12<sup>th</sup> Symposium on Biologic Scaffolds for Regenerative Medicine





Letter from the Symposium Chair

May 18, 2023

Welcome to the 12th Symposium on Biologic Scaffolds for Regenerative Medicine at the Silverado Resort and Spa! For those of you that have attended this event in the past, welcome back. For those of you attending for the first time, I believe you will find the venue, the science, and the interaction between industry, academia and clinical medicine/surgery to be unique.

We have a superb line-up of speakers that will stimulate and challenge all of us interested in naturally occurring biomaterials and their influence upon cell and tissue structure/function. The venue and format of the Symposium encourage open dialogue, especially dialogue that relates basic science concepts to clinical outcomes. The mixture of individuals and specialties at this meeting is quite distinctive and I strongly encourage you to actively participate and make the most of the next couple of days. You will have the opportunity to engage with cross-disciplinary basic scientists, clinicians/surgeons at the vanguard of therapy with "biologics", and industry leaders that develop, manufacture and deliver such products to the research and clinical communities.

Enjoy the science, the venue and the wine.

Steve Badylekin

Stephen F. Badylak, DVM, PhD, MD Symposium Chairperson

#### WE GRATEFULLY ACKNOWLEDGE OUR SYMPOSIUM SPONSORS



# PLEASE REMEMBER TO VISIT OUR EXHIBITORS



#### Day 1: May 18, 2023 (Thursday)

3:00 – 8:00 pm	Registration	Silverado Foyer
5:00 – 6:00 pm	Keynote: Robert Mecham, PhD Washington University, St. Louis	The Extracellular Matrix in Tissue Engineering: Rebuild It or Reuse It?
6:00 – 8:00 pm	Wine and Cheese Reception	Silverado East & Fairway Deck

6:00 – 8:00 pm Exhibits Open

Silverado East

#### Day 2: May 19, 2023 (Friday)

7:00 – 8:00 am	Breakfast	Fairway Deck
Welcome		
8:00 – 8:05 am	Stephen F. Badylak, DVM, PhD, MD <i>University of Pittsburgh</i>	Silverado West
Session I:	The ECM: Immune System Interface Session Chair: Marley Dewey, PhD, University of Pittsburgh	
Plenary Session: 8:05 – 8:40 am	Featured Presentation: Alberto Mantovani, MD, <i>Humanitas University, Italy</i>	Macrophage Plasticity and the Orchestration of Tissue Repair
8:40 – 9:05 am	Benjamin G. Keselowsky, PhD <i>University of Florida</i>	Tissue-Anchored and Circulating Indoleamine 2,3-Dioxygenase for Immunometabolic Suppression of Inflammation
9:05 – 9:30 am	Matthew Wolf, PhD National Cancer Institute, NIH	Inducing Antigen Specific Tumor Regression with a Biologic Scaffold Assisted Therapeutic Cancer Vaccine
9:30 – 9:55 am	George Hussey, PhD <i>University of Pittsburgh</i>	The Extracellular Matrix Bound Nanvesicle
9:55 – 10:15 am	Milos Marinkovic, PhD University of Texas Health Science Center at San Antonio	Depletion of Cyr61/CCN1 from the Bone Marrow Stromal Niche is a Potential Mechanism Contributing to the Dysregulation of MSCs in Aging Skeletal Tissue
10:15 – 10:35 am	Break	Silverado East
Session II:	<b>Composition and Biologic Activity of the ECM</b> Session Chair: Kevin E. Healy, PhD, University of California, Berkeley	
10:35 – 10:55 am	Maxwell McCabe, PhD University of Colorado	A Mass Spectrometry-based Atlas of Extracellular Matrix Proteins Across 25 Mouse Organs

