

Sunday, May 2	
5:30PM-6:30PM	Welcome Reception
6:30PM-10:00PM	Dinner
6:30PM-6:45PM	Introductory Remarks: George Daley, Harvard University and Peter Zandstra, University of Toronto
6:45PM-7:15PM	A Network Biology Approach to Stem Cell Engineering James J. Collins, Boston University Keynote Presentation
7:15PM-7:45PM	Design Principles of Pluripotency Austin Smith, Cambridge University Keynote Presentation
Monday, May 3	
8:30AM-9:45AM	Session 1: High Throughput and Microfluidic Screening Platforms Chairs: Sangeeta Bhatia, Massachusetts Institute of Technology and Joel Voldman, Massachusetts Institute of Technology
8:30AM-9:00AM	High throughput microfluidics platforms for neuroscience and systems biology Hang Lu, Georgia Institute of Technology Invited Presentation
9:00AM-9:15AM	Microfluidics-Integrated Time-Lapse Imaging for Analysis of Cellular Dynamics Jagesh Shah, Harvard-Massachusetts Institute of Technology
9:15AM-9:30AM	Nanovolume Bioreactors Optimized to Match Macroscale Culture Performance and Allow High-Throughput Assessment of Heterogeneity in Hematopoietic Stem Cell Populations James M. Piret, University of British Columbia
9:30AM-9:45AM	A Microfluidic Platform for the Spatial-Temporal Generation of Infarcted Heart Conditions: Highthroughput Screening On Human Embryonic Stem Cells-Derived Cardiomyocytes Elisa Cimetta, University of Padova

9:45AM-10:05AM	Break
10:05AM-12:05PM	Session 2: iPS Cell Programming and Disease Models Chairs: Mahendra Rao, Ivtn and Stephen Oh, Singapore
10:05AM-10:35AM	Stem Cell Engineering for Drug Discovery Lee Rubin, Harvard University Invited Presentation
10:35AM-10:50AM	Mesenchymal Stem Cell Dysfunction in An iPSC –Derived Model of Human Progeria Alan Colman, A*STAR Institute of Medical Biology
10:50AM-11:05AM	Efficient Generation of Functional Dopaminergic Neurons From Human Induced Pluripotent Stem Cells Under Defined Conditions Xianmin Zeng, Buck Institute for Age Research
11:05AM-11:20AM	The Nuclear Receptor Nr5a2 Can Replace Oct4 in the Reprogramming of Murine Somatic Cells to Pluripotent Cells Huck-Hui Ng, Genome Institute of Singapore
11:20AM-12:05PM	Molecular Elucidation and Engineering of Stem Cell Microenvironments David Schaffer, UC Berkley Keynote Presentation
12:05PM-1:30PM	Lunch
1:30PM-2:45PM	Session 3: Novel Approaches for Adult Stem Cell Growth and Differentiation Chairs: Lars Ahrlund-Richter, Karolinska Institutet and William Miller, Northwestern University
1:30PM-2:00PM	Targeting the niche to restore function to aged stem cells Amy Wagers, Harvard University Invited Presentation
2:00PM-2:15PM	ECM-Functionalized Microcavity Arrays to

	Explore Fate Decisions in Hematopoietic Stem Cells Carsten Werner, Leibniz Institute of Polymer Research Dresden
2:15PM-2:30PM	Engineering Three-Dimensional Stromal Tissues Ivan Martin, University Hospital Basel
2:30PM-2:45PM	Substrate Elasticity Regulates Murine Skeletal Muscle Stem Cell Self Renewal in Culture Karen Havenstrite, Stanford University
2:45PM-3:05PM	Break
3:05PM-3:35PM	Session 4: Endogenous Repair Chairs: Anand Asthagiri, Cal Tech and Carsten Werner, Dresden University
3:05PM-3:35PM	Cellular constituents of the hematopoietic stem cell niche Paul Frenette, Mount Sinai School of Medicine Invited Presentation
3:35PM-4:05PM	Programming Cells In Situ Using Polymers David Mooney, Harvard University Invited Presentation
4:05PM-4:20PM	Development of Osteogenic Scaffolds with Prospectively Isolated Adult Mesenchymal Stem Cells for Endogenous Bone Repair Matthew B. Murphy, University of Texas Health Science Center - Houston
4:20PM-4:35PM	The In Vivo Bioreactor: A Unique Paradigm for De Novo Tissue Engineering V. Prasad Shastri, University of Freiburg
4:35PM-4:50PM	Nano-Topographically Defined Scaffolds for Heart Regeneration and Repair Andre Levchenko, Johns Hopkins University
4:50PM-6:30PM	Poster Session with Refreshments Poster Chairs: Julie Audet, University of

