

The latest tech innovations in flow cytometry

Gert Van Isterdael

Katrien Van der Borght

10 February 2026

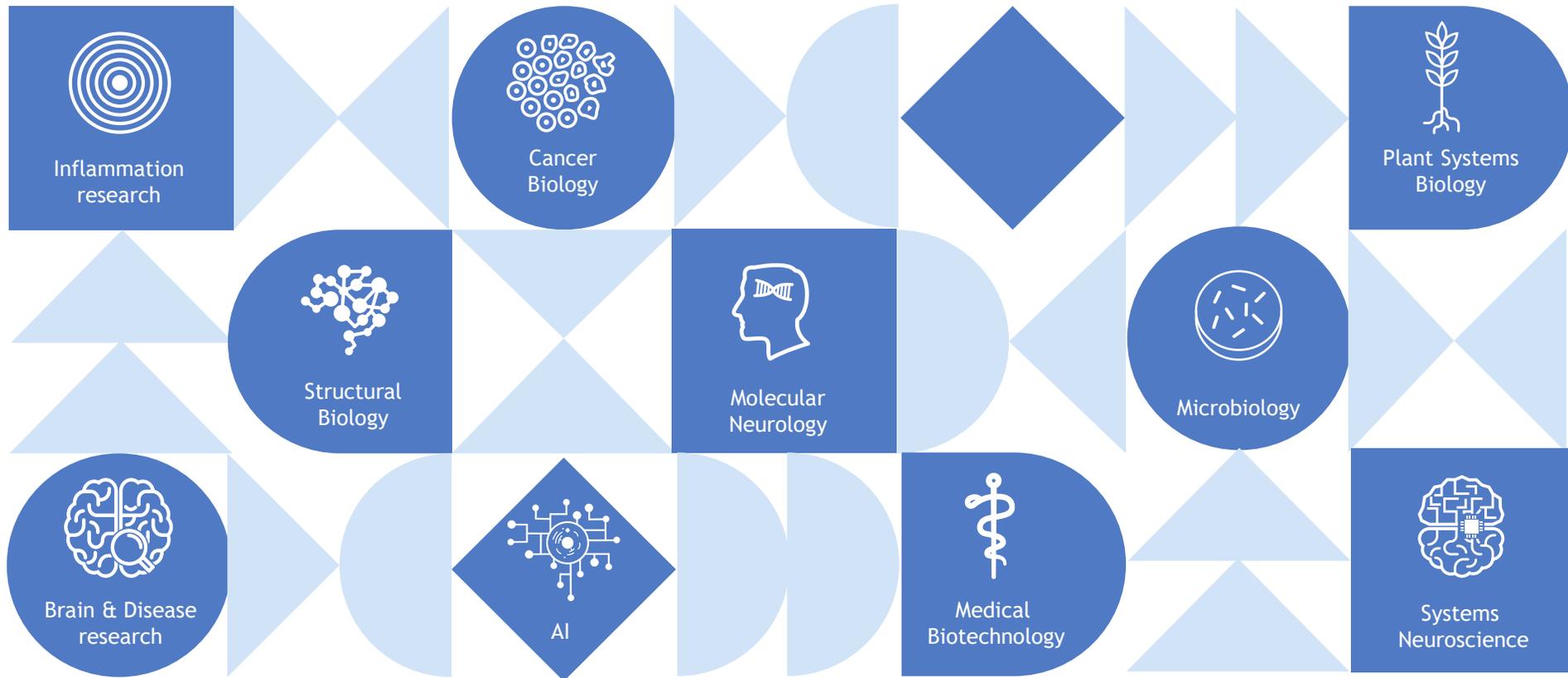
VIB

VIB is a leading life sciences research institute in Belgium with an entrepreneurial spirit. We are a vibrant, multidisciplinary, and inclusive community of highly skilled scientists.

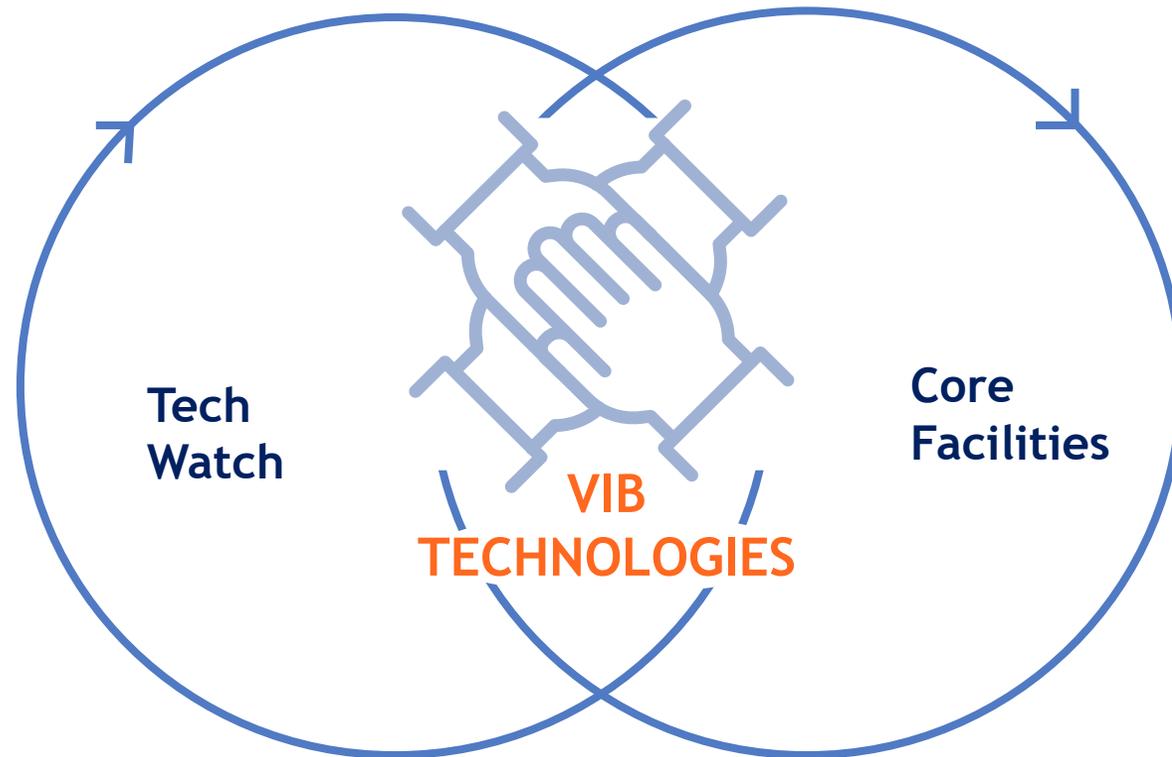


VIB Pioneering life sciences research

10 focused research areas



VIB Technologies



110 FTEs



17 nationalities



MISSION:

To provide a competitive advantage to VIB researchers and the local life science landscape by enabling access to technology and expertise.

VIB Flow Core Ghent



- Katrien Van der Borgh FC Expert
- Julie Van Duyse FC Expert
- Elien Ruysinck Lab Manager
- Margot Van Zandweghe Lab Technician
- Janto Malfliet Jr. Lab Technician
- Gert Van Isterdael Head of Core



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Our facility is open to all!

Next to our VIB researchers, we offer our services to academic and industrial users. Feel free to contact us and find out how we can help you with all things Flow or FACS related.

[Connect with us!](#)

Flow cytometry

Flow cytometry is a technique that allows researchers to study cells at single cell level at unsurpassed speed. Since its development in the fifties, the technology evolved and advanced a lot but the fundamentals and basic idea behind it, have never changed. On a flow cytometer, cells in suspension are injected in a flow cell and get hydrodynamically focused. Once the cells are aligned, they one-by-one pass laser(s) and get analyzed. Multiple parameters (morphologic and fluorescence) are measured and this at event rates of up to 10.000 cells per seconds or even more.

Flow cytometry makes it possible to characterize millions of cells in short time frames, giving you robust statistical analysis.

Our core has a whole range of analyzers available. Contact us to find out which one best fits your needs.



FACS

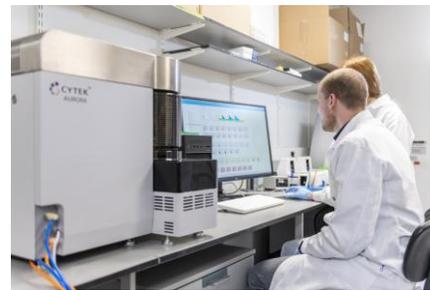
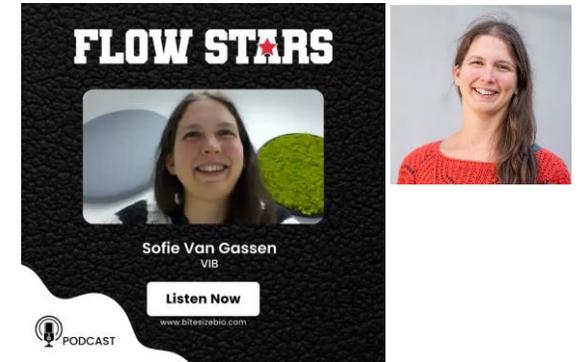
If you want to have the option to sort subsets of cells out of your sample, then you need to use a Fluorescence Activated Cell Sorter or in short a FACS. With a FACS sorter, which is basically a flow cytometer analyzer with extra sorting capabilities, you can divert specific cell populations from a heterogeneous sample into separate tubes (2ml, 5ml, 15ml tubes) or into single wells of 96- or 384-well plates. The VIB Flow Core has different FACS devices available to cover all your needs: From very basic 1 colour, 1-way sorting to advanced 30 colours, 6-way sorting or plate sorting, we've got you covered!



VIB Flow Core Ghent



- Katrien Van der Borgh
 - Julie Van Duyse
 - **Sofie Van Gassen**
 - Elien Ruysinck
 - Margot Van Zandweghe
 - Janto Malfliet
 - Gert Van Isterdael
- FC Expert
 - FC Expert
 - FC Expert, data analysis**
 - Lab Manager
 - Lab Technician
 - Jr. Lab Technician
 - Head of Core



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Our facility is open to all!

Next to our VIB researchers, we offer our services to academic and industrial users. Feel free to contact us and find out how we can help you with all things Flow or FACS related.

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VIB Flow Core's Mission

- Provide **quality service** and access to **state-of-the-art equipment**
 - Specialized staff
 - Quality controlled flow cytometers, cell sorters and multiplex machines
- **Train** current and next generation of scientists
 - Full theoretical training program, hands-on courses
- Help with **design, execution, and analysis** of experiments
- **New assay development**
- Implementation of **new technologies/applications**



All-in service



Training



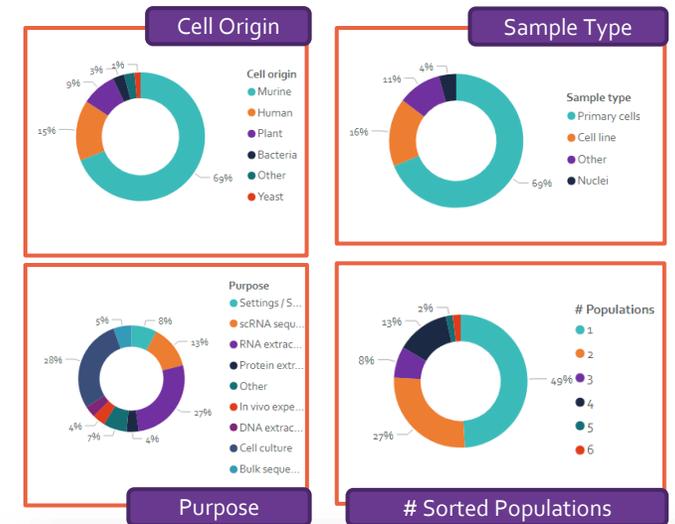
Collaboration



Technology scouting,
adaptation, implementation

VIB Flow Core Ghent in numbers

- Flow Cytometer analyzers: 13
- FACS cell sorters: 8
- Users: >270 active users
- Booked device time: >9.000h usage/year
- Number of sorting experiments: >1100 exp./year
- Training:
 - Flow demos >300 students/year
 - Theoretical introduction sessions >80 participants/year
 - Hands-on trainings >90 participants/year
 - FlowJo trainings >45 participants/year
 - Computational Summer School >40 participants/year



ANALYZING FLOW CYTOMETRY DATA USING FLOWJO
 25 February 2025
 Ghent - VIB/UGent FSVM II

Computational cytometry summer school (3rd edition)
 4-8 MAY 2026, GHENT, BELGIUM
 REGISTRATION IS FOR SELECTED PARTICIPANTS ONLY

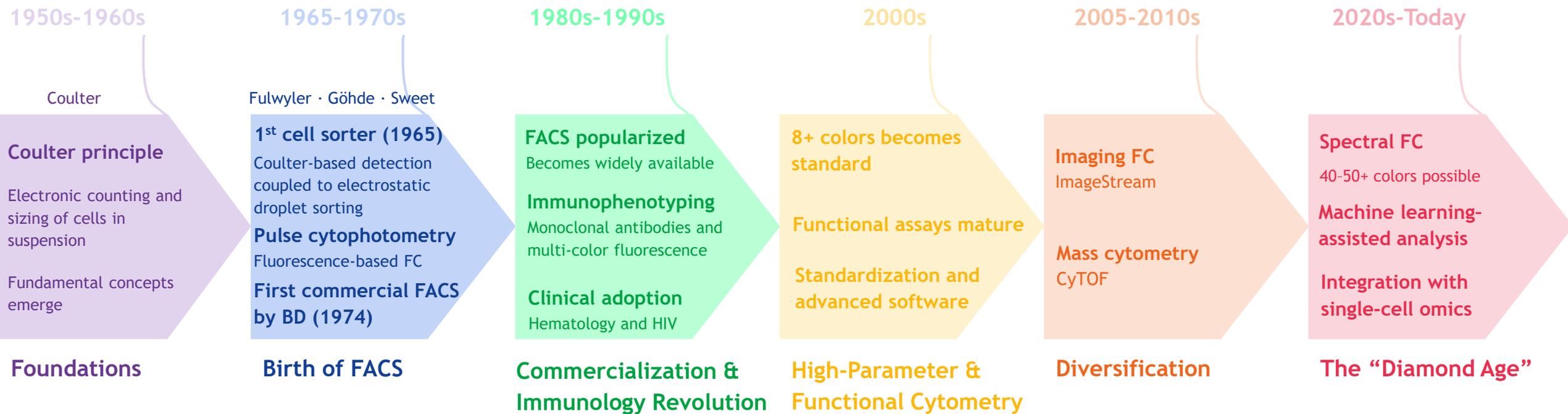
4-8 May 2026, Ghent, Belgium

1. The history and basics of Flow Cytometry



History of Flow Cytometry

Birth of ‘real’ FC is debated, because it combines several technical concepts
 → fluidics, optics, electronics, fluorescence chemistry and computation

