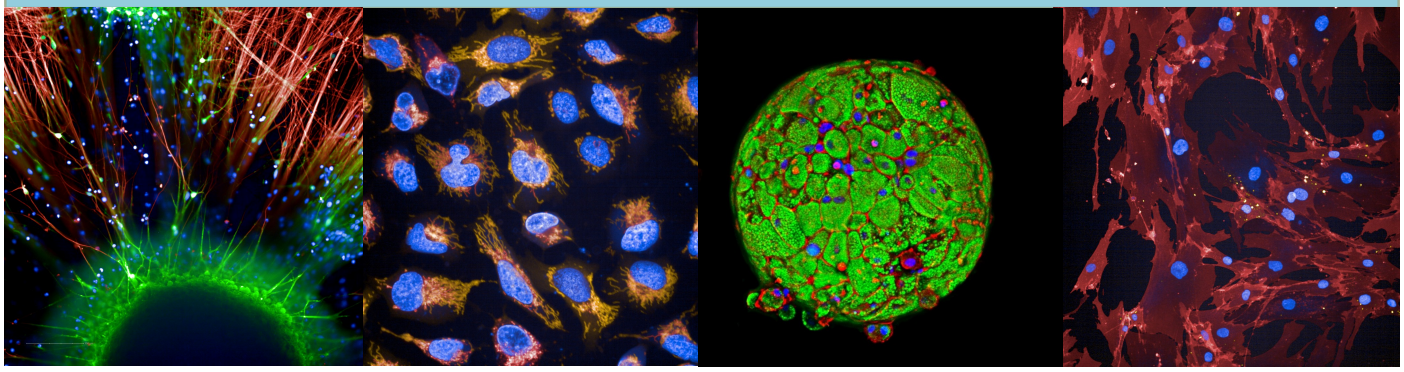
SOCIETY OF BIOMOLECULAR IMAGING AND INFORMATICS

**SBI2 High Content 2019**
**6th Annual Conference**
**September 17-19th 2019**
Joseph B Martin Conference Center
Harvard Medical School, Boston, Massachusetts

# PROGRAM & EVENT GUIDE



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SBI² Society of Biomolecular Imaging and Informatics

# President's Welcome to SBI² 2019, 6th Annual Conference!

On behalf of myself and the board of the Society for Biomolecular Imaging and Informatics I welcome you to the 6th edition of the SBI2 annual meeting at the Joseph B Martin Conference Center. We are excited to be back at this venue again to put on such a wide range of topics with the support of our sponsors and vendors. From it's inception SBI2 has been all about providing a forum for the very best research and education in high content screening and informatics with new topics evolving over years, such as 3D imaging, machine learning and new disease models, we have made an effort to stay on top of current trends. This year's 3-day program kicks off with the educational courses, lead by our experienced instructors and covering topics from introductory high-content screening to areas that will challenge the most experienced. Following this we have our colloquium on "Cell Painting in Drug Discovery". At the end of the day on Tuesday and Wednesday we have receptions to mingle and discuss the latest research or just socialize.

For the main scientific sessions on Wednesday and Thursday, we are honored to have Keynote Speakers, Aviv Regev from the Broad institute and Chee-Yeun Chung from Yumanity Therapeutics; as well as four main scientific sessions on "HCS-HTS successes and learnings", "Focus on imaging in neurological disease and oncology", "Therapeutic drug discovery for complex disease" and "Machine learning/artificial intelligence and/or conventional outputs?".

As the conference comes to a close, I hope it lived up to your expectations and you travel home with new knowledge and friendships. You might also consider joining us in helping run the society in one of open board positions or helping on a working group. It's also never to early to make plans to attend our 7th annual meeting in Pittsburgh!

Myles Fennell
President, Society of Biomolecular Imaging and Informatics

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| | |
|---|---|
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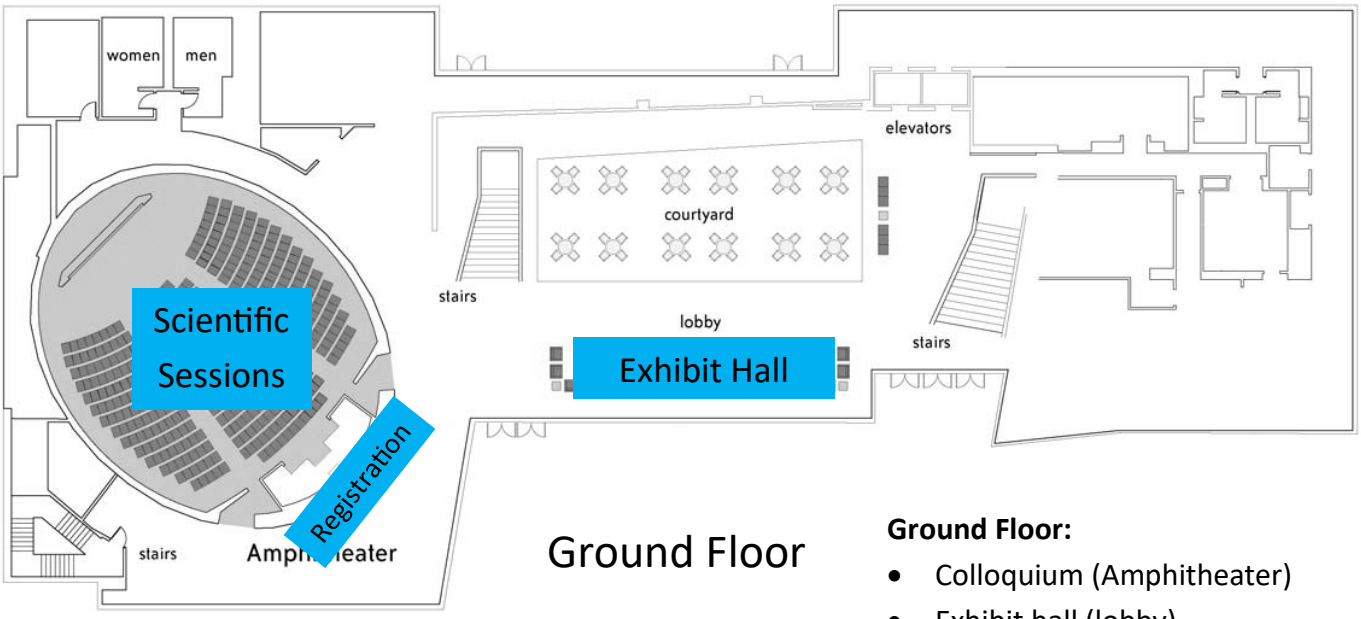
**For Logistics and On-site concerns**
**Please visit the SBI2 Registration Desk, Contact one of our SBI2 Board Members**
**Or email us at: info@sbi2.com**

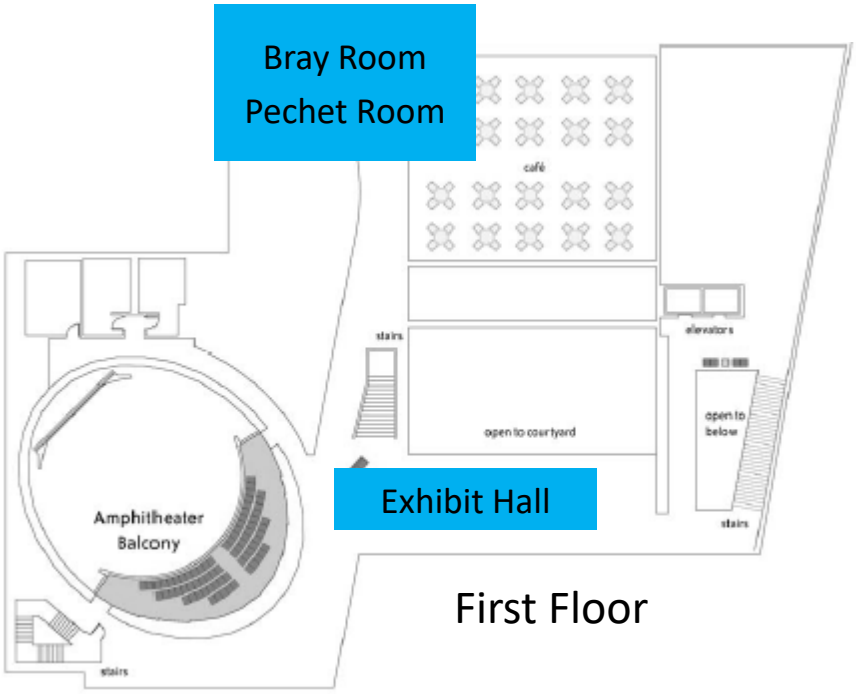
# Venue Floor Plan




Ground Floor

**Ground Floor:**

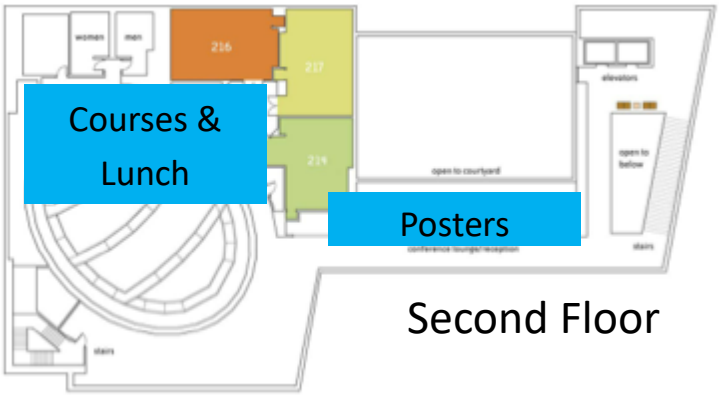
- Colloquium (Amphitheater)
- Exhibit hall (lobby)
  Booths 1-19
- Scientific sessions
  (Amphitheater)
- Breakfast/coffee breaks
  (Wednesday & Thursday only)
- Receptions
  (Tuesday & Wednesday)




