resonance Imaging.
H. Ghuman, R. Azar, S. Badylak, M. Modo;
University of Pittsburgh, Pittsburgh, PA.

10:15 AM – 10:30 AM
115
Multimodal Assessment Of In-situ 3d Net Mold System-derived Myocardial Patch
A. Staneviciute¹, Y. Koda², R. Tung², N. Hibino², T. Ota², M. K. Vaicik¹, K. Kawaji¹;
¹Biomedical Engineering, Illinois Institute of Technology, Chicago, IL, ²University of Chicago, Chicago, IL.

10:30 AM – 10:45 AM
116
Enabling Non-invasive Cell Tracking For Patient-specific Vascular Endothelial Cells
B. Jiang, C. Duan, G. Ameer;
Biomedical Engineering, Northwestern University, Evanston, IL.

10:45 AM – 11:00 AM
117
Resonant Acoustic Viscoelastography For The Mechanical Characterization Of Soft Biomaterials
E. C. Hobson, C. X. Deng, J. P. Stegemann;
Biomedical Engineering, University of Michigan, Ann Arbor, MI.

11:00 AM – 11:15 AM
118
Effects Of Freeze-thaw Cycling On Articular Cartilage Anisotropy Measured Using Ultrasound
M. Motavalli¹, C. Jones², J. Berilla³, M. Li⁴, M. Schluchter⁴, J. Mansour¹, J. Welter¹;
¹Biology, Case Western Reserve University, Cleveland, OH, ²Hathaway Brown High School, Cleveland, OH, ³Civil Engineering, Case Western Reserve University, Cleveland, OH, ⁴Biostatistics, Case Western Reserve University, Cleveland, OH.

11:15 AM – 11:30 AM
119
Quantifying Bladder Tumor Induced Changes In Stromal Collagen Architecture
M. Devarasetty¹, S. Camalan², K. Niazi², M. N. Gurcan², S. Soker¹;
¹Wake Forest Institute for Regenerative Medicine, Winston-Salem, NC, ²Wake Forest Center for Biomedical Informatics, Winston-Salem, NC.

10:00 AM - 11:30 AM
Scientific Session 7

Grand Caribbean 6
Biomaterials for Stem Cell Culture and Therapy

Session Chairs:
Dr. Akon Higuchi, Dr. Anamaria Orza

SYIS Session Chair:

