COMMERCIAL TUTORIALS

Sunday, 24 June

Sorter Session: Sony - iCyt Sorting Solutions

Sony - iCyt
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1230 – 1330 - Hall 2, Level +1

Sony and iCyt show strong commitment in the future of cell sorting with product offerings with innovative technologies that suit a variety of lab needs.

sy3200:True Innovation iCyt – a Sony Group Company

Presenter: Sharlene Wright, Global Marketing Manager

The sy3200 platform is differentiated with true innovation in optics, electronics, and industrial design that achieves superior performance and versatility. The first part of this session will detail the design elements of the sy3200 system that can measure up to 30 colors with up to 6 lasers. Sony technology enables fast acquisition and sorting speeds while ensuring superior sensitivity and resolution. Additional topics will focus on the sy3200 unique capability to efficiently expand to a dual independent sorter system as well as the system's innovative approach to ensuring the highest levels of biosafety.

Microfluidic Cell Sorting Chip Platform Sony Corporation, Japan

Presenter: Masataka Shinoda, General Manager

This session will describe a novel cell sorter platform which utilizes a microfluidic cell sorting chip. This innovative approach enables a unique cell sorter system that is capable of automated chip loading as well as automated optical alignment and a sorting parameters setup. The microfluidic cell sorting chip is manufactured using an industrial plastic material and a highly precise injection molding duplication. By using optical disc manufacturing process, the chip has low-cost and high analyzing and sorting performance. In this tutorial, we investigate a disposable microfluidic cell sorting chip for a sense in channel sorter.

New Technologies for Sorting QC

BD Biosciences
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1230 – 1330 - Hall 3, Level +1

Presenters: David Archer PhD, Assistant Professor, Emory University School of Medicine

Joseph Trotter *Principal Scientist, BD Fellow BD Biosciences*

As flow cytometry becomes adopted in a broader range of fields, operators require evidence to convince core lab customers of the capability of their instruments and tools to troubleshoot problem samples. This tutorial will focus on flow cytometry sorting performance. We will present data to validate single cell sorting with the new BD FACSJazz cell sorter by examination of the collected events post-sort. New methods for analyzing sorts and predicting sorting outcomes will be introduced that leverage the new parameters enabled by BD FACS Sortware software and understanding sample behaviors in flow.

Enhanced Dynamic Range Capabilities for Microcapillary Cytometry

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1230 – 1330 - Hall 4, Level +1

Presenters: Dr Alan Tunnicliffe and Dr Lars Ohl

Sensitive and multi-parametric cell analysis by flow cytometry typically requires substantial expertise, a confusing array of protocols, and cumbersome software analysis, thereby limiting its utility for on-demand use. Flow cytometric set-up can often be cumbersome and time consuming as it requires multiple steps for instrument configuration and data analysis. Samples often require gain adjustment to view positive and negative samples on screen, or

else both populations cannot be visualized together. Conversely, small shifts within experiments may be overlooked if display scaling is not utilized to its fullest. In this work, we demonstrate how features of InCyteTM software allow the user to not only display samples comparing large fluorescence shifts and minimal fluorescence shifts, such as GFP expressing cells and CFSE stained cells, but additionally we highlight how small fluorescent shifts in Cytochrome *c* loss from the mitochondria can be detected with no loss in data integrity. Additionally, utilizing features such as six-parameter heat-mapping and IC50/EC50 curve generation offer sophisticated data analysis in just a few steps, with updates in real time and easy export of data. As a result, users now have complete flexibility regarding their choice of assay and analysis methods. Experiments can utilize a set of samples run in a single day, across multiple days, or even between multiple assays or experimental questions. Taken as a whole, these novel and innovative advancements of IncyteTM Software enable analysis of multiparametric cellular data in a format which is even faster, simpler and more accurate.