First Floor

**1st Floor:**

- Exhibit hall (balcony area)
  Booths 20-23
- CellProfiler Session (Bray)
- Technology Spotlight Lunch
  (Pechet)




Second Floor

**2nd Floor:**

- Posters (lounge area)
- Some seating (lounge)
- Breakfast/coffee breaks (Tues. only)
- Tuesday Educational Courses (214, 216, 217)
- Technology Spotlight Lunch Over-flow (214, 216, 217)

SBI² Society of Biomolecular Imaging and Informatics

# CONFERENCE AT A GLANCE

## Tuesday, September 17, 2019

| | | |
|---|---|---|
| • Registration Opens | 8:00 AM | (Amphitheater entrance) |
| • Pre-conference Education Courses | 9:00 AM - 3:00 PM | (Bray and 2nd floor) |
| • Exhibitor Move-In | 1:00 PM - 6:00 PM | (Ground and 1st floor) |
| • SBI² Colloquium | 3:00 PM - 5:30 PM | (Amphitheater) |
| • Reception | 6:00 PM - 7:00 PM | (Exhibit Hall) |

## Wednesday, September 18, 2019

| | | |
|---|---|---|
| • Registration | 8:00 AM - 5:00 PM | (Amphitheater entrance) |
| • Poster Viewing | 8:00 AM - 5:00 PM | (2nd floor lounge) |
| • Exhibit Hours | 8:00 AM - 6:30 PM | (Ground and 1st floor) |
| • Welcome & Opening Keynote | 8:50 AM - 10:00 AM | (Amphitheater) |
| • Scientific Program (AM Session) | 10:00 AM -12:30 PM | (Amphitheater) |
| • Technology Spotlight Lunch | 12:45 PM - 1:30 PM | (Pechet and 2nd floor) |
| • Scientific Program (PM Session) | 1:50 PM - 5:00 PM | (Amphitheater) |
| • SBI² Annual General Meeting | 5:00 PM - 5:30 PM | (Amphitheater) |
| • SBI² Reception | 5:30 PM - 6:30 PM | (Exhibit Hall) |

## Thursday, September 19, 2019

| | | |
|---|---|---|
| • Registration | 8:00 AM - 3:00 PM | (Amphitheater entrance) |
| • Poster Viewing | 8:00 AM - 3:00 PM | (2nd floor lounge) |
| • Exhibit Hours | 8:00 AM - 3:00 PM | (Ground and 1st floor) |
| • Scientific Program (AM Session) | 8:50 AM - 10:30 PM | (Amphitheater) |
| • Poster Presentations | 10:30 PM - 12:00 PM | (2nd floor lounge) |
| • Technology Spotlight Lunch | 12:15 PM - 1:00 PM | (Pechet and 2nd floor) |
| • Closing Keynote Presentation | 1:15 PM - 2:15 PM | (Amphitheater) |
| • Scientific Program (PM Session) | 2:15 PM - 4:25 PM | (Amphitheater) |
| • Awards and Closing Remarks | 4:25PM - 4:45 PM | (Amphitheater) |

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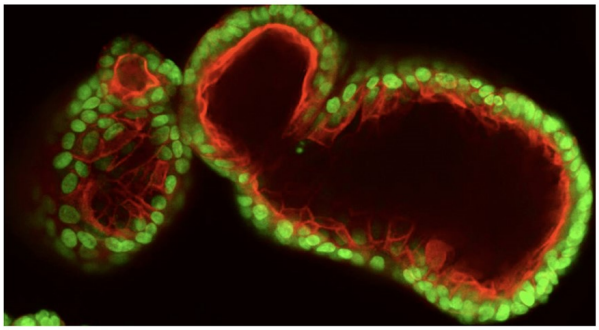
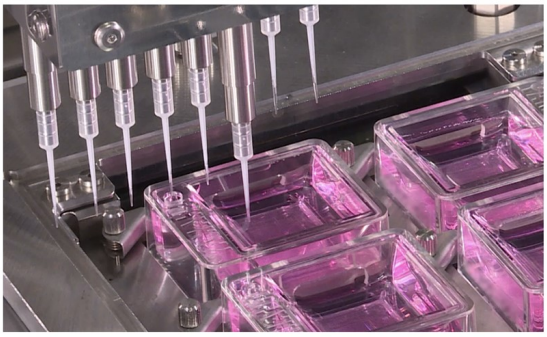
# Automated Spheroid Imaging & Transfer



Yokogawa High Content Confocal



Yamaha Automated Cell Picker

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SBI² Society of Biomolecular Imaging and Informatics

# Day 1: Tuesday September 17th, 2019

## SBI² HCS/HCA Educational Courses
## 9:00 AM to 3:00 PM

*At the 2019 Annual Meeting in Boston, the Society of Biomolecular Imaging and Informatics will offer three tutorial tracks during the Education Day on Sep. 17, 2019 (first day of the conference). The participants will have an opportunity to learn about biology-related data-science methods (including image processing, data reduction, and visualization), assay development strategies, as well as familiarize themselves with various technologies used in high-content screening and analysis (cytometry, modern imaging modalities, etc.). The educational program is intended for beginners and experienced users of the technology. The flexible schedule is designed to allow participation in three presentations and the practical session. The Data Track includes a hands-on image analysis session employing CellProfiler. The attendees are encouraged to bring their laptop computers with pre-installed CellProfiler software to follow along with the demonstration by the instructor.*

**9:00 - 3:00** **Educational Courses (2nd Floor Classrooms and Bray Room)**

### Introductory HCS/HCA Training Course Topics:

1. **Introduction to Image and Data Analysis** Mark Bray (Novartis)
2. **Introduction to Flow Cytometry** David Gebhard (Gebhard Cytometry Consulting)
3. **Basic Concepts in Imaging-Based High-Throughput Screening and High-Throughput Profiling Assay Development** Joshua Harrill (U.S. Environmental Protection Agency)
4. **Fundamentals of Statistical Analysis of Screening Data** Bartek Rajwa (Purdue University)

### Practical Course:

1. **Hands-on CellProfiler Tutorial** Santosh Hariharan (Pfizer)

### Advanced HCS/HCA Course Topics:

1. **Advanced Image Analysis: Feature Extraction, Machine Learning** Beth Cimini (Broad Institute)
2. **Multimodal Biological Imaging of 3D Models for High-Throughput Phenotypic Screening** Seungil Kim (University of Southern California)
3. **Data Dimensionality Reduction : PCA, t-SNE, UMAP** Anna Belkina (Boston University)
4. **Imaging Mass Cytometry 101** Jared K. Burks (MD Anderson Cancer Center)
5. **Robust or Go Bust: An Introduction to the NCATS Assay Guidance Manual** Nathan Coussens (NCATS)
6. **3D Cell Culture for Advanced High-Content Imaging and Screening** Olivier Frey (InSphero, AG)
7. **HCS Compatible Protein-Protein Interaction Assays** Paul Johnston (University of Pittsburg)

