University at Buffalo
The State University of New York

5th Annual

Stem Cells in Regenerative Medicine Symposium

(SCiRM)

PRESENTED BY:
THE SCIRM TRAINING PROGRAM

NYSTEM NEW YORK STATE STEM CELL SCIENCE

Hosted by:
New York State Stem Cell Science

University at Buffalo

CONTENTS

FROM THE DIRECTOR

Welcome! This is the fifth (and final) symposium for the Stem Cells in Regenerative Medicine (SCiRM) Training Program. The program was launched in Fall of 2016 with funding from the New York State Stem Cell Science Board (NYSTEM). The UB School of Engineering and Applied Sciences, the UB Jacobs School of Medicine and Biomedical Sciences, and Roswell Park Comprehensive Cancer Center Graduate Division joined forces to develop an interdisciplinary program. The aim was to foster stem cell science and engineering, accelerate clinical translation of our research, and to train the future leaders in stem cell science and engineering.

Much has been accomplished in the past four and a half years- the SCiRM program has trained 18 graduate students and produced 71 publications in the area of stem cell science and engineering, from embryonic and induced pluripotent to neural and cardiac stem cells. Our faculty and fellows are involved in research with various types of stem cells including embryonic and induced pluripotent stem cells, as well as adult stem cells.

Our faculty are involved in research with various types of stem cells including embryonic and induced pluripotent stem cells, as well as adult stem cells (mesenchymal, cardiac, skeletal, hematopoietic, neural and neural crest stem cells). Our research ranges from basic aspects of stem cell maintenance and differentiation to translational work aimed at using stem cells for treatment of cardiovascular, neurologic, or metabolic disorders. SCiRM fellows are co-advised by faculty from Medicine and Engineering, thereby promoting multidisciplinary collaborations and interdisciplinary approaches to research and education.

This rich, interdisciplinary environment fostered integration of scientific discoveries and engineering breakthroughs by our faculty and students. Many of our graduates have continued their research at positions with renowned medical schools offering MD/PhD degrees. Others have joined leading stem cell laboratories as post-doctoral fellows. Still others continue with biotechnology and pharmaceutical industries in New York State and around the country.

We are looking forward to an outstanding virtual symposium as several leading researchers as well as SCiRM and other UB/RPCCC students will be presenting exciting work on stem cell biology and bioengineering. I look forward to seeing you at our event.

Stelios T. Andreadis
SCiRM Director

Stem Cell in Regenerative Medicine Faculty

Stelios Andreadis, SUNY Distinguished Professor, Chemical and Biological Engineering, UB and SCiRM Director

Ph.D., University of Michigan Chemical Engineering

Research Interests: Stem cells for vascular, skeletal and gland tissue engineering; signaling pathways in stem cell aging, cell-cell adhesion and wound healing; lentiviral reporters and CRISPR libraries for high- throughput gene expression analysis and gene discovery

John Canty Jr., SUNY Distinguished Professor and Chief, Division of Cardiovascular Medicine UB

MD., University at Buffalo

Research Interests: Apoptosis and cell death; Cardiac pharmacology; Cardiology; Cardiovascular Disease; Gene therapy; Genomics and proteomics; Molecular Basis of Disease; Stem Cells

Thomas Cimato, Associate Professor, Medicine, UB

MD Ph.D., University at Buffalo

Research Interests: Cardiology; Critical Care Medicine

Jian Feng, Professor, Physiology and Biophysics, UB

Ph.D., University of Tennessee

Research Interests: Apoptosis and cell death; Cytoskeleton and cell motility; Gene Expression; Molecular and Cellular Biology; Molecular genetics; Neurobiology; Neurodegenerative disorders; Neurology; Pathophysiology; Protein Folding; Signal Transduction; Toxicology and Xenobiotics; Transcription and Translation

Stem Cell in Regenerative Medicine Faculty

David Goodrich, Professor Oncology, Roswell Park Comprehensive cancer Center
Ph.D., University of California, Berkeley

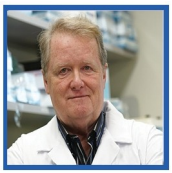
Research Interests: Understanding molecular mechanisms underlying tumor suppression mediated by the RB1 and TP53 genes. Identifying genes involved in prostate cancer metastasis. Discerning how transcriptionally formed R-loops contribute to cancer initiation and progression.