Flow Cytometric Analysis of Signal Transduction Responses in Normal Bone Marrow and Application in AML Using PerFix-P

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1230 – 1330 - Hall 5, Level +1

Presenter: Charles Goolsby, PhD

Acute myeloid leukemia (AML) is characterized by molecular and cytogenetic alterations frequently resulting in dysregulation of major signal transduction pathways. Necessary for detection and interpretation of signal transduction abnormalities in AML will be defining characteristics of cell signaling responses within the context of normal myeloid differentiation/maturation. Characterization of signal transduction pathway responses at the cellular level was done based on complex flow cytometry 9 and 10-color flow cytometry analyses. Levels of six phospho-proteins were measured untreated and following treatment with seven cytokine/growth factors within immunophenotypically defined populations, spanning progenitor to mature myeloid/myelomonocytic cells in normal adult bone marrows (BM). Cells were prepared using the PerFix-P system and cells were analyzed on Cyan or Gallios instruments. These studies show robust and reproducible flow cytometry phospho-protein analyses after growth factor/cytokine treatment of normal BM with cell lineage specific and maturation-associated changes were seen. Further, clear, easily identifiable alterations/differences in signal responses compared to normal were seen in virtually all AML studied.

Flow Cytometry Functional Analysis of Stem Cells, Yeast, Bacteria, Plant and Human Cells in Alginate in the Size Range from 90-500 Micron

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1230 – 1330 - Room 10, Level +2

Presenter: Rico Bongaarts

Instruments (COPASTM and BioSorter) are now available to automate the analysis and sorting of large (20-1,500 micron) particles in a continuously flowing stream at a rate of 10-1000 objects/second. Using object size, optical density, and intensity of fluorescent markers as sorting criteria, selected objects in this size range, can be dispensed in multi-well plates for further analysis. A gentle pneumatic sorting mechanism located after the flow cell avoids harming or changing sensitive objects, thereby making the instrument suitable for live biological materials or sensitive chemistries. Multiple fluorescence excitation and emission wavelengths are available. Applications include: Various cells encapsulated in alginate, Hepatocytes, Cardiomyocytes, Neurospheres and Embryoid Bodies analyses and dispensing, In this presentation we will focus on various functional tests of cells (bacteria, yeast, human stem cells) included in alginate beads. In addition, Profiles analysis of fluorescence of the object in alginate are shown.

MACS Based Antigen Reactive T Cell Enrichment (MACS-ART) and Circulating Endothelial Cell (cEC) Assessment via Flow Cytometry Analysis

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1200 – 1300 - Hall 1, Level +1

Presenter: Klaus Neef and Petra Bacher

We have developed a new, sensitive detection system for antigen-specific T helper cells, based on a combination of magnetic pre-enrichment and multi-parametric flow cytometric analysis of CD154 (CD40L)-expressing CD4+ T cells directly from human peripheral blood. This technology allowed us to identify a highly diverse functional repertoire within the CD4+ T cell response against various pathogens. The possibility to visualize T cells reactive against any antigen of interest from human peripheral blood will open up new possibilities to advance human T cell research and to improve clinical diagnostics and prognosis. In this study we investigated the frequency of cEC in peripheral blood of patients before and at defined time points after two different heart valve replacement surgeries using the Miltenyi cEC Enrichment and Enumeration Kit. This kit involves the automated enrichment of subpopulations of blood cells and the quantification of cEC frequency. We correlate these results to conventional markers of endothelial damage and with clinical parameters, in order to establish a new cell based diagnostic and prognostic marker for patients undergoing cardiac surgery.

New Analyzer Solutions from Sony - iCyt

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1230 – 1330 - Hall 2, Level +1

Hyper Spectral Flow Cytometry Sony Corporation

Presenter: Motohiro Furuki, Senior Manager, Sony Corporation

Spectral Flow Cytometry is a technique that employs a series of prisms to produce an analytical spectrum which is then measured by a novel multi-channel PMT. The Sony Hyper spectral Analyzer is a two-laser (488nm/638nm) system that is equipped with a replaceable microfluidic chip-based flow cell and a 32 channel multi-anode PMT. This PMT functions as a collection of single PMTs each with its own independently controlled voltage, and the broad fluorescent spectra generated by fluorochromes are divided into 32 discreet channels. These spectral profiles are then automatically unmixed, using a newly developed mathematical algorithm. We provide some data to demonstrate this novel and highly precise analytical method, and its unique applications.

