SBI\textsuperscript{2} High Content 2017

4\textsuperscript{th} Annual Conference

September 13\textsuperscript{th} – 15\textsuperscript{th}

San Diego, CA

KEYNOTE SPEAKERS

Dr. Brenda J. Andrews

“Automated analysis of high-content microscopy data”. Charles H. Best Chair of Medical Research Director, Professor, Department of Molecular Genetics, University of Toronto

Dr. Richard Caprioli

“Imaging Mass Spectrometry: Molecular Microscopy for Biology and Medicine”. Stanford Moore Chair in Biochemistry, Chemistry, Pharmacology & Medicine, School of Medicine, Vanderbilt University.

Abstract Deadlines

Platform / Podium Oral Presentations: Closed

Poster Presentations: For publication in ADT, opened until Friday, August 25, 2017; Late Breaking Abstracts without publication in ADT will be accepted until September 08, 2017.

For more details visit www.sbi2.org
Day 1: Wednesday, September 13th, 2017
SBI2 Educational Courses Program (09:00 am -12:30 pm)

8:00 – 9:00  Registration and Coffee

9:00 – 10:00 “Introduction: Hardware and Image Acquisition”, Doug Bowman, Indica Labs (Room 30C)

09:00 – 10:00 “New Technologies”, David Andrews, University of Toronto (Room 30D)

09:00 – 10:00 “Phenotypic Screening”, Myles Fennel, Sloan Kettering Cancer Center and Paul Selzer, Novartis (Room 30E)

10:00 – 10:15 Coffee Break

10:15 – 11:15 “Introduction: Assay Types and Assay Development”, Joe Trask, Perkin Elmer (Room 30C)


10:15 – 11:15 “Kinetic Imaging of Cancer”, Leslie Griner, Novartis (Room 30E)

11:15 – 11:30 Coffee Break

11:30 – 12:30 “Introduction: Image and Data Analysis”, Mark Bray, Novartis (Room 30C)

11:30 – 12:30 “Single Cell Cytometry: Introduction to Flow Cytometry and How Flow and Image Cytometry are Related”, David Gebhard, Pfizer (Room 30D)

11:30 – 12:30 “CRISPR Technology”, Sam Hasson, Pfizer (Room 30E)

12:45 – 2:30 Special Lunch Time Sessions (lunch provided)

- “Assay Quality Measures and Validation & Data Analysis”, Bartek Rajwa, Purdue University and Allen Goodman, Broad Institute (Room 30C)
- “3D HCS Drug Discovery: Essentials for Imaging and Analysis of Tumor Organoids”, Dan LaBarbera, University of Colorado & Todd Shelper, Griffith University (Room 30D)

2.30-3.00 Coffee Break

Colloquium “Modern Live-Cell Imaging, 3D, Bioprinting” (3:00-6:00 PM)

Emerging Technologies in Biological Models, When and Why? A guided roundtable discussion focused on Best Practices & Unmet Needs to address these selected challenges in high content imaging practices

3:00 - 3:05 Welcome & Introduction, Ann Hoffman, GSK

3:05 - 4:00 The Technologies: FCS, Imaging Mass Spec, HCS the Synergies, When and Why. John P Nolan, PhD Professor The Scintillon Institute

4:00 - 5:00 Informatics with Emphasis on Deep Learning Informatics, Peter Horvath, Ph.D., Group Leader Synthetic and Systems Biology, Hungarian Academy of Sciences

5:00 – 6:00 Modern Live Cell Imaging, 3D, Bioprinting, Sharon Presnell, Ph.D., CSO & President Organovo, Inc

6:00 – 7:00 SBI2 Reception and Opening of the Exhibit Hall
Day 2: Thursday, September 14th, 2017
SBI2 Conference Scientific Program

8:00 AM - 5:00 PM Registration

8:00 AM - 9:00 AM Poster Viewing

9:00 - 9:10 Introduction & Welcome to the 4th Annual SBI2 “High Content” Conference
Kaylene Simpson, President SBI2

9:10 - 10:00 Opening Keynote Address
“Automated analysis of high-content microscopy data”, Brenda Andrews, Charles H. Best Chair of Medical Research Director, Professor, Department of Molecular, Genetics, University of Toronto

Session I: Advanced and Complex Cell Models (10:10 - 12:25)
Session Chairs & Scientific Program Committee:
Sharon Presnell, CSO, Organovo, Inc., & President at Samsara Sciences, Inc, San Diego, CA
David Egan, Co-founder, Core Life Analytics BV, Netherlands

Session Abstract: An increased focus on translational research in academia and the desire to reduce the attrition rate in industrial drug discovery programs has lead biologists to increasingly adopt more physiologically relevant cellular models. These include organoids, co-cultures, organ-on-a-chip technologies, iPSC-derived cultures and CRISPR-modified cell lines. These systems, while offering great opportunities, also bring attendant challenges that need to be addressed with novel methods and technologies. Validation is also required to determine whether these more complex, and more expensive platforms, are worth the additional investment required. In this session speakers will describe a variety of advanced cellular systems and address the critical issues related to their adoption.