		Establishing the Mechanistic Role of	
10:55 – 11:15 am	Michel Modo, PhD	Matrix Metalloproteinase (MMP) in ECM	
	University of Pittsburgh	Hydrogel Degradation	
	Kirsi Rilla, PhD		
11:15 – 11:35 am	University of Eastern Finland	Hyaluronan and Its Role in EV Biology	
11:35 – 12:00 pm	John P Fischer, MD, MPH, FACS	Re-imagining Hernia Repair with	
·	University of Pennsylvania	Bioabsorbable Materials	
12:00 – 1:15pm	Lunch	Fairway Deck	
12:30 – 1:15pm	Exhibits Open	Silverado East	
	Basic Science meets Clinical Application	าร	
Session III:	sion III: Session Chair: Robert G. Matheny, MD. CorMatrix Cardiovascular		
	·		
1:15 – 1:35 pm	Karen Christman, PhD	Infusible Extracellular Matrix for Treating	
	University of California San Diego	Inflamed Tissues	
		Devicendial Delivery of Micropized Metrix	
	Vishnu Vasanthan MD	Biomaterial Enhances Post infarct Cardiac	
1:35 – 1:55 pm	University of Calgary Canada	Repair	
	enveloky el edigaly, edilada		
		Esophageal Regeneration Following	
	William Fodor, PhD	Surgical Implantation of a Tissue	
1:55 – 2:10 pm	Biostage, Inc.	Engineered Esophageal Implant:	
		Understanding the Regeneration Time	
		Course and Translation to the Clinic	
		Extracellular Matrix Adjuncts in a Rat	
2·10 – 2·30 pm	Vince Anto, MD	Model of a High-Risk Colorectal	
2.10 2.00 pm	University of Pittsburgh Medical Center	Anastomosis	
0.00 0.55		MBV for FSHD: Effect of Matrix-Bound	
2:30 – 2:55 pm	Peter Jones, PhD	Nanovesicies on a Dystrophic	
	University of Nevaua		
0.55 0.45	Ducale	Cilverado Esst	
2:55 – 3:15 pm	Break	Silverado East	
Session IV:	ECM Formulations, Sourcing and Concepts Session Chair: George Hussey, PhD, University of Pittsburgh		
		Xenogenic Induction of Adipose Tissue	
	Dennis Orgill, MD, PhD	and Maintenance Through Pre- and Post-	
3:15 – 3:35 pm	Brigham and Women's Hospital/Harvard	Conditioning Using External Volume	
	Oniversity	Expansion Fetal-inspired Scaffolds for Intervertebral	
3:35 – 4:00 pm	Joana Calderia, PhD	Disc Regeneration	
-	i3S, Universidade do Porto, Portugal		
4.00 4.05	loshua lones PhD	Engineered Neural Tissue from	
4.00 – 4:25 pm	University of Nottingham. UK	Nerve Repair	

Mitigation of Fibrosis Response Using Roche de Guzman, PhD **Biologic SIS-ECM Envelopes with** 4:25 - 4:50 pm Hofstra University, Hempstead, NY Implantable Electronic Devices Stephen F. Badylak, DVM, PhD, MD University of Pittsburgh 4:50 – 4:55 pm Closing Remarks Silverado East & Fairway 5:00 - 7:00 pm **Poster Session and Wine Reception** Deck **Exhibits** Open 5:00 - 7:00 pm Silverado East Day 3: May 20, 2023 (Saturday) 7:00 – 8:00 am Breakfast Fairway Deck Welcome Stephen F. Badylak, DVM, PhD, MD 8:00 - 8:05 am University of Pittsburgh Silverado West Plenary Session: Keynote Address: Harald C. Ott, MD Engineered Organ Therapeutics - How 8:05 - 8:40 am Harvard Medical School Close Are We in 2023? General and Reconstructive Surgical Applications of Naturally Occurring Session V: Bioscaffolds Session Chair: John A. DeFord, PhD (retired) former BD Exec Vice President and CTO Total Breast Reconstruction with Autologous Fat Grafting and P4HB Absorbable Mesh - an Eight Year Experience: Lessons Learned and Robert Rehnke, MD The Center for Surgical Excellence, Theories on the Self-organizing 8:40 - 9:05 am Tampa, FL Regenerative Superficial Fascia. Kevin E. Healy, PhD 4D Hyaluronic Acid-Based Hydrogels for University of California, Berkeley Cell Transplantation and Tissue 9:05 - 9:30 am Regeneration Development of a Vascular Graft Woven Gaetan Roudier from Extracellular Matrix Yarn and First 9:30 – 9:55 am University of Bordeaux, France Use as an Arteriovenous Shunt in Sheep Stephen Badylak, DVM, PhD, MD The Effects of ECM Hydrogel on the 9:55 – 10:20 am Wound Microenvironment University of Pittsburgh 10:20 – 10:45 am Break Silverado East **ECM: Structure/Function** Session Chair: John Harper, PhD, Sr. VP R&D, Chief Technology Officer, Mimedx Session VI: Group. Inc. Kirk Hansen, PhD University of Colorado Anschutz Extracellular Matrix Remodeling in 10:45 – 11:10 am Medical Campus Acomys Cahirinus Skin Regeneration Carlos Sonnenschein, MD 11:10 - 11:35 am Tufts University Cancer is a Developmental Disease