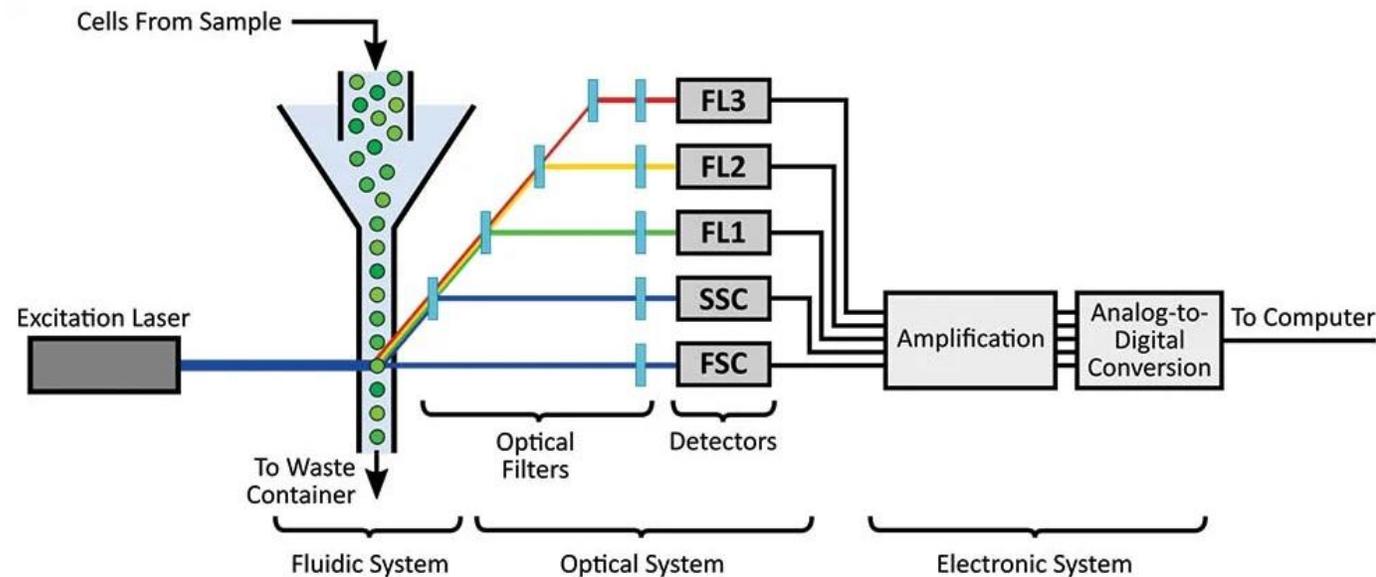


As a cornerstone technology, flow cytometry has driven major advances in biology, medicine and healthcare.

Basics of Flow Cytometry

Principle of FC did not fundamentally change over the past ~ 65 years

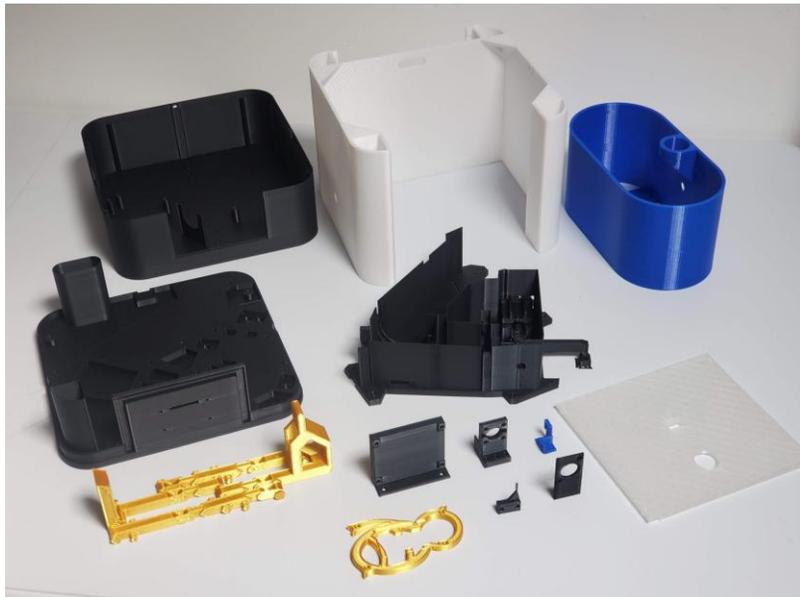
- Enabling rapid, multiparameter single-cell **analysis** and **sorting**
- Build your own FC - Open-source - Low Cost - Kit Form
- **CYKIT-K-1**: Kit containing fluidic components, optical components, solid state detectors, electronics hardware



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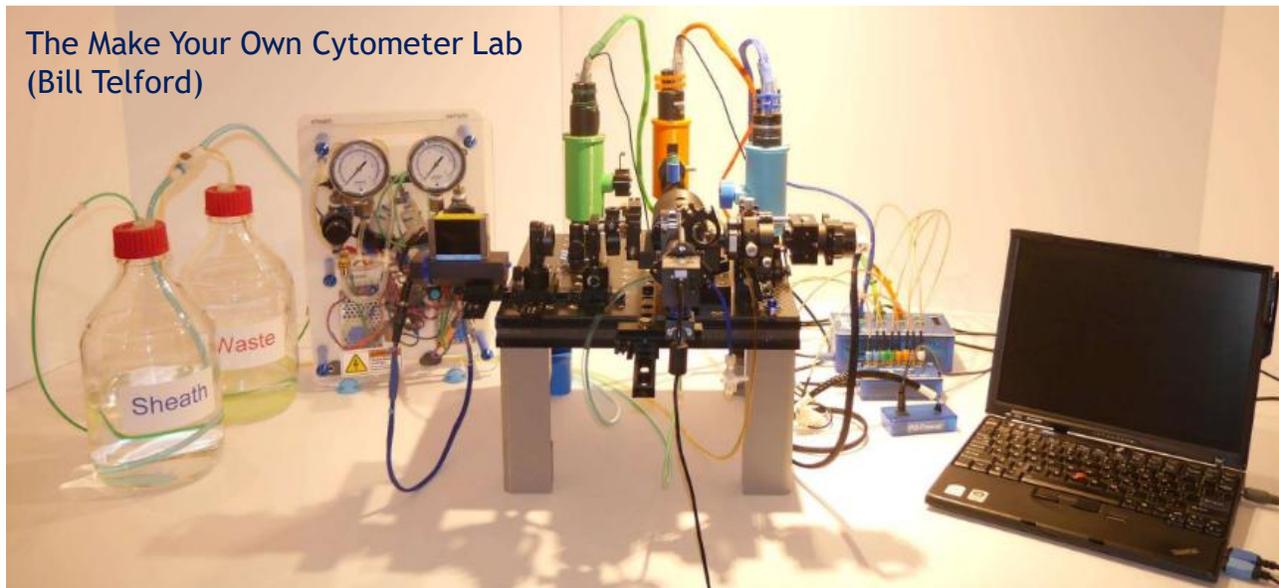
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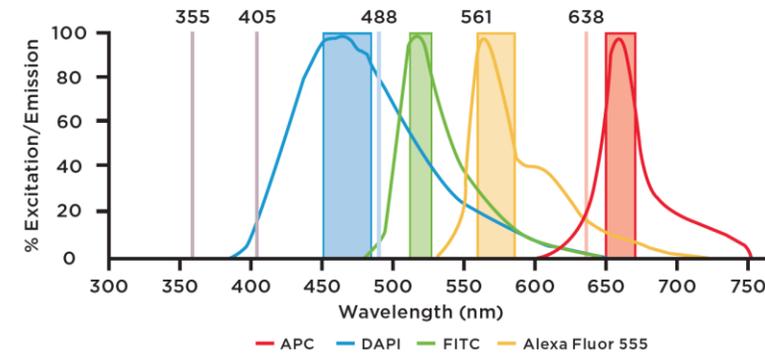
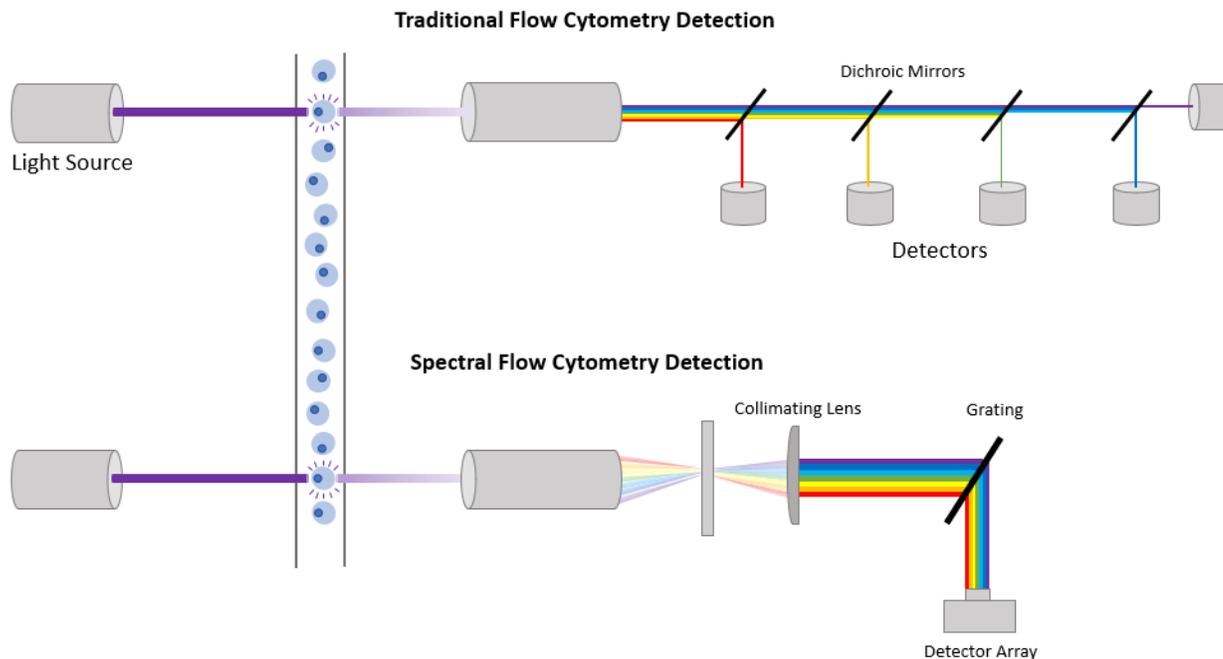


- Teaching & training programs
- Resource-limited labs
- Citizen science / maker communities / Tech nerds / Lab hackers

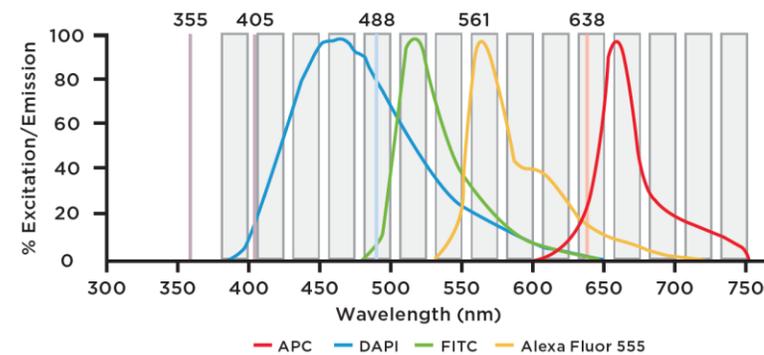
Basics of Flow Cytometry

Conventional versus Spectral Flow Cytometry

- DIY Flow Cytometer has:
488-nm laser, forward scatter, side scatter, **one spectral fluorescence array** (15 channels total)



Part of emitted spectrum detected

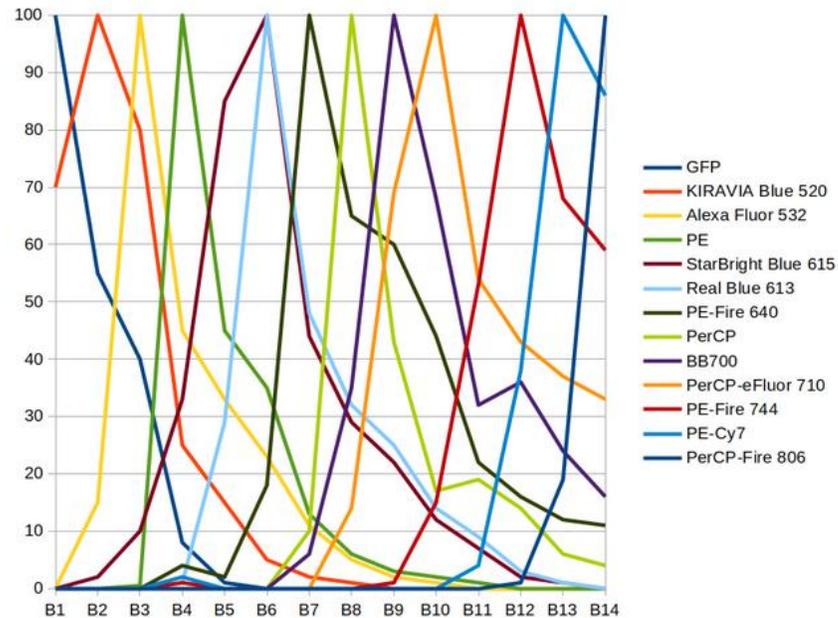


Full emitted spectrum detected

Basics of Flow Cytometry

Conventional versus Spectral Flow Cytometry

- DIY Flow Cytometer has:
 - 488-nm laser, forward scatter, side scatter, **one spectral fluorescence array** (15 channels total)



Example of 13 color panel in one laser DIY FC:

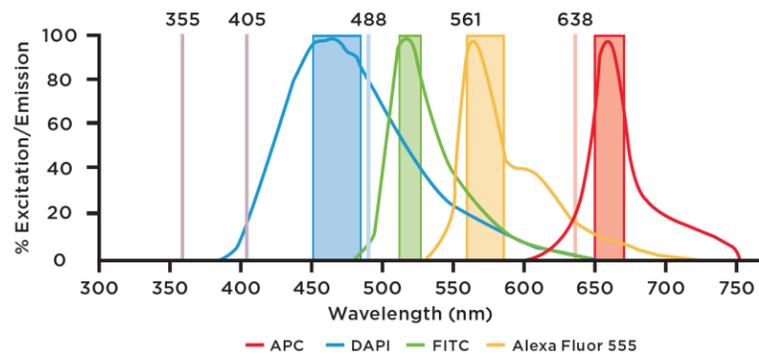
GFP, KIRAVIA Blue 520, Alexa Fluor 532, PE, StarBright Blue 615, Real Blue 613, PE-Fire 640, PerCP, BB700, PerCP-eFluor710, PE-Fire 744, PE-Cy7, PerCP-Fire 806

2. High-Parameter Flow Cytometry

High-parameter Cytometry

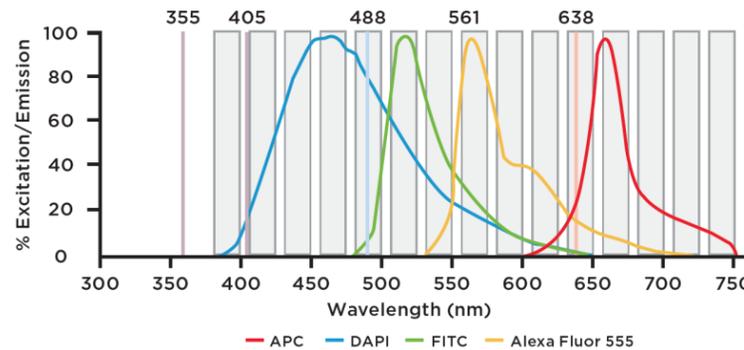
Conventional

- Part of emitted spectrum detected
- # colors = # detectors
- Max. 28 color panel



