

Vascular Matrix Biology and Bioengineering Workshop Abstracts with authors

ORAL PRESENTATIONS:

Anti-inflammatory Serpin Peptides derived from the Reactive Site Loop (RSL) of Myxomavirus Serp-1 and Mammalian Neuroserpin Reduce Monocyte Activation

Lucas, Alexandra R.; Munuswamy-Ramunujam, Ganesh; Dai, Erbin; Liu, Liying
University of Florida, Gainesville, FL, USA

Effect of chemical MMP inhibitors on POVPC- and II1-beta induced phenotypic switching of smooth muscle cells.

Cherepanova, Olga A.; Alexander, Matthew R.; Owens, Gary K.
University of Virginia, Charlottesville, VA, USA

Extracellular Activity of Granzyme B Contributes to Abdominal Aortic Aneurysm

Ang, Lisa S.¹; Chamberlain, Ciara M.¹; Boivin, Wendy A.¹; Folkesson, Maggie²; Zhao, Hongyan¹; Swedenborg, Jesper²; McManus, Bruce M.¹; Allard, Michael F.¹; Granville, David J.¹

1. The James Hogg iCAPTURE Centre, Vancouver, BC, Canada
2. Karolinska Institute, Stockholm, Sweden

Regulation of monocyte recruitment and macrophage accumulation in atherosclerosis by discoidin domain receptor 1

Franco, Christopher; Hou, Guangpe); Wong, Eric H.; Zhu, Su-Ning; Chen, Mian; Cybulsky, Myron I.; Bendeck, Michelle P.
University of Toronto, Toronto, Canada

Arterial calcification is driven by RAGE in Enpp1-/- mice

Cecil, Denise; Polewski, Monika; Terkeltaub, Robert A.
VAMC and University of California San Diego, San Diego, CA, USA

NADPH Oxidase / Nox Signaling Stimulates Myofibroblast Msx2 Transcription Via Hydrogen Peroxide

Lai, Chung-Fang; Huang, Emily; Behrmann, Abraham; Shao, Jian Su; Towler, Dwight A.
Washington University in St. Louis, St Louis, MO, USA

Controlling Cell Polarity Through Functions of N-cadherin in Migrating Vascular Smooth Muscle Cells

Sabatini, Peter J.¹; Zhang, Ming²; Silverman-Gavrila, Rosalind²; Bendeck, Michelle P.¹

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2. University Health Network, Toronto, Canada

Differentiation of valve interstitial cells leading to calcification is modulated by the stiffness of the extracellular matrix

Yip, Cindy Y.; Chen, Jan-Hung; Simmons, Craig A.
University of Toronto, Toronto, ON, CAN

Role of AGEs and RAGE in diabetes-induced acceleration of elastocalcinosis

Bouvet, Céline; Moreau, Simon; Moreau, Pierre
University of Montreal, Montreal, PQ, Canada

Development of a novel cardiac tissue engineering construct using a templated fibrin scaffold with a microporous and microchanneled architecture

Thomson, Kassandra S.; Korte, Frederick S.; Linnes, Michael; Giachelli, Cecilia; Ratner, Buddy D.; Regnier, Michael; Scatena, Marta
University of Washington, Seattle, WA, USA

Stromal Cells Support Vascularization of a Human Embryonic Stem Cell-Derived Cardiac Tissue Patch

Kreutziger, Kareen L.; Stevens, Kelly R.; Murry, Charles E.
University of Washington, Seattle, WA, USA

Characterization of a thromboresistant and pro-angiogenic extracellular matrix.

Tian, Weiming; Kyriakides, Themis R.
Yale University, New Haven, CT, USA

Bioengineered Human Microvessels by Co-Engraftment of Endothelial Cells and Pericytes

Shepherd, Benjamin R.; Maier, Cheryl L.; Pober, Jordan S.
Yale School of Medicine, New Haven, CT, USA

Laminin $\alpha 4$ regulates angiogenic sprouting by modulating Dll4/Notch signalling

Stenzel, Denise
Cancer Research UK, London, United Kingdom

POSTER PRESENTATIONS:

Matrix Remodeling in Vascular Disease

01

A novel ELISA measuring MMP-9 mediated type III collagen degradation in atherosclerosis

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02

MMP-9 mediated collagen type III degradation is associated with atherosclerosis

Barascuk, Natasha; Larsen, Lise; Karsdal, Morten A.
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03

Imaging of collagen and associated structures in atherogenesis in murine carotid arteries using two-photon microscopy

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04

Retention of intestinally derived chylomicron-remnants is increased in arteries of JCR:LA-cp insulin-resistant rats ex-vivo and are associated with binding to biglycan

Mangat, Rabban; Wang, Ye; Warnakula, Samantha; Uwiera, Richard; Vine, Donna F.; Proctor, Spencer
University of Alberta, Edmonton, AB, Canada

Vascular Matrix Calcification

06

Could Transglutaminase be the Missing Link in the Development of Arterial Stiffness?