Gen Suzuki, Associate Professor, Medicine, UB
M.D., Ph.D., Akita University School of Medicine

Research Interests: Apoptosis and cell death; Cardiology; Cardiovascular Disease; Cell Cycle; Cell growth, differentiation and development; Gene therapy; Internal Medicine; Stem Cells

Richard Gronostajski, Professor Biochemistry; Director, Genetics, Genomics & Bioinformatics Program, Director, Western NY Stem Culture & Analysis Center (WNYSTEM)
Ph.D., Harvard University

Research Interests: Bioinformatics; Cell growth, differentiation and development; Gene Expression; Genomics and proteomics; Molecular and Cellular Biology; Molecular Basis of Disease; Molecular genetics; Neurobiology; Stem Cells; Transgenic organisms



Michael Higgins, Associate Professor, Molecular & Cellular Biology, Roswell Park Comprehensive Cancer Center
Ph.D., Queen's University

Research Interests: Molecular genetics of Beckwith-Wiedemann syndrome (BWS); epigenetic imprinting and cancer.

Stem Cell in Regenerative Medicine Faculty

Jonathan Lovell, Assistant Professor, Biomedical Engineering, UB
Ph.D., University of Toronto

Research Interests: Nanomedicine and Phototherapy

Sriram Neelamegham, Professor, Chemical & Biological, Biomedical Engineering, UB
Ph.D., Rice University

Research Interests: Biomedical Engineering; cell biomechanics; vascular engineering

Michael Nemeth, Assistant Member, Medicine, Roswell Park Comprehensive Cancer Center *Ph.D., Dartmouth College*

Research Interests: Identifying the mechanisms that regulate the development and maintenance of adult stem cells. Developing therapeutic strategies that can target the cancer stem cell population.

Natesh Parashurama, Assistant Professor, Chemical & Biological Engineering, UB
MD, Ph.D., Rutgers University

Research Interests: Liver stem cell biology; differentiation; cell therapy; organogenesis; disease modeling; tissue engineering; multimodality molecular imaging; monitoring molecular events in living subjects

Stem Cell in Regenerative Medicine Faculty

Fraser Sim, Associate Professor, Pharmacology & Toxicology, UB
Ph.D., University of Cambridge

Research Interests: Genomics and proteomics; Neurobiology; Neurodegenerative disorders

Satrajit Sinha, Associate Professor, Biochemistry, UB
Ph.D., University of Texas Health Science Center

Research Interests: Gene Expression; Genomics and proteomics; Molecular and Cellular Biology

AGENDA

Friday, May 21st

8:45 a.m.	Welcome | Opening Remarks Dr. Stelios Andreadis, SCiRM Director and SUNY Distinguished Professor, University at Buffalo
9:00 - 9:45 a.m.	Janet Rossant, PhD, University of Toronto "Stem Cells, Embryos, and Embryo Models"
9:55 - 10:25 a.m.	Celeste Nelson, PhD, Princeton University "Uncoupling Tissue Morphogenesis and Differentiation"
10:35 - 11:10 a.m.	In-Hyun Park, PhD, Yale University "Integrated Brain Organoids to Study Neurodevelopmental Disorders"
11:20 - 11:50 a.m.	Marcos Simoes-Costa, PhD, Cornell University "Signals and Circuits Controlling Neural Crest Positivity"
11:50 a.m.- 12:30 p.m.	**BREAK**
12:30 p.m. - 2:00 p.m.	Poster Competition
2:00 p.m. – 2:45 p.m.	Deepak Srivastava, MD, PhD, Gladstone Institute (UC-SF) "Cellular Reprogramming Approaches for Human Disease"
2:55 p.m. – 3:25	Todd McDevitt, PhD, Gladstone Institute (UC-SF) "Engineering the Morphogenesis of Human Pluripotent Stem Cells for Organoid Development"
3:30 p.m. – 4:00 p.m.	Yibing Qyang, PhD, Yale University "Human Tissue-Engineered Vascular Grafts Using Induced Pluripotent Stem Cells"
4:05 p.m. – 4:35 p.m.	Tudorita Tumbar, PhD, Cornell University "Defining the Heterogeneity of Epidermal Lineages in Adult Skin"
4:35 p.m. – 5:00 p.m.	Poster Winners Announced Closing Remarks