10:10 - 10:40 “The OrganoPlate: Human organ-on-a-chip tissue models for predictive drug testing in any throughput 3D bioprinting”, Invited Speaker, Jos Joore, Co-founder & Managing Director, Mimetas, Netherlands (invited speaker)

10:40 - 11:10 Break for coffee & exhibit viewing

11:10 - 11:40 “iPS cells help generate patient-specific ocular tissue to model and treat age related macular degeneration”, Kapil Bharti, Stadtman Investigator, National Eye Institute, NIH (invited speaker)

11:40 - 12:05 “Implementation of 3D Pancreatic Cancer Organoid Models for High Throughput Phenotypic Drug Screening”, Shurong Hou, The Scripps Molecular Screening Center (selected from abstracts)

12:05 - 12:30 “An improved cell-proliferation assay based on fluorescence imaging of the interior of intact tumor spheroids using tissue clearing”, Thomas S. Villani, Visikol Inc (selected from abstracts)

12:35 –1:30 LUNCH TIME TECHNOLOGY SPOTLIGHTS (Rooms 30A, 30B & 31A)
- Chroma Technologies Technology Spotlight
- PerkinElmer Technology Spotlight
- ThermoFisher Scientific Technology Spotlight
Day 2: Thursday, September 14th, 2017  
SBI2 Conference Scientific Program

Poster Viewing & Exhibit Hall (1:30-2:00pm)

Session II: Phenotypic Drug Discovery (2:00 - 4:55)

Session Chairs & Scientific Program Committee:  
Kristen A. Johnson, Principal Investigator, California Institute for Biomedical Research, San Diego, CA  
John Joslin, Associate Director, Assay Development & High Throughput Screening, The Genomics Institute of the Novartis Research Foundation, San Diego, CA

Session Abstract: The challenge of phenotypic screening is to develop an assay amenable to high throughput automation but still preserve the connection to disease pathology. The combination of advanced automation and high content imaging have enabled many assays to be miniaturized to small plate formats, but still capture the relevant readouts required for many phenotypic assays. The field is continuing to push these boundaries using induced pluripotent stem cells, microfluidics, complex 3D assays, and next generation sequencing. This session will highlight some of these efforts and provide insights into how phenotypic screening will continue to advance new discoveries for unmet medical needs.

2:00 - 2:30 “Vascularized MicroTumors: A platform for phenotypic drug discovery and validation”, Chris Hughes, University of California, Irvine (invited speaker)  

2:30 - 3:00 “High throughput and high content assays and screens for mitochondrial function and dynamics in neurons”, Ron Davis, Scripps Research Institute Florida, Department of Neuroscience, Jupiter, FL (invited speaker)  

3:00 - 3:30 “Phenotypic Screening for Heart Failure Therapeutics?” Timothy McKinsey University of Colorado Denver – Anschutz Medical Campus (selected from abstracts)  

3:30 - 4:00 Break for coffee & exhibit viewing  

4:00 - 4:30 “Phenotypic Screening in Huntington’s Disease Models using Compounds and siRNA Libraries”, Lisa Ellerby, Buck Institute for Research on Aging (selected from abstracts)  

4:30 - 4:55 “High content screen for chemical modulators of influenza replication”, Hanspeter Niederstrasser, University of Texas Southwestern Medical Center (selected from abstracts)  

5:00 - 5:30 SBI2 Annual General Meeting  
The general meeting is a business meeting required for non-profits. This is an excellent opportunity to learn more about the society and find out how you can participate.  

5:30 - 6:30 SBI2 Sponsored Reception (Exhibit Hall)  

END of DAY 2
Day 3: Friday, September 15th, 2017
SBI2 Conference Scientific Program

8:00 AM - 9:00 AM Poster & Exhibit Viewing

9:00 - 9:10 2nd Day Opening Remarks for the 3rd Annual SBI2 Meeting
Kaylene Simpson, President SBI2

Session III: Informatics (9:10 - 2:20)

Session Chairs & Scientific Program Committee:
Anne Carpenter, Imaging Director, Broad Institute of Harvard and MIT, Cambridge, MA
Thierry Dorval, Servier Laboratories, Croissy-Sur-Seine, France

Session abstract: Several recent revolutions are increasing the amount and quality of information that can be extracted from large-scale imaging experiments. From 3D models of organs and tumors to complex cell and material systems, biologists are making ever more complex assay systems that push the limits of what can be accurately quantified. Advances in the world of computer science are pushing the field forward as well, from deep learning to high-dimensional data analysis techniques to methods that leverage the single-cell data inherent in images of cell populations.