**See Page 8 for Educational Course Schedule at a Glance**

**See Page 10-13 for detailed descriptions of the Educational Courses**

# Day 1: Tuesday September 17th, 2019 (continued)

## SBI² HCS/HCA Educational Courses
## 9:00 AM to 3:00 PM

# Educational Courses Schedule at a Glance

| Time | Data Track | Assay Development and Standardization Track | Technology Track |
|---|---|---|---|
| | **Room 214** | **Room 216** | **Room 217** |
| **9:00-10:00 AM** | Introduction to Image Analysis | Basic Concepts in Imaging-based HTS and HT Profiling Assay Development | Introduction to Flow Cytometry for Microscopists |
| **10:00-10:15 AM** | **Coffee Break** | | |
| **10:15-11:15 AM** | Data Dimensionality Reduction: PCA, t-SNE, UMAP | Introduction to Statistics for HCS/HTS | Multimodal Biological Imaging of 3D Models for HTS |
| **11:15-11:30 AM** | **Coffee Break** | | |
| **11:30-12:30 PM** | Advanced Image Analysis: Feature Extraction, Machine Learning | Robust or Go Bust: An Intro to the NCATS Assay Guidance Manual | Imaging Mass Cytometry 101 |
| | **Bray Room** | **Room 216** | **Room 217** |
| **12:30-1:15 PM** | Grab lunch and head to the Bray room for: | **Lunch** | |
| **1:15-2:15 PM** | Hands-On CellProfiler Tutuorial | HCS of Protein-Protein Interactions | 3D Cell Culture for Advanced High Content Imaging and Screening |
| **2:15-3:00 PM** | | **Break** | |

**12:30 PM** **Pick up lunch bags** **(2nd Floor Lounge)**

**Lunch Sponsored by** FUJIFILM Value from Innovation

**2:15 - 3:00** **Break for coffee & refreshments**

# Day 1: Tuesday September 17th, 2019 (continued)

## Colloquium: Cell Painting in Drug Discovery
## 3:00PM to 5:30PM

*SBI² is leading a Cell Painting for Drug Discovery Colloquium, an exciting opportunity for the SBI² community to participate in an interactive discussion. This colloquium will address the state of the art in Cell Painting, including adaptations of imaging and analysis for drug discovery, challenges and opportunities, and the future of this approach. This session will be conducted by thought leaders in the field from the Broad Institute and the pharmaceutical industry.*

## The Colloquium is sponsored by:

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**3:00 - 3:15** **Welcome & Introduction.**
**Justin Boyd** Pfizer

**3:15 - 4:00** **State of the art in Cell Painting**
**Santosh Hariharan** Pfizer

**4:00 - 4:45** **The Future of Cell Painting**
**Anne Carpenter** Broad Institute

**4:45 - 5:30** **Panel Discussion on Cell Painting in Drug Discovery**
**Justin Boyd** Pfizer
**Santosh Hariharan** Pfizer
**Anne Carpenter** Broad Institute
**Veronica Soloveva** Merck
**Susanne Swalley** Biogen
**Mark Bray** Novartis
**John Concannon** Novartis
**James Evans** PhenoVista
**Ann Hoffman** GSK
**Patrick Faloon** Biogen

6:00 -7:00 **OPENING RECEPTION (Exhibit Hall)**
***Sponsored by SBI²***

SBI² SOCIETY OF BIOMOLECULAR IMAGING AND INFORMATICS

# Educational Course Abstracts:

# Introductory Level Courses:

## Introduction to Image and Data Analysis

***Mark Bray***
**Novartis Institutes for BioMedical Research, Cambridge, MA**

This introduction will acquaint attendees with the concepts, methods, software and workflows behind automated image analysis. We will introduce the researcher to the basic principles behind determining which pixels in an image below to each cell and/or cellular compartments and measuring properties of interest, with the intent of providing a fuller understanding of the rich information available for discerning phenotypes of interest. No prior knowledge is assumed, though attending the companion introductory sessions is recommended.

## Introduction to Flow Cytometry

***David Gebhard***
**Gebhard Cytometry Consulting**

Flow cytometry is a legacy technology for single cell analysis that shares many of the same underlying fundamental principles with quantitative image analysis. Flow cytometry and quantitative image analysis are both used to derive high content data from single cells. This tutorial will review the concepts and fundamentals of flow cytometry, terms, operations and processes, and will compare and contrast flow and image cytometry to help the attendees better understand how flow and image cytometry can complement and inform each other.
No prior knowledge of flow cytometry is required. The material assumes a working knowledge of fluorescence applications.

## Basic Concepts in Imaging-Based High-Throughput Screening and High-Throughput Profiling Assay Development

***Joshua Harrill***
**The National Center for Computational Toxicology, U.S. Environmental Protection Agency, Research Triangle Park, NC**

This session introduces basic concepts of imaging-based high-throughput screening (HTS) and high-throughput profiling (HTP) assay development. HTS assays are designed to evaluate a discrete cellular process and produce a single, or small number of quantitative outputs. In contrast, HTP assays measures dozens to thousands of features and provide highly-multiplexed quantitative outputs. Either type of approach may be used to evaluate the effects of chemicals or other perturbagens on cellular biology. Topics for this session include (but are not limited to) considerations for model selection, endpoint selection, HCS assay design, identification and use of positive control and reference chemicals, methods for evaluating assay dynamic range and approaches for evaluating assay reproducibility. Attendees will gain a basic foundational knowledge of guiding principles underlying the development of imaging-based HTS and HTP assays. *The views expressed in this presentation are those of the author and do not necessarily reflect USEPA policy.*

## Fundamentals of Statistical Analysis of Screening Data

***Bartek Rajwa***
**Bindley Bioscience Center, Purdue University, West Lafayette, IN**

This tutorial will briefly review the statistical approaches used to analyze, visualize and interpret the HT/HC screening data, and formulate conclusion regarding the screening results. We will discuss the measures of effect sizes (Cohen's d and its multivariate generalization), the dedicated metrics of assay quality such as Z' (Z-prime) and Sw (assay window), and demonstrate the relationship between them. The presentation will explain the conceptual origins of the common HT/HC assay quality indices, the logic behind the formulas, as well as their applicability, implicit assumptions, and limitations. The talk will address the relationship between the traditional measures used in screening, and classification performance measures employed in machine-learning (sensitivity, specificity, predictive values, F1 score, and AUC). The tutorial will also touch upon other essential concepts of data analysis in phenotypic screening: the notions of significance, replication, statistical power, fixed and random effects, and meta-analysis, and link those ideas to the everyday praxis of assay design, optimization, and execution. The intended audience includes the screening practitioners working with all the types of HT or HC screens (bulk assays, image-based system, and flow cytometry instruments).

# Educational Course Abstracts cont'd

# Practical Course:

## Hands-on CellProfiler Tutorial

***Santosh Hariharan***
**Primary Pharmacology Group, Pfizer, Groton, CT**

Automated imaging and analysis have become the workhorse for the current high content screening strategy. In combination with machine learning methods, biologists can now get additional insights regarding fundamental biological processes. CellProfiler is one of the most widely used open-source software for automated analysis of cell images. With its easy to use user interface biologists can build advanced analysis pipeline without the need for in-depth knowledge of image processing. In this workshop, we will demo the installation and usage of CellProfiler. We will go through all the basic steps necessary to build pipeline, extract numerical features from cell images as well as analyze high dimensional data using CellProfiler Analyst through sample image datasets. Attendees can bring their laptops and work alongside using instructions from the workshop.

**IMPORTANT COURSE PREPARATION INFORMATION:**

***Attendees are encouraged to bring their laptop computers with pre-installed CellProfiler software to follow along with the demonstration by the instructor.***

***CellProfiler experts will be available on Tuesday morning sessions and during the Lunch Break (Bray Room) to answer CellProfiler installation questions. Please check in with the SBI2 Registration Desk on Tuesday morning if you require assistance.***

# Educational Course Abstracts cont'd

# Advanced Level Courses:

## Advanced Image Analysis: Feature Extraction, Machine Learning

***Beth Cimini***
**Broad Institute, Cambridge, MA**

Image analysis can be a powerful tool for biologists due to its adaptability and flexibility. In addition to finding and counting objects, it can create hundreds or thousands of measurements for every object found, allowing users to classify objects on either simple or complex criteria. In this session, we will cover some classes of measurements frequently used in bioimaging assays, tools for capturing them, and cases where this sort of learning can be particularly powerful. The tutorial will expand the topics covered in the introductory image analysis session presented by Mark Bray.

## Multimodal Biological Imaging of 3D models for High-throughput Phenotypic Screening

***Seungil Kim***
**Lawrence J. Ellison Institute for Transformative Medicine, University of Southern California, Los Angeles, USA**

Phenotypic image analysis of traditional 2D cell cultures has afforded large-scale drug screenings in the preclinical setting. However, high failure rates of lead compounds in clinical testing suggests we need better models during the drug development process. 3D biomimetic models such as spheroids and organoids have increased in popularity because they can provide a 3D microenvironment that more closely recapitulates in vivo conditions compared to 2D monolayer cultures. There are multiple imaging platforms and available image analyses to elucidate interesting and dynamic biological processes in 3D. In this educational session, we will introduce basic concepts for different imaging techniques such as confocal, 2-photon and light-sheet microscopy, considerations and limitations in designing 3D imaging approaches, integration with high-throughput and high-content applications, and the types of analyses available for specific examples. This session will be beneficial for those who want to gain a basic knowledge on 3D imaging and for advanced users interested in discussing potential challenges associated with scaling current imaging workflows for large scale drug screening applications.