Keynote Speakers:
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 AM – 10:30 AM</td>
<td>Engineered Extracellular Systems for the Derivation of Organ-Specific Cell Types</td>
<td>Samira Musah</td>
</tr>
<tr>
<td>10:30 AM – 11:00 AM</td>
<td>Efficient Differentiation of Human ES and iPS Cells into Cardiomyocytes on Biomaterials under Xeno-free Conditions</td>
<td>Akon Higuchi</td>
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<td>11:00 AM – 11:30 AM</td>
<td>Title TBD</td>
<td>Anamaria Orza</td>
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<td>11:30 AM - 1:00 PM</td>
<td>SYIS Career Panel Discussion</td>
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<tr>
<td>11:30 AM – 12:15 PM</td>
<td>TWIG Meetings</td>
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<td>1:00 PM - 2:30 PM</td>
<td>Scientific Session 8</td>
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<tr>
<td>1:00 PM - 1:30 PM</td>
<td>Biobased Materials for Regenerative Medicine</td>
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<tr>
<td>1:30 PM – 2:00 PM</td>
<td>Role of Bio-based Materials for Regenerative Medicine</td>
<td>Stefan Jockenhoevel</td>
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<tr>
<td>2:00 PM – 2:05 PM</td>
<td>Magnetically-actuated Alginate Scaffold: Effects On Macrophage Function And Angiogenesis</td>
<td>L. A. Steele¹, K. Spiller², S. Cohen³, B. Polyak¹;</td>
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<td></td>
<td></td>
<td>¹Surgery, Drexel University College of Medicine, Philadelphia, PA, ²Biomedical Engineering, Science and Health Systems, Drexel University, Philadelphia, PA, ³Avram and Stella Goldstein-Goren Department of Biotechnology Engineering, Ben-Gurion University of the Negev, Beer Sheva, ISRAEL.</td>
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<td>2:05 PM – 2:10 PM</td>
<td>Decellularized Vocal Fold Lamina Propria-ECM And Associated Matrix-bound Vesicles: Proteomic And In Vitro Characterization Of The TGF-β1 Mediated Fibrotic Response In Human Fibroblasts</td>
<td>C. A. Mora-Navarro¹,², A. Badileanu¹,², E. A. Wrona¹,², L. Gaffney¹,², A. M. Gracioso Martins¹, J. R. Enders³, R. C. Branski⁴, D. O. Freytes¹,²</td>
</tr>
<tr>
<td>2:10 PM – 2:15 PM</td>
<td>3d Bioprinting Of Biomimetic Pancreas With Biocompatible Hydrogel,</td>
<td></td>
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</tbody>
</table>
Adipose-derived Stem Cells And Islets
H. Scholz¹,², S. Abadpour¹,², Y. Zhao³, D. Josefsen⁴, H. P. Gullestad⁵, E. Thompson³, C. Troedsson³, P. Gatenholm⁶;
¹Transplant Medicine and Institute for Surgical Research, Oslo University Hospital, Oslo, NORWAY, ²Institute of Basic Medical Sciences, University of Oslo, Oslo, NORWAY, ³Ocean TuniCell, Blomsterdalen, NORWAY, ⁴Section for Cell Therapy, Oslo University Hospital, Oslo, NORWAY, ⁵Plastic and Reconstructive Surgery, Oslo University Hospital, Oslo, NORWAY, ⁶CELLHEAL, Sandvika, NORWAY.

2:15 PM – 2:20 PM
123
Aging Affects The Immune Response To Synthetic And Biological Implants Through Divergent Mechanisms
B. Popovic¹, M. Kulkarni¹, L. Marchal¹, C. Skillen², B. Brown¹;
¹Bioengineering, McGowan Institute for Regenerative Medicine, Pittsburgh, PA, ²Bioengineering, McGowan Institute for Regenerative Medicine, Pittsburgh, PA.

2:20 PM – 2:25 PM
124
In Vitro Assessment Of Decellularized Human Skin As A Stand-alone Scaffold For Cardiac Regeneration
V. Romano¹, F. Di Meglio¹, I. Belviso¹, A. Sacco¹, G. Ricci², M. Cammarota², D. Nurzynska¹, C. Schiraldi², C. Maiello³, F. Schonauer¹, S. Montagnani¹, C. Castaldo¹;
¹Public Health, University of Naples "Federico II", Naples, ITALY, ²Experimental Medicine, Università della Campania "Luigi Vanvitelli", Naples, ITALY, ³Cardiovascular Surgery and Transplant, Monaldi Hospital, Naples, ITALY.

2:25 PM – 2:30 PM
125
Non-neoplastic Extracellular Matrix Components Mitigate Primary Human Glioma Cell Growth
M. H. Murdock¹, A. Iftikhar¹, J. T. Chang¹, R. C. Hill², K. C. Hansen², N. M. Amankulor¹, G. S. Hussey¹, S. F. Badylak¹;
¹University of Pittsburgh, Pittsburgh, PA, ²University of Colorado, Denver, CO.
1:44 PM – 2:06 PM Optimizing Skeletal Muscle Function After Volumetric Muscle Loss Injury by Leveraging the Pathophysiology
Sarah M Greising

2:06 PM – 2:28 PM Functional Metrics and Computational Models for Evaluating the Degree of Physiological Impairment Following VML Injury and Repair
George J. Christ

1:00 PM - 2:30 PM Scientific Session 8
Grand Caribbean 8-10 Regenerative Medicine in Ophthalmology
Session Chairs: Dr. Kapil Bharti, Dr. Xiaokun Wang
SYIS Session Chair:
Oral Presentations:
1:00 PM – 1:15 PM 194 Hypoxia-induced Choroidal Neovascularization In 3D Bioprinted Model Of Retinal Pigment Epithelium-Choroid Interface
E. Nguyen, R. Quinn, M. Song, K. Bharti;
National Eye Institute, National Institutes of Health, Bethesda, MD.

