



McGowan Institute for Regenerative Medicine Holds Its Annual Scientific Retreat

The McGowan Institute for Regenerative Medicine held its 2014 Scientific Retreat March 9-11, 2014. The focus was on peer-to-peer networking, and the retreat provided many opportunities to explore collaborative endeavors with other researchers, participating guests, and external partners who are working to bring regenerative medicine technologies to clinical use.

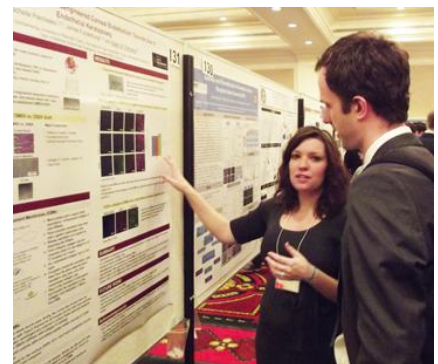
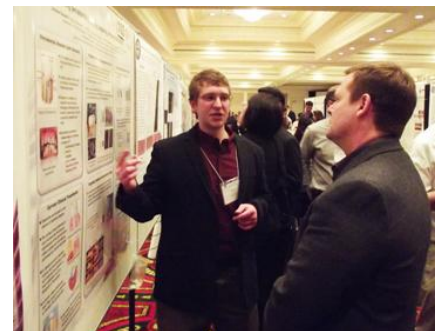
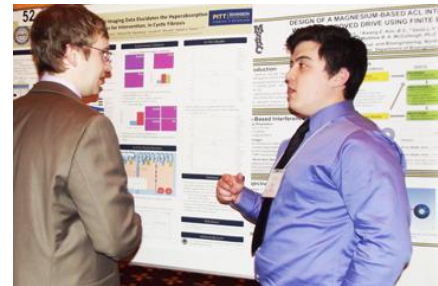
The participation and contributions of the guests and external collaborators - along with McGowan Institute for Regenerative Medicine affiliated faculty and trainees - provided for insightful discussions and identification of opportunities for partnership. This year's program was chaired by [Kacey Marra, PhD](#), Associate Professor in the Departments of Plastic Surgery (primary) and Bioengineering (secondary), as well as Co-Director of the Adipose Stem Cell Center at the University of Pittsburgh.

Program Highlights

The retreat program included special presentations by the following guests:

- Arthur S. Levine, MD, Senior Vice Chancellor and Dean-School of Medicine, University of Pittsburgh: *"Welcome to the MIRM Annual Retreat and to the University of Pittsburgh"*
- McGowan Institute Distinguished Lecture, *"The Critical Role of Extracellular Matrix and Microenvironment in Metastasis and Dormancy,"* by Mina Bissell, PhD, Distinguished Scientist, Life Sciences Division, Lawrence Berkeley National Laboratory
- Highlights of emerging clinical therapies introduced by [J. Peter Rubin, MD](#) and [Peter Wearden, MD, PhD](#)

The Retreat program also included a great cross-section of scientific presentations given by invited researchers from other institutions and agencies who are not formally affiliated with the Institute (in alphabetical order):





- Albert J. Banes, PhD, Professor – Joint Department of Biomedical Engineering, North Carolina State University and the University of North Carolina-Chapel Hill, President, Flexcell International Corporation: *“Breakthroughs in Improving Collagen Hydrogels for Strength and Materials Testing”*
- Kapil Bharti, PhD, Ophthalmic Genetics and Visual Function Branch, National Eye Institute, National Institutes of Health: *“Induced to Cure: Using iPS Cell Derived RPE to Treat Degenerative Eye Diseases”*
- David Allenson Borton, PhD, Assistant Professor of Neuroengineering, Brown University, Marie Curie Fellow, Swiss Federal Institute of Technology, Lausanne, Switzerland: *“A Connection-Free Translational Analysis Platform for Neuromotor Disease Research and Therapeutic Validation”*
- Judy Cameron, PhD, Professor of Psychiatry and Director of Pitt Science Outreach, University of Pittsburgh: *“Neuroprotective Effects of Physical Activity”*
- Geoffrey Camirand, PhD, Research Assistant Professor of Surgery, University of Pittsburgh: *“Intravital Microscopy: Applications in Transplantation”*
- Sidney Coleman, MD, TriBeCa Plastic Surgery, New York, New York: *“The Evolution and Applications of Minimally Invasive Autologous Fat Transfer in Clinical Surgery”*
- Michael Davis, MD, SAMMC and ISR, Department of Defense: *“Reconstructive Transplantation for Devastating Combat Trauma – Translational Insights and Clinical Prospects”*
- Rear Admiral Bruce Doll, Chief of Navy Medical Research and Development: *“Opportunities for Collaboration with the Military”*
- Matthew Fisher, PhD, Assistant Professor-Joint Department of Biomedical Engineering, North Carolina State University and the University of North Carolina-Chapel Hill: *“Development of a Trajectory-Based Tissue Engineering Approach for Cartilage Repair”*
- Robert M. Friedlander, MD, Chairman, Walter E. Dandy Professor of Neurological Surgery, Head of Cerebrovascular Neurosurgery, University of Pittsburgh & UPMC: *“Mitochondrial Protein Import Dysfunction in Huntington’s Disease”*
- G.F. Gebhart, PhD, Professor and Director, Center for Pain Research, University of Pittsburgh: *“Inflammation, Afferent Sensitization, Hyperalgesia and Pain”*
- Mark W. Grinstaff, PhD, Professor- Biomedical Engineering, Professor- Chemistry, Boston University: *“Commercialization of an Ocular Sealant: The HyperBranch Medical Technology Story”*
- Jelena M. Janjic, PhD, Assistant Professor Pharmaceuticals, Graduate School of Pharmaceutical Sciences, and Founder and Co-Director, Chronic Pain Research Consortium, Duquesne University: *“Theranostic Pain Nanomedicine: Entry to the New Era of Inflammatory Pain Research?”*
- Adam Kwiatkowski, PhD, Assistant Professor, Cell Biology, University of Pittsburgh: *“Imaging the Dynamic Cytoskeleton”*



