

TECHNICAL PROGRAM

Sunday, January 20

6:00pm – 7:00pm	Welcome Reception	St. Tropez Foyer
7:00pm – 10:00pm	Dinner	St. Tropez C, D
7:00pm – 7:15pm	Introductory Remarks: David Schaffer, <i>University of California, Berkeley</i>	
7:15pm – 8:15pm	George Daley, <i>Boston Children's Hospital, Harvard University</i>	Histocompatible Pluripotent Stem Cells

Monday, January 21

Session 1: High Throughput and Microfluidic Screening Platforms

Chair: **Ravi Kane,** *Rensselaer Polytechnic Institute*

8:30am – 9:10am	Invited Speaker: Sangeeta Bhatia, <i>Massachusetts Institute of Technology</i>	Engineering the Stem Cell Microenvironment: Microtechnology Tools for High-Throughput Analysis
9:10am – 9:30am	Daniel G. Anderson, <i>Massachusetts Institute of Technology</i>	Combinatorial Development of Biomaterials for Tissue Engineering and Drug Delivery
9:30am – 9:50am	Tiago G. Fernandes, <i>Rensselaer Polytechnic Institute</i>	A High Throughput 3D Cell Microarray to Study Stem Cell Fate
9:50am – 10:10am	Shuichi Takayama, <i>University of Michigan</i>	Microfluidics for Stem Cell Biology and Therapy
10:10am – 10:30am	Edwin Monuki, <i>University of California, Irvine</i>	Dielectric Differences among Neural Stem Cells and Their Progeny
10:30am – 10:50am	Break	St. Tropez Foyer

Session 2: Stem Cells in Drug and Gene Discovery

Chair: **Sangeeta Bhatia,** *Massachusetts Institute of Technology*

10:50am – 11:30am	Invited Speaker: Sheng Ding, <i>The Scripps Research Institute</i>	A Chemical Approach to Stem Cell Biology
11:30am – 11:50am	Jon Chesnut, <i>Invitrogen</i>	Chromosomal Targeting in Embryonic Stem Cells Using the phiC31 Family of Integrases: Stem Cells as Enabling Tools for Screening
11:50am – 12:10pm	Joel Voldman, <i>Massachusetts Institute of Technology</i>	Microscale Manipulation of Mouse Embryonic Stem Cells for Studying Cell Fusion-Mediated Reprogramming and Diffusible Signaling
12:10pm – 12:30pm	Danny Van Noort, <i>Institute of Bioengineering and Nanotechnology</i>	3D Cell Cultures in Microfluidics for Drug Discovery
12:30pm – 2:00pm	Lunch	La Terrasse
2:00pm – 2:50pm	Keynote Speaker: Doug Lauffenburger, <i>Massachusetts Institute of Technology</i>	Quantitative Systems Analysis of Signaling Networks Governing Cell Phenotype Behavior

Session 3: Systems-Based Approaches to Understanding Fate Decisions

Chair: **Peter Zandstra,** *University of Toronto*

2:50pm – 3:30pm	Invited Speaker: Christopher Chen, <i>University of Pennsylvania</i>	Stem Cell Differentiation: Mechanical Forces RhoA and Adhesion Signaling
3:30pm – 3:50pm	Nicolas Plachta, <i>California Institute of Technology</i>	Engineered Embryonic Stem Cells as a Discovery Tool in Neurobiology: Identification of Molecular Mechanisms of Axonal Degeneration
3:50pm – 4:10pm	WeiJia Wang, <i>University of Toronto</i>	A Multiparameter Flow Cytometric Assay to Investigate Cytokine Synergies during Erythroid Development
4:10pm – 4:30pm	Babak Esmaeli-Azad, <i>DNAmicroarray, Inc.</i>	Modeled Stem Cell Niche Assays Using Biomaterial Microarrays
4:30pm – 6:00pm	Poster Session with Refreshments	St. Tropez Foyer
	Chairs: Julie Audet, <i>University of Toronto</i> ; Karen McCloskey, <i>University of California at Merced</i> ; and Sean Palecek, <i>University of Wisconsin-Madison</i>	
	Free Night for Dinner	