1:15 PM – 1:30 PM 127 High-purity Photoreceptor Precursors From Human Induced Pluripotent Stem Cells For Photoreceptor Replacement Therapy
A. D. Dias¹, M. J. Phillips², B. C. Shelley¹, K. A. Wallace¹, B. J. Meline¹, M. J. Sternfeld¹, D. J. Phillips¹, M. Fenn¹, E. R. Berndt¹, L. D. Jager², A. L. Ludwig², K. L. Nilles², S. Stuedemann², A. A. Mack¹, C. Cliff³, D. M. Gamm², L. G. Chase¹;
¹R&D, FUJIFILM Cellular Dynamics, Inc., Madison, WI, ²Waisman Center, University of Wisconsin-Madison, Madison, WI, ³Opsis Therapeutics, Madison, WI.

1:30 PM – 1:45 PM 128 Hydrogels For Enhanced Transplanted Retinal Ganglion Cells Survival
P. Dromel¹, D. Singh², M. Young³, M. Spector⁴;
¹Material Science and Engineering, MIT, Harvard Medical School, Cambridge, MA, ²Ophtalmology, Harvard Medical School, Cambridge, MA, ³Ophtalmology, Harvard medical school, Cambridge, MA, ⁴Department of Orthopedic Surgery, VA Boston Healthcare System, Brigham and Women’s Hospital, Boston, MA.

1:45 PM – 2:00 PM 129 Matrix Bound Nanovesicles (mbv) Prevent Retinal And Optic Nerve Damage Following Acute Ocular Injury
C. Pineda Molina¹, G. S. Hussey², S. F. Badyak³;
¹McGowan Institute for Regenerative Medicine, University of Pittsburgh, Pittsburgh, PA, ²McGowan Institute for Regenerative Medicine, Surgery, University of Pittsburgh, Pittsburgh, PA, ³McGowan Institute for Regenerative Medicine, Surgery, Bioengineering, University of Pittsburgh, Pittsburgh, PA.

2:00 PM – 2:15 PM 130 Antimicrobial Drug Eluting Hydrogels For The Treatment Of Bacterial Keratitis
2:15 PM – 2:30 PM  

131  
Characterization Of The Immune Pathways In Corneal Scarring And  
Immunomodulation To Promote A Healthy Repair  
L. Chung\textsuperscript{1}, X. Wang\textsuperscript{1}, D. Maestas\textsuperscript{2}, J. Elisseeff\textsuperscript{2};  
\textsuperscript{1}Biomedical Engineering, Johns Hopkins University, Baltimore, MD, \textsuperscript{2}Biomedical  
Engineering, Johns Hopkins University, Baltimore, MD.

1:00 PM - 2:30 PM  

Scientific Session 8  

Grand Caribbean 6  

Applications and Challenges for Dental Pulp Stem Cells use in Tissue  
Engineering  
Session Chairs: Dr. Akishige Hokugo  
Syis Session Chair:  
Keynote Speakers:  
1:00 PM – 1:15 PM  
The Use of Dental Pulp Stem Cells in Tissue Engineering: From Basic  
Science to Bedside  
Daniela Franco Bueno  
1:15 PM – 1:30 PM  
New Strategies for Pulp Regeneration  
Pamela Yelick  

Oral Presentations:  
1:30 PM – 1:45 PM  
132  
Bioengineered Alveolar Bone And Tooth Constructs  
W. Zhang\textsuperscript{1}, W. Chang\textsuperscript{2}, S. Saxena\textsuperscript{2}, A. Fakhrzadeh\textsuperscript{2}, T. Pashuck\textsuperscript{2}, S. Young\textsuperscript{3}, J.  
Kohn\textsuperscript{2}, P. yelick\textsuperscript{4};  
\textsuperscript{1}Tufts University, School of Dental Medicine, Boston, MA, \textsuperscript{2}New Jersey Center for  
Biomaterials, Piscataway, NJ, \textsuperscript{3}The University of Texas Health Science Center at  
Houston, School of Dentistry, Houston, TX, \textsuperscript{4}tufts univ school of dental medici,  
Boston, MA.