	Toronto, Jeff Karp, Massachusetts Institute of Technology, Taby Ahsan, Tulane University, Jon Rowley, Lonza Group Ltd.
	Free Night for Dinner
Tuesday, May 4	
8:30AM-9:45PM	Session 5: Intercellular Signaling and the Engineered Niche Chairs: Christopher Chen, University of Pennsylvania and John Aunins, Merck
8:30AM-9:00AM	Matrix and Myosin in cell fate decisions: MSCs, HSCs, and Embryonic Cardiomyocytes Dennis Discher, University of Pennsylvania Invited Presentation
9:00AM-9:15AM	Tissue Geometry and Epithelial-Mesenchymal Transition Celeste M. Nelson, Princeton University
9:15AM-9:30AM	Perfusion Primes Mouse Embryonic Stem Cells for Differentiation in a Self-Renewing Environment Via Shear Stress Yi-Chin Toh, Massachusetts Institute of Technology
9:30AM-9:45AM	Cell Geometry and Adhesive Chemistry Influences Mesenchymal Stem Cell Lineage Commitment Kristopher Kilian, University of Chicago
9:45AM-10:05AM	Break
10:05AM-12:05PM	Session 6: Bioreactors and Bioprocesses for Cell Expansion and Differentiation Chairs: Jamie Piret, University of British Columbia and Joaquim Cabral, IST Portugal
10:05AM-10:35AM	Stem Cell Engineering – Toward Stem Cell Bioprocesses Wei-Shou Hu University of Minnesota Invited Presentation

10:35AM-10:50AM	Effect of Hypoxia On Proliferation and Neural Commitment of Embryonic Stem Cells at Different Stages of Pluripotency Tiago G. Fernandes, Instituto Superior Técnico
10:50AM-11:05AM	Expansion and Directed Differentiation of Human Pluripotent Stem Cells in Scalable Stirred-Suspension Bioreactors Emmanuel (Manolis) S. Tzanakakis, State University of New York at Buffalo
11:05AM-11:20AM	Versatile Microcarrier Systems for Enhancing hESC Expansion and Cardio-Differentiation Steve Oh, Bioprocessing Technology Institute
11:20AM-12:05PM	Repairing the Infarcted Heart with Engineered Human Myocardium Chuck Murry, University of Washington Keynote Presentation
12:05PM-1:30PM	Lunch
1:30PM-2:45PM	Session 7: Systems-Based Approaches to Understanding Fate Decisions Chairs: Ihor Lemischka, Mount Sinai School of Medicine and Doug Lauffenburger, Massachusetts Institute of Technology
1:30PM-2:00PM	Heterogeneity and flexibility of cell fate decisions - A conceptual perspective Ingo Roeder, University of Lipzig Invited Presentation
2:00PM-2:15PM	Constrained Fuzzy Logic: a Novel Methodology for Training Predictive, Quantitative Biomolecular Signaling Network Models Melody Morris, Massachusetts Institute of Technology
2:15PM-2:30PM	Subpopulation Tracking of Human Pluripotent Stem Cells Screened in Controlled Microenvironments Reveals Signalling Cues Regulating the Early