Applications on the Sony - iCyt ec800 Analyzer
iCyt – a Sony Group Company

Presenter: Viki Mosiman, Global Marketing Manager, iCyt

We will be presenting a variety of data including common 4 - 6 color immunophenotyping applications with syringe-based absolute counting, Electronic Volume for cell sizing and Fluorescence Concentration, Stem Cells, 6 Fluorescent Protein detection using 405 nm, 488 nm, and 561 nm laser options, and more. Data being shown has been collected on the newly released ec800 instrument with version 1.3 software incorporating field upgradeable 4 – 6 PMT's. This tutorial will also describe use of the many of the unique standard features of the ec800 including: 12x75mm 40 tube, or 24-384 well plate autoloader formats , on-board sample preparation, automatic start-up, cleaning and shutdown, sample cooling options, and off-line analysis with our license-free software.

Demonstrating Application Setup Portability and Flexibility in the BD FACSVerse/FACSuite System

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1230 – 1330 - Hall 3, Level +1

Presenter: Alan Stall, Principal Scientist, Advanced Cytometry Technologies / Research & Development

The new BD FACSuite™ software, in conjunction with the BD FACSVerse™ flow cytometer, has been designed to deliver a seamless workflow from system setup, through assay creation, data acquisition and analysis. The system provides new and unique tools to achieve reproducible and consistent setup of assays across time and instruments. User-defined experiments created in BD FACSuite software can easily be transferred to any equivalent FACSVerse cytometer by import/export of all relevant settings , acquisition and analysis worksheets, gating strategies, and report parameters. This dramatically reduces the time and effort necessary to transfer assays and minimizes data variability across users and sites**.**

Using standard multi-color assays such as a regulatory T-cell assay, this tutorial will demonstrate how the BD FACSuite™ software is capable of quickly creating a complex assay on one BD FACSVerse™ system and easily export to set up any other FACSuite™ system for the same assay. The studies will show that data acquisition and analysis are highly reproducible and consistent within and between multiple laboratories or cytometers. As part of the assay development we will also highlight the advantages of newly developed fluorochromes that have significantly improved brightness compared to previously available reagents

Optimizing the Amnis ImageStream^X for CTC and other Rare Cell Analysis Applications

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Seattle, WA 98119
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1230 – 1330 - Hall 4, Level +1

Presenter: David Basiji, PhD, CEO

The ImageStreamX has been widely adopted for the analysis of CTCs and other rare cells. Such applications place stringent demands on instrument speed, sample handling efficiency, and real-time data analysis capabilities. This talk will describe a range of optimizations to the ImageStream^X that have greatly increased its utility for rare cell analysis and numerous other applications.

Gallios Microparticle Tutorial, How to Optimize the Instrument

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1230 – 1330 - Hall 5, Level +1

Presenter: Vasilis Toxavidis, John Tigges

There is great interest in both the medical and scientific communities in submicron cell-derived particles termed microparticles or microvesicles. A great difficulty in this field, however, has been the optimization and standardization of techniques to measure these small particles. Although competing techniques have been developed, flow cytometry remains the dominant approach. The specific cytometers, standards, and parameters for measuring microparticles, however, have not been established. Many diagnostic and imaging applications rely on fluorescent microspheres for detection of binding events or signal enhancement. This workshop will construct a protocol to measure microparticles on the Gallios research flow cytometer.

High Content, Single Cell Mass Cytometry: Elucidating Cell Signaling Pathways

DVS Sciences, Inc.
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Phone: 905 513-1704
Email: Ted.young@dvssciences.com
Web: www.dvssciences.com

1230 – 1330 - Room 10, Level +2

Presenters: Dr. Scott Tanner, *Co-founder and CTO DVS Sciences*
Dr. Bernd Bodenmiller, University of Zurich

A novel combination of elemental mass spectrometry with single cell analysis (mass cytometry - CyTOF) offers examination of 30-50 parameters (theoretically up to 100) without fluorescent agents or interference from spectral overlap. Essentially fluorophores are replaced by heavy metal isotopes as reporters. By then exploiting the resolution, sensitivity, and dynamic range of elemental mass spectrometry, on a time-scale that allows the measurement of 1000 individual cells per second, this device offers a much-simplified alternative for ultra-high content cytometric analysis

FCS Express 4 Flow and Image Cytometry

De Novo Software, Inc.
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Web: www.denovosoftware.com

1230 – 1330 - Room 11, Level +2

Presenter: David Novo

FCS Express 4 is the state of the art Flow and Image Cytometry data analysis software. The presentation will showcase new applications utilizing our novel image analysis capabilities. We will also be showcasing recent enhancements including our new automated compensation system, 21 CFR Part 11 features and patented collaboration capabilities.