Tuesday, January 22

Session 4: Intercellular Signaling and the Engineered Niche

Chair: **Sharon Gerecht,** *Johns Hopkins University*

8:10am – 8:50am	Invited Speaker: Peter Zandstra, <i>University of Toronto</i>	Control of Auto-Regulatory Signaling to Modulate Embryonic Stem Cell Self-Renewal and Differentiation
8:50am – 9:10am	Krishnendu Roy, <i>The University of Texas at Austin</i>	Engineering Intercellular Signals of Thymic Niche: Towards Generation of Functional T Cells from Stem Cells
9:10am – 9:30am	Eleftherios Sachlos, <i>Harvard University</i>	Embryoid Body Shell Formation Reduces Diffusive Transport of Inductive Biochemicals
9:30am – 9:50am	Basha Stankovich, <i>University of California, Merced</i>	Role of Adhesion Molecules in Hematopoietic and Endothelial Commitment of Muring Embryonic Stem Cells
9:50am – 10:10am	Natesh Parashurama, <i>Harvard Medical School</i>	Activin Alters the Kinetics of Endoderm Induction in Embryonic Stem Cells Cultured on Collagen Gels
10:10am – 10:30am	Break	St. Tropez Foyer

Session 5: Novel Approaches for Embryonic Stem Cell Growth and Differentiation		
Chair: Ralph Brandenburger , <i>Geron Corporation</i>		
10:30am – 11:10am	Invited Speaker: Mick Bhatia , <i>McMaster University</i>	Controlling Human Embryonic Stem Cells by Niche Regulation
11:10am – 11:30am	Emmanuel E. Baetge , <i>Novocell, Inc.</i>	Engineering Embryonic Stem Cells to Create a Cell Therapy for Diabetes
11:30am – 11:50am	Clark K. Colton , <i>Massachusetts Institute of Technology</i>	Differentiation of Murine Embryonic Stem Cells to Cardiomyocytes Is Increased Under Reduced Oxygen
11:50am – 12:10pm	Jennifer Blundo , <i>Stanford University</i>	Molecular Imaging of Cardiac Constructs Derived from Human Embryonic Stem Cells
12:10pm – 12:30pm	Shelly Sakiyama-Elbert , <i>Washington University</i>	The Effect of Controlled Growth Factor Delivery on Embryonic Stem Cell Differentiation inside of Fibrin Scaffolds
12:30pm – 2:00pm	Lunch	La Terrasse
Session 6: Novel Approaches for Adult Stem Cell Growth and Differentiation		
Chair: Irina Conboy , <i>University of California, Berkeley</i>		
2:00pm – 2:40pm	Invited Speaker: Fred Gage , <i>Salk Institute</i>	Neurogenesis in the Adult Mammalian Brain
2:40pm – 3:00pm	Pin Wang , <i>University of Southern California</i>	Engineering Stromal Cells for Supportive Differentiation of TCR-Transduced Hematopoietic Stem Cells into CD4 T Cells <i>in Vitro</i>
3:00pm – 3:20pm	Irina Conboy , <i>University of California, Berkeley</i>	Understanding Bio-Chemical Changes in the Aged Muscle Niche
3:20pm – 3:40pm	Kartik Subramanian , <i>University of Minnesota</i>	Directed Differentiation of Multipotent Adult Progenitor Cells into the Cells of the Hepatic Lineage
3:40pm – 4:00pm	C. Lobato da Silva , <i>National Institute of Health</i>	Maximization of the Ex-Vivo Expansion of Human Hematopoietic Stem/Progenitor Cells by Direct Contact Culture with Mesenchymal Stem Cells
4:00pm – 5:30pm	Poster Session with Refreshments	St. Tropez Foyer
5:30pm – 6:30pm	Chairs: Julie Audet , <i>University of Toronto</i> ; Karen McCloskey , <i>University of California at Merced</i> ; and Sean Palecek , <i>University of Wisconsin-Madison</i>	Normal and Neoplastic Stem Cells