	Lineage Differentiation Tree Emanuel J.P. Nazareth, University of Toronto
2:30PM-2:45PM	Quantitative Models of Reprogramming Somatic Cells to Pluripotency Krishanu Saha, Whitehead Institute for Biomedical Research
2:45PM-3:05PM	Break
3:05PM-4:50PM	Session 8: Translating Stem Cells Towards the Clinic Chairs: Matthias Lutolf, Ecole Polytechnique Federale de Lausanne and Sharon Gerecht, Johns Hopkins University
3:05PM-3:35PM	Cancer Stem Cells – Lessons from Leukemia Connie Eaves, TFL Vancouver Invited Presentation
3:35PM-4:05PM	Combinatorial development of biomaterials for tissue engineering and drug delivery Daniel Anderson, Massachusetts Institute of Technology Invited Presentation
4:05PM-4:20PM	Mechanobiology of Glioblastoma: Lessons Learned and Implications for Brain Tumor Stem Cells Sanjay Kumar, University of California, Berkeley
4:20PM-4:35PM	Engineering the Perivascular Niche to Study Brain Cancer Tumorigenesis Claudia Fischbach, Cornell University
4:35PM-4:50PM	Bone Marrow Niche-Inspired, Multi-Phase Expansion of Megakaryocytic Progenitors and Mature Megakaryocytic Cells with High Polyploidization Potential William M. Miller, Northwestern University
4:50PM-6:30PM	Poster Session with Refreshments Chairs: Julie Audet, University of Toronto, Jeff Karp, Massachusetts Institute of

	Technology, Taby Ahsan, Tulane University, Jon Rowley, Lonza Group Ltd.
	Free Night for Dinner
Wednesday, May 5	
8:30AM-9:45AM	Session 9: Tissue Engineering and Regeneration using Stem Cells Chairs: Todd McDevitt, Georgia Institute of Technology and Jennifer Elisseeff, Johns Hopkins University
8:30AM-9:00AM	Dynamically Tunable Scaffolds to Direct Cell Function and Tissue Regeneration Kristi Anseth, University of Colorado Invited Presentation
9:00AM-9:15AM	Engineered Heart Tissue Enables Interrogation of Regenerative Potential of Injected Pluripotent Stem Cells and Their Derivatives Milica Radisic, University of Toronto
9:15AM-9:30AM	Stem Cell-Derived 3-Dimensional Heart Tissues with Advanced Electromechanical Function Nenad Bursac, Duke University
9:30AM-9:45AM	Generating Epithelial Tissues From Human Pluripotent Stem Cells Sean P. Palecek, University of Wisconsin - Madison
9:45AM-10:05AM	Break
10:05AM-12:25PM	Session 10: Novel Approaches for Pluripotent Stem Cell Growth and Differentiation Chairs: Ralph Brandenberger, Geron Corporation and Sean Palecek, University of Wisconsin
10:05AM-10:35AM	Directed differentiation of pluripotent stem cells Gordon Keller, University of Toronto Invited Presentation
10:35AM-10:50AM	Effect of Shear Stress Parameters On Differentiation of Escs to Hematopoetic and

	Endothelial Phenotypes Taby Ahsan, Tulane University
10:50AM-11:10AM	Engineering the Differentiation of Embryoid Bodies in Suspension Culture Todd C. McDevitt, Georgia Institute of Technology / Emory University
11:10AM-11:25AM	Up Scaling Single Cell-Inoculated Suspension Culture of Human Embryonic Stem Cells Robert Zweigerdt, Hannover Medical School (MHH)
11:25AM-11:55PM	Stem cells to create a pancreas and recreate human Type1 diabetes Doug Melton, Harvard University Keynote Presentation
11:55PM-12:25PM	Engineering Human Tissues Gordana Vunjak-Novakovic, Columbia University Keynote Presentation
12:25PM-12:30PM	Closing Remarks by George Daley, Children's Hospital, Harvard Medical School and Peter Zandstra, University of Toronto
	Box Lunch Departure