- Yang Liu, PhD, Assistant Professor, Department of Medicine, Division of Gastroenterology, Hepatology and Nutrition, Assistant Professor, Department of Bioengineering, Director, Biomedical Optical Imaging Laboratory (BOIL), University of Pittsburgh, University of Pittsburgh Cancer Institute: *"From Quantitative Phase Microscopy to Nanovision Diagnostics"*
- Paul Robbins, PhD, Professor, Department of Metabolism & Aging, Florida Campus, The Scripps Institute: *"Developing Stem Cell Based Approaches for Treating Age-Related Pathologies"*
- Frederick J. Schoen, MD, PhD, Professor of Pathology and Health Sciences and Technology, Harvard Medical School, Executive Vice Chairman, Department of Pathology, Brigham and Women's Hospital: *"Heart Valve Replacement and Regeneration: Status, Challenges and Opportunities"*
- Kevin Shakesheff, PhD, Professor of Advanced Drug Delivery and Tissue Engineering, Faculty of Science, University of Nottingham: *"The UK Regenerative Medicine Platform and Technologies to Enhance CNS Repair Technologies"*
- Mario G. Solari, MD, Assistant Professor, Department of Plastic Surgery, University of Pittsburgh: *"Vascularized Composite Tissue Allotransplantation – Progress and Potential"*
- Alkiviadis Tsamis, PhD, Senior Postdoctoral Researcher, Bioengineering, University of Pittsburgh: *"Aortic Valve Morphology Predicts Spatially-Distinct Fiber Architecture in Ascending Aorta Aneurysm"*
- Dmitry Tuder, MD, SAMMC and ISR, Department of Defense: *"Reconstructive Transplantation for Devastating Combat Trauma – Translational Insights and Clinical Prospects"*
- Bennett Van Houten, PhD, Professor-Department of Pharmacology and Chemical Biology, University of Pittsburgh: *"Mitochondria-Telomere Cross-Talk: A Unifying Model of Aging?"*
- Kia Washington, MD, Assistant Professor, Department of Plastic Surgery, University of Pittsburgh: *"From Experimental Model to Clinical Reality"*
- Holger Willenbring, MD, PhD, Associate Professor, Department of Surgery, Division of Transplantation, Eli and Edythe Broad Center of Regeneration Medicine and Stem Cell Research, University of California, San Francisco: *"Origin of New Hepatocytes in Liver Homeostasis and Injury"*
- Xiao Xiao, PhD, Fred Eshelman Distinguished Professor of Gene Therapy, Vice Chair, Division of Molecular Pharmaceutics, University of North Carolina Eshelman School of Pharmacy: *"Gene Therapy for Regenerative Medicine"*

A special session addressing career tracks as shared by recent graduates included presentations by:

- Priya Baraniak, PhD, Director of Business Development, RoosterBio: *"From Graduate Training to Postdoc in Academia and Then Industry"*



- Matthew Fisher, PhD, Assistant Professor-Joint Department of Biomedical Engineering, North Carolina State University and the University of North Carolina-Chapel Hill: *"Staying in Academia"*
- Zahida Khan, MD, PhD, Pediatric Gastroenterology Fellow, Children's Hospital of Pittsburgh: *"MD/PhD Track"*
- Tim Maul, PhD, ECMO Coordinator, Children's Hospital of Pittsburgh, and Research Assistant Professor, University of Pittsburgh: *"Staying in Academia"*

The Retreat saw increased participation by representatives from industry; industry representatives included:

- ACell, Inc.
- ALung Technologies, Inc.
- BioSpherix, Ltd
- Dow Corning Corp.
- Instron, Inc.
- MPI Research
- Omnyx, LLC
- RoosterBio
- Vertex, Inc.