		Therapeutic Matrix-Bound Nanovesicles
11:35 – 11:55 am	Gavin Arteel, PhD	(MBV) Protect Against Experiment
	University of Pittsburgh	Alcohol-associated Liver Disease in Mice
	- · · ·	Human Placental Extracellular Matrix
11:55 – 12:15 pm	Sarah Moreno	Particulate Supports Fibroblast Cellular
	MiMedx Group, Inc	Activities: Therapeutic Potential for
		Wound Applications
12·15 - 1·15pm	Lunch	Fairway Deck
12.10 – 1.10pm	Luich	
12:45 – 1:15pm	Exhibits Open	Silverado East
Section VIII	Effects of Manufacturing upon ECM Bioa	ctivity
Session vii:	Session Chair: Kirk Hansen, PhD, Universit	y of Colorado Anschutz Medical Campus
	Kara Spiller, PhD	Controlled Release of Immunomodulatory
1: <u>15 – 1:40 pm</u>	Drexel University	Factors for Regenerative Medicine
	Michael Hiles PhD	
1:40 – 2:00 pm	Cook Biotech. Inc	The Case for Inflammation B?
2:00 – 2:25 pm	Lisa White, PhD	Supercritical Carbon Dioxide
	University of Nottingham, UK	Decellularization – Hope vs Hype?
		Age-associated Senescent-I Cell
0.05 0.50 mm	Jin Han, PhD	Signaling Promotes Type 3 Immunity that
2:25 – 2:50 pm	Johns Hopkins University	Inhibits Regenerative Response
2:50 – 3:10 pm		
	Break	Silverado East
Section VIII	Next Generation ECM Products	
Session vill.	Session Chair: Matthew T Wolf, PhD, Cente	er for Cancer Research, NIH
		Clostridium Collagenase Impact on Zone
3·10 – 3·35 pm	Roseanne Frederick, PhD	of Stasis Stabilization and Transition to
0.10 0.00 pm	Smith & Nephew, Inc	Healthy Tissue in Burns
	• •	Self-assembling Extracellular Matrix
3·35 – 3·55 pm	Michael Buckenmeyer, PhD	Tumor Spheroids: A 3D in Vitro Model of
0.00 0.00 p	National Cancer Institute	Dynamic Reciprocity
	Jason Spector, MD, FACS	
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	Weill Cornell Medicine and co-founder	Dermisphere <sup>™</sup> · Harnessing
	Weill Cornell Medicine and co-founder and Chief Medical Officer of Fesarius	Dermisphere™: Harnessing Microstructural Cues in a Collagen
3:55 – 4:15 pm	<i>Weill Cornell Medicine and co-founder and Chief Medical Officer of Fesarius Therapeutics.</i>	Dermisphere™: Harnessing Microstructural Cues in a Collagen Hvdrogel to Optimize Vascular Invasion
3:55 – 4:15 pm	Weill Cornell Medicine and co-founder and Chief Medical Officer of Fesarius Therapeutics.	Dermisphere™: Harnessing Microstructural Cues in a Collagen Hydrogel to Optimize Vascular Invasion Immunomodulatory Effect of Matrix Bound
3:55 – 4:15 pm 4:15 – 4:40 pm	Weill Cornell Medicine and co-founder and Chief Medical Officer of Fesarius Therapeutics. Hector Capella Monsonis, PhD	Dermisphere™: Harnessing Microstructural Cues in a Collagen Hydrogel to Optimize Vascular Invasion Immunomodulatory Effect of Matrix Bound Nanovesicles (MBV) upon Myeloid
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3:55 – 4:15 pm 4:15 – 4:40 pm 4:40 – 4:50 pm	Weill Cornell Medicine and co-founder and Chief Medical Officer of Fesarius Therapeutics. Hector Capella Monsonis, PhD University of Pittsburgh Stephen F. Badylak, DVM, PhD, MD University of Pittsburgh	Dermisphere™: Harnessing Microstructural Cues in a Collagen Hydrogel to Optimize Vascular Invasion Immunomodulatory Effect of Matrix Bound Nanovesicles (MBV) upon Myeloid Precursor Cells Closing Remarks