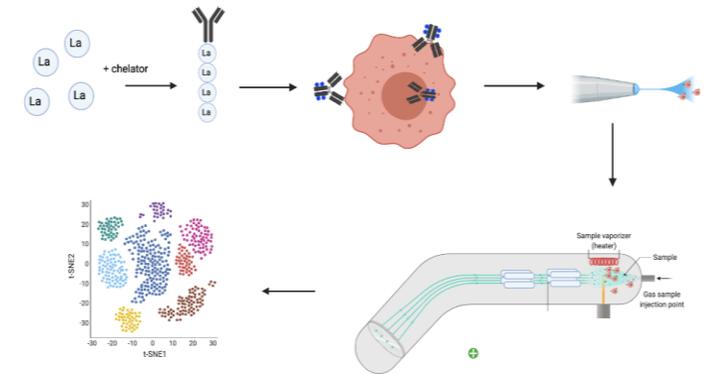
Spectral

- Full emitted spectrum detected
- # colors < # detectors
- +50 color panel



Mass

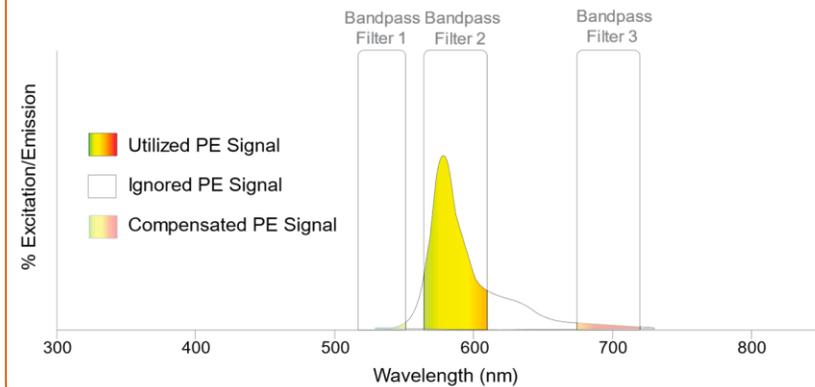
- Heavy-metal labeled antibody
- Time-of-flight mass spectrometry
- 48 parameter panel



High-parameter Cytometry

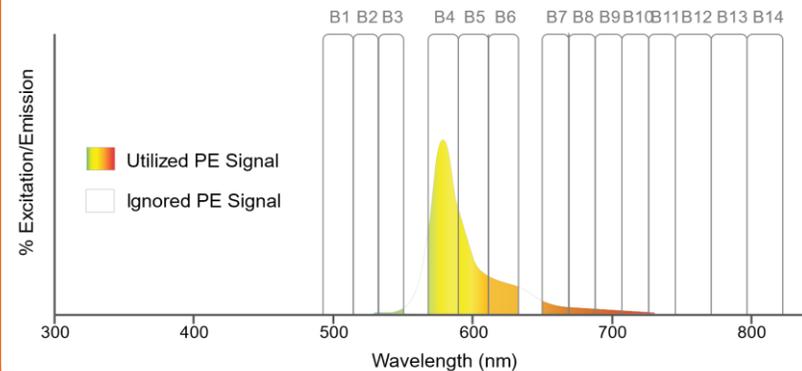
Conventional

- Part of emitted spectrum detected
- # colors = # detectors
- Max. 28 color panel
- Signal in other detectors = compensated



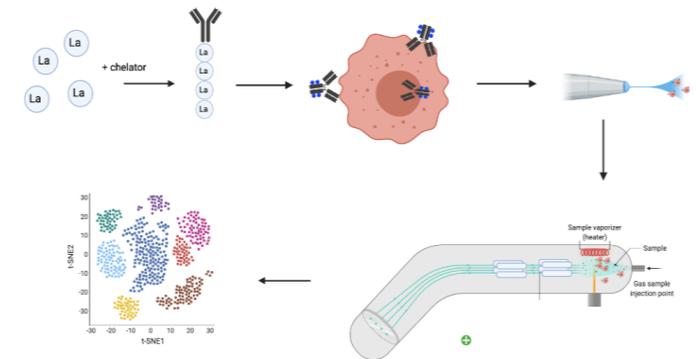
Spectral

- Full emitted spectrum detected
- # colors < # detectors
- +50 color panel
- Specific signature of each fluorochrome known = spectral unmixing



Mass

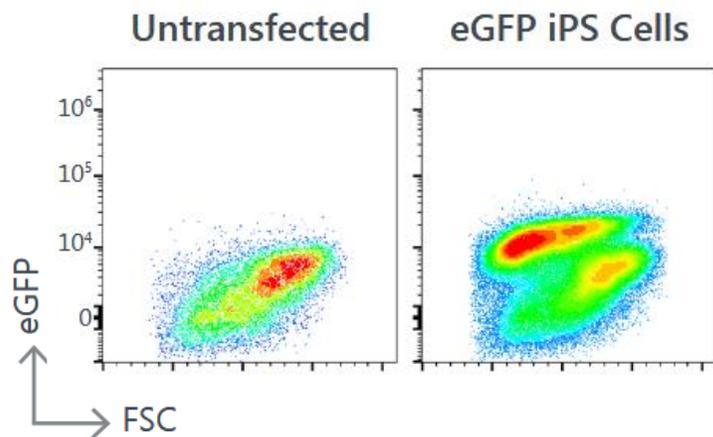
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High-parameter Cytometry

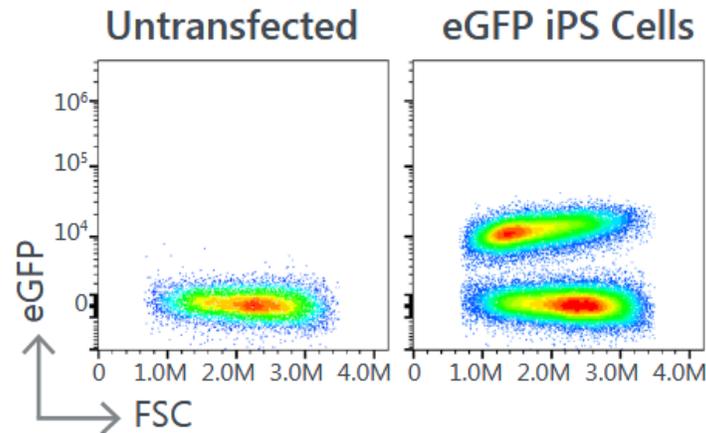
Conventional

- Part of emitted spectrum detected
- # colors = # detectors
- Max. 28 color panel
- Signal in other detectors = compensated
- Autofluorescence problem



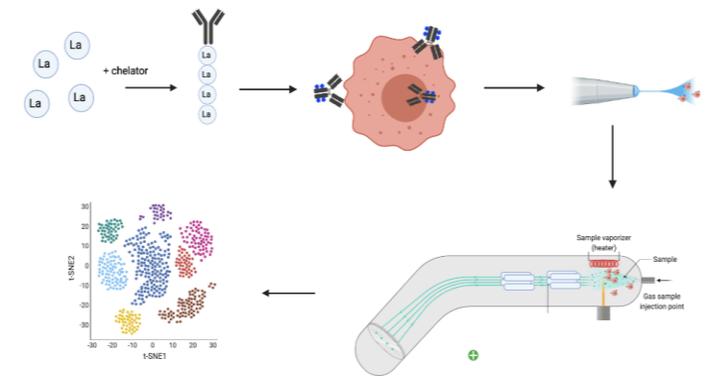
Spectral

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- +50 color panel
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Mass

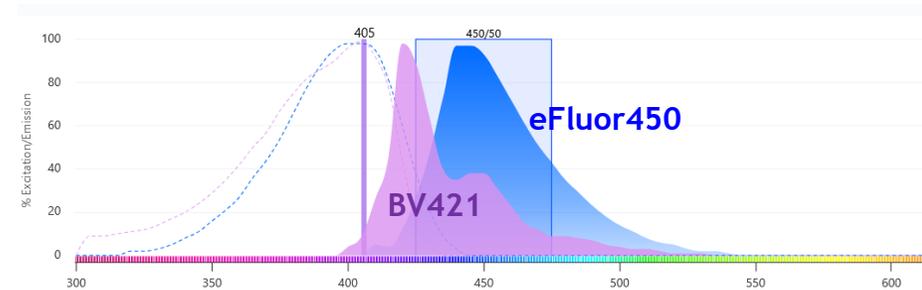
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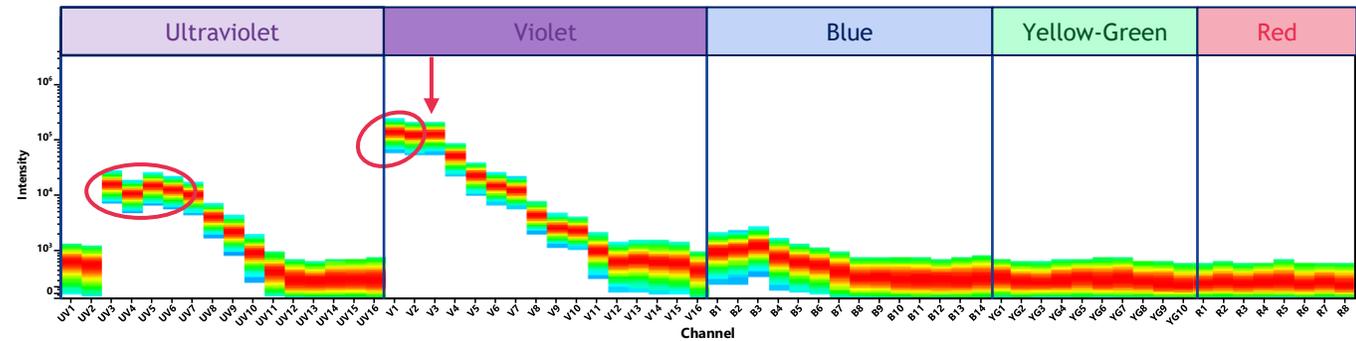
Spectral Flow Cytometry

Spectral fingerprint or signature

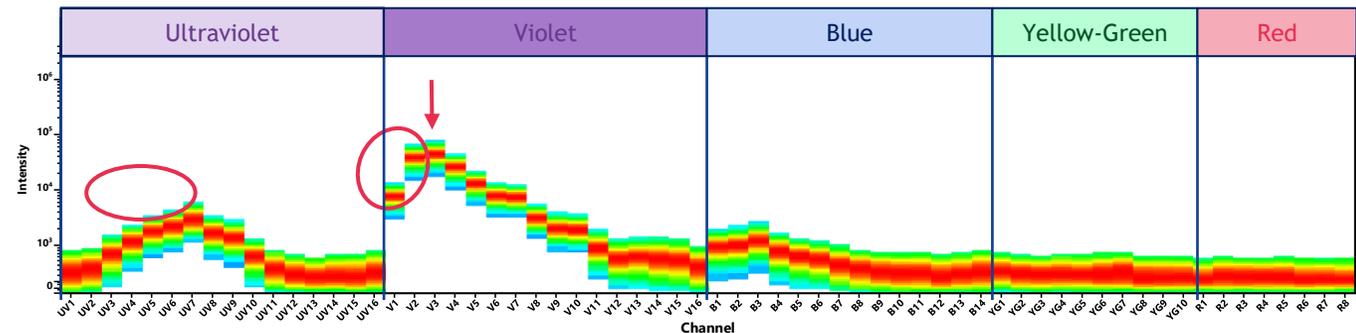
- Unique to fluorochrome
- Overlapping emission
 - Conventional = problem
 - Spectral = same emission max. but different spectrum
- Spectral unmixing of similar fluorochromes is possible



BV421



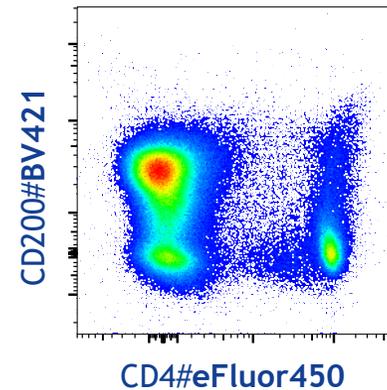
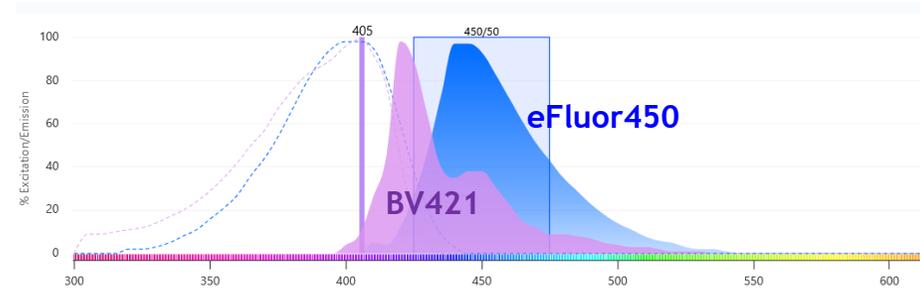
eFluor450



Spectral Flow Cytometry

Spectral fingerprint or signature

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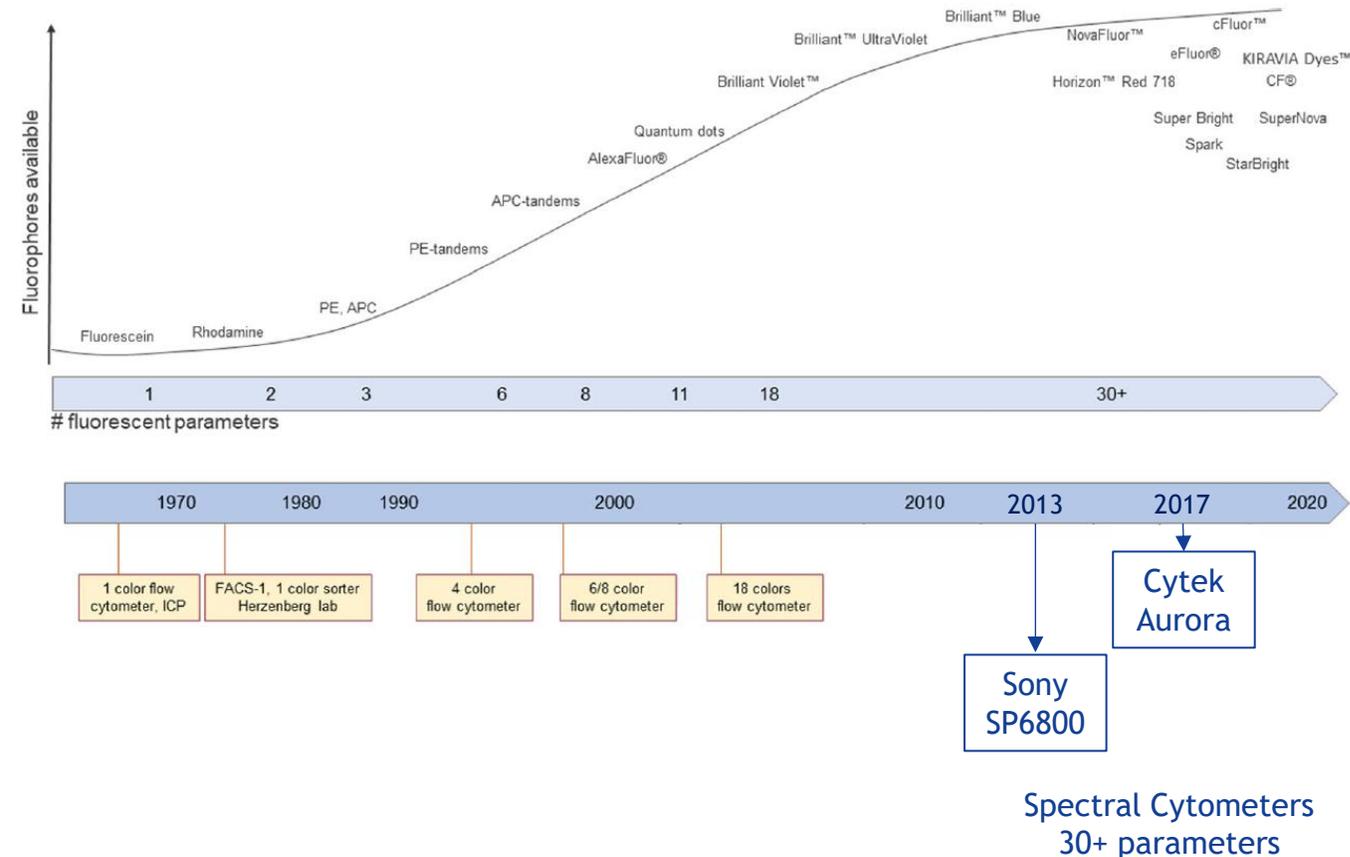
➡ More colors and thus more markers possible

