14th Annual McGowan Retreat

March 8-10, 2015

Nemacolin Woodlands Resort

Sunday March 8:

3:00 PM	Hotel check-in available (Self-park, or valet park at participant's expense)	Main Lobby
5:00-8:30 PM	Meeting Registration	Marquis Foyer
5:30 PM	Poster Session and Reception	Marquis Ballroom

Posters must be in place by 5:30 PM. Sunday Poster sessions will be held March 8 and 9, 2015. Posters must be in place both days. Posters will be selected for presentation on a single session. Presenters will be notified upon check-in at the registration table on March 8th which day they are scheduled to present.

7:30 PM ***New Clinical Applications*** Marquis Ballroom

- Lawrence Wechsler, MD – Stem cell based stroke therapy
- Christian Bermudez, MD and William Federspiel, PhD
  Lung transplant
- Vijay Gorantla, MD, PhD – Limb transplant

Monday March 9:

7:00-8:00 AM	Meeting Registration	Marquis Foyer
	Breakfast	Marquis Ballroom
8:00 AM	**Plenary Session**	Lecture Hall

- ***State of the McGowan Institute***
  William Wagner, PhD
  Professor, Departments of Surgery, Bioengineering and Chemical Engineering
  Director, McGowan Institute for Regenerative Medicine

- **Distinguished Lecture: *"Tissue Engineering: Into the Era of Personalized Medicine"***
  Gordana Vunjak-Novakovic, PhD
  Mikati Foundation Professor, Departments of Biomedical Engineering and Medical Sciences
  Columbia University

9:30 AM **Working Session 1**

Trauma and Critical Care - The Cutting Edge Lecture Hall

Session Chairs: Michael Davis, MD
Deputy Commander, US Army Institute of Surgical Research

Vijay Gorantla, MD, PhD
Associate Professor, Department of Plastic Surgery
University of Pittsburgh

- ***The Defense Health Program Surgical Critical Care Initiative (SC2i): Decision Making in Complex Trauma*** (9:30-9:50 AM)
  Jonathan Forsberg, MD
  Commander, Medical Corps, US Navy
  Associate Professor, Department of Surgery
  Uniformed Services University

- ***Managing the Severely Injured - Lessons from a Busy Level 1 Trauma Center*** (9:50-10:10 AM)
  Joshua Hazelton, DO
  Attending Surgeon
  Cooper University Hospital

- ***Predictive Modeling and Analytics in Trauma, Sepsis and Critical Care*** (10:10-10:30 AM)
  Yoram Vodovotz, PhD
  Professor, Department of Surgery
  University of Pittsburgh

- ***Military Programmatic Gaps and Research Priorities in Regenerative Medicine and Trauma/Critical Care*** (10:30-10:50 AM)
  Brian Pfister, PhD, MBA
  Strategic Portfolio Manager for Regenerative Medicine Clinical and Rehabilitative Medicine Research Program (CRMRP)
  US Army Medical Research and Materiel Command (USAMRMC)

Working Session 2

Imaging

Grand Ballroom

Session Organizer: Ian Sigal, PhD
Assistant Professor, Departments of Ophthalmology and Bioengineering
University of Pittsburgh

Session Chair: Anne Robertson, PhD
Professor, Departments of Mechanical Engineering and Materials Science
University of Pittsburgh

- ***Introduction*** (9:30-9:35 AM)
  Anne Robertson, PhD

- ***Use of Multiple Bioimaging Modalities for Understanding the Varied Mechanisms of Structural Remodeling In Cerebral Aneurysms*** (9:35-9:55 AM)
  Anne Robertson, PhD

- ***Brillouin Microscopy for Imaging Tissue Mechanical Properties*** (9:55-10:10 AM)
  Giuliano Scarcelli, PhD
  Assistant Professor, Department of Dermatology
  Massachusetts General Hospital
  Harvard Medical School

- ***Assessment of Cerebral Blood Flow and Cerebral Microcirculation after Experimental Pediatric Cardiac Arrest*** (10:10-10:40 AM)
  Mioara D. Manole, MD
  Assistant Professor of Pediatrics
  University of Pittsburgh
  Safar Center for Resuscitation Research