## Data Dimensionality Reduction: PCA, t-SNE, UMAP

***Anna Belkina***
**School of Medicine, Boston University, Boston, MA**

Both human expert-analysts and many machine learning algorithms struggle with multidimensional datasets. However, such datasets often contain partially redundant features, and with so-called dimensionality-reduction methods, one can create a low-dimensional representation of high-dimensional data while retaining most of the information. In this tutorial, the participants will be first presented with a general overview of dimensionality reduction concepts, following by an exploration of various popular dimensionality reduction methods such as PCA, t-SNE, and UMAP. Using several toy and real-life datasets, we will demonstrate and discuss each of these techniques and their applicability for biological data analysis. Although we will briefly touch on feature extraction approaches for cell imaging, the tutorial will focus mainly on visualization-enabling data processing methods. This tutorial is intended for biologists who are interested in computational approaches designed to explore their data in a comprehensive and unbiased manner. The participants will learn how various classes of single-cell data (including microscopy, flow and mass cytometry, and single-cell transcriptomics) can be processed for 2- and 3-D representation, allowing convenient visualization and easier interpretation.

## Imaging Mass Cytometry 101

***Jared K. Burks***
**Flow Cytometry & Cellular Imaging Core Facility, Department of Leukemia, M.D. Anderson Cancer Center, Houston, TX**

Imaging Mass Cytometry was developed from a suspension-based mass cytometry (CyTOF) founded in inductively coupled plasma (ICP) mass spectroscopy. Using carrier molecules, isotopically enriched lanthanide metals are attached to antibodies. These metal-labeled antibodies are then used to detect target proteins in tissues, cells, or most anything attached to a microscope slide. Detection of these metal labeled antibodies occurs when a laser is used to ablate the sample material from the slide thus introducing the lanthanide metals to the ICP. Once the material and lanthanide metals are ionized in the ICP torch, 5500-7500 Kelvin, the lanthanide metals (high mass) are separated by their relative masses in a time of flight (TOF) chamber. The sample is interrogated via a raster scan, introducing the sample material into the detector a pixel at a time. When the pixel data is reassembled a quantitative image is generated. Come to the talk for the details, high-plex imaging that results, and what and why we employ this technology.

# Educational Course Abstracts cont'd

# Advanced Level Courses Cont'd:

## Robust or Go Bust: An Introduction to the NCATS Assay Guidance Manual

***Nathan P. Coussens***
**Molecular Pharmacology Branch Laboratories. Frederick National Laboratory for Cancer Research, Frederick, MD**

The NCATS Assay Guidance Manual (AGM) is an eBook of best practices for the design, development, and implementation of robust assays for early drug discovery. Initiated by pharmaceutical company scientists, the manual provides guidance for designing a "testing funnel" of assays to identify genuine hits using high-throughput screening (HTS) and advancing them through preclinical development. With contributions from more than 100 scientists, much of this information was previously "tribal knowledge" within the pharmaceutical industry and is not readily found in a classroom or the literature. Combined with a workshop/tutorial component, the overall goal of the AGM is to provide a valuable resource for training translational scientists. Expected Educational Benefits: The NCATS Assay Guidance Manual eBook is intended to benefit the worldwide drug discovery community by providing guidelines and best practices for the successful design, optimization, implementation, and interpretation of robust assays suitable for early stage discovery. The eBook is complimented by a workshop series, data analysis tools, and educational videos. This presentation will highlight the wide range of topics, tools, and events enabled by the AGM, as well as the AGM history and future perspectives. Targeted Audience Level: This presentation will benefit students, early-career researchers, and experienced investigators, who are interested in robust assay design, development, and implementation to support early-stage drug discovery

## 3D Cell Culture for Advanced High-content Imaging and Screening

***Olivier Frey***
**InSphero AG, Schlieren Switzerland**

The use of 3D cell culture models and organ-on-chip systems is rapidly expanding because they are recognized as representing more structurally and physiologically relevant models of in vivo biology. Making 3D cell structures accessible to high content imaging and screening poses a next level of multi-disciplinary challenges on development teams. This course will provide a short overview of available scalable 3D cell culture models ranging from individual scaffold-free culture approaches to complex multi-organ devices. The advantages and limitations of the various culture models, assays and imaging approaches will be addressed and discussed.

## HCS Compatible Protein-Protein Interaction Assays

***Paul A. Johnston***
**Department of Pharmaceutical Sciences, University of Pittsburgh School of Pharmacy**

Protein-protein interactions (PPIs) are obligatory for all cellular functions and represent potential therapeutic targets for drug discovery. Never-the-less, the relative paucity of approved PPI inhibitor/disruptor drugs indicates that the discovery of such molecules remains challenging and the prevailing perception has been that PPI targets are essentially "undruggable". However, the structural elucidation of several PPI complexes has revealed that protein-binding interfaces contain discrete "hot spots" that may preferentially facilitate binding interactions. It's been proposed that a relatively small number of amino acids at the PPI interface contribute most of the binding energy, and that the contact surfaces exhibit some degree of flexibility with cavities, pockets and grooves available for small molecule binding. The enormous potential of PPI inhibitors/disruptors as therapeutics has prompted the development and implementation of many biochemical and cell-based assay formats compatible with HTS and/or HCS. In cell-based PPI formats, the interacting partners are generated in situ and PPIs occur within the cellular milieu where cofactors or post-translational modifications are available. This course will describe three distinct PPI assays compatible with HCS: fluorescence resonance energy transfer (FRET) based assays, protein complementation assays (PCA), and positional biosensor assays.


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# Day 2: Wednesday September 18th, 2019

## SBI² Conference Scientific Program

**8:00 - 5:00** **Registration Open**

**8:00 - 6:30** **Exhibit and Poster Viewing**

**8:50- 9:00** **Introduction & Welcome to the 6th Annual SBI² Conference**
**Myles Fennell,** President SBI²

**9:00 - 10:00** **Opening Keynote Presentation**

### Integrating Cellular and Spatial Maps for a Human Cell Atlas

**Aviv Regev**
Institute Member, Chair of the Faculty, Co-director of the Cell Circuits Program, Broad Institute

## Session I: HCS-HTS Successes and Learnings

**Session Chairs & Scientific Program Committee:**

**Debra Nickischer,** co-chair
Arvinas

**Regis Doyonnas,** co-chair
Pfizer

*High content screening allows us to interrogate simultaneously many cellular parameters representative of the biological activity present in physiologically and disease relevant cell-based assays. By exploring high dimensional phenotypic signatures, complex biological pathways can be mapped so that novel drugs with subtle effects or complex mechanism of actions may finally be identified. The **HCS-HTS Successes and Learning** session at the 6th Annual SBI2 conference will cover success stories and lessons learned when applying these complex assays to drug discovery in industry and academia.*

**10:00- 10:30** **Identification of novel factors involved in the nuclear export of mRNA using RNAi and CRISPR-based cellular phenotyping screens.**
Invited Speaker, **Kaylene Simpson** (Victorian Centre for Functional Genomics ACRF Translational Proteomics)

**10:30 - 11:00** **Break for coffee– Exhibit & Poster viewing**

**11:00 - 11:30** **Development and Use of a High Content Imaging-Based Phenotypic Profiling Assay for Bioactivity Screening of Environmental Chemicals**
Invited Speaker , **Joshua Harrill** (National Center for Computational Toxicology, US EPA)

**11:30 - 12:00** **Live imaging of epigenetic landscape**
Invited Speaker, **Alexey Terskikh** (Neuroscience and Aging Research Center, Sanford Burnham Institute)

# Day 2: Wednesday September 18, 2019 *(continued)*

**12:00 - 12:20** **Phenotypic Discovery Platform for Efficacious Antioxidants**
Selected Abstract, **Kyle Vick** (Aerie Pharmaceuticals)

**12:20 - 12:30** **A "Brighter" future: Introduction to unique imaging reagents from Funakoshi Company**
**10 Min Spotlight**, **Kelvin Lee** (Funakoshi)

**12:45 - 1:30** **Perkin Elmer Technology Spotlight Lunch**
**(Pechet Room, overflow rooms 214, 216, 217)**

PerkinElmer

**Object-Based Imaging Reduces Data Volume and Time to Results,**
Speaker, **Alexander Schreiner** (PE)
**An Automated Deep-learning Workflow for Analyzing HCS screens,**
Speaker, **Oren Kraus** (Phenomic AI)