6:30pm – 9:30pm	Keynote Address: Irving Weissman , <i>Stanford University</i>	St. Tropez C, D
	Dinner	
Wednesday, January 23		
Session 7: Biomaterials for Stem Cell Growth and Differentiation		
Chair: Shelly Sakiyama-Elbert , <i>University of Washington, St. Louis</i>		
8:30am – 9:10am	Invited Speaker: Dennis Discher , <i>University of Pennsylvania</i>	Matrix Elasticity Directs Stem Cell Lineage Specification
9:10am – 9:30am	Kevin Healy , <i>University of California, Berkeley</i>	High Throughput Identification of Novel Peptide Ligands for Engineering Surfaces for Stem Cells
9:30am – 9:50am	Sean P. Palecek , <i>University of Wisconsin - Madison</i>	3D Microwell Array Culture of Human Embryonic Stem Cells Reveals Effects of Colony Morphology on Cell Growth and Differentiation
9:50am – 10:10am	Todd McDevitt , <i>Georgia Institute of Technology / Emory University</i>	Microparticle Delivery of Morphogenic Factors within Embryoid Bodies for Directed Embryonic Stem Cell Differentiation
10:10am – 10:30am	David Brafman , <i>University of California, San Diego</i>	Arrayed Cellular Microenvironments for Exploring Cell Fate
10:30am – 10:50am	Break	St. Tropez Foyer
Session 8: Bioreactors and Bioprocesses for Cell Expansion and Differentiation		
Chair: Joachim Cabral , <i>Institute for Biotechnology and Bioengineering, Portugal</i>		
10:50am – 11:30am	Invited Speaker: Ramkumar Mandalam , <i>Cellerant Therapeutics</i>	Novel Universal Cell-Based Drug from Adult Hematopoietic Stem Cell
11:30am – 11:50am	Matt Croughan , <i>Keck Graduate Institute</i>	Manufacturing Stem Cells: Lessons Learned from 15 Years of CHO Cell Culture for Recombinant Protein Production
11:50am – 12:10pm	Behnam A. Baghbaderani , <i>University of Calgary</i>	Large-Scale Production of Human Neural Precursor Cells in Computer-Controlled Suspension Bioreactors and Applications to the Treatment of Neuropathic Pain
12:10pm – 12:30pm	Rosario Scott , <i>Merck</i>	A Platform for Predictive Bioprocessing of Autologous Cells for Therapy Based on Automated Microwell Cultures
12:30pm – 2:00pm	Lunch	La Terrasse
Session 9: Biomaterial Scaffolds for Stem Cell Therapeutic Applications		
Chair: Kevin Healy , <i>University of California, Berkeley</i>		
2:00pm – 2:40pm	Invited Speaker: Jennifer Elisseeff , <i>Johns Hopkins University</i>	Adult and Embryonic Stem Cells in Musculoskeletal Tissue Repair
2:40pm – 3:00pm	Song Li , <i>University of California, Berkeley</i>	Nanofibrous Scaffolds and Mesenchymal Stem Cells for Vascular Regeneration
3:00pm – 3:20pm	Michael Sacks , <i>University of Pittsburgh</i>	Tissue-to-Cellular Deformation Coupling in Cell-Microintegrated Elastomeric Scaffolds
3:20pm – 3:40pm	Paul. Critser , <i>Indiana University School of Medicine</i>	Engineered Three-Dimensional Collagen-Based Extracellular Matrices Provide Microenvironmental Guidance of Endothelial Colony Forming Cell Proliferation Potential and Vascular Network Formation <i>in Vitro</i>
3:40pm – 4:00pm	Sherry L. Voytik-Harbin , <i>Purdue University</i>	Fibril Microstructure-Mechanical Design Features of Engineered 3D Collagen-Based Extracellular Matrices Modulate Mesenchymal Stem Cell Proliferation and Lineage Specific Differentiation
4:00pm – 4:15pm	Closing Remarks by David Schaffer , <i>Conference Chair</i>	St. Tropez C,D