- ***Concurrent Mechanical and Structural Assessment of Tissue Constructs In Vivo by Non-Invasive Multi-Modality Imaging*** (10:40-10:55 AM)
  Kang Kim, PhD
  Assistant Professor, Department of Medicine and Bioengineering
  University of Pittsburgh

- ***Wrap-up*** (10:55-11 AM)
  Anne Robertson, PhD

11:00 **Break**

11:15 AM **Working Session 3**

Adipose-Derived Stem Cells and Pericytes Lecture Hall

Session Chairs: Kacey Marra, PhD
Associate Professor, Departments of Plastic Surgery and Bioengineering
University of Pittsburgh

Albert Donnenberg, PhD
Professor, Departments of Infectious Disease and Microbiology and Medicine
University of Pittsburgh

- ***The Surface Proteome of Progenitor Cells in the Adipose Stromal Vascular Fraction*** (11:15 AM-11:35 AM)
  Albert Donnenberg, PhD

- ***Peri-Adventitial Adipose is a Repository for Progenitor Cells in Human Adult Aorta*** (11:35 AM-11:55 AM)
  Julie Phillippi, PhD
  Assistant Professor, Department of Cardiothoracic Surgery
  University of Pittsburgh

- ***New Directions in the Use of Adipose-Derived Stem Cells for Cancer Detection and Prevention*** (11:55 AM-12:15 PM)
  Faina Linkov, PhD, MPH
  Associate Professor, Department of Obstetrics, Gynecology and Reproductive Sciences
  University of Pittsburgh

- ***Lymphatic Potential of Adipose-derived Stromal Vascular Fraction*** (12:15 PM-12:35 PM)
  Catherine Baty, DVM, PhD
  Research Assistant Professor, Departments of Medicine, Renal-Electrolyte Division
  University of Pittsburgh

- ***Open Discussion*** (12:35 PM-12:45 PM)

Working Session 4

Relaxin: Cardiovascular Effects and Therapeutic Potential

Grand Ballroom

Session Chairs: Guy Salama, PhD
Professor
Department of Medicine, Division of Cardiology
University of Pittsburgh

Sanjeev G. Shroff, PhD
Distinguished Professor and Gerald E. McGinnis Chair
Department of Bioengineering
University of Pittsburgh

- ***The Cardiovascular Hormone, Relaxin: A Long Journey from Pregnancy to Potential Therapeutics*** (11:15–11:35 AM)
  Kirk P. Conrad, MD
  Professor, Department of Physiology and Functional Genomics
  University of Florida

- ***Relaxin' with Idiopathic Pulmonary Fibrosis*** (11:35-11:55 AM)
  Daniel J. Kass, MD
  Assistant Professor, Department of Medicine
  Division of Pulmonary, Allergy and Critical Care Medicine
  University of Pittsburgh

- ***Therapeutic Potential of Relaxin in Left Ventricular Diastolic Dysfunction*** (11:55-12:15 PM)
  Sanjeev G. Shroff, PhD

- ***Relaxin: A Potential Therapy for Paroxysmal Atrial Fibrillation*** (12:15-12:35 PM)
  Guy Salama, PhD

- ***Open Discussion*** (12:35-12:45 PM)

12:45 PM **Buffet Lunch** Marquis Ballroom

2:00 PM **Working Session 5**

Aging & Regeneration Lecture Hall

Session Chairs: Johnny Huard, PhD
Henry J. Mankin Professor
Director, Stem Cell Research Center
Vice Chair for Musculoskeletal Cellular Therapeutics, Department of Orthopaedic Surgery,
Professor of Pediatrics, Microbiology & Molecular Genetics, Physical Medicine & Rehabilitation
UPMC Sports Medicine

Fabrisia Ambrosio, PhD, MPT
Assistant Professor, Department of Physical Medicine and Rehabilitation
University of Pittsburgh

- ***Development of Clinically Relevant Approaches to Extend Health Span*** (2-2:30 PM)
  Paul Robbins, PhD
  Professor, Department of Metabolism and Aging
  The Scripps Research Institute

- ***Adult Stem Cell Depletion During Aging and Disease: Implication for Stem Cell Therapy*** (2:30-3 PM)
  Johnny Huard, PhD

- ***The Aged Myomatrix is Inhibitory for Muscle Stem Cell Function*** (3-3:30 PM)
  Fabrisia Ambrosio, PhD, MPT