➡ multiplexing capabilities increase → Fewer panels needed

→ less sample needed → interesting for rare clinical samples with low cell number

Spectral Flow Cytometry

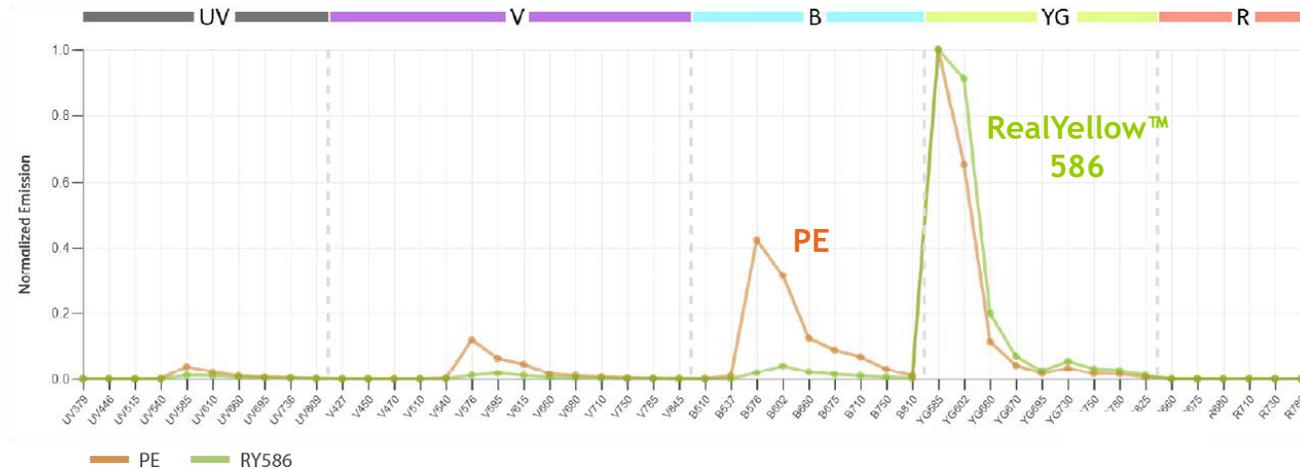
The “dye revolution”



- Many new dyes on the market thanks to spectral FC
- **Goal**
 - Reduce spillover
 - Minimal cross laser excitation
 - Narrow emission
 - Fill ‘spectral’ gaps, expand panels to >60 dyes
 - Brighter
 - More stable (less issues with fixatives)
 - Extending into near-IR, beyond 820nm
- Conventional FC also benefits from better dyes

Spectral Flow Cytometry

The “dye revolution”



BD Horizon RealYellow™ 586 Reagents

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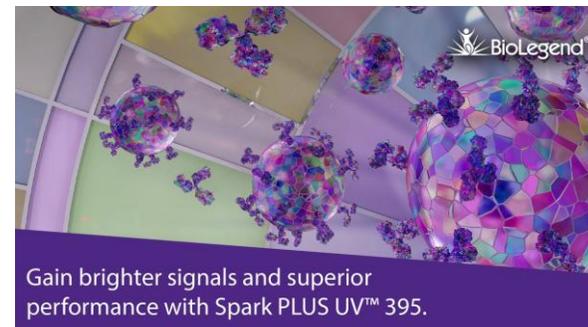
- **BD Biosciences**
 - Real dyes: RealYellow™, RealBlue™, RealRed™,...
- **Biolegend**
 - Spark PLUS™
 - Fire™ tandem dyes
- **Thermo Fisher**
 - NovaFluor™ dyes
- **Beckman Coulter**
 - SuperNova Fluorescent Polymer Dyes
 - Infrared fluorescent IR820 and IR870 dye
- **BioRad**
 - StarBright™ dyes
- **Cytek Biosciences**
 - cFluor® portfolio
- *New, not yet commercialized:*
 - *Chromatwist*



It's just a better dye.
Swap PE-Cy7 for RB780

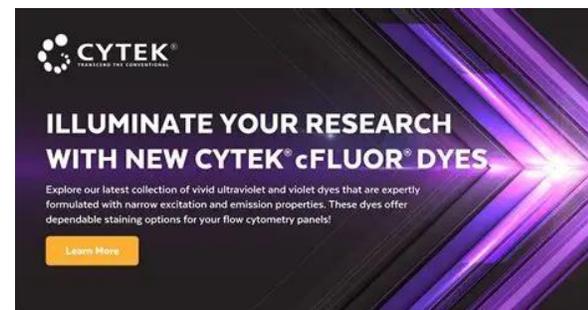
BD Horizon RealBlue™ Reagents

[Learn more](#)



BioLegend®

Gain brighter signals and superior performance with Spark PLUS UV™ 395.



CYTEK
ILLUMINATING YOUR RESEARCH

ILLUMINATE YOUR RESEARCH WITH NEW CYTEK® cFLUOR® DYES.

Explore our latest collection of vivid ultraviolet and violet dyes that are expertly formulated with narrow excitation and emission properties. These dyes offer dependable staining options for your flow cytometry panels!

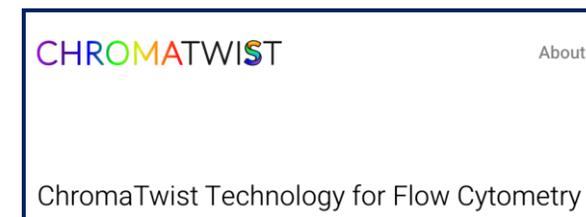
[Learn More](#)



NovaFluor Dyes

See your cells in a whole new light

[Find NovaFluor antibodies](#)



CHROMATWIST About ▾

ChromaTwist Technology for Flow Cytometry

Ultra-high dimensional Flow Cytometry

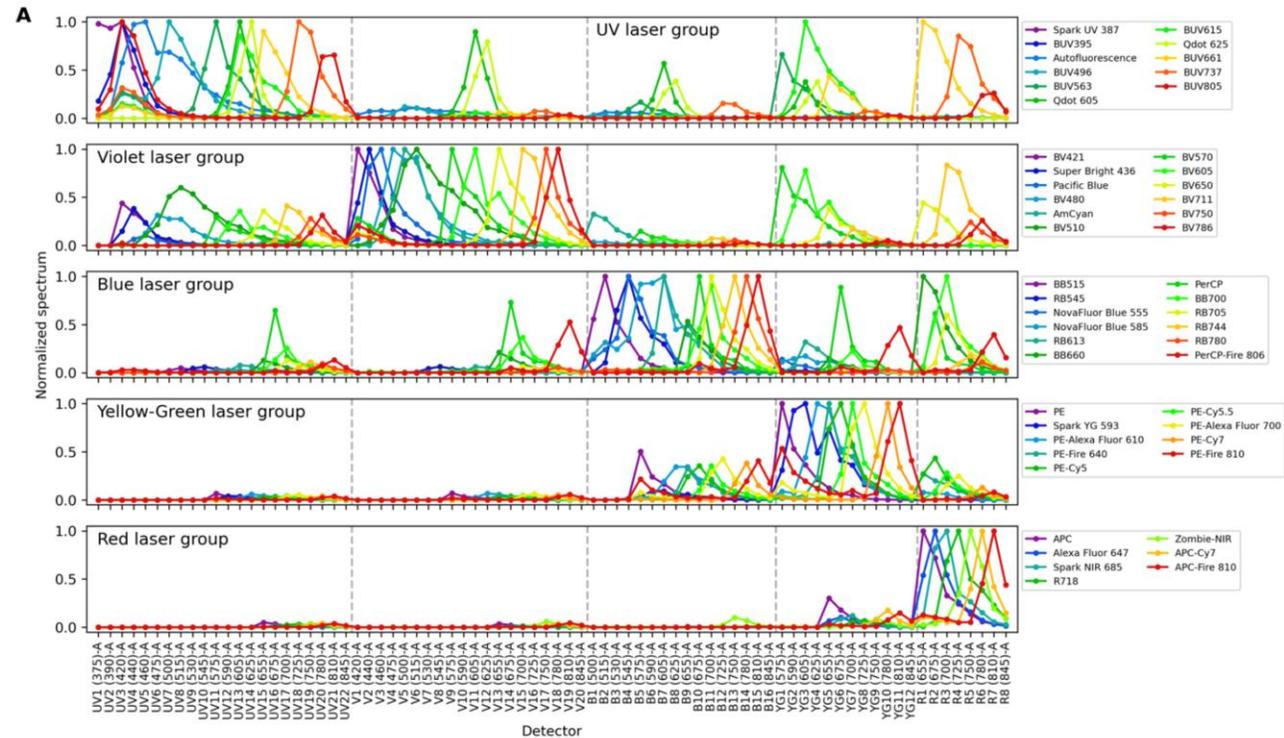


OMIP

OMIP-102: 50-color phenotyping of the human immune system with in-depth assessment of T cells and dendritic cells

Andrew J. Konecny, Peter L. Mage, Aaron J. Tzysnik, Martin Prlic, Florian Mair

First published: 18 April 2024 | <https://doi.org/10.1002/cyto.a.24841> | [VIEW METRICS](#)



(B)

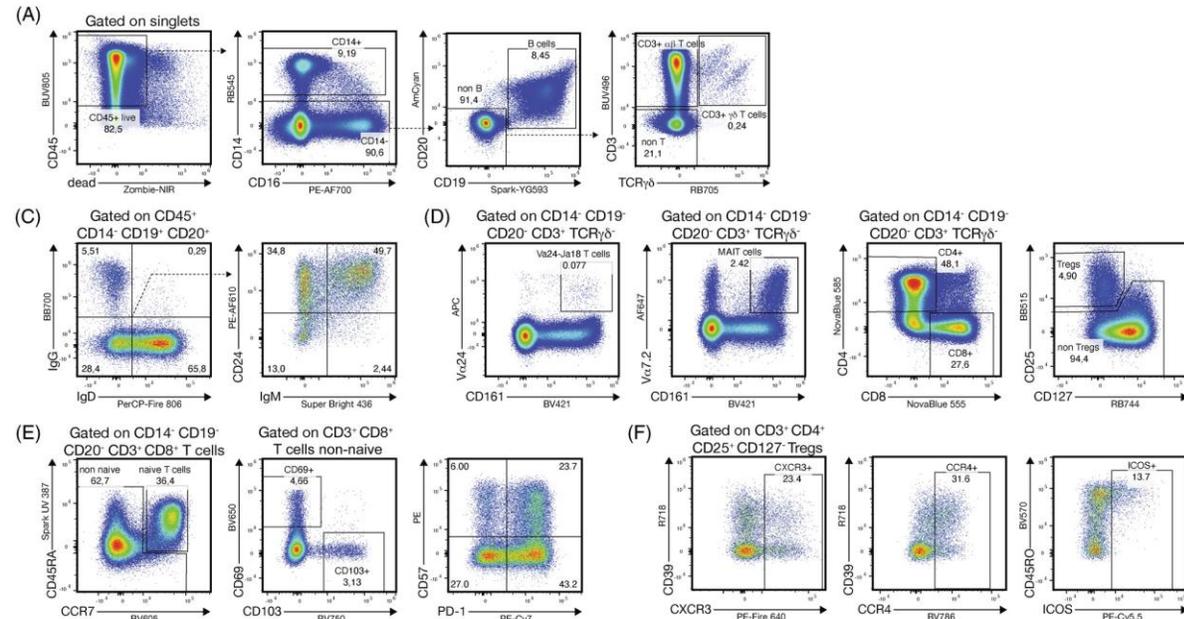
List of markers in panel (total of 50 with Live/Dead):

Lineage markers (19): CD45, CD14, CD16, CD20, CD19, CD2, CD3, TCR $\gamma\delta$, V α 24 TCR, V α 7.2 TCR, CD4, CD8, CD11c, CD141, HLA-DR, CD123, CD303, CD56, Nkp46

B cell phenotyping (4): IgG, IgD, IgM, CD24

T cell phenotyping (20): CD161, CD25, CD127, CD57, PD-1, CD69, CD103, CD45RA, CD45RO, CCR7, CXCR3, CCR4, ICOS, CD39, BTLA, CD27, CD28, CD38, TIGIT, KLRG1

APC phenotyping (6): CD86, CD40, CD11b, CD163, FcER1, CD1c



High-parameter Spectral Cytometry

In 2026, most vendors have a spectral FC on the market



	Cytek Aurora	Sony ID7000	BD FACS Discover A8	Thermo Xenith	Agilent Opteon	Beckman Coulter Mosaic
Laser Config.	≤5	≤7	≤5	≤6	≤5	≤6
Fluorescent Channels	≤64	≤186	≤72	≤51	≤73	≤88
Fluorescent Detectors	APD	PMT	APD	PMT	APD	APD
Unmixing Model	Ordinary Least Squares (OLS)	Weighted Least Squares-based (WLSM)	SpectralFX	Ordinary Least Squares (OLS)	Least Squares Regression	LSM Unmixing or Poisson Unmixing

Differences in:

- Hardware
- Software
- Unmixing algorithms
- Nomenclature
- Single stain controls
- Autofluorescence MGMT
- Post-unmixing actions
- Data output

Need for standardization!