Elevator Pitch Competition

Under the leadership of Paul J. Petrovich, CPA, the University of Pittsburgh, Office of Enterprise Development (OED), hosted the "Innovator Elevator Pitch Contest." This event consisted of a series of scheduled brief presentations from on the value of their technology to an audience which included industry participants, faculty, and trainees.

This year, there were two prizes. One winner was determined by the audience and one by the expert commentators/judges. The winners were:

By the judges:

Rapid Preservation Catheter for Transplant Organ Recovery
by [Bryan Tillman, MD, PhD](#)





By the audience:

CuroStem™: Cellular Bandage
by Don Taylor, PhD, and Austin Nuschke



The two winning "pitches" received guaranteed acceptance into the Innovation Institute's Pitt Venture 1st Gear Enterprise Creation Team (EC Team) Development Program. This program provides a \$6,000 award to establish and train EC Teams to "Articulate the Opportunity for the Technology." The award will fund the student's participation in 1st Gear and can also be used to further the technology development and commercial understanding, including travel to interview prospective customer segments.

Poster Session

The poster session, which had more entries than any other Retreat, was effective in introducing the focus of the Retreat and interests of the faculty and the guests. [Andrew Duncan, PhD](#), Assistant Professor in the Department of Pathology, Division of Experimental Pathology, University of Pittsburgh, and his committee organized the session and judged the posters. The winners of the poster session were:



Category: Cellular Therapy

First place: Aparna Rao

Mentor: [Eric Lagasse, PharmD, PhD](#)

Department of Pathology; University of Pittsburgh

"Engineering an ectopic thymus in the lymph node to induce central tolerance and long-term allograft acceptance"

Runner-up: Mehwish Khaliq

Mentor: [Donghun Shin, PhD](#)

Department of Developmental Biology; University of Pittsburgh

"Characterization and role of id2a in zebrafish liver development and regeneration"



Category: Computation and Modeling

First place: Callie Miller

Mentor: [Lance Davidson, PhD](#)

Department of Bioengineering; University of Pittsburgh

"Mechanics of actomyosin linear morphologies"

Runner-up: Thang Ho

Mentor: [Robert Parker, PhD](#)

Department of Chemical and Petroleum Engineering; University of Pittsburgh

"An Algorithm for Patient-Specific Cancer Chemotherapy Scheduling"

Category: Medical Devices

First place: Molly Blank

Mentor: [James Antaki, PhD](#)

Department of Biomedical Engineering; Carnegie Mellon University

"Design and assessment of a breast palpation device alpha-prototype for the quantification of breast lesions"

Runner-up: Salim Olia

Mentor: [Marina Kameneva, PhD](#)

Department of Bioengineering; University of Pittsburgh

"A Novel Left Ventricle Inflow Cannula for the PediaFlow® Pediatric Ventricular Assist Device"

Category: Tissue Engineering

First place: Saik-Kia Goh

Mentor: [Ipsita Banerjee, PhD](#)

Department of Bioengineering; University of Pittsburgh

"In-vivo Maturation of Endocrine Pancreas-based on Perfusion-Decellularized Pancreatic Matrix and Human Embryonic Stem Cells"

Runner-up: Rachelle Palchesko, PhD

Mentor: [Adam Feinberg, PhD](#)

Department of Biomedical Engineering; Carnegie Mellon University

Department of Ophthalmology; University of Pittsburgh

"Development of a Human Bioengineered Corneal Endothelium Towards Use in Endothelial Keratoplasty"



CATER Poster Session Winners:

First place: Megan A. Jamiolkowski

Mentor: [William R. Wagner, PhD](#)

Department of Bioengineering; University of Pittsburgh
"Real Time Visualization and Characterization of Platelet Deposition Under Flow onto Clinically-Relevant Opaque Surfaces"



Runner-up: Mehwish Khaliq

Mentor: [Donghun Shin, PhD](#)

Department of Developmental Biology; University of Pittsburgh
"Characterization and role of id2a in zebrafish liver development and regeneration"

Recognition of Recent CATER Graduates:

Julie Cramer, PhD and Christopher Medberry, PhD



Winners of the door prizes were Xinzhu Gu, [Alan Wells, PhD](#), and Brian Sicari, PhD. Prizes were courtesy of Nemaclin Woodlands.

A special thank you is extended to all who made this year's Retreat a success!

See the full Retreat Program [here](#).