Working Session 6

Damage Associated Molecular Pattern Molecules and Regenerative Medicine Grand Ballroom

Session Chair: Michael T. Lotze, MD
Professor, Departments Surgery and Bioengineering
Vice Chair of Research-Department of Surgery
Assistant Vice Chancellor-Schools of the Health Sciences
University of Pittsburgh

- ***Dying Dangerously – Apoptosis, Necroptosis, Ferroptosis, and Necrosis*** (2-2:30 PM)
  Daolin Tang, MD, PhD
  Assistant Professor, Department of Surgery
  University of Pittsburgh

- ***Out of Synch – Mitochondrial/Nuclear Mismatch and Cancer: Models for Regeneration*** (2:30-3 PM)
  Michael T Lotze, MD

- ***Looking for Bioenergetics in All the Wee Places*** (3-3:30 PM)
  Sruti Shiva, PhD
  Associate Professor
  Department of Pharmacology and Chemical Biology
  University of Pittsburgh

4:00 PM **Poster Session and Networking Reception** Marquis Ballroom

6:00 PM **Dinner**

7:15 PM **Networking Session: Poster Area** Marquis Ballroom

Tuesday March 10:

7:00 AM **Breakfast** Marquis Ballroom

8:00 AM **Plenary Session** Lecture Hall

The Road to Technology Implementation including FDA Experiences

- ***Introduction of the Medical Product Development Lifecycle; the Pathway from Innovation to Application*** (10 minutes)
  Patsy Trisler, JD, RAC
  Principal Consultant - Medical Devices
  Trisler Consulting LLC

CASE STUDIES

Hemolung (10 minutes)
Jeremy Kimmel, PhD
ALung Technologies

Pathway
- McGowan developed technology;
- Licensed to ALung Technologies
- Product development by ALung Technologies
- Under contract-preclinical studies at McGowan
- CE Mark
- Now to the FDA

End Point:
- Commercial product for clinical use

General Principles and Surgical Mesh Materials (10 minutes)
Stephen Badylak, DVM, PhD, MD
Professor, Department of Surgery
Deputy Director, McGowan Institute for Regenerative Medicine
Director, Center for Pre-Clinical Tissue Engineering
University of Pittsburgh

Pathway
- McGowan developed technology (procedures-not products/devices)
- Sponsored by DOD
- Preclinical studies at McGowan
- IDE application to run pilot studies

End Point:
- Clinical procedures using FDA approved devices

Liver Perfusion (10 minutes)
Paulo Fontes, MD, FACS
Associate Professor, Department of Surgery
Director, Machine Perfusion Program
University of Pittsburgh Medical Center

Pathway
- McGowan developed technology (Marriage of machine and oxygen carrying solution)
- Preclinical studies at McGowan
- IDE application to run pilot studies

End Point:
- Clinical procedures using FDA approved devices

Wrap Up and Summary (10 minutes)
Patsy Trisler, JD, RAC

9:00 AM **Working Session 7**

Pediatric Device Initiative Lecture Hall

Session Chairs: William J. Federspiel, PhD
William Kepler Whiteford Professor, Departments of Bioengineering, Chemical Engineering and Critical Care Medicine
University of Pittsburgh

Peter Wearden, MD, PhD
Children's Hospital of Pittsburgh
University of Pittsburgh Medical Center
Assistant Professor, Departments of Cardiothoracic Surgery and Bioengineering
University of Pittsburgh

- ***Clinical Need for a Pediatric Initiative: What We Will Do*** (9-9:15 AM)
  Peter Wearden, MD, PhD

- ***Unique Challenges of Pediatric Device Development*** (9:15-9:30 AM)
  Robert Kroslowicz
  President and CEO
  Berlin Heart Inc.