DISTINGUISHED SPEAKERS

Janet Rossant, PhD

Professor, Departments of Molecular Genetics and Obstetrics/Gynaecology and Paediatrics, University of Toronto

Janet Rossant, CC, FRS, FRSC is a graduate of Oxford University (BA) and Darwin College, Cambridge University (PhD). She joined the University of Toronto after working at the Lunenfeld-Tanenbaum Research Institute. She is a developmental biologist well known for her contributions to the understanding of the role of genes in embryo development. She is a world-renowned leader in developmental biology. Her major findings are related to the question of how genetically identical cells adopt distinct characteristics during embryo development. Her current research interests focus on stem cells, molecular genetics, and developmental biology.

Celeste Nelson, PhD

Professor, Department of Chemical and Biological Engineering, Director of the Program in Engineering Biology, Princeton University.

Celeste Nelson received her undergraduate degree at the Massachusetts Institute of Technology. She was a postdoctoral research fellow at the Lawrence Berkeley National Laboratory. Nelson joined Princeton University in 2007. Her research considers how cells within tissues integrate complicated biological systems spatially and dynamically. At Princeton Nelson leads the Tissue Morphodynamic Laboratory, which combines engineering, cell biology and developmental biology.

In-Hyun Park, PhD

Professor, Department of Genetics, Yale Stem Cell Center, Yale School of Medicine, Yale University

In-Hyun Park received his Ph.D. from the University of Illinois at Urbana-Champaign, where he studied mTOR pathways regulating cell growth and myogenic differentiation. He continued his research as a postdoctoral fellow, where he isolated one of the first human induced pluripotent stem cells (iPSCs) and investigated epigenetic changes during reprogramming process. Park investigates human neurodevelopment and related disorders using human iPSCs and develops *in vitro* brain developmental model systems.

Marcos Simoes-Costa, PhD

Professor, Department of Molecular Biology and Genetics, Cornell University

Marcos Simoes-Costa received his PhD from the University of Sao Paulo and is currently focused on research in cell differentiation, developmental biology, gene regulation, gene regulatory networks, and neural crest biology. His research group focuses on how transcription factors and signaling systems are organized into regulatory circuits that drive multipotent progenitors into adopting a specific cell fate. He is a recent recipient of the Basil O'Connor Starter Scholar Award.

Deepak Srivastava, MD, PhD

Professor, Gladstone Institute of Cardiovascular Disease, Departments of Pediatrics and Biochemistry and Biophysics, University of San Francisco

Dr. Srivastava completed his medical training at the University of Texas Medical Branch in Galveston and his residency in the Department of Pediatrics at UCSF. His laboratory focuses on the gene networks that guide the development of the heart, seeking to understand how aberrations in these pathways can cause congenital heart disease, and how this knowledge can help generate new cardiac cells to repair heart damage. Srivastava served as president of the International Society for Stem Cell Research and is on the editorial boards of the journals *Cell* and *Cell Stem Cell*. In addition, Srivastava has co-founded two biotechnology companies, iPierian Inc. and Tenaya Therapeutics and chaired their scientific advisory boards.

Todd McDevitt, PhD

Professor, Gladstone Institute of Cardiovascular Disease, Department of Bioengineering and Therapeutic Sciences, University of San Francisco.

Dr. McDevitt received his PhD at the University of Washington. He was previously the founding Director of the Stem Cell Engineering Center at Georgia Tech. Dr. He has focused primarily on stem cell biology and engineering. One of the primary objectives of Dr. McDevitt's research is to engineer tissues, largely from stem cell sources, for regenerative medicine and in vitro diagnostic applications. Much of the research focuses on the application of microtechnologies to engineer 3D environments to more effectively control multicellular organization.

Yibing Qyang, PhD

Professor, Yale Cardiovascular Research Institute, Department of Internal Medicine, Yale University.

Dr. Qyang received his PhD from the University at Texas M.D. Anderson Cancer Center. He has been studying the renewal and differentiation of cardiovascular progenitor cells, marked by Isl1, a LIM-Homeodomain transcription factor, as well as cardiovascular disease mechanisms using human stem cell and animal models. He has been the Director of the Yale Stem Cell Research Forum since 2010.