**See Page 22-23 for detailed description of Technology Spotlights**

## Wednesday PM Sessions (Ampitheater) 1:50 PM– 5:00PM

**1:50 - 2:00** **Genedata Imagence® - Deep Learning Automates the Analysis of Cell Painting Assays**
**10 Min Spotlight**, **Matthias Fassler** (Genedata)

## Session II: Focus on Imaging in Neurological Disease and Oncology

**Session Chairs & Scientific Program Committee:**

**Le Ai Trinh,** co-chair
University of Southern California

**Vance Lemmon,** co-chair
University of Miami

*Phenotypic screening is increasingly dependent on modeling, computational approaches and 3D imaging to attack complex biological problems at both high-content and high-throughput. This has been especially empowering in oncology and neuroscience where the use of pluripotent stem cells, self-organized organoids and whole animal models are enabling screens for a range of cellular phenotypes from the electrophysiological profile of individual neurons to their degeneration. This session will highlight recent developments that expand our ability to understand the local environment in tumor progression and degeneration and regeneration of the nervous system.*

**2:00 - 2:30** **High content analysis of tumor-fibroblast crosstalk in colorectal cancer**
Invited Speaker, **Shannon Mumenthaler** (University of Southern California)

**2:30 - 3:00** **Scalable Measurements of Intrinsic Excitability in Human iPS Cell-Derived Excitatory Neurons Using All-Optical Electrophysiology**
Invited Speaker, **Graham Dempsey** (Q-State Biosciences)

# Day 2: Wednesday September 18, 2019 *(continued)*

| | |
|---|---|
| **3:00 - 3:10** | **Spheroid Painting with DRAQ9™:Simple Identification and Measurement in 3D Cell Culture**<br>**10 Minute Spotlight**, **Roy Edward** (Biostatus) |
| **3:10 - 3:20** | **FAST-HDR: A novel vector system for the rapid development of knock-in cell lines**<br>**10 Minute Spotlight**, **Oscar Perez-Leal** (Temple University) |
| **3:20 - 3:50** | **Break for coffee- Exhibit and Poster viewing** |
| **3:50 - 4:20** | **Dynamic Arrays for Profiling Antitumor Activity of CAR T Cells**<br>Invited Speaker, **Daniel Irimia** (Harvard Medical School, Massachusetts General Hospital) |
| **4:20 - 4:40** | **Using a novel colorectal cancer-on-chip model to investigate tumor microenvironment-mediated cancer progression**<br>Selected Abstract, **Carly Strelez** (USC) |
| **4:40 - 5:00** | **3D Co-Cultures of Prostate Cancer Patient-Derived Xenografts, Stroma, and Endothelium in a Perfused Microplate**<br>Selected Abstract, **Lindsey K Sablatura** (Rice University) |
| **5:00 - 5:30** | **SBI$^2$ Annual General Meeting** **(Amphitheater)** |
| **5:30 - 6:30** | **SBI$^2$ Sponsored Reception** **(Exhibit Hall)** |

## Please plan to attend the 2019 SBI$^2$ Annual General Meeting

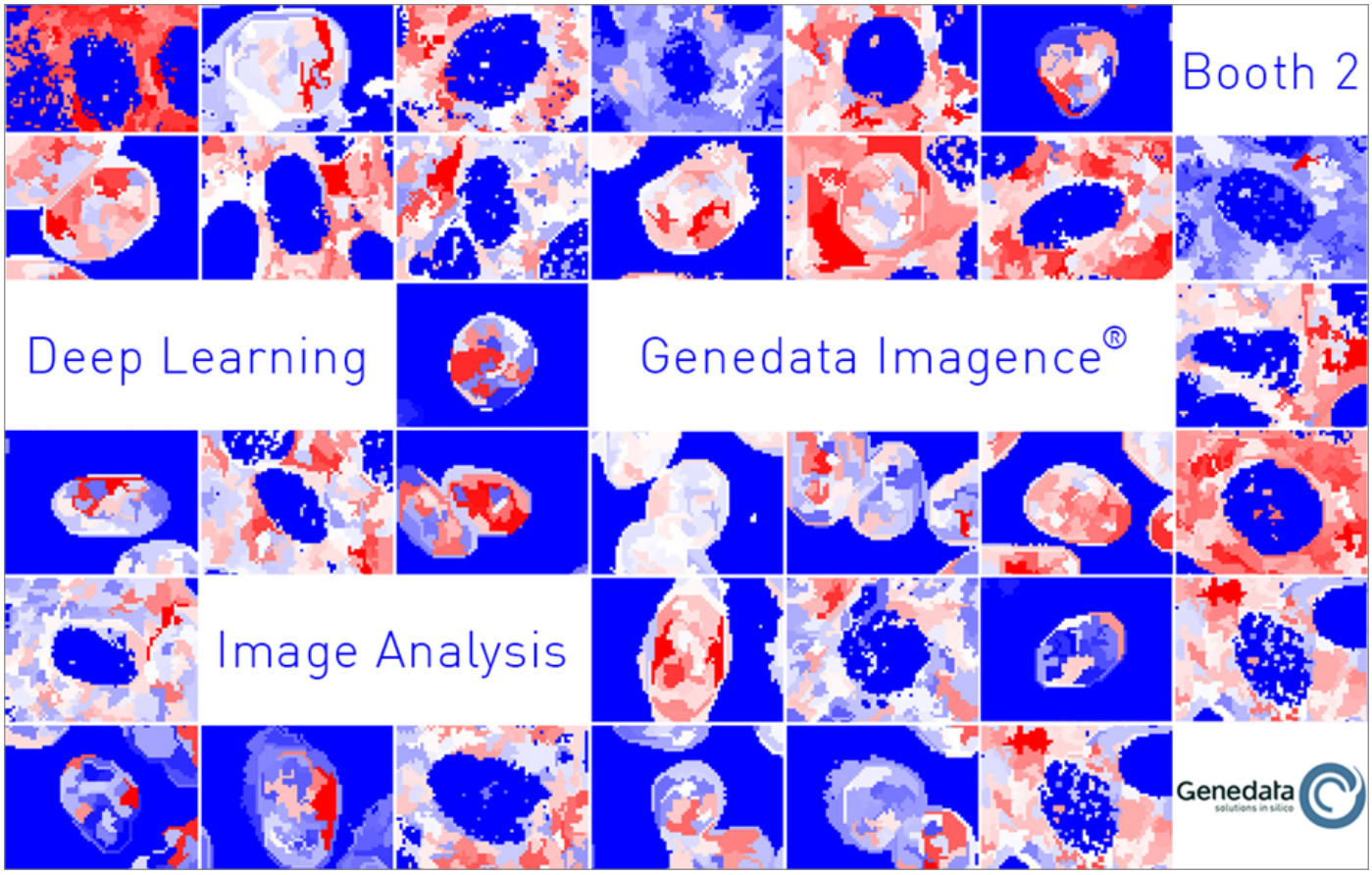
The general meeting is a business meeting required for non-profits. This is an excellent opportunity to learn more about the society and find out how you can participate.

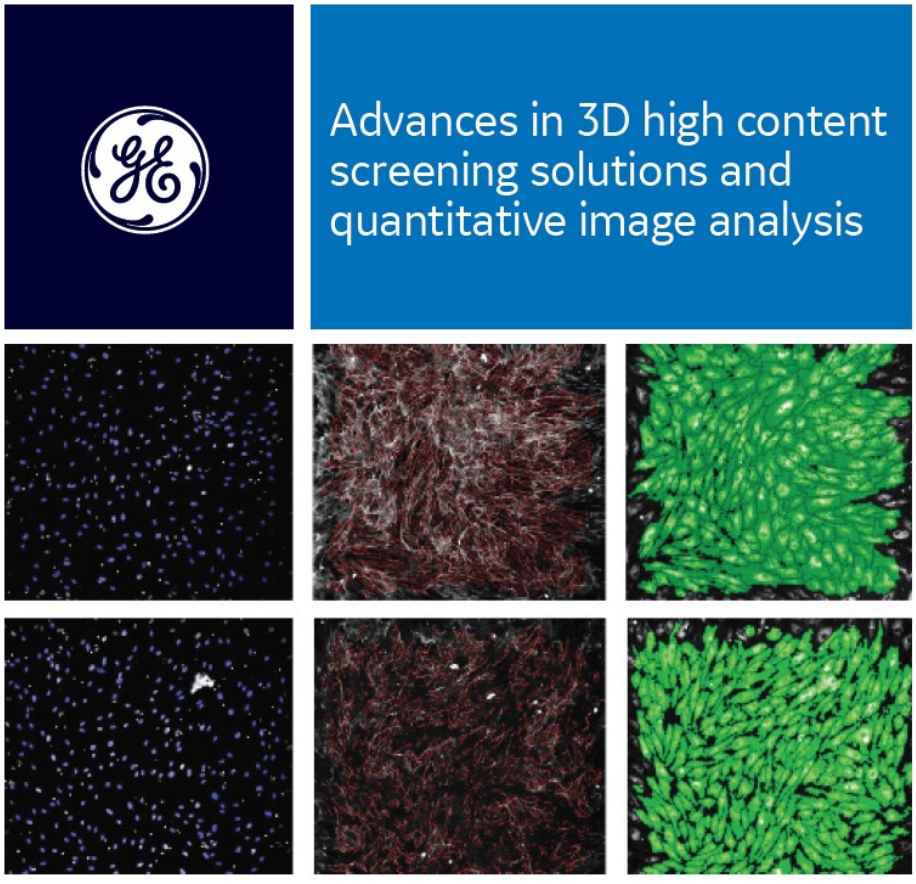
***On Wednesday, Sept. 18 at 5:00 p.m.***
in the amphitheater
followed by the SBI$^2$ sponsored reception in the exhibit hall