- ***Bioabsorbable Metallic Devices for Pediatric Cardiovascular Applications*** (9:30-9:45 AM)
  William R Wagner, PhD

- ***Pediatric Paracorporeal Assist Lung (P-PAL)*** (9:45-10 AM)
  Linn Zhang
  Department of Bioengineering
  University of Pittsburgh

- ***Pediatric Esophageal Reconstruction*** (10-10:15 AM)
  Ricardo Londono
  Badylak Lab, Department of Pathology
  University of Pittsburgh

Working Session 8

CNS

Grand Ballroom

Session Chair: Michel Modo, PhD
Associate Professor, Department of Radiology
University of Pittsburgh

- ***Towards In Situ Tissue Reconstruction After a Stroke*** (9-9:30 AM)
  Michel Modo, PhD

- ***MR Imaging in Regenerative Medicine*** (9:30-10 AM)
  Jeff Bulte, PhD
  Director of Cellular Imaging, Institute for Cell Engineering
  Professor, Departments of Radiology, Biomedical Engineering, and Chemical and Biomolecular Engineering
  Johns Hopkins University

- ***Taking the CTX Human Neural Stem Cell Product to Clinical Trials in Disabled Stroke Patients*** (10-10:30 AM)
  John Sinden, PhD
  Chief Scientific Officer
  ReNeuron, Inc.

Breakout Session

Special Idea Generation Mini-Workshop: Nemacolin 1 & 6
"Military Interests - Human Performance Optimization"

Workshop Organizer: Ron Poropatich, MD
Executive Director, Center for Military Medicine Research
Professor, Department of Medicine, Division of
Pulmonary, Allergy and Critical Care Medicine

Outline: Human Performance Optimization (HPO) in general describes a combination of techniques and technologies that can optimize each person's performance in order to successfully accomplish their mission. A new construct to expand this definition beyond products developed for a non-injured person and also apply medical research technologies developed for injured or ill patients into a comprehensive program that maximizes human performance will be discussed.

A multi-disciplinary and innovative scientific team is needed to translate discoveries that more broadly improves overall human performance. Examples of this approach include:

- Improvement of warfighter thermogenic adaptability to cold weather with injection of brown fat progenitor cells,
- Use of engineered anti-microbial peptides to counter weapons of mass destruction, and
- Using human systems engineering approaches to accelerate discovery of novel solutions for better human optimization for both the individual and the platform/environment that humans rely on.

This workshop will introduce an approach to leverage research and technology programs at Pitt for injured and non-injured people, and identify opportunities to assimilate potential contributors into a university wide program.

10:30 AM **Break**

10:45 AM **Working Session 9**

Reconstructive Transplantation-At the Crossroads Lecture Hall
Session Chair: Vijay Gorantla, MD, PhD
Associate Professor, Departments of Surgery and Plastic Surgery
Administrative Medical Director of the
UPMC Reconstructive Transplant Program
University of Pittsburgh

- ***Reconstructive Transplantation - New Paradigms for Care in the Military*** (10:45-11:05 AM)
  Michael Davis, MD
  Deputy Commander, US Army Institute of Surgical Research

- ***Regenerative Medicine and Tissue Engineering in Reconstructive Surgery- Indications and Applications*** (11:05-11:20 AM)
  Mario Solari, MD
  Assistant Professor, Department of Plastic Surgery
  University of Pittsburgh

- ***Reconstructive Transplantation - Innovations, Advancements and the Future*** (11:20-11:35 AM)
  Vijay Gorantla, MD, PhD

- ***Challenges and Opportunities in Limb Transplantation*** (11:35 AM- 12:05 PM)
  Warren Breidenbach III, MD, MSc
  Chief, Division of Reconstructive and Plastic Surgery
  Professor, Department of Surgery
  University of Arizona

- ***Open Discussion*** (12:05-12:15 PM)

Working Session 10

Craniofacial Regeneration Grand Ballroom

Session Chair: Charles Sfeir, DDS, PhD
Associate Dean of Research
University of Pittsburgh School of Dental Medicine
Associate Professor
Clinical and Translational Science Institute
Associate Professor
School of Dental Medicine and the School of Engineering
Founding Director, Center for Craniofacial Regeneration

- ***DOD Priorities and Opportunities for Regenerative and Rehabilitative Technologies*** (10:45-11:05 AM)
  Brian Pfister, PhD, MBA
  Strategic Portfolio Manager for Regenerative Medicine Clinical and Rehabilitative Medicine Research Program (CRMRP)
  US Army Medical Research and Materiel Command (USAMRMC)

- ***A Regenerative Medicine Approach to Reconstruction of the Temporomandibular Joint Disk*** (11:05-11:25 AM)
  Bryan Brown, PhD
  Research Assistant Professor, Department of Bioengineering
  University of Pittsburgh