Tudorita Tumbar, PhD

Professor, Department of Molecular Biology and Genetics, Cornell University

Dr. Tumbar received her PhD in Cell Biology at University of Illinois at Urbana-Champaign. Her post-doctoral training with Elaine Fuchs began at University of Chicago and continued at Rockefeller University. She is now leading her own research group in the Department of Molecular Biology and Genetics at Cornell University working on molecular mechanisms controlling cell fate of hair follicle stem cells.

SPEAKER ABSTRACTS

Stem Cells, Embryos, and Embryo Models

Janet Rossant, Ph.D.
Hospital for Sick Children
The Gairdner Foundation
University of Toronto

I will explain the molecular pathways underlying the transition from totipotency to pluripotency during mouse embryo development and related this to the properties of the stem cell lines that derived from the blastocyst. These cell lines have recently been used to make stem cell-derived embryo models in the mouse and in the human. It is becoming clear that mouse and human embryo and stem cell development show important differences that need to be understood if stem cell-based embryo models are to be used more routinely to model human development.

Uncoupling Tissue Morphogenesis and Differentiation

Celeste Nelson, PhD
Department of Chemical and
Biological Engineering
Director of the Program in
Engineering Biology
Princeton University

Organogenesis and organ regeneration require both (re)creation of tissue form, a process known as morphogenesis, as well as specification of cell fate, a process known as differentiation. We have developed microfluidic approaches to investigate the mechanical forces and downstream signaling pathways responsible for generating the airways and differentiated cell types of the lung. I will discuss how we combine these experimental techniques with computational models to uncover how physical forces drive lung development, with a specific focus on determining which comes first: tissue form or specification of cell fate. I will also describe efforts to uncover and actuate the different physical mechanisms used to build the airways in lungs from birds, mammals, and reptiles.

Integrated Brain Organoids to Study Neurodevelopmental Disorders

In-Hyun Park, PhD
Department of Genetics, Yale Stem Cell Center
Yale School of Medicine, Yale University

Human brain organoid techniques have rapidly advanced to facilitate investigating human brain development and diseases. Since the first report, a number of protocols were reported to produce brain organoids, raising a question whether the brain organoids from different protocols are similar or different. We accrued the scRNA-seq data from the published works, and performed a comparative analysis. We found that regardless of methods, brain organoids produce similar types of cells that are produced in primary brain. We also applied the brain organoids tools to investigate human brain developmental disorders, called Rett syndrome (RTT) that are caused by mutations in MeCP2. We derived hESC lines with mutations in MeCP2 by CRISPR-editing, and applied the genomics tools to neurons and brain organoids derived from the MeCP2 mutant cells. We found that MeCP2 mutations caused the neural dysfunction by the abnormal transcription regulation, and that BET inhibitor JQ1 rescued the phenotypes of MeCP2 null neurons and animal. Overall, our studies demonstrated that brain organoids are important tools that can be readily used to study human brain development and diseases.

Signals and Circuits Controlling Neural Crest Plasticity

Marcos Simoes-Costa, PhD
Department of Molecular Biology and Genetics
Cornell University

My research group studies the biology of the neural crest, a stem cell population that plays a crucial role in the genesis of the vertebrate body plan. Neural crest cells emerge from the central nervous system to give rise to intricate structures like the craniofacial skeleton and the peripheral ganglia. They have served as an essential developmental model system, owing to their motility and ability to form a broad array of cell types. In my laboratory, we study neural crest formation and differentiation to identify common principles in cell state transitions. We want to understand how genetic networks operate in space to generate tissues and organs. What are the gene circuits that control neural crest differentiation into distinct cell types? What are the molecular programs that endow these cells with their remarkable plasticity? How are these mechanisms disrupted or erroneously deployed in the context of disease? We employ a developmental genomics platform in avian and mouse embryos and human embryonic stem cells to address these and many other questions. We approach the neural crest as a system for integrative biology, surveying how multiple layers of regulation work together to control cell identity and behavior.