High-parameter Cytometry

Conventional

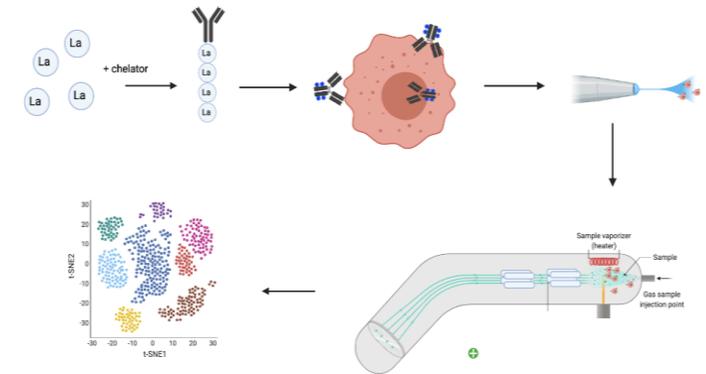
- Part of emitted spectrum detected
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Spectral

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Mass

- Heavy-metal labeled antibody
- Time-of-flight mass spectrometry
- **48 parameter panel**



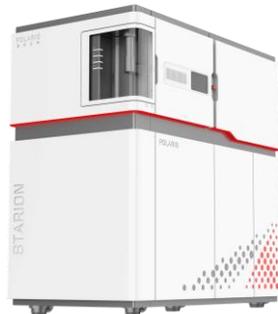
High-parameter Mass Cytometry

Two main players on the market

- CyTOF™ single-cell proteomics



- Polaris Starion™ mass cytometry system



Example of a Biological Application

CyTOF reveals predictive biomarkers for response and survival in lung cancer immunotherapy

Conventional panel in spectral fluorescence

25 surface markers*

Additional simultaneous coverage on on CyTOF system

+25 intracellular/functional markers*



Biomarker for identification of drug targets in multiple myeloma trial

BMS' | nivolumab
Predictive biomarker of response in combination nivo Phase 2 trial

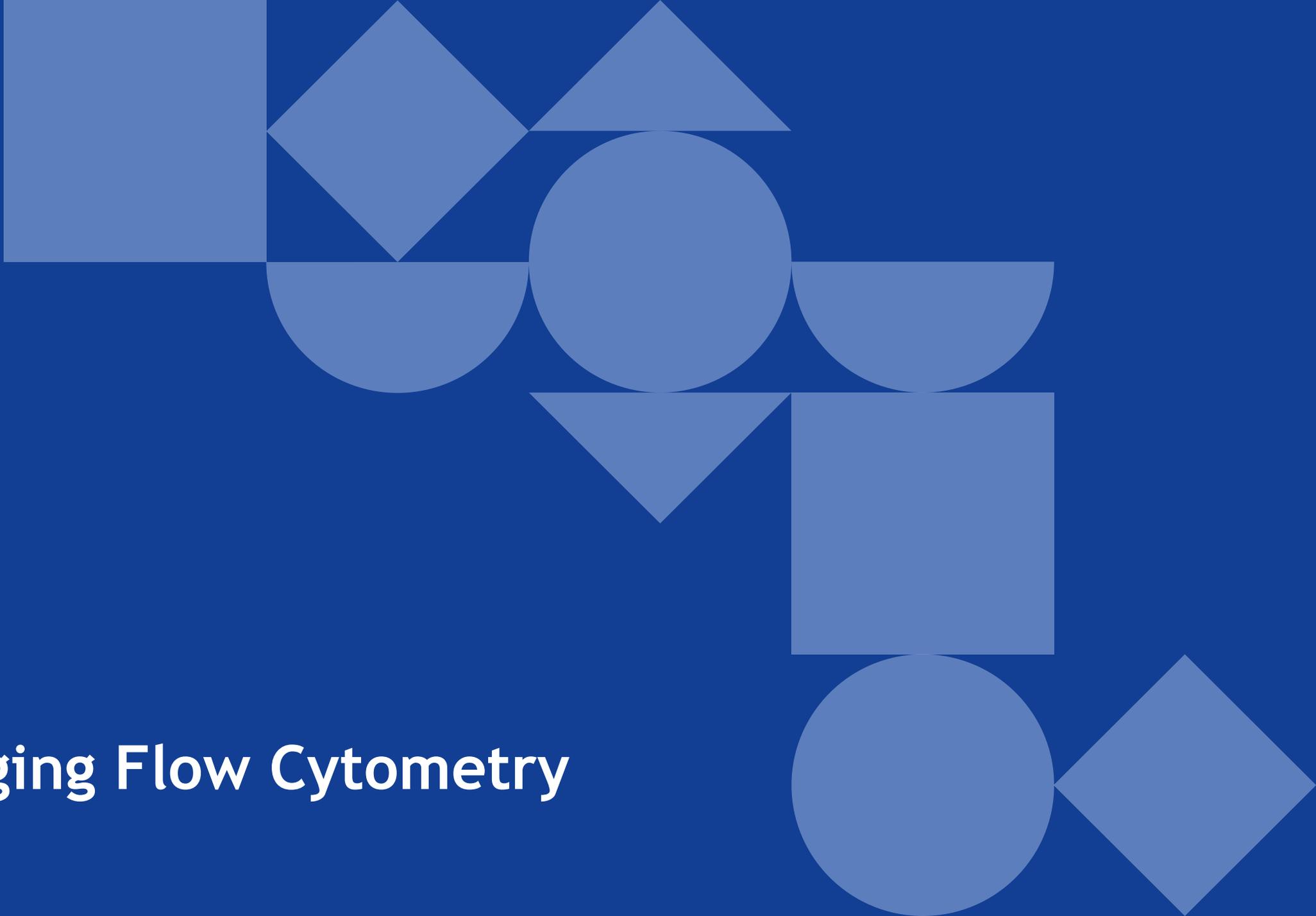
MERCK' | pembrolizumab
Predictive biomarker of survival in pembro Phase 1 trial

NOVARTIS' | CAR T
Predictive biomarker of response in CAR T

Unique predictive biomarker

Borders between technologies are fading > Mass Spectrometry + Flow Cytometry = Mass Cytometry

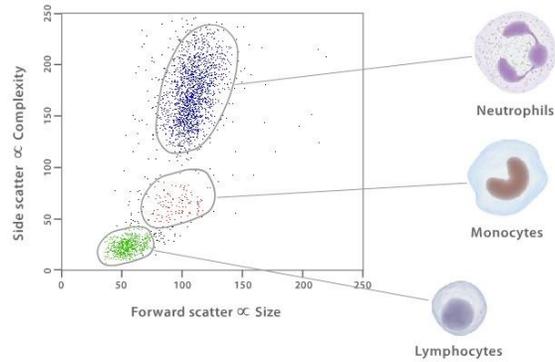
3. Imaging Flow Cytometry



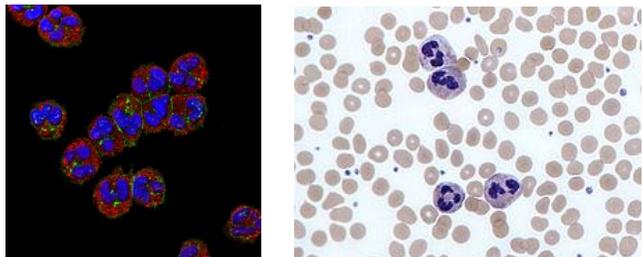
Imaging Flow Cytometry

Merges flow cytometry speed with microscopy-level single-cell imaging

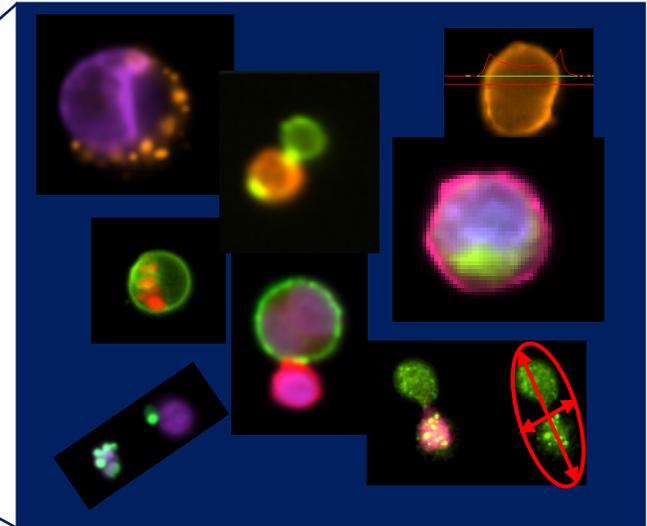
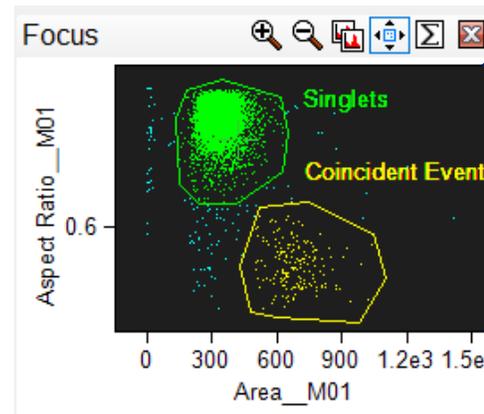
Flow Cytometry



Microscopy

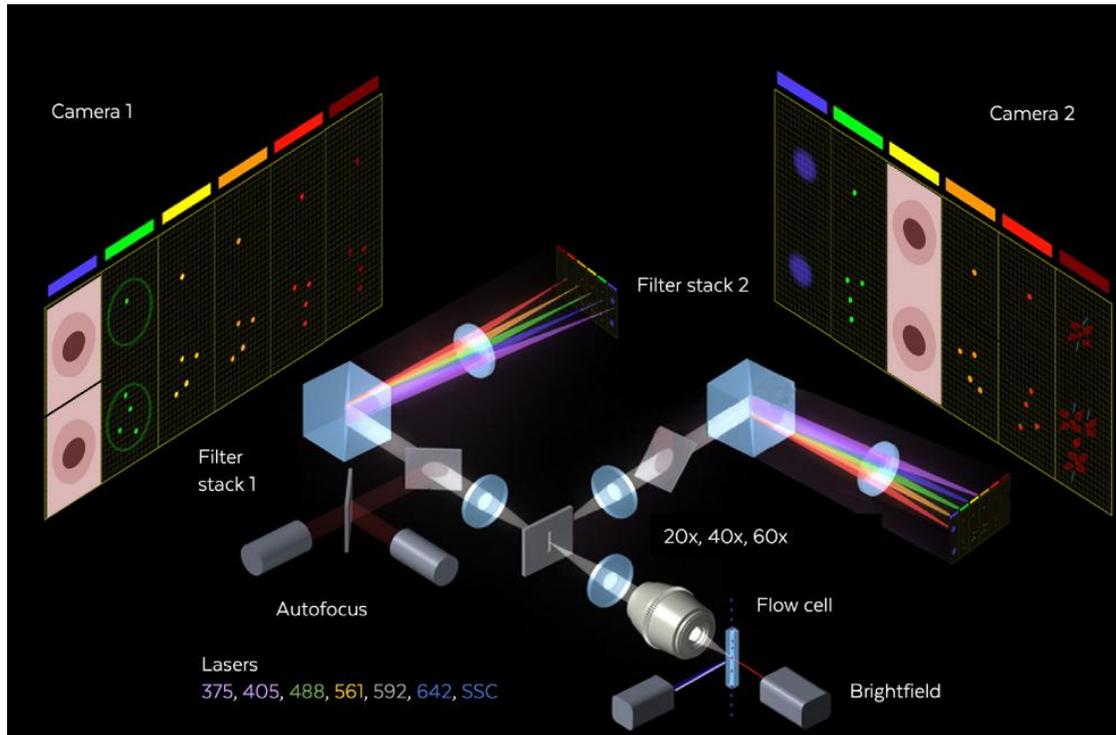


Imaging Flow Cytometry



Imaging Flow Cytometry

Merges flow cytometry 'speed' with microscopy-level single-cell imaging



Cytek® Amnis® ImageStream®X Mk II
imaging flow cytometer



First commercial instrument launched in **2005**

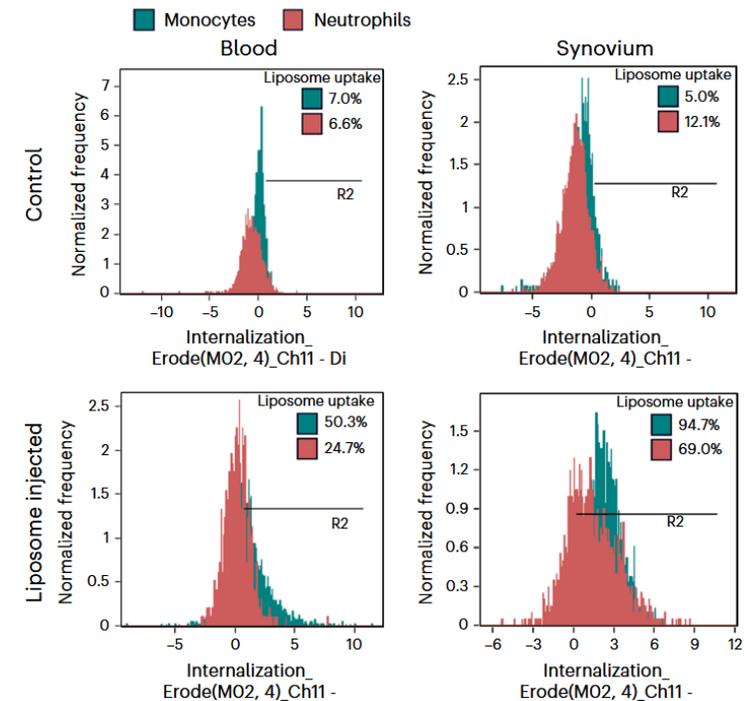
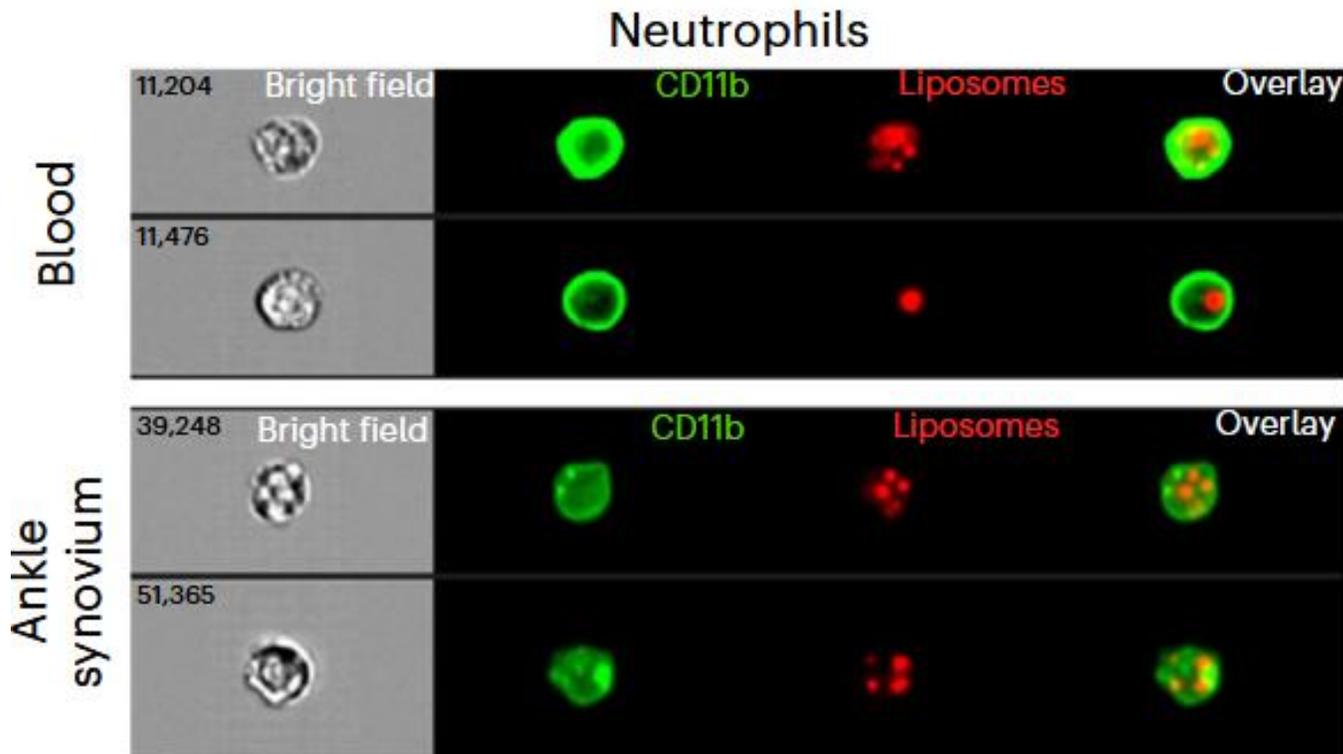
Run at ~1,000/s for routine experiments
to balance throughput and image quality

Imaging Flow Cytometry

Example of a Biomedical Application

Do myeloid cells actively transport liposomes to arthritic joints thereby fueling inflammation?