Your input is valuable to our success and we look forward to your attendance!

*SBI$^2$ Mission Statement*

*The Society of Biomolecular Imaging and Informatics (**SBI$^2$**) is an international community of leaders, scientists, and students promoting technological advancement, discovery, and education to quantitatively interrogate biological models to provide high context information at the cellular level.*



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gelifesciences.com/cellanalysis

# Day 3: Thursday September 19, 2019

**8:00 5:00** **Registration Open**

**8:00 - 3:00** **Exhibit and Poster viewing**

**8:50 - 9:00** **Day 2 Opening Remarks**
**Myles Fennell,** President SBI$^2$

## Session III: Therapeutic Drug Discovery for Complex Disease

**Session Chairs & Scientific Program Committee:**

**George Lee,** co-chair
Bristol-Myers Squibb

**Daniel Levner,** co-chair
Emulate

*Novel technologies such as 3D models and digital pathology are transforming drug development through the quality, complexity and human-relevance of the data they produce. In particular, recent advances in Organ-Chip and organoid technologies have provided new disease models that more closely recapitulate human disease, while advances in digital pathology and image analysis allow for the appreciation of spatial relationships within the tissue microenvironment. In this session we explore these technologies and address their potential to reveal mechanisms for therapeutic response.*

**9:00 - 9:30** **Structure-function relationships in human organ models**
Invited Speaker**, Janna Nawroth** (Emulate Inc)

**9:30 - 10:00** **Phenotyping the tumor micro-environment with advanced tissue-based multiplexing assays**
Invited Speaker, **Bonnie Philipps** (Ultivue Inc)

**10:00 - 10:20** **Maximizing the Value of Cancer Drug Screening in Multicellular Tumor Spheroid Cultures: Are you Analyzing your 3D Tumor Models Appropriately?**
Selected Abstract, **Paul Johnston** (U of Pittsburg)

**10:20 - 10:30** **Introducing two software modules that bring new functionality in image acquisition and analysis software from Amnis, now a part of Luminex Corporation**
**10 Minute Spotlight, Darin Fogg** (Lunimex)

**10:30 - 11:00** **Coffee Break– Exhibit Viewing**

**10:30 - 12:00** **Poster Presentations (authors at posters)**

***SBI2 High Content 2019 Poster Competition***
***Sponsored by ChemBridge: 1st, 2nd, & 3rd place awards***

**12:15 - 1:00** **GE Healthcare Technology Spotlight Lunch**
**(Pechet Room, overflow rooms 214, 216, 217)**
**Pick up Lunch in 2nd floor lounge**

**Diving Deeper: Advances in 3D High Content Screening Solutions and Quantitative Image Analysis**
Speaker, **Will Marshall** (GE)

**See Page 22-23 for detailed description of Technology Spotlights**

# Day 3: Thursday September 19, 2019 *(continued)*

**1:15 - 2:15** **Closing Keynote Presentation**

## From Yeast to Neurons to Patients: A Novel Drug Discovery Platform for Neurodegenerative diseases

### Chee-Yeun Chung

Scientific Co-Founder, Director, Discovery Biology
Yumanity Therapeutics

## Session IV: Machine Learning/Artificial Intelligence and/or Conventional outputs?

**Session Chairs & Scientific Program Committee:**

**Sam Cooper,** co-chair
Phenomic AI

**Neil O. Carragher,** co-chair
MRC Institute of Genetics & Molecular Medicine

*Machine learning has been a feature of drug discovery for almost four decades and delivered multiple successes, with early algorithms focused around in silico optimization of compounds. So what's all the fuss about now? In contrast to the rules and simulation based approaches of past decades, new machine learning approaches such as deep-learning allow us to extract valuable insights from a wide variety of data types, including imaging, sequencing, and compound data, without having to explicitly engineer new features for each data type. In this session we will bring together a group of researchers working on state-of-the art techniques for microscopy image analysis, and explore how imaging data can be integrated with other data modalities to answer key questions in biological and pharmaceutical research.*

**2:15 - 2:45** **Deep learning for single cell biology**
Invited Speaker, **David A. Van Valen** (California Institute of Technology)

**2:45 - 3:15** **Machine learning: a new approach enabling drug discovery**
Invited Speaker, **Eric Lubeck** (Insitro)

**3:15 - 3:45** **Break for coffee & exhibit viewing**

**3:45 - 4:05** **Comparison of classical image analysis methods and deep-learning approaches for 3D single cell measurements within multi-cellular spheroids**
Selected Abstract, **Ty Voss** (NCATS/NIH)

**4:05 - 4:25** **Nucleus segmentation across imaging experiments: The 2018 Data Science Bowl**
Selected Abstract, **Juan Caicedo** (Broad Institute)

**4:25 –4:45** **Awards Ceremony and Closing remarks**
**Myles Fennell**, President SBI$^2$

The President's Award is sponsored by PerkinElmer

# 10 Minute Spotlight Presentations

## Genedata

**Genedata Imagence® - Deep Learning Automates the Analysis of Cell Painting Assays**
**Matthias Fassler** Genedata

Here we show how the new software solution Genedata Imagence enabled the complete analysis of a Cell Painting screen of 1'500 test compounds within a few hours. In our case study we employed this workflow to train a neural network to recognize the cell-painted phenotypes of reference compounds with known mode-of-action (MoA). This network was used to analyze the entire BBBC022 data set and successfully detected compounds with similar MoA. Genedata Imagence provides a streamlined workflow that facilitates discovery by making powerful deep learning approaches intuitive and easily accessible to any HCS biologist.

## Funakoshi

**A "Brighter" future: Introduction to unique imaging reagents from Funakoshi Company**
**Kelvin Lee** Funakoshi

Funakoshi Company has been a contributing leader providing research reagents and instruments for life science markets. In this spotlight session, our unique imaging tools will be introduced – targeting for lipid droplets <LipiDye>, cytoplasm <CytoSeeing>, nucleus <NucleoSeeing>, neuron receptors <LiveReceptor>, cell-based GST assay probes and intracellular temperature monitoring tool <Thermoprobe>. These imaging reagents are truly innovative, receiving favorable response from our research users and only available through Funakoshi Company.

## BioStatus

**Spheroid Painting with DRAQ9™:Simple Identification and Measurement in 3D Cell Culture**
**Roy Edward** Biostatus

Cell-based assay reproducibility is critical to drug discovery and tissue engineering. It is widely accepted 2D assays limit representation of *in vivo* responses - 3D formats are, therefore, desirable. Integral to 3D object analysis is boundary identification, failure results in inaccurate downstream morphometrics. Current methods for automated segmentation use grayscale transmission images with complex filtering which struggle with debris, matrices or scaffolds. Fluorescent nuclear counterstaining enables cellular localization in 2D. We adapt this using DRAQ9™, a far-red cell-permeant cytoplasmic probe, as whole 3D-object "paint" for reliable boundary identification, using an inexpensive universal platform, simplifying image analysis, for rapid, effective screening.

## ExpressCells

**FAST-HDR: A novel vector system for the rapid development of knock-in cell lines**
**Oscar Perez-Leal** Temple University

While CRISPR/Cas9 greatly facilitates gene editing, its use for tagging endogenous proteins via reporter gene knock-in remains constrained because the process is tedious and time-consuming. Here we describe a homologous recombination system (FAST-HDR) that, in combination with CRISPR/Cas9, makes this process far more efficient. We developed advanced cell lines with 3 fluorescently tagged endogenous proteins, permitting high-content phenotypic drug screening without staining or immunofluorescence. Thus, the FAST-HDR system can be used for developing enhanced cell-based models for drug discovery.