Cellular Reprogramming Approaches for Human Disease

Deepak Srivastava, MD, PhD
The Gladstone Institute
University of California, San Francisco

Heart disease is a leading cause of death in adults and children. We, and others, have described complex signaling, transcriptional and translational networks that guide early differentiation of cardiac progenitors and later morphogenetic events during cardiogenesis. By leveraging these networks, we have reprogrammed disease-specific human cells in order to model genetically defined human heart disease in patients carrying mutations in cardiac developmental genes. These studies revealed mechanisms of haploinsufficiency and have led to new therapeutic approaches, and we demonstrated the contribution of genetic variants inherited in an oligogenic fashion in congenital heart disease. We also utilized a combination of major cardiac developmental regulatory factors to induce direct reprogramming of resident cardiac fibroblasts into cardiomyocyte-like cells with global gene expression and electrical activity similar to cardiomyocytes, and have revealed the epigenetic mechanisms underlying the cell fate switch. Knowledge regarding the early steps of cardiac differentiation in vivo has led to effective strategies to generate necessary cardiac cell types for disease-modeling and regenerative approaches, and may lead to new strategies for human heart disease.

Objectives:

1. Understand molecular bases for some human heart disorders.

2. Understand how cellular reprogramming can be used for regenerative medicine.

3. Understand novel ways to screen for therapeutics using gene networks.

Engineering the Morphogenesis of Human Pluripotent Stem Cells for Organoid Development

Todd McDevitt, PhD
The Gladstone Institute
University of California, San Francisco

Pluripotent stem cells (PSCs) are a robust source for organoid models due to their innate ability to differentiate into all cell types while also executing dynamic morphogenic programs that can yield complex multicellular constructs that recapitulate features of primitive tissues. However, the widespread adoption and further development of human organoids is often limited by the inability to consistently and robustly control the intrinsic mechanisms that dictate PSC fate and multicellular organization. Our group is focused on studying and exploiting endogenous mechanisms of human PSC morphogenesis in order to understand the governing principles that dictate organoid development. In this talk, I will focus on our work examining basic mechanisms of symmetry breaking events in human PSCs that dictate the early divergence of cell fate decisions and how such principles can be applied to create new organoid models of human development, such as the axial elongation of the primitive neural tube.

Human Tissue-Engineered Vascular Grafts Using Induced Pluripotent Stem Cells

Yibing Qyang, PhD
Yale Cardiovascular Research Institute
Department of Internal Medicine
Yale University

Mechanically robust vascular grafts are in urgent clinical demand for treating cardiovascular diseases or providing hemodialysis access. Vascular smooth muscle cells (VSMCs) can be derived in large numbers from human induced pluripotent stem cells (hiPSCs) for producing tissue-engineered vascular grafts (TEVGs). We will discuss the generation of hiPSC-derived TEVGs with mechanical strength comparable to native vessels used in arterial bypass grafts by utilizing biodegradable scaffolds, incremental pulsatile stretching, and optimal culture conditions. Following implantation into a rat aortic model, hiPSC-TEVGs show excellent patency without luminal dilation and effectively maintain mechanical and contractile function. To develop readily available vascular grafts, we have decellularized hiPSC-TEVGs based on an efficient decellularization approach. We have also successfully endothelialized decellularized hiPSC-TEVGs with hiPSC-derived ECs (hiPSC-ECs) under shear stress in a flow bioreactor. Immunologically "universal" hiPSCs will be discussed in order to make hiPSC-TEVG readily available for vascular treatment. Finally, the progress on exploring TEVGs as a potential treatment for single ventricle congenital heart defects will be shared. These studies may provide a foundation for future production of non-immunogenic hiPSC-TEVGs for treating cardiovascular diseases.

Defining the Heterogeneity of Epidermal Lineages in Adult Skin

Tudorita Tumbar, PhD
Department of Molecular Biology and Genetics
Cornell University of California

Despite the crucial importance of the inter-follicular epidermis (IFE) for the essential body barrier function, the stem cell identity and the lineage hierarchy in this critical tissue are still under debate. The current prevailing model of lineage hierarchy is that of a single population of progenitors residing in the basal layer of the IFE. Previously, we identified two Cre-ER marked IFE basal populations residing in distinct epidermal territories, which correspond to scales and inter-scales in mouse tail but are also present in other skin regions. These epidermal territories regenerate at different rates and are molecularly distinct. This suggested that the IFE might be heterogeneous, containing more than a single progenitor population. We have performed lineage tracing and clonal analysis of our CreER marked IFE populations and demonstrated distinct population behavior both during homeostasis and injury repair. We also identified a third novel population of basal cells that is abundant, undergoes primarily asymmetric cell fates, expands rapidly early on, and does not self-renew in the long term. This qualifies our new population as the missing transit amplifying cell of the epidermis, while the Dlx1-CreER cells behave as stem cell types, undergoing long-term self-renewal via a neutral drift mechanism. Although we cannot infer a direct relationship between our different CreER marked IFE populations , our model clearly refutes a single population model and provides evidence for functional heterogeneity in the epidermis. Furthermore, single cell transcriptome data from our laboratory and from others demonstrated multiple cell clusters found within the basal layer of epidermis in both mouse and human skin. The epidermis is emerging as a complex tissue with unprecedented levels of cellular, functional, and territorial heterogeneity.