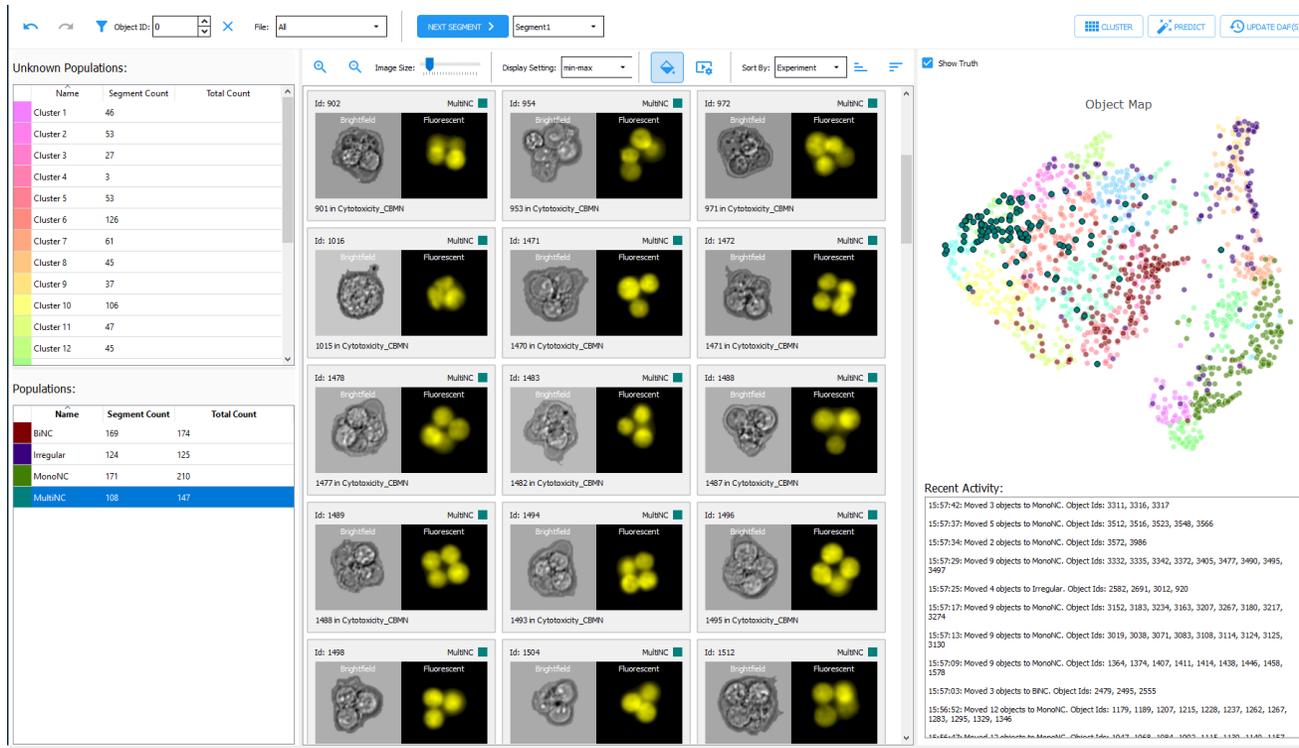
Yes → Visual confirmation and quantification by imaging FC that these cells internalize liposomes in blood and inflamed synovium



Imaging Flow Cytometry meets AI

Amnis® AI Image Analysis Software

- Next generation of image analysis software
- Visually hand-tag multiple cell types → train the software to identify those populations in unknown samples



The screenshot displays the Amnis AI Image Analysis Software interface. It features a grid of cell images with corresponding brightfield and fluorescent views. On the left, there are two tables: 'Unknown Populations' and 'Populations'. The 'Unknown Populations' table lists clusters 1 through 12 with their respective segment and total counts. The 'Populations' table lists BINC, Irregular, MonoNC, and MultiNC with their counts. On the right, there is an 'Object Map' showing a scatter plot of objects colored by cluster. Below the object map is a 'Recent Activity' log showing a series of object movements between clusters.

Name	Segment Count	Total Count
Cluster 1	46	
Cluster 2	53	
Cluster 3	27	
Cluster 4	3	
Cluster 5	53	
Cluster 6	126	
Cluster 7	61	
Cluster 8	45	
Cluster 9	37	
Cluster 10	106	
Cluster 11	47	
Cluster 12	45	

Name	Segment Count	Total Count
BINC	169	174
Irregular	124	125
MonoNC	171	210
MultiNC	108	147

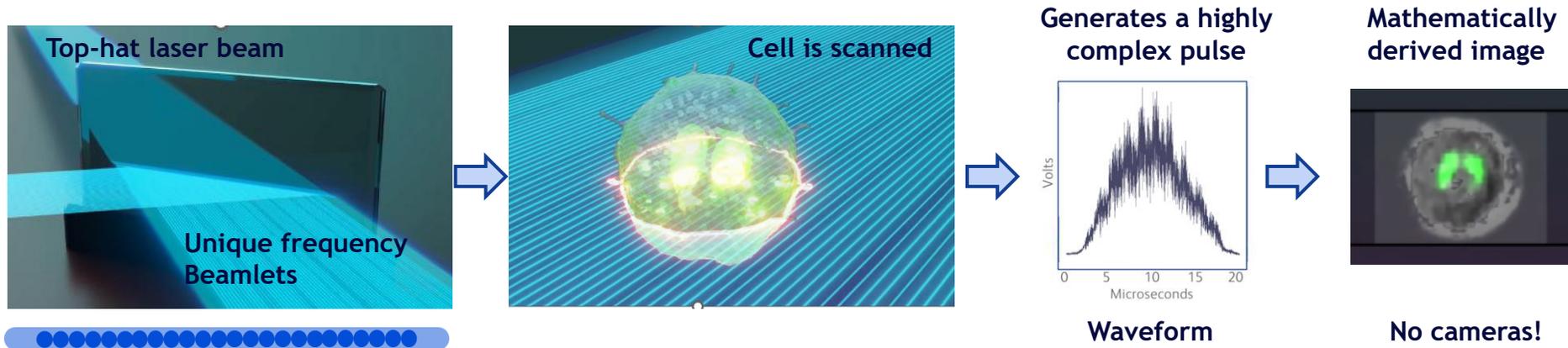
- Population clustering
- Deep Learning
- Accuracy analytics to verify that results match the expectation

Low throughput + No sorting possible

Imaging FC transitions to high-throughput analysis and cell sorting

BD FACSDiscover™ A8 (Analyzer) and S8 (FACS) use **BD CellView™ Image Technology**

FIRE Microscopy: Fluorescence Imaging using Radiofrequency-tagged Emission (*FIRE*)



6 imaging PMT detectors



Lower resolution images compared to camera-based FCs like ImagestreamX

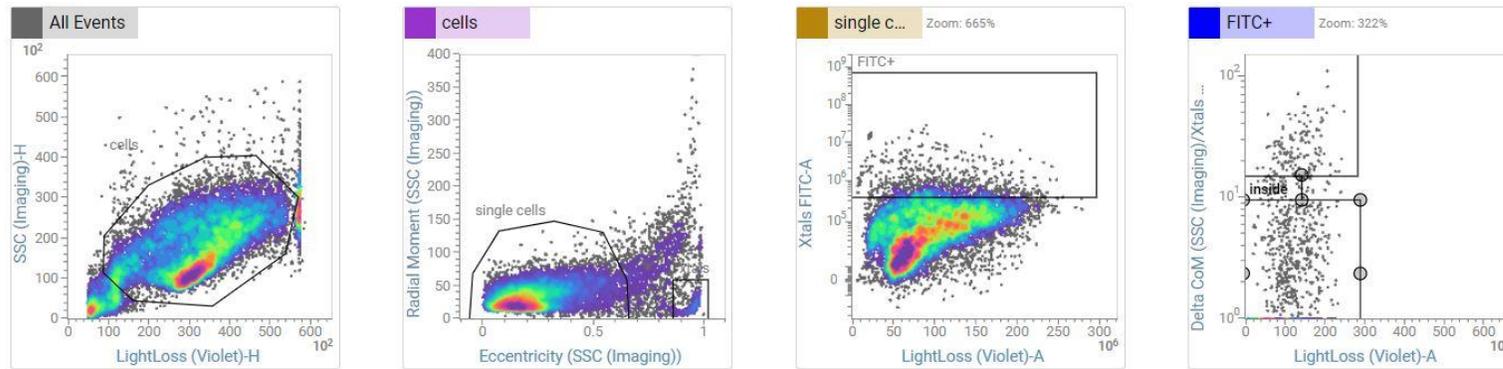
High throughput + Sorting possible → 12.500 images per second and instantly sort on image-derived parameters

New biological insights using BD FACSDiscover™ S8

Example of a Biomedical Application

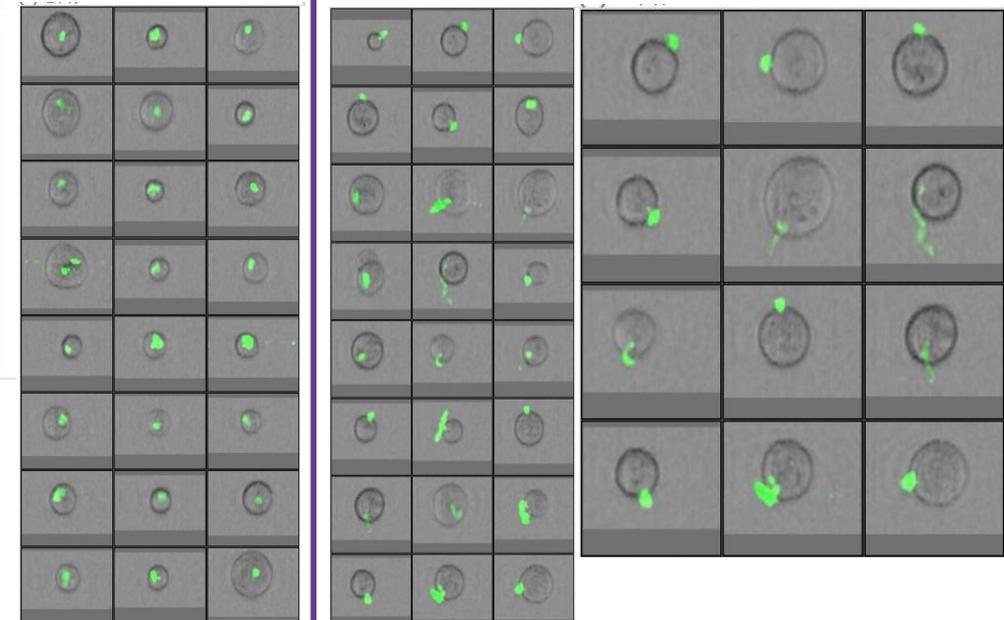
Assess uptake of immunogenic protein crystals

Only sort cells that phagocytosed crystals



Unpublished data

inside | outside

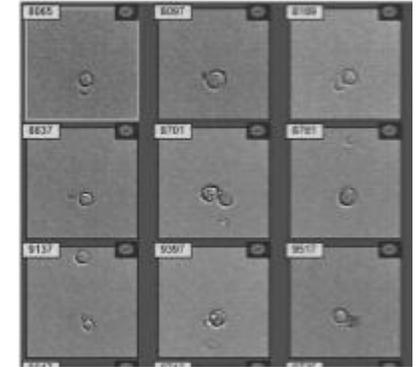


Imaging Flow Cytometry: The Future Is Now

- **Attune™ CytPix™ from Thermo Fisher**

High-throughput FC with a **high-speed brightfield camera** that captures images at 6,000 images/sec of a configurable subset of events

Label-free imaging to analyze e.g. cell morphology, sample quality, ...