## Luminex

**Introducing two software modules that bring new functionality in image acquisition and analysis software from Amnis, now a part of Luminex Corporation**
**Vidya Venkatachalam** Luminex

Amnis imaging flow cytometers deliver objective, quantitative and statistically significant high-content data to inform decisions regarding cellular processes, drug discovery, drug development and basic research.
The richness of the image data and the associated features in the IDEAS® Software provides huge benefits for the user, but also introduces complexity in the data analysis. We address this by providing a tool for automated feature creation using machine learning that enables the creation of new features tailored to sets of image data. We will discuss the details of this tool and provide examples of features generated by the tool to identify populations of interest

# Lunch Time Technology Spotlight Presentations

## Perkin Elmer

### Object-Based Imaging Reduces Data Volume and Time to Results

**Alexander Schreiner** Perkin Elmer

A bottleneck challenge in 3D imaging is the huge volumes of image data generated and extended time needed to acquire and analyze images. For example in hydrogel assays and other 3D matrices, a large number of image fields will be either empty or only contain partially cover objects. To reduce the acquisition of unnecessary images, our latest software includes an update to our intelligent image acquisition solution, PreciScan. This automated process identifies objects of interest in x, y, and z dimensions using a pre-scan and re-scan approach. We will showcase in a hydrogel cell model how PreciScan reduces image acquisition time by 36x and decreases the data volume of the re-scan by a factor of 50

### An Automated Deep-learning Workflow for Analyzing HCS screens

**Oren Kraus** Phenomic AI

Imaging-based phenotypic screening of cell-based disease models has become an indispensable tool for modern drug discovery. Despite the growing adoption of HCS, analyzing complex imaging data can take weeks and require hands-on programming by data scientists. Here we described a cloud-enabled deep learning platform for analyzing and visualizing HCS data. The workflow involves importing raw HCS feature data and experimental metadata to ColumbusPlus™. Known reference control conditions are selected in Spotfire and a segmentation-free deep convolutional multiple instance learning model is trained to classify fields-of-view based on control treatments. This classifier is then used to score the rest of the unknown treatments screened. The resulting scores and images highlighting positive phenotypes are displayed in Spotfire.

## GE Healthcare

### Diving Deeper: Advances in 3D High Content Screening Solutions and Quantitative Image Analysis

**Will Marshall** GE Healthcare

High Content Analysis (HCA) tools continually evolve with changing research trends, resulting in a large breadth of current applications and potential to advance research in completely new areas. Recent adoption of 3D cell culture models and generation of high dimensional phenotypes have already generated enough success stories to signal that the HCA community is on a promising path toward disruptive change. However, the use of microtissues and more comprehensive computational methods present new challenges. To maximize the utility of these technologies for HCA, innovations in automation and interpretation of the exponentially larger and more complex datasets will be critical.

GE Healthcare's Cell Analysis team intends to facilitate advancements in HCA by developing products that not only provide researchers access to cutting edge methods, but also address the overarching complexities that arise when combining the methods into a single workflow that can generate reliable results

.

# Poster Presentations

1. **An automated deep-learning workflow for HCS POSTER** Alberto Pascal and Oren Kraus
2. **Novel plate-based detection method for T cell activation/proliferation, migration, and cytotoxicity assay using image cytometry** Jordan Bell and Leo Li-Ying Chan
3. **Watch It Live With DRAQ9™: Time-lapse Imaging of Cell Behaviour on 2D Substrates and in 3D Aggregates** Roy Edward
4. **Semi-automated approach for 3D retinal tissue differentiation and analysis** Petr Baranov and Evgenii Kegeles
5. **Developing an efficacious high-content, high-throughput chemoresponse assay for personalized CLL treatment** Mark Xiang Li
6. **Live Imaging of Gene Expression in High-Throughput and at the Single Transcription Site Level** Yihan Wan, Diana Stavreva, Varun Sood, David Garcia, George Zaki, Gordon Hager, Tom Misteli, Dan Larson, Gianluca Pegoraro
7. **Cell Painting predicts impact of cancer variants** Juan C Caicedo, Shantanu Singh, Jesse Boehm, Anne E. Carpenter
8. Withdrawn
9. **Exploring cell-cell interactions with weakly supervised learning** Oren Kraus
10. **High content analysis (HCA) of tau aggregation in primary neurons: screening anti-tau antibodies and modeling tauopathy progression in vitro** Katherine Titterton
11. **Deep Learning-derived Features Outperform Classical Computer Vision in Low Dimension-Embedding of High-Content Screening Data** Matthias Fassler, Daniel Siegismund, Marusa Kustec, Stephan Heyse, Stephan Steigele
12. **Development of phenotypic high content imaging assays for the evaluation of ROS induction and mitochondrial ATP levels in induced pluripotent stem cell derived cardiomyocytes for pharmacological safety assessment of cardiotoxicity** John Bassett and Elena Trepakova
13. **3D Spheroid Models for Oncology and Immunology Applications** Jennifer Gasparek, Apeksha Villath, Kirsten Dean, Mehar Cheema, Matthew Betzenhauser, Grant Carr, Rory Curtis, Maria Tsompana
14. **A Novel Islet - Peripheral Blood Mononuclear Cell Co-Culture Model for Studying Type 1 Diabetes** Judi Wardwell, Nikole Perdue, Joan Mir-Coll, Adelinn Biernath, Aparna Neelakandhan, Felix Forschler, Claire Gibson Bamman, Matthias Von Herrath, Johnna Wesley, Burcak Yesilda

# Poster Presentations Cont'd

15. **High-content Profiling in Oesophageal Adenocarcinoma Identified Selectively Active Classes of Compounds for Repurposing and Novel Drug Discovery** Neil Carragher
16. **Shape Matters - Development of a Morphometric Imaging Assay for Sickle-Cell Disease** Sheila Kantesaria
17. **Top Tips and Guidelines for a Successful High-Content Screening Assay with a 3D Cell Model System** Angelika Foitzik, Karin Boettcher, Hartwig Preckel , Joe Trask, Stefan Letzsch, Alexander Schreiner
18. **Spatio-temporal activation of androgen receptor (StAR): a novel drug discovery workflow** Harish Sura, Katherin Patsch, Grzegorz Zapotoczny, Boris Kashemirov, Emma Fong, Chao Liu, Yuanye Sun, Dane Lemons, Nolan Ung, Maya Aljehani, Ren Sun, Daniel Ruderman, Charles E. McKenna, David B. Agus
19. **Using 3D Neural Spheroids to Accelerate Drug Discovery with Kinetic and High Content Imaging** Blake Anson, Fabian Zanella, Cassiano Carromeu, Oivin Guicheritt, Kendra Prum, Javier Pineda, Chris Koehler
20. **A Human Stem Cell-derived Oligodendrocyte-based Screen for the Discovery of Re-myelinating Drugs** Donald J. Zack, Xitiz Chamling, Alyssa Kallman, Cindy Berlinicke, Peter Calabresi

S/A **A Phenotypic Discovery Platform for Efficacious Antioxidants** Kyle Vick

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***1st, 2nd, & 3rd place awards***

Don't forget to pick up your complementary hardcopy of

***Assay and Drug Development Technologies, September 2019!***

The SBI$^2$ conference special issue includes a summary program with invited speaker abstracts, research articles and an editorial review of the meeting. A second special online issue will be published in January including a summary of the final program including abstracts from oral presentation and posters. A synopsis of the colloquium is scheduled for publication in January 2019. See www.SBI2.org for more details.