# **Poster Session**

1	Arteel Gavin, PhD University of Pittsburgh	The Plasma Degradome Reflects Later Development of Severe NASH Fibrosis After Liver Transplant.
2	Hector Capella Monsinis, PhD McGowan Institute for Regen Med	Immunomodulatory Matrix Bound Nanovesicles (MBV) do not Compromise the Humoral Adaptive Immunity
3	Marley Dewey, PhD McGowan Institute for Regen Med	Optic Nerve Neuroprotection and Repair using Matrix-Bound Nanovesicles and Fluvastatin
4	Marissa N. Behun, PhD University of Pittsburgh	Acellular Nerve-Derived Hydrogel Improves Outcomes Following Direct Muscle Neurotization in Rats
5	Jeffrey Brown, PhD Essent Biologics	The Competitive Advantage of Using Allogeneic Biomaterials
6	Bryant W. Fisher, MD UPMC	Vasculogenic Sprouting from Human Aortic Pericytes Potentiated by Porcine Adventitial ECM Biomaterial
7	Rolando Gittens, PhD INDICASAT AIP	Nanostructured Titanium Microcarriers as a Minimally Invasive Vehicle to Repair Osteolytic Lesions Due to Cancer Metastasis
8	Vincent Anto, MD University of Pittsburgh	Developing a Reliable Small Animal Model of Rectal Anastomoses for Medical Product Testing
9	Daniela Romero, PhD McGowan Institute for Regen Med	Developing a Reliable Small Animal Model of Rectal Anastomoses for Medical Product Testing
10	Sarah Moreno MiMedx Group	Human Placental Extracellular Matrix Particulate Supports Fibroblast Cellular Activities: Therapeutic Potential for Wound Applications
11	Arthi Shridhar, PhD X-Therma, Inc.	Advancing the Storage and Transport of Engineered Tissues and Organs Using Anti-freeze Protein Mimics at a Radically New High Sub-zero Temperature.
12	Vishnu Vasanthan, MD University of Calgary	Bioinductive and Anti-fibrotic Properties of the Extracellular Matrix-derived Implantable Electronic Device Envelope: Potential for Optimized Post-procedural Healing
13	William Dangelo, PhD McGowan Institute for Regen Med	Effects of MBV on Primary FSHD Patient-derived Myoblasts
14	Joseph Reynolds, PhD University of California Los Angeles	The Extracellular Matrix Environment from Dystrophin- deficient Muscle Contributes to Muscle Cell Membrane Fragility in Duchenne Muscular Dystrophy

#### Symposium images courtesy of Badylak Laboratory.





Thank you for attending!

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