Moreau, Simon; N, Chabot; Bouvet, Céline; Keillor, Jeffrey W.; Moreau, Pierre
University of Montreal, Montreal, Canada

07

Heat Shock Protein 70 Binds to Matrix Gla Protein and Enhances BMP-4 Signaling in Vascular Cells

Yao, Yucheng; Watson, Andrew D.; Ji, Sheng; Bostrom, Kristina I.
University Of California, Los Angeles, Los Angeles, USA

08

Lineage Reprogramming of Smooth Muscle Cells in Calcifying? Blood Vessels of Matrix Gla Protein Knockout Mice

Speer, Mei Y.; Yang, Hsueh-Ying; Brabb, Thea; Leaf, Elizabeth; Look, Amy; Lin, Wei-Ling; Frutkin, Andrew; Dicheck, David; Giachelli, Cecilia
University of Washington, Seattle, USA

09

Osteoprotegerin is an inhibitor of Smooth Muscle Cell Calcification

Scatena, Marta; Rosenfeld, Michael E.
University of Washington, Seattle, WA, USA

10

Relationship between Vascular Calcification and Elevated Pulse Wave Velocity and Severity of Adenine-Induced Chronic Kidney Disease

Holden, Rachel M.; Shobeiri, Navid; Phelan, Rachel; Adams, Michael A.
Queen's University, Kingston, ON, Canada

11

The pantetheinase vanin-1 promotes artery calcification by regulating PPARgamma expression and the inflammatory signaling response in smooth muscle cells

Polewski, Monika D.¹; Terkeltaub, Robert A.²
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2. VA Medical Center, San Diego, CA, USA

Vascular Tissue Engineering

12

A system for rapid generation and mechanical analysis of cell-derived vascular tissue constructs

Gwyther, Tracy A.; Hu, Jason Z.; Christakis, Alexander G.; Shaw, Sharon M.; Skorinko, Jeremy K.; Billiar, Kristen L.; Rolle, Marsha W.
Worcester Polytechnic Institute, Worcester, MA, USA

13

Elastin-mimetic protein polymers as cell adhesive hydrogel matrices

Ravi, Swathi¹; Chaikof, Elliot L.²
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2. Emory University, Atlanta, GA, USA

14

Directed Differentiation, Purification and Characterization of Endothelium from Human Embryonic Stem Cells

Halpin, Daniel E.; Nourse, Marilyn B.; Scatena, Marta; Mortisen, Derek J.; Hauch, Kip D.; Ratner, Buddy D.; Pabon, Lil; Murry, Charles E.
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15

Strain and Endothelial Co-Culture Induce Organization in Human-Derived Cardiac Constructs

Tulloch, Nathaniel L.; Reinecke, Hans; Murry, Charles E.
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16

Expression of versican isoform V3 improves elastogenesis in engineered vascular constructs

Keire, Paul A.¹; L'Heureux, Nicolas²; Vernon, Robert¹; Merrilees, Mervyn³; Starcher, Barry⁴; Okon, Elena⁵; Dusserre, Nathalie²; McAllister, Todd²; Wight, Thomas N.⁶
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3. The University of Auckland, Auckland, New Zealand
4. University of Texas Health Center at Tyler, Tyler, TX, USA
5. University of British Columbia, Vancouver, BC, Canada
6. The Hope Heart Program, Seattle, WA, USA

17

Human progenitor cells generate engineered vasculature in collagen, fibrin, and hydrogel matrix materials

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18

Impact of Elastin Matrix Disruption on Induced Regenerative Repair by

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19

Induced Elastic Matrix Regeneration and Repair by Aneurysmal Human Smooth Muscle Cells (SMCs)

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2. *Medical University of South Carolina, Charleston, SC, USA*

20

Multimodality Characterization of Tissue Engineered Vascular Graft Conduits in a Murine model

Sawh-Martinez, Rajendra; Hibino, Narutoshi; Mirensky, Tamar; Dobrucki, Wawrzyniec; Sinusas, Albert; Kyriakides, Themis; Shin'oka, Toshiharu; Breuer, Christopher
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21

Alloimmunogenicity of Pericytes Isolated from Human Placenta

Maier, Cheryl L.; Shepherd, Benjamin R.; Pober, Jordan S.
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Engineering Vascular Scaffolds

22

Creating waved and aligned nanofiber composites with biomimetic microstructure that match the compliance of natural blood vessels

Beachley, Vince Z.; Wen, Xuejun
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23

Fibril microstructure and mechanical properties of 3D collagen matrices modulate ECFC vasculogenesis in vivo