- **VisionSort from Thinkcyte- ‘Ghost Cytometry’**

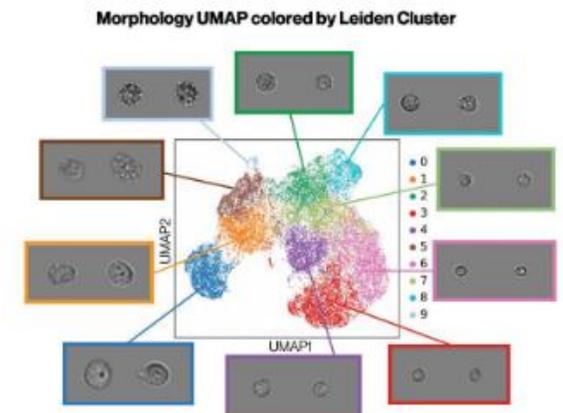
Merges fluorescence FC with high-dimensional **AI-driven morphological profiling** to create a cellular fingerprint

Label-free, image-free cell sorting based on cell morphology



- **REM-I from Deepcell**

Brings deep-learning-powered microscopy into live, label-free single-cell sorting



Imaging Flow Cytometry: The Future Is Now

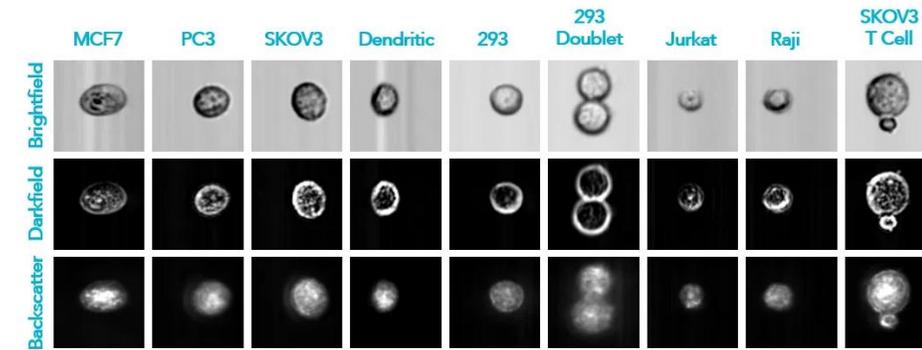
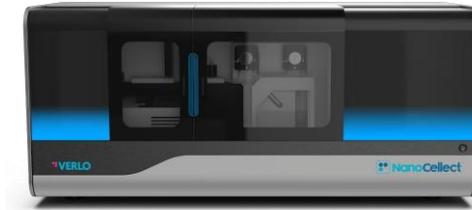
- VERLO™ cell sorter from NanoCollect

Image-guided sorter combined with gentle microfluidic-based cell sorting to visualize and sort cells based off image features and cell morphology

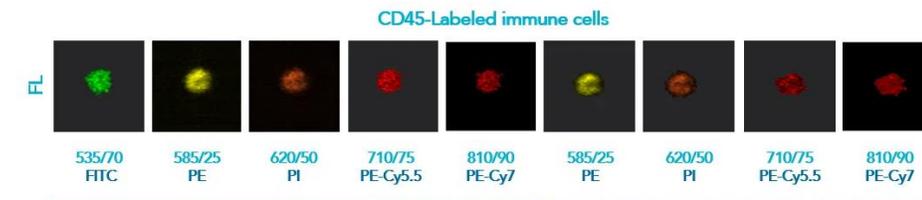
3 label-free channels and 9 fluorescent channels

- ZOMP™ imaging flow cytometer

Multicolour 3D imaging cytometry to quantify complex cell structures

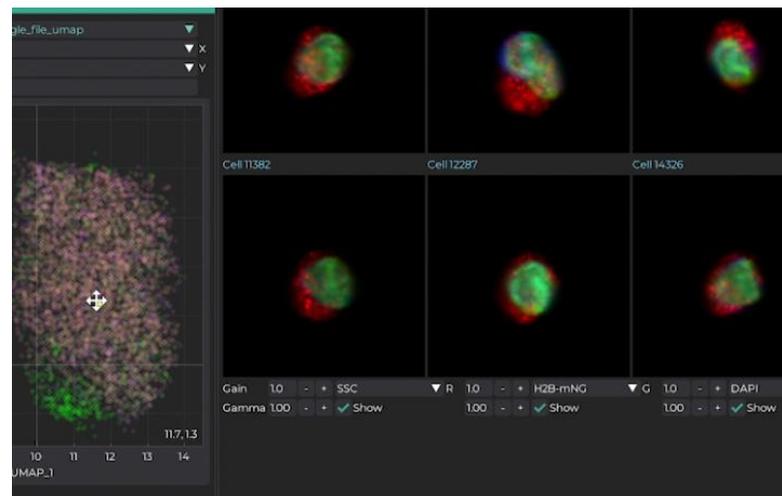


All label-free channels from the 488 nm Laser



488 nm Laser

561 nm Laser

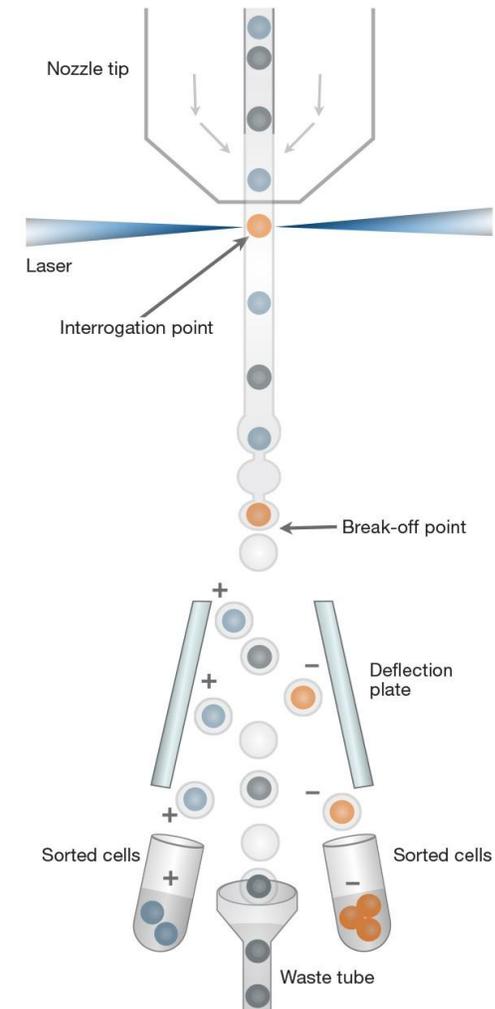




4. Cell Sorting Innovations

Conventional Cell Sorting

- **Key vendors**
 - BD Biosciences
 - Beckman Coulter
 - Sony Biotechnology
 - Cytex Biosciences (Aurora CS can be used as conventional)
 - Thermo Fisher (BigFoot is hybrid device)
- **Established technology**
 - Droplet cell sorters
 - 3-5 laser
 - Up to 30 fluorescent parameters
 - 2- to 6- way sorting
 - Multi-well plate sorting option
 - Cuvette based or jet-in-air systems



Conventional Cell Sorting

- **Key vendors**
 - BD Biosciences
 - Beckman Coulter
 - Sony Biotechnology
 - Cytek Biosciences (Aurora CS can be used as conventional)
 - Thermo Fisher (BigFoot is hybrid device)
- **Established technology**
 - Droplet cell sorters
 - 3-5 laser
 - Up to 30 fluorescent parameters
 - 2- to 6- way sorting
 - Multi-well plate sorting option
 - Cuvette based or jet-in-air systems
- **End of an era?**



Cell Sorting Innovations

- Spectral cell sorters
- Image based spectral sorting
- Cartridge based / microfluidic cell sorters

Spectral Cell Sorting

- Key vendors
 - BD Biosciences
 - Sony Biotechnology
 - Cytex Biosciences
 - Thermo Fisher
- Based on established technology, enhanced with Spectral capabilities:
 - Droplet cell sorters
 - 3-5 laser
 - Up to 182 fluorescent parameters
 - 2- to 6- way sorting
 - Multi-well plate sorting option
 - Cuvette based or jet-in-air systems



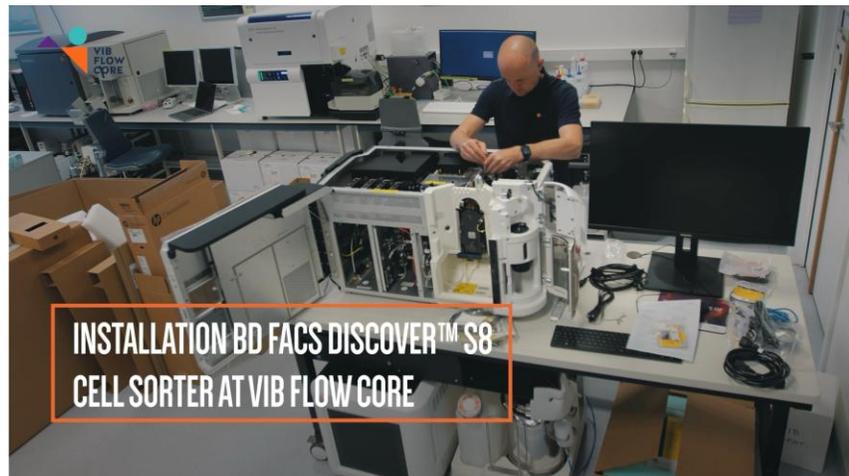
Image based spectral cell sorting

- **BD FACSDiscover™ S8 Cell Sorter**
 - 5 laser image based spectral cell sorter
 - BD CellView™ technology with 15 imaging derived parameters
 - 6 imaging detectors
 - BD SpectralFX™ with 78 fluorescent detectors
 - 6-way sorting
 - Fast index plate sorting
 - 85, 100, 130 µm nozzle



Overview

Derive greater insights and unlock new discoveries using image-enabled spectral sorting



INSTALLATION BD FACS DISCOVER™ S8 CELL SORTER AT VIB FLOW CORE

Advanced BD spectral system expands panel size and flexibility with 78 fluorescent detectors across five lasers with algorithmically optimized filter bandwidths

BD spectral flow cytometry increases flexibility by maximizing and simplifying the choice of fluorochromes detectable per laser. Expanding the palette of colors provides in-depth single-cell insights that can be isolated with high-speed sorting for further downstream studies.

Although spectral cytometry can seem intimidating or complex, our advanced spectral cytometry system offers you a guided user-interface including individually adjustable spectral detectors, auto-alerts if a detector is saturated and the flexibility to easily assign an autofluorescence-matched negative for each single color control.

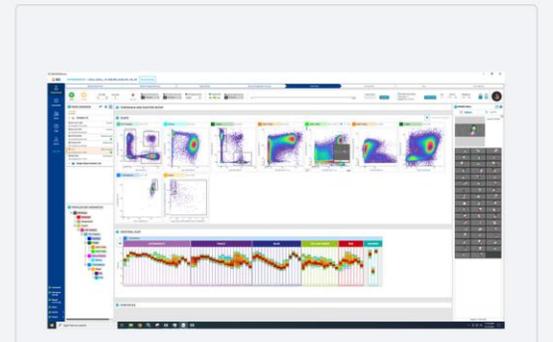
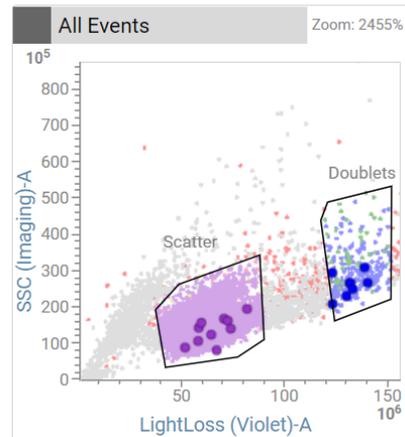


Image based spectral cell sorting

Fast image-based index sorting on BD FACSDiscover S8™

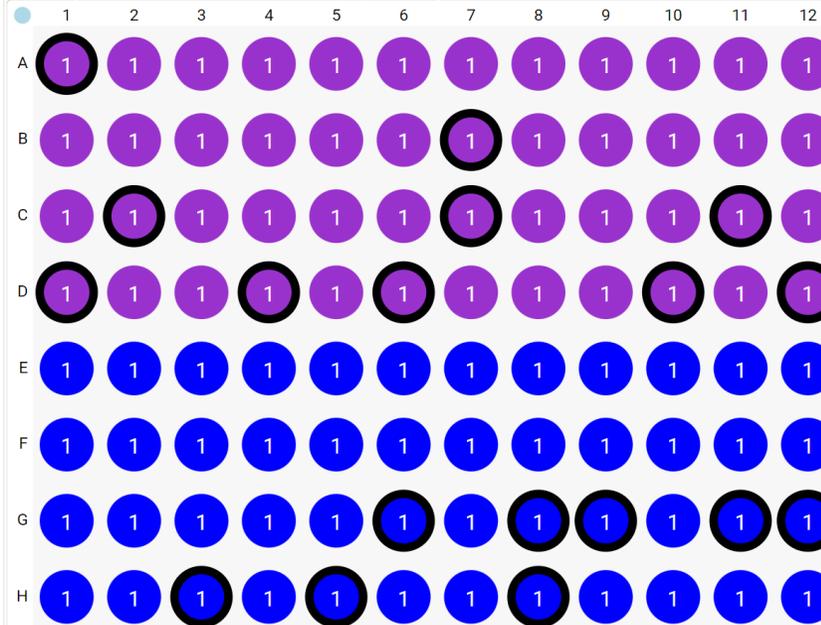
- Development of Smart-Seq3 pipeline for single cell sequencing in collab with VIB single cell core

■ SORT POPULATION PLOTS



■ SORT OUTCOME

Select a well or group of wells to display their corresponding images on the Image Wall and to locate them on the Plots panels.
CTRL allows multiple selections across panels, releasing CTRL displays only the selected images when selecting from the wall. CTRL and SHIFT displays all images for continued selection.



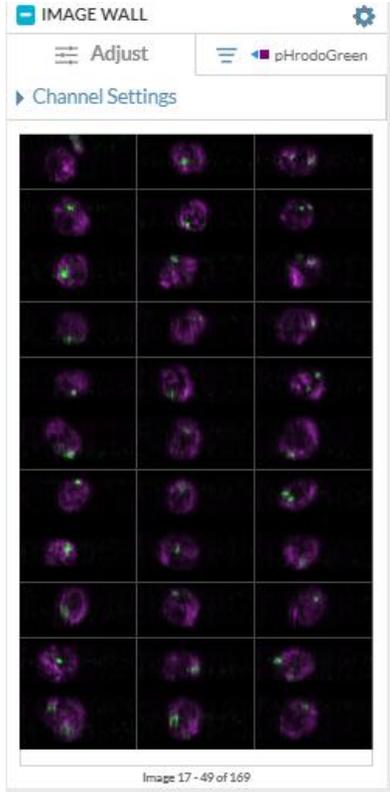
■ IMAGE WALL



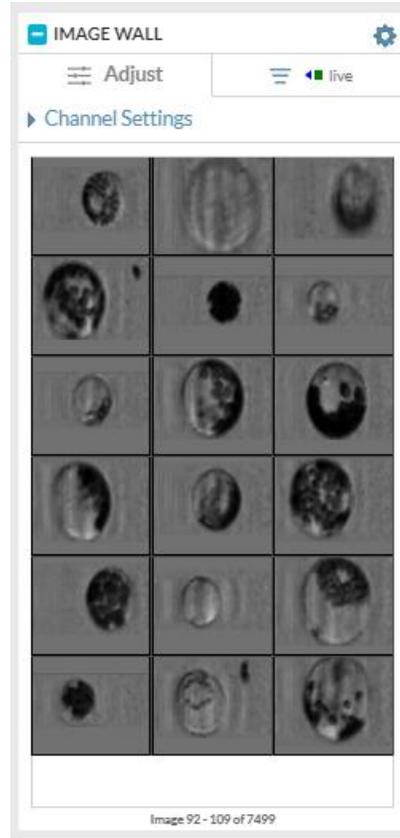
- 85, 100, 130 μm nozzle

Image based spectral cell sorting

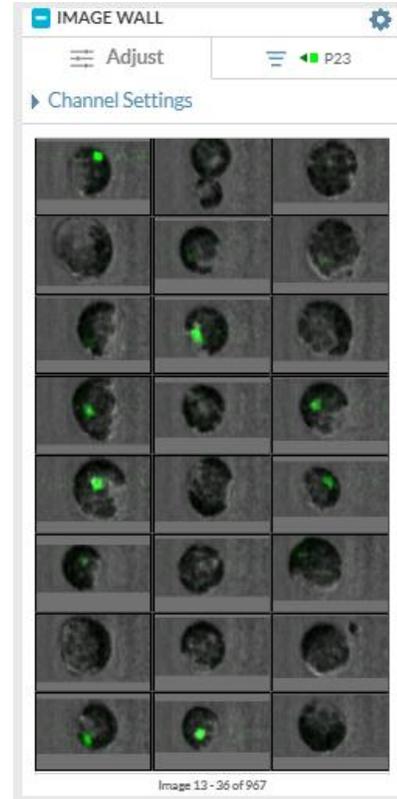
Diverse species, diverse applications



Macrophages
(Phagocytosis bacteria)