# Exhibitor Company Descriptions

**Booth 1**
www.perkinelmer.com

**SBI² Supporting Partner & Platinum Level Sponsor**

PerkinElmer is a global leader committed to innovating for a healthier world. Our dedicated team of 8,000 employees worldwide are passionate about providing customers with an unmatched experience as they help solve critical issues especially impacting the diagnostics, discovery and analytical solutions markets. Our innovative detection, imaging, informatics and service capabilities, combined with deep market knowledge and expertise, help customers gain earlier and more accurate insights to improve lives and the world around us

**Booth 2**
www.genedata.com

**SBI² Supporting Partner & Gold Level Sponsor**

Genedata Screener® analyzes, visualizes, and manages screening data from in-vitro screening assay technologies across the enterprise, including very complex as well as ultra-high throughput experiments. Its screening-oriented business logic enables rapid processing and comprehensive analysis of complete campaigns

**Booth 3**
www.nexcelom.com

Headquartered in Lawrence, MA, Nexcelom Bioscience LLC is a manufacturer of innovative Cellometer®, Cellaca™ MX, and Celigo® image cytometry products for cell analysis. Nexcelom's solutions automate time-consuming procedures, enabling scientists to focus less on the process and more on the research results. Contact Nexcelom Bioscience at +1 978-327-5340 or visit www.nexcelom.com

**Booth 4**
www.opticalbiosystems.com

Introducing StellarVision, the first high-throughput smFISH imaging platform to integrate both spatial and genomic information at single cell and molecule resolution. Powered by Optical Biosystem's own Synthetic Aperture Optics, StellarVision's oil-free 20X lens easily digitizes whole tissue sections or entire microplates at the equivalent resolution of a 100x oil lens

# Exhibitor Company Descriptions

**Booth 5** **Gold Level Sponsor**

www.gbo.com

Greiner Bio-One North America, Inc. is a privately held plastic manufacturing company located in Monroe, NC whose three divisions manufacture a variety of products for the medical and research fields. The manufactured products include plasticware for the cultivation and analysis of cell and tissue cultures, microplates for high-throughput screening related to drug screening, products for blood and specimen collection, tests for the detection of bacteria and viruses, as well as, custom-made products.

**Booth 6** **Gold Level Sponsor**

www.gelifesciences.com/cellanalysis

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our expertise in cellular imaging and information technologies, drug discovery, and biopharmaceutical manufacturing technologies is advancing and accelerating how our customers discover, make and use patient biotherapeutics.

**Booth 7**

www.funakoshi.co.jp/exports

Funakoshi company, located in Tokyo, Japan has been contributing as a leader to providing research reagents and instruments for researchers in the life science fields since its foundation. Our corporate mission is to provide products to broad range of customers throughout our worldwide network.

**Booth 8**

www.chroma.com

Chroma Technology designs and manufactures optical interference filters using advanced sputtering technologies. Our high performance filters are intended for imaging applications ranging from widefield and confocal fluorescence microscopy, TIRF and Super-Resolution techniques to flow cytometry, high content screening, multi-photon and Raman spectroscopy. Chroma also provides comprehensive technical and applications support.

# Exhibitor Company Descriptions

**Booth 9** **Gold Level Sponsor**

www.moleculardevices.com

At Molecular Devices, we enable our customers to unravel the complexity of biological systems. We provide platforms for high-throughput screening, genomic and cellular analysis, colony selection and microplate detection. These leading-edge products empower scientists to improve productivity and effectiveness, ultimately accelerating research and the discovery of new therapeutics.

**Booth 10** **Gold Level and Educational Session Sponsor**

ww.wakoautomation.com

Fujifilm Wako Automation supplies high throughput platforms for 3D assays. The Yokogawa CV8000 platform provides high content imaging in the fastest and most versatile dual spinning disk platform. The Yamaha Cell Handler provide automated selection and transfer of spheroids and organoids to plates for screening.

**Booth 11**

www.olympus.com

Olympus is a global technology leader, crafting innovative optical and digital solutions in medical technologies; life sciences; industrial solutions; and cameras and audio products. Throughout our nearly 100-year history, Olympus has focused on being true to society and making people's lives healthier, safer and more fulfilling.

**Booth 12**

www.corelifeanalytics.com

Core Life Analytics gives biologists the ability to analyze their own high content data. With our StratoMineR online data analytics platform, they can apply powerful analytical methods, including A,I to large, complex numeric data sets. It is especially useful for advanced phenotypic screening methods such as Cell Painting.

# Exhibitor Company Descriptions

## Booth 13

Www.bluecatbio.com

BLUE CAT BIO

Blue®Washer uses centrifugation to remove liquids from 96, 384 and 1536w plates, eliminating background and variability in assay data. Highly reproducible, low residual volumes < 0.3 µl/ well raise z' by 0.1-0.3 for typical cellular assays. Higher z' means more reliable compound profiles - fewer truly active compounds missed AND fewer false positives to re-screen.

## Booth 14

www.denovosoftware.com

De Novo™ Software

De Novo Software specializes in producing high quality cytometry data analysis software. Our flagship product, FCS Express 7, is a full feature solution for Flow Cytometry data. FCS Express 7 Image Cytometry introduces the same support and flexibility for imaging data files. FCS Express combines a user-friendly modern interface with powerful analysis tools, visualization capabilities, and sophisticated presentation features, making it the tool of choice for thousands of researchers needing results quickly from their data

## Booth 15

www.insphero.com

insphero

InSphero sets the standard for *in vitro* drug discovery and safety testing with innovative 3D cell-based technology and comprehensive preclinical research solutions. Its robust and highly physiologically relevant suite of 3D InSight™ Platforms for liver toxicology, liver disease, diabetes, and oncology are used by major pharmaceutical biotechnology companies worldwide

## Booth 16

www.stemonix.com

StemoniX

StemoniX® eases workflows by providing high quality ready-to-use 3D culture systems and offering state of the art services through our Discovery as a Service outsourcing program. We accelerate your research with human iPSC-derived neural and cardiac cells for HTP discovery, disease-modeling, and toxicity testing. See more at www.stemonix.com.

# Exhibitor Company Descriptions

## Booth 17

www.unionbio.com

UNION BIOMETRICA
Large Particle Analysis and Sorting

Union Biometrica Large Particle Flow Cytometers automate the analysis & dispensing of objects too big/too fragile for traditional flow cytometers. Samples include large delicate cells (adipocytes), cell clusters (EBs, islets), organoid bodies (enteroids), spheroids (neurospheres, tumorspheres), hydrogel-encapsulated samples, and others. COPAS and BioSorter instruments cover the full 10-1500µm size range.

## Booth 18

www.yokogawa.com

YOKOGAWA

Yokogawa has created cutting-edge Life Science research equipment for over 20 years, interfaced with dual-microlensed spinning disk confocal technology including the Confocal Scanner Unit (CSU) for live-cell imaging, CQ1, and CV8000 for High Content Acquisition. Coupled with our CellPathfinder analysis software system, HCA systems provide high-quality 3D live-cell analysis imaging.

## Booth 19

www.xpresscells.com

ExpressCells

ExpressCells creates custom, knock-in cell lines for drug development, toxicology, and other biologic research, tagging multiple proteins of interest in cell lines far faster than is possible with conventional methods. Researchers can follow intracellular processes longitudinally—in target- or phenotype-based assays, for example—reducing or eliminating fixation, staining, and immunofluorescence

## Booth 20

www.luminexcorp.com

Luminex
complexity simplified.

Our mission is to empower labs to obtain reliable, timely, and actionable answers, ultimately advancing health. We serve markets including clinical diagnostics, life science research, immunology, and personalized medicine. Our goal is to transform global healthcare with innovative instruments and assays that deliver cost-effective, rapid results to clinicians and researchers

# Exhibitor Company Descriptions

## Booth 21

www.thermofisher.com

Thermo Fisher Scientific supplies innovative solutions for the world's biomolecular imaging & informatics industry. With applications that span the bio-informatics processes – from CRISPR libraries through high content analysis products – we provide a broad range of products and services including validated antibodies, fluorescent probes, siRNAs, and proprietary fluorescence ISH (FISH) and sequential branched-DNA amplification techniques to visualize RNA with single-molecule sensitivity. Collectively these tools can be integrated for multiparametric phenotypic screening and downstream Cell Painting applications to help elucidate the detection of next-generation drug targets and mechanism of actions

## Booth 22

www.biotek.com

Think Possible

For over 50 years, BioTek has been a global leader in the design and manufacture of innovative life science instrumentation, including cell imaging systems, microplate readers, washers, dispensers, automated incubators and stackers.

## Booth 23

**Gold Level Sponsor**

www.microscope.healthcare.nikon.com

Nikon Instruments Inc. is the US microscopy arm of Nikon Healthcare, a world leader in the development and manufacture of imaging technology for biomedical applications. Leveraging our expertise in optics, image acquisition and analysis, Nikon is able to offer a wide range of solutions for high content imaging.

## Spotlight Presenter

www.biostatus.com

BioStatus - the home of DRAQ5™ & DRAQ7™! These far-red alternatives to traditional DNA-binding vital and viability dyes offer new opportunities in assay design and investigation of 3D cellular structures. Our latest product – DRAQ9™ - enables robust masking of spheroids and real-time tracking of cell migration and proliferation.

# Scientific Program and Organizing Committees

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## Please Provide Feedback

www.surveymonkey.com/r/SBI2-2019

## Want to get involved in the Society?

ATTEND the Annual General Meeting on Wednesday
VISIT www.sbi2.org
EMAIL info@sbi2.org

SOCIETY OF BIOMOLECULAR IMAGING AND INFORMATICS

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P. O. Box 12300
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To all our exhibitors:
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