Critser, Paul J.¹; Kreger, Seth T.²; Voytik-Harbin, Sherry L.²; Yoder, Mervin C.¹

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24

Tubular vascular grafts containing protein matrix and circumferentially aligned nanofibers and cells

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Bioengineering Angiogenesis

25

Angiogenic Matrices Derived from Differentiating Embryonic Stem Cells

Ngangan, Alyssa V.; Waring, James C.; McDevitt, Todd C.
Georgia Institute of Technology, Atlanta, GA, USA

26

COPPER and GROWTH FACTOR SYNERGY in the STIMULATION of ANGIOGENESIS

Doillon, Charles J.¹; Gerard, Catherine¹; Bordeleau, Louis-Jean¹; Barralet, Jake²

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2. *McGill University, Montreal, Canada*

27

Functional Vascular Derivatives for Building Microvasculature Tissue from Embryonic Stem Cells

McCloskey, Kara E.

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Matrix and Angiogenesis

28

Alignment of Angiogenic Microvessels and the Surrounding Collagen Matrix Over Time In Culture

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29

Cell-instructive surfaces for improved vascularization in tissue engineering

Abrahamsen, Iren; Micoulet, Alexandre; Blois, Anna; Evensen, Lasse; Lorens, James

University of Bergen, Bergen, Norway

30

Different expression patterns of aggrecanase in 2D and 3D collagen in vitro angiogenesis assays

Obika, Masanari; Vernon, Robert; Braun, Kathleen; Chan, Christina K.; Gooden, Michel; Potter-Perigo, Susan; Wight, Thomas N.

Benaroya Research Institute at Virginia Mason, Seattle, WA, USA

3

1

Mechanosensitive control of VEGFR2 transcription and angiogenesis through antagonism between GATA2 and TFII-I

Mammoto, Akiko; Ingber, Donald E.

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32

Membrane type-1 metalloproteinase, alpha2 beta 1 integrin and Cdc42 form an intermolecular complex that control endothelial lumen formation in 3D collagen matrices

Sacharidou, Anastasia¹; Koh, Wonshill¹; Senger, Donald R.²; Davis, George E.¹

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33

The effect of high glucose extracellular matrix alterations on endothelial cell plasminogen system balance

Graham, Drew A.; Morss Clyne, Alisa

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Vascular Cell-Cell and Cell-Substrate Interactions

34

Beta 4 Integrin Signaling on Mammary Cancer Cell Adhesion in the Microcirculation

Lu, Yonggang¹; Zeng, Min¹; Pepe-Caprio, Angela²; Giancotti, Filippo G.²; Fu, Bingmei M.¹

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35

Chemokine Regulation of Vascular Inflammation is Predominately Local with Equal Dependence upon Glycosaminoglycans and Receptors

Lucas, Alexandra R.; Dai, Erbin; Liu, Liyang; McFadden, Grant

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36

Pericytes Catalyze Endothelial Cell Basement Membrane Formation During Vascular Morphogenesis

Stratman, Amber N.; Davis, Michael J.; Davis, George E.

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37

Platelet adhesion and adhesion inhibition studied in real-time under flow in novel microfluidic flow chamber arrays

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Matrix Mechanobiology

38

3D-Matrix stiffness regulates breast cell phenotype, signaling, and gene expression through a FAK-ERK linkage

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39

A Dynamic Stochastic Model of Frequency-dependent Stress Fiber Alignment Induced by Cyclic Stretch

*Hsu, Hui-Ju; Lee, Chin-Fu; Kaunas, Roland
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40

A Mathematical Model Coupling Actin Cytoskeletal Dynamics with JNK Activation in Response to Matrix Stretching

*Kaunas, Roland; Huang, Zuyi; Hahn, Juergen
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41

FAK, PIP5KI-gamma and Gelsolin Cooperatively Mediate Force-Induced Expression of Alpha Smooth Muscle Actin

*Chan, Matthew; Arora, Pamela; Bozavikov, Peter; McCulloch, Christopher A.
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Vascular Matrix Biology - Other

42

Elucidating the role of the sodium dependent phosphate co-transporter PiT-1 during early murine development

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43

TCF Transcription Factors: Differential Distribution and Function in Arterial Wall Cells

*Boroomand, Seti, Lisa Ang, Edmond Chau, Brian Wong, Jon M. Carthy, Hubert Walinski, Caroline Cheung, Maziar Rahmani, Bruce McManus
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44

Collagen plus Fibronectin Provides a Better Support Structure for Endothelialisation

*Sgarioto, Melissa K.¹; Vigneron, Pascale²; Patterson, John¹; Nagel, Marie-Danielle²
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45

SCUBE2, a surface and secreted matrix protein, suppresses breast tumor cell proliferation and confers a favorable prognosis in invasive breast cancer

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