CD6: New low/negative Surface Marker for Human FOXP3+ Naturally-Occurring Regulatory T-Cells

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1230 – 1330 - Hall 2, Level +1

Presenter: Carlos Garcia-Santana

Natural T-regulatory cells, nTreg, are responsible for the maintenance of dominant self tolerance. nTreg cells play an important role in prevention of autoimmune disorders, allergy; and in maintenance of fetal maternal tolerance and graft tolerance after organ transplantation. For these reasons nTreg cells have been a subject for extensive research in the past decade. While the nuclear transcription factor, FOXP3, uniquely defines nTreg cells, there is a need for more convenient surface markers that can be used for nTreg isolation. Several surface markers have been already identified. Among them, CD25 and CD127 are the most commonly used. However, active search for new surface markers for identification of nTreg cells and their functional subsets continues. We report here the discovery of CD6 as a low/negative surface marker for nTreg cells. CD6 provides a new approach for enriching/isolating/expanding nTreg cells and facilitates the analysis of highly pure FOXP3+ nTreg.

Simplified, Enhanced Kinetic Studies and New Special Order Laser Configurations on the BD Accuri™ C6

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1230 – 1330 - Hall 3, Level +1

Presenters: Dr Alfonso Blanco, Director of Flow Cytometry, University College Dublin Conway Institute of Biomolecular and Biomedical Research

Grant Howes, Director of Marketing, Personal Flow Cytometry Platforms, BD Biosciences

The BD Accuri™ C6 personal flow cytometer supports a continuous-flow method that allows the addition of test compounds, without gaps in the data acquisition where important changes in cell metabolism may take place. The unique fluidics design of the BD Accuri C6 allows researchers to add test compounds to a sample while it is being processed and monitor the effects continuously. The resulting data offers insight into cellular responses that can occur within nanoseconds and would be missed by other methods. Using the continuous-flow method, we will illustrate how flow cytometry can provide an extremely sensitive view into cellular dynamics

The Special Order Research Product Group (SORP) is geared to the development of flow cytometers that provide customized, advanced technologies in the area of lasers, optics, and detectors. The result is a complete, integrated system configured specifically to investigators requirements, provided with the high quality expected of BD Biosciences products

We will present information on new laser excitation wavelengths and their applications, now available for the BD Accuri C6

Simplified Multi-dimensional Cell Health Analysis on the Muse Cell Analyzer

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1230 – 1330 - Hall 4, Level +1

Presenter: Cornelia Rössler

Cellular analysis is made simpler and accessible with the introduction of the novel, affordable Muse Cell Analyzer. The small footprint instrument that can even fit into a hood, utilizes innovative optics and detection electronics along with a touch-screen interface to effortlessly guide users to obtain quantitative cellular analysis results. Several dedicated and validated cell-health assays in mix and read formats enable facile measurement of cell count and viability, apoptosis and cell cycle characteristics on the instrument. The session will highlight features and benefits of the Muse Cell Analyzer along with examples of its applications to suspension and adherent cells for multi-dimensional cell health analysis.

The Latest Advances in Cytometry Powered by Molecular Probes®

Life Technologies
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Web: www.invitrogen.com/site/us/en/home/brands/Molecular-Probes

1230 – 1330 - Hall 5, Level +1

Presenter: Michael Olszowy and Greg Kaduchak

Life Technologies'™ Attune® Acoustic Focusing Cytometer is the first-of-its-kind cytometry system to use sound waves to precisely control the focusing of particles and cells. The same scientists who designed and built Attune® inspire true discovery in flow cytometry with the newest flow cytometry reagents and selection tools from Molecular Probes® - reagents and tools for flow cytometry that take significant steps forward in the analysis of cellular function, far beyond immunophenotyping. The FLoid™ Cell Imaging Station, designed in collaboration with fluorescence microscopy users, captures high-quality, three-color fluorescent cell images right at your bench top, with an interface that is so simple even novice users can collect data in just a few clicks of the mouse. The integrated Molecular Probes® reagent selection guide with protocols helps you design and execute your cell imaging experiments. Late breaking data from both platforms will be presented.