- ***Do We Need Growth Factors to Regenerate Bone?*** (11:25-11:45 AM)
  Charles Sfeir, DDS, PhD

- ***Gaps in Craniofacial Soft Tissue Reconstruction*** (11:45-12:05 AM)
  Rodney Chan, MD
  Chief of Plastic and Reconstructive Surgery
  Clinical Division/Burn Center
  United States Army Institute of Surgical Research
  San Antonio Military Medical Center

12:15 PM **Lunch** Marquis Ballroom

- Poster Awards: Andrew Duncan, PhD
  Assistant Professor, Department of Pathology and Bioengineering
  University of Pittsburgh

- CATER Poster Awards: William Wagner, PhD
  Professor, Departments of Surgery, Bioengineering and Chemical Engineering
  Director, McGowan Institute for Regenerative Medicine

- Elevator Pitch Awards: Paul J. Petrovich, CPA
  University of Pittsburgh Innovation Institute
  Office of Enterprise Development

1:15 PM **Working Session 11**

Lab on a Chip Lecture Hall

Session Chairs: Andrew Duncan, PhD
Assistant Professor, Department of Pathology and Bioengineering
University of Pittsburgh

Julie Phillippi, PhD
Assistant Professor, Departments of Cardiothoracic Surgery and Bioengineering
University of Pittsburgh

- ***Human Microphysiology Platform for Liver Efficacy and Safety Testing and Linkage to other Organ Systems*** (1:15-1:41 PM)
  Lans Taylor, PhD
  Allegheny Foundation Professor of Computational and Systems Biology
  Director of the University of Pittsburgh Drug Discovery Institute
  University of Pittsburgh

- ***Systems Analysis of Human Pluripotent Stem Cells Self-Renewal and Differentiation*** (1:41-2:07 PM)
  Ipsita Banerjee, PhD
  Assistant Professor, Department of Chemical and Petroleum Engineering
  University of Pittsburgh

- ***An All Human Microphysiologic Skin System for Melanoma Progression*** (2:07-2:33 PM)
  Alan Wells, MD, DMS
  Thomas J. Gill III Professor of Pathology
  Vice-Chairman of the Department of Pathology
  University of Pittsburgh

- ***Microphysiological and Organotypic Systems to Model Skeletal Tissues: Technologies and Platforms*** (2:33-3:00 PM)
  Rocky Tuan, PhD
  Arthur J. Rooney, Sr. Chair Professor in Sports Medicine, Department of Orthopaedic Surgery
  Professor and Executive Vice Chairman for Orthopaedic Research
  Director, Center for Cellular and Molecular Engineering
  Director, Center for Military Medicine Research
  Associate Director, McGowan Institute for Regenerative Medicine
  University of Pittsburgh

Working Session 12

A New Generation for Regeneration of the Eye Grand Ballroom

The speakers represent newer members of the Pittsburgh research community whose work is focused on ocular regeneration

Session Chair: James Funderburgh, PhD
Professor, Department of Ophthalmology
Associate Director, Louis J. Fox Center for Vision Restoration

- ***Progress Toward a Whole Eye Transplant*** (1:15-1:35 PM)
  Kia Washington, MD
  Assistant Professor, Department of Plastic Surgery
  University of Pittsburgh

- ***Mitochondrial Dynamics Regulate Retinal Ganglion Cell Axon Regeneration*** (1:35-1:55 PM)
  Michael Steketee, PhD
  Assistant Professor, Department of Ophthalmology
  University of Pittsburgh

- ***Relationship Between Visual Functional Connectivity and Duration of Blindness Depends on Onset of Visual Deprivation*** (1:55-2:15 PM)
  Matthew Murphy, PhD
  OTERO Postdoctoral Fellow
  Fox Center for Vision Restoration

- ***Scaffold-Free Engineering of Corneal Stromal Lamellar Tissue*** (2:15-2:35 PM)
  Fatima Syed-Picard, PhD
  Postdoctoral Associate, Department of Ophthalmology
  University of Pittsburgh

- ***Preclinical Testing of a Novel Controlled Release Formulation for Glaucoma*** (2:35-2:55 PM)
  Morgan Fedorchak, PhD
  Research Assistant Professor, Departments of Chemical Engineering and Ophthalmology
  University of Pittsburgh

3:00 PM **Wrap-up and Depart**