9:10 - 9:40 “From pixels to phenotypes: Deep learning for analyzing high-content cellular images”, William Godinez-Navarro, Novartis Institutes for Biomedical Research, Basel, Switzerland (invited speaker)

9:40 - 10:10 “Identification of therapeutics for rare genetic diseases using phenotypic signatures”, Yolanda Chong, Vice President of Biology at Recursion Pharmaceuticals (invited speaker)

10:10 - 10:30 “A comprehensive workflow enables the practical use of Deep Learning for pharma relevant research applications”, Daniel Siegismund, Genedata AG (selected from abstracts)

10:30 - 11:00 Break for coffee & exhibit viewing

11:00 - 11:20 “Building an Imaging pipeline to map the human cell” Nathalie Gaudreault, Allen Institute for Cell Science (selected from abstracts)

11:20 - 11:40 “Image Analysis of Cellular Epigenetic Landscapes Identifies a Signature of Glioblastoma Differentiation”, Chen Farhy, Sanford Burnham Prebys Medical Discovery Institute (selected from abstracts)

11:40-12:00 ”Quantifying subcellular localization dynamics using automated image analysis”, Santosh Hariharan, Medical Biophysics, University of Toronto, Sunnybrook Research Institute

12:00 - 1:30 Poster Session (Lunch provided)
Day 3: Friday, September 15th, 2017
SBI2 Conference Scientific Program

Session IV: New Technologies: (1:30 - 4:00)

Session Chairs & Scientific Program Committee:
David Andrews, Director of Biological Sciences, Sunnybrook Research Institute, Professor, Dept. of Biochemistry, University of Toronto
Jeff Price, President and CEO at Vala Sciences, Inc., and Professor, Scintillon Institute, San Diego

Session Abstract: Most phenotypic screening is based on intensity based measurements of the localization of fluorophores within cells. With the development of fully automated confocal microscopy it became possible to make much more sophisticated measurements and therefore to perform screens that were previously inaccessible. Although a major challenge, incorporating new technologies developed for manual microscopes in high content screening instruments provides new rich data that can be used to answer important biological questions. Examples include optimal interrogation of larger objects such as 3D cultures with light-sheets microscopy. At the other end of the spectrum automated fluorescence lifetime imaging enables measurement of protein-protein interactions in live cells. This session will highlight how these and other cutting edge technologies are expanding the range of measurements that can be made in high content screens.

1:30 - 2:00 “Control of cell polarity, adhesion and germinal zone exit during neuronal progenitor differentiation”, David Solecki, St. Jude Children's Research Hospital, Department of Developmental Neurobiology, TN (invited speaker)

2:00 - 2:30 “A new FLIM-FRET instrument with hyperspectral imaging for quantitative high content screening”, Christian Tardif, Jean-Pierre Bouchard, Pascal Gallant, Sebastien Roy, Ozzy Mermut, Biophotonics Program Institute Nationale Optic INO, Quebec City, Canada (invited speaker)

2:30 - 2:55 “FLECS technology for high-throughput force biology and screening”, Ivan Pushkarsky UCLA (selected from abstracts)

2:55 - 3:10 Break for coffee & exhibit viewing

3:10 - 3:35 “Reversing EMT as a therapeutic strategy for metastatic colon cancer”, Dan LaBarbera, University of Colorado Anschutz Medical Campus (selected from abstracts)

3:35 - 4:00 “New fluorescent tools to identify stressed cells and interrogate second messenger signaling in neurodegeneration”, Thomas Hughes, Montana Molecular (selected from abstracts)

4:00 - 5:00 Closing Keynote Address
“Imaging Mass Spectrometry: Molecular Microscopy for Biology and Medicine”, Richard Caprioli, Stanford Moore Chair in Biochemistry, Chemistry, Pharmacology & Medicine, School of Medicine, Vanderbilt University.

5:00 - 5:30 Awards Ceremony

END of Day-3

END of Conference
Scientific Program & Organizing Committees

Scientific Program Co-Chairs
O. Joseph Trask (PerkinElmer), & Daniel R. Rines (Vala Sciences).

Education & Short Courses
Debra Nickischer (Pfizer), & Doug Bowman (Takeda)

HCS/HCA Colloquium Coordinator
Ann F. Hoffman (GSK)

Marketing Contacts
Paul A. Johnston (University of Pittsburgh) & Kaylene Simpson (Peter MacCallum Cancer Cen-

Registration Overview

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* Non-member conference rate includes SBI\textsuperscript{2} annual membership for 2018
* SBI\textsuperscript{2} High Content 2016 rates shown – 2017 rates may be adjusted

Quote from 2016 SBI\textsuperscript{2} Keynote

Steven Finkbeiner, M.D., Ph.D., Professor, Departments of Neurology & Physiology, UCSF, Senior Investigator & Associate Director, Gladstone Institute of Neurological Disease; Director Taube/Koret Center for Neurodegenerative Disease Research. "I travel about 200,000 miles a year, and this is one of the most stimulating meetings I have attended the last couple years for our work’’

SBI\textsuperscript{2} Mission —> SBI\textsuperscript{2} is an international community of leaders, scientists, & students promoting technological advancement, discovery, & education to quantitatively interrogate biological models to provide high context information at the cellular level. At this 4\textsuperscript{th} annual conference it is SBI\textsuperscript{2}’s goal to build on our previous successes and continue to offer the scientific community a high value, low cost meeting with world-class experts in the field that teach introductory & advanced educational courses, organize a premier scientific program, and provide forums for discussion & networking.

For more information please visit www.sbi2.org or email us at info@sbi2.org

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