Interactive System Modeling: Taking Risk Out of Design

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1230 – 1330 - Room 10, Level +2

Presenter: Giacomo Vacca

Have you ever iterated? You're in good company. No product design is born perfect and complete. However, as development goes on, design changes and bug fixes become more and more costly—and time-consuming. One of the most cost-effective ways to reduce these costs is to execute comprehensive system modeling early on. While many specialized solutions exist to model certain subdomains (e.g., optical propagation software, CAD packages, etc.), they typically don't tell the designer how the *system* as a whole will behave in response to design choices. Worse yet, they generally force you to go through a very user-unfriendly and time-consuming interface. Kinetic River drastically reduces trial-and-error by providing *interactive* and intuitive system modeling tools. Whether you're wondering just how CVs might be affected by higher laser pointing instability, or what impact a cheaper filter might have on dynamic range, we build the critical parameters of your system into a live, hands-on simulation tool that you can use to explore a wide range of design choices—and to trigger system decisions with confidence. In this tutorial we will showcase our approach for reducing development risks—while making the design process a lot more fun.

The Amnis FlowSight – Capabilities and Applications of a Low-Cost Imaging Flow Cytometer

Amnis Coporation
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1230 – 1330 - Room 11, Level +2

Presenter: William Ortyn, *President and CEO*

The FlowSight is a 12 channel flow cytometer that images every cell and is priced for every lab. The FlowSight can be upgraded with up to four lasers, a 96-well AutoSampler, and an image analysis package, providing the flexibility and capability to meet the needs of novice and advanced cytometrists alike. Important applications of the FlowSight in flow cytometry and image analysis will also be discussed, including nuclear translocation, apoptosis, and phagocytosis.

Wednesday, 27 June

Bringing Your Cytometer from the Past to the Future

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1300 – 1400 - Hall 2, Level +1

Presenter: Raymond Lannigan

Cytek's line of cytometer upgrades are designed specifically for BD FACScanTM, FACSortTM and FACSCaliburTM flow cytometers. Cytek's Extra Parameter (xP) and Digital Extra Parameter (DxP) customizable configurations and add-on options support a wide range of applications. By leveraging the use of existing proven fluidics, xP and DxP systems are a cost effective alternative to buying a new cytometer. Discover how our upgrade options can extend the useful life of your existing technology by adding capabilities and updating components. In this workshop, Cytek will present various configuration options with experimental design recommendations. Experimental data will be demonstrated using Cytek's acquisition software, FlowJo Collector's Edition. Comparison QC and Biological data from multiple cytometer platforms will be presented. See for yourself how a Cytek upgrade compares to buying new in both quality and cost.

Innovation in Multidimensional Flow Cytometry Data Analysis

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1300 – 1400 - Hall 3, Level +1

Presenter: Roberto Juanes Juanes

In our commitment to the innovation and development of flow cytometry, Cytognos presents Infinicyt™, state-of-the-art software for data integration and Multidimensional analysis of flow cytometry files. Its innovative features make the analysis and interpretation of the results easier, faster and more accurate.

Cytell™ – A Simplified Solution for Image-Based Cytometry

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1300 – 1400 - Hall 4, Level +1

Presenter: Elizabeth Roquemore PhD, Technology Manager, Molecular Cell Technologies

Image Cytometry can yield valuable information about cell health, phenotype and function, but factors such as instrument cost, assay development time and the need for specialized training can present barriers to more widespread and routine use of this technology in the laboratory environment. Using minimal (20µl) sample volumes containing 20 - 10,000 cells, Cytell™ Image Cytometer is used to quantify cell count, cell viability and other useful parameters. Up to 8 samples are conveniently assessed in parallel in less than 2.5 minutes. The workflow and capabilities of the Cytell™ Image Cytometer will be discussed along with the experimental results.