1:45 PM – 2:00 PM  
133  
Enhancing Peripheral Nerve Regeneration Using Scaffold-free Dental Pulp  
Stem Cell Sheets  
M. N. Ahmed, M. Dailey, K. Rothermund, F. Syed-Picard;  
University of Pittsburgh, Pittsburgh, PA.

Rapid Fire Presentations:  
2:00 PM – 2:05 PM  
134  
Transplantation Of Islets Derived From Dental Pulp Stem Cells Into Diabetic  
Rats  
K. Yaegaki;  
Department of Oral Health, Nippon Dental University, Chiyodaku, JAPAN.
2:05 PM – 2:10 PM  
**135**
*Decellularized Dental Pulp Extracellular Matrix For Pulp Regeneration*

*S. Zaky*

1, Q. AlQahtany, A. Patel, E. Beniash, H. Ray, C. Sfeir;  
1Oral Biology, Center for Craniofacial Regeneration, Pittsburgh, PA, 2Department of Endodontics, Pittsburgh, PA, 3Periodontics, Center for Craniofacial Regeneration, Pittsburgh, PA.

2:10 PM – 2:15 PM  
**136**
*Utilization Of Antioxidant Agents For Thawing Of Stem Cells For Use In Regenerative Medicine*

D. B. Gomes, N. Maurmann, L. Alvorcem, G. Leipnitz, P. Pranke;  
1Hematology & Stem Cell Laboratory, Faculty of Pharmacy, Universidade Federal do Rio Grande do Sul, Porto Alegre, BRAZIL, 2Programa de Pós Graduação em Ciências Biológicas: Bioquímica, Departamento de Bioquímica, Universidade Federal do Rio Grande do Sul, Porto Alegre, BRAZIL.

2:15 PM – 2:20 PM  
**137**
*Processed Lipoaspirate Cells And Dental Pulp Stem Cells The Mirna Expression Profile*

C. M. Lopes-Ramos, C. G. Pinheiro, R. B. Parmigiani, D. F. Bueno;  
Ensino e Pesquisa, HOSPITAL SÍRIO-LIBANÊS, SÃO PAULO, BRAZIL.

2:20 PM – 2:25 PM  
**138**
*Design And Characterization Of A Chitosan Hydrogel Scaffold For Dental Pulp Regeneration*

S. Moreira, G. Sarra, G. Lopes, F. G. Gonçalves, T. Araujo Silva, M. Marques;  
1Dentistry, Ibirapuera University, São Paulo, BRAZIL, 2Dentistry, University of São Paulo, São Paulo, BRAZIL, 3Dentistry, Ibirapuera University, São Paulo, BRAZIL.

2:25 PM – 2:30 PM  
**139**
*Novel Strategy Of Tissue Engineering Construct For Cartilage Regeneration From Dental Pulp Stem Cells*

1Sports Medicine Group, Universidade de Sao Paulo, Sao Paulo, BRAZIL, 2Hospital Sirio-Libanes, Sao Paulo, BRAZIL, 3Hospital Sirio-Libanes, Sao Paulo, BRAZIL.

2:30 PM – 3:00 PM

**TWIG Meetings**

Grand Caribbean 3-5 Musculoskeletal

Grand Caribbean 8-10 Ophthalmologic

Grand Caribbean 6 Dental and Craniofacial

2:30 PM – 3:00 PM

**WFIRM Awards**

Grand Caribbean 7
3:00 PM - 3:15 PM  
SYIS Oral and Poster Presentation Awards  
Grand Caribbean 7

3:15 PM - 4:00 PM  
Closing Ceremony & TERMIS-AM General Assembly Meeting  
Grand Caribbean 7