POSTERS

1. Developing a Better Model for MS: Delayed Oligodendroglia Recruitment and Maturation in Large Volume Demyelination of the Rabbit CNS

James Cooper[1], Jessie Polanco[2], Darpan Saraswat[1], Jennifer Peirick[3], Fraser Sim[1,2],
[1] Department of Pharmacology and Toxicology, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York
[2] Neuroscience Program, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York
[3] Laboratory Animal Facility, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York 14260

2. Hydrogel Assisted Cell Therapy Approach to Treat the Demyelinating Diseases

Ashis Kumar Podder[1], Mohamed Alaa Mohamed[1], Georgios Tseropoulos [1], Stelios Andreadis[1]
[1]Department of Chemical and Biological Engineering, University at Buffalo, Buffalo, New York 14260

3. Wnt/BMP signaling axis regulates multipotency of Neural Crest Stem Cells via metabolic and epigenetic rewiring

Pihu Mehrotra[1], Stelios Andreadis [1]
[1]Chemical and Biological Engineering, University at Buffalo, Buffalo, NY 14260, USA

4. Determining the Cellular Sources of Acetylcholine following Demyelination

Roopa Ravichandar[3], Jessie Polanco[3], Darpan Saraswat[2], Jacqueline Broome[2], Jennifer K. Lang[1], Fraser J. Sim[2,3]
[1] Department of Medicine, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York 14260
[2] Department of Pharmacology and Toxicology, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, New York 14260
[3] Program in Neuroscience, University at Buffalo, New York 14263

5. Regulation of human oligodendrocyte progenitor cell fate by oscillatory store-operated calcium signaling

Richard Seidman[1], Darpan Saraswat[2], Heba Khattab[2], Jessie Polanco[1], Jacqueline Broome[2]
Melanie O'Bara[2], Fraser J. Sim[1,2]
[1]Neuroscience Program, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York 14260
[2]Department of Pharmacology and Toxicology, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York 14260

6. Immobilized NRG-Fc enhances differentiation of human Epidermal Neural Crest to Schwann Cells and promotes Radial Sorting

Georgios Tseropoulos[1], Emma Wilson[2], Julien Kann[3], Laura MFeltri[2]Andreadis[1,3]
[1]Department of Chemical and Biological Engineering, University at Buffalo, Buffalo, New York 14260
[2]Hunter James Kelly Research Institute, Departments of Biochemistry and Neurology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo
[3] Center of Excellence in Bioinformatics and Life Sciences, Buffalo, NY 14263

7. Age-related neurodegeneration and cognitive impairments of NRMT1 knockout mice are preceded by misregulation of RB and abnormal stem cell development

James Catlin[1], Leandro N. Marziali[2], Benjamin Rein[3], Zhen Yan[3], M. Laura Feltri[2], Christine E. Schaner Tooley[1]
[1] Department of Biochemistry, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, Buffalo, New York 14260
[2]Hunter James Kelly Research Institute, Departments of Biochemistry and Neurology, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo,

8. Mitochondrial Mechanism underlying NANOG induced reversal of Aging

Debanik Choudhury[1], Na Rong Nika Rajabian[1], Izuagie Ikhapoh[1], GeorgiosTseropoulos[1],Aref Shanini[1], Ramkumar Thiyagarajan[4], Kenneth Seldeen[4], Bruce Troen[4], Stylianos Andreadis[1,2,3]
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[3] Center of Excellence in Bioinformatics and Life Sciences, University at Buffalo, Buffalo, New York 14260

[4] Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

9. Specific Exosomal miRNA are Necessary for Therapeutic Benefit of Cardiosphere-Derived Cells (CDCs)

Lindsey M. Euscher[1], Kyle I. Mentkowski[1,3], Lisa A. Eagler[1], Jennifer K. Lang[1,2,3]

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[2] Department of Pharmacology and Toxicology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

[3] Department of Biomedical Engineering, University at Buffalo, Buffalo, New York

10. CDC-derived extracellular vesicles dampen the pro-inflammatory monocyte response through repression of C-C chemokine receptor type 2 (CCR2)

Kyle I. Mentkowski [1,2], Rohan Pandey[2], Lisa Eagler[2], Jessica Reynolds[1], Jennifer K. Lang[1,2,3]

[1]Department of Biomedical Engineering, School of Engineering and Applied Sciences, University at Buffalo, Buffalo, New York 14260

[2] Department of Medicine, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, New York 14260

[3] Veterans Affairs, Buffalo, New York

11. Neutrophils aid Cellular therapeutics by enhancing glycoengineered stem cell recruitment and retention at sites of inflammation

Arezoo Momeni[1,2], Lisa Eagler[1,3], Chi Y. Lo[1,2], Brian Weil[1,4], John M. Canty Jr. [1,3,4,6], Jennifer K. Lang[1,3,4,5,6], Sriram Neelamegham,[1,2,5,6]

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[2]Department of Chemical and Biological Engineering, University at Buffalo, Buffalo, NY

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[4]Department of Physiology and Biophysics, University at Buffalo
[5]Department of Biomedical Engineering, University at Buffalo
[6]Department of Medicine, Jacobs School of Medicine & Biomedical Sciences, University at Buffalo
[7]Department of Pharmacology and Toxicology, University at Buffalo, Buffalo, New York

12. Metabolic Rewiring of Aged Myoblasts and Restores RegenerativePotential of Progeric Skeletal Muscle

Nika Rajabian[1], Izuagie Ikhapoh[1], Aref Shahini[1], Ramakumar Thiyagarajan[2], Aimee Stablewski[3], Kenneth Seldeen[2], Bruce R. Troen[2], Stelios T. Andreadis[1,4,5]

[1]Department of Chemical and Biological Engineering, University at Buffalo, The State University of New York
[2] Division of Geriatrics and Palliative Medicine, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo and Research Service, Veterans Affairs Western New York Healthcare System, Buffalo, NY.
[3] Gene Targeting and Transgenic Shared Resource, Roswell Park Cancer Institute
[4] Department of Biomedical Engineering, University at Buffalo, NY
[5] Center of Excellence in Bioinformatics and Life Sciences, Buffalo, NY

13. Novel Mediators of the p63-driven Oncogenic Processes in Squamous Cell Carcinoma

Alexandra Glathar[1], Akinsola Oyelakin[2], Christian Gluck[1] , Satrajit Sinha[1]

[1]Department of Biochemistry, University at Buffalo, Buffalo, New York
[2] Department of Oral Biology, University at Buffalo, Buffalo, New York

14. A Proteomics screen of Huntingtin (HTT) and its interactome in the context of Huntington's disease (HD) patients compared to normal individuals: Isolating HTT-Rab-mediated axonal transport defects in HD

Thomas Krzystek[1], Shermali Gunawardena[1]

[1]Department of Biological Sciences, University at Buffalo, Buffalo, New York

15. Novel Role of Cadherin-11 in breast cancer metastasis via cross-talking with Wnt-pathway

Yayu Liu[1], Anagha M Kashyap[1], Theodore Groth[2], Pedro Lei[2], Ronel Z Samuel[2], Stelios Andreadis[2]
[1] Department of Biomedical Engineering, University at Buffalo, Buffalo NY.
[2] Department of Chemical and Biological Engineering, University at Buffalo

16. Restoring Collagen Synthesis by NANOG Through Enhanced Mitochondria Function in Senescent Stem Cells

Na Rong[1], Debanik Choudhury[1], Nika Rajabian[1], Panagiotis Mistriotis[1], Georgios Tseropoulos[1], Xiaoyan Wang[1], Stelios Andreadis[1]

[1]Department of Chemical and Biological Engineering, University at Buffalo, Buffalo, New York

17.The building of the salivary gland: Using Human IPSC as the source

Ronel Samuel[1], Olga J. Baker[2], Stelios Andreadis[1]

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ACKNOWLEDGMENTS

We gratefully acknowledge generous funding for The Stem Cells in Regenerative Medicine (SCiRM) Training Program from NYSTEM.