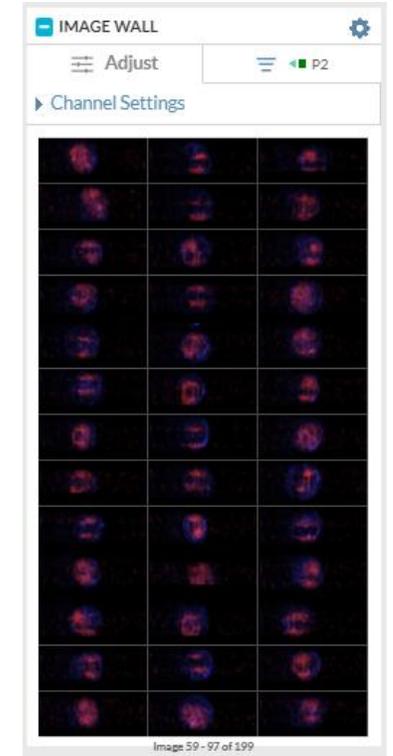
Canola -leaf



Arabidopsis - leaf



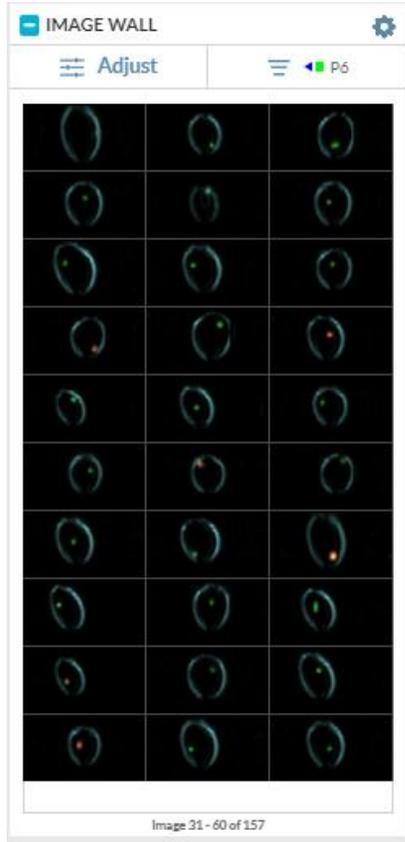
PSB-D cell line



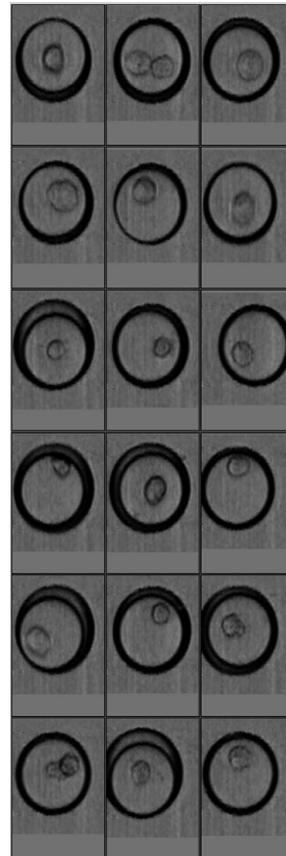
HACAT (cell cycle)

Image based spectral cell sorting

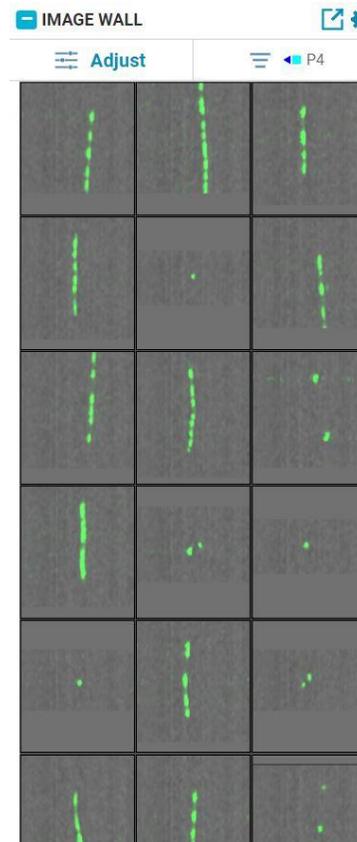
Diverse species, diverse applications



DE-droplets beads



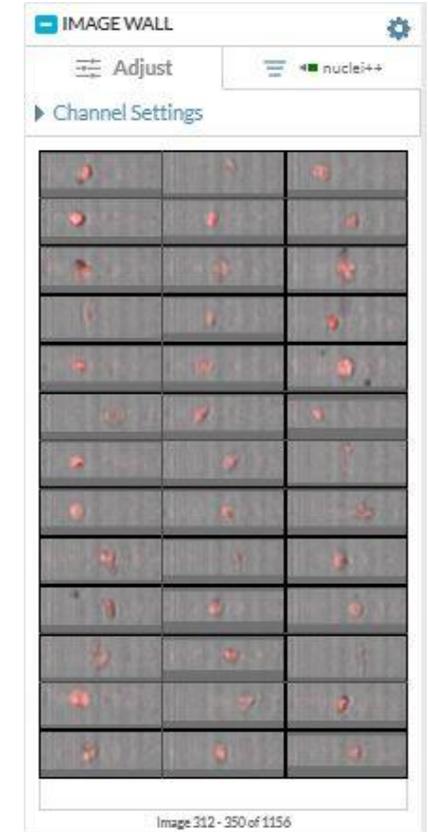
DE-droplets cells



Archaea



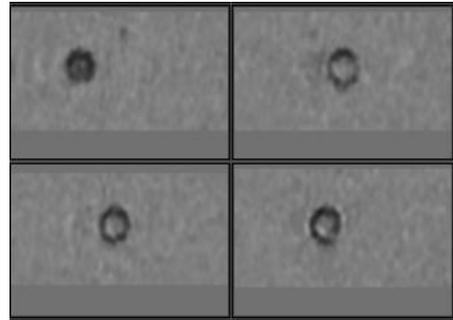
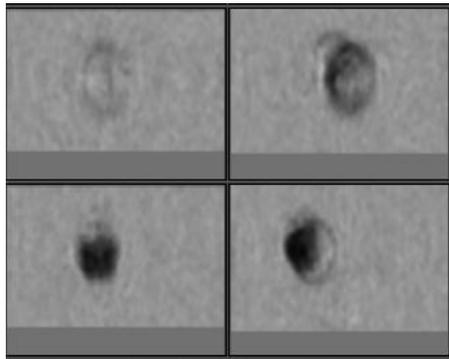
Yeast



Nuclei (tomato)

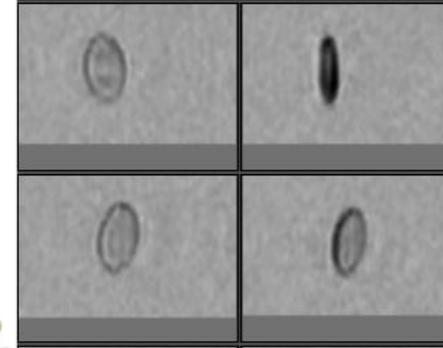
Image based cell sorting

Diverse species, diverse applications

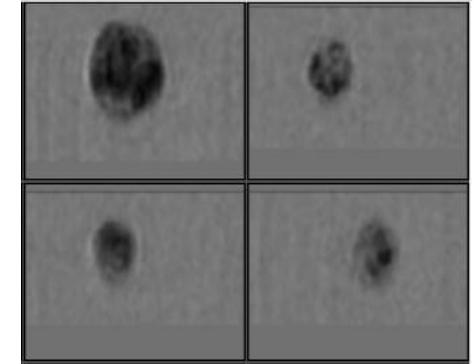


Liver neutrophils

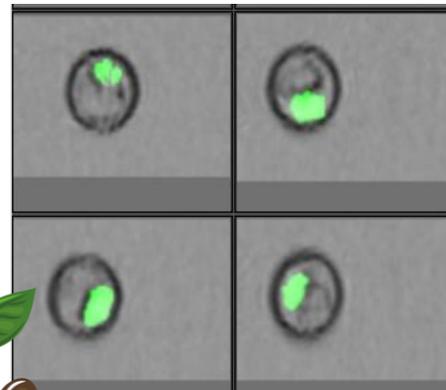
Red blood cells
of *Xenopus trop.*



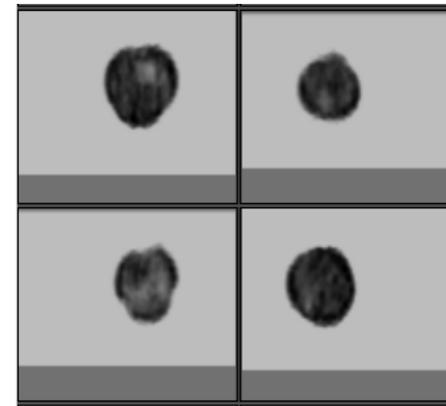
Cells
of honeybee



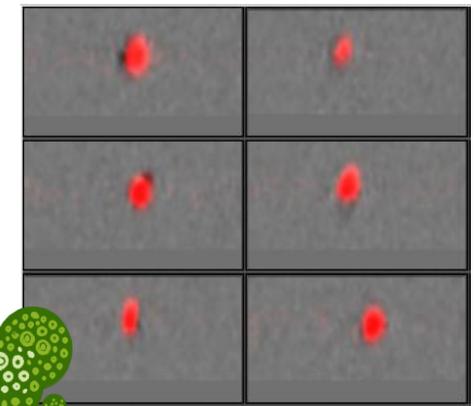
Arabidopsis th.
root protoplasts



Brassica napus
(rapeseed) microspores



Autofluorescent gametes
of *Ulva* (microalgae)



Cartridge based cell sorting

- **Key vendors**

- Miltenyi

- *MACSQuant Tyto*
 - *MACSQuant Tyto LUX*

- NanoCollect

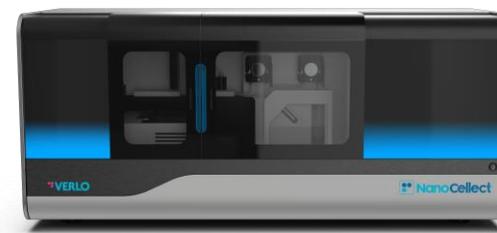
- *Verlo*
 - *Wolf G2*

- STEMCELL technologies

- *Highway1 Cell Sorter*

- **Microfluidic based systems**

- Closed, sterile workflows
 - Sample buffer as sheath fluid
 - Gentle, low-pressure
 - Small sorting volumes
 - Compact in design
 - Low parameter, max 2-way sorting
 - Consumable cost of cartridges/chips

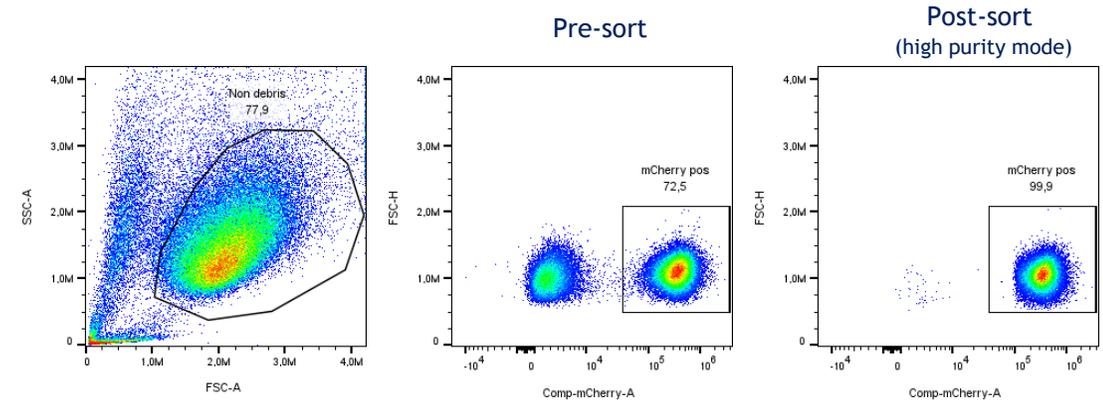


MACSQuant Tyto LUX

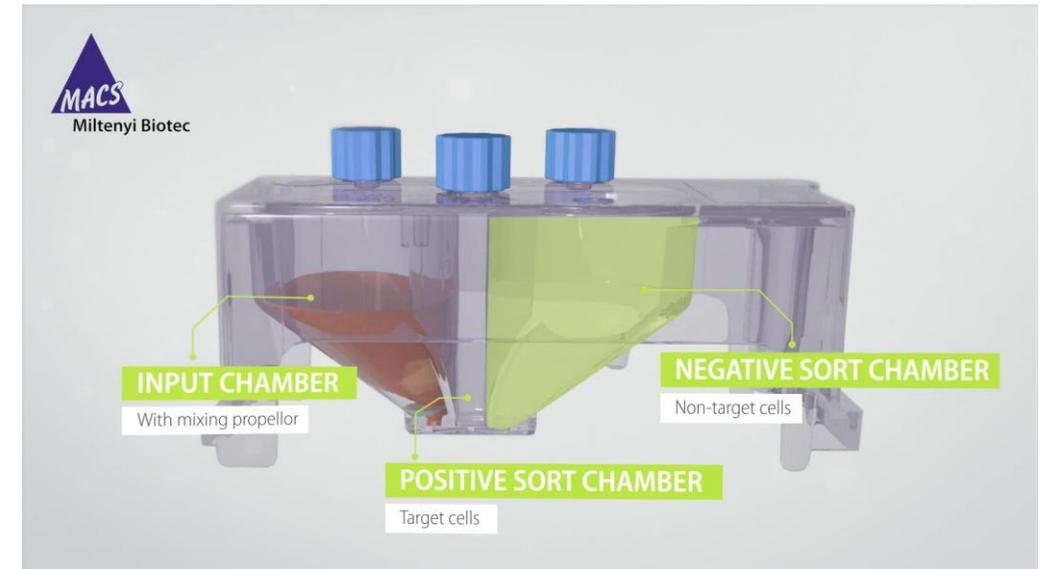
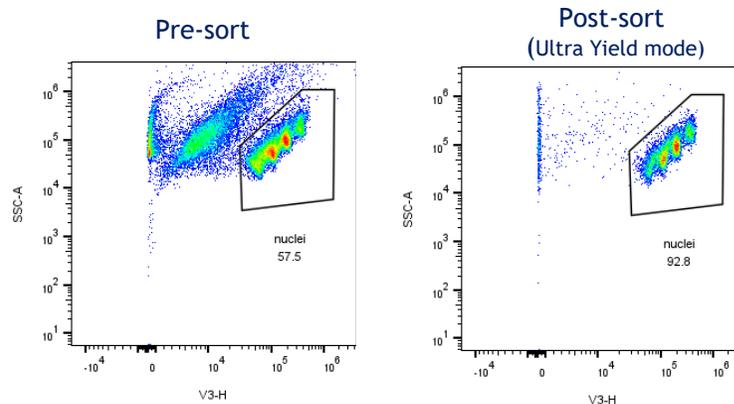
Samples tested:

- Eosinophils
- Hepatocytes
- Neutrophils
- Macrophages
- Nuclei (plants and murine)
- Human and mouse cell lines
 - tdTomato, mCherry, mRFP

B16-mCherry (mouse melanoma cell line)



Arabidopsis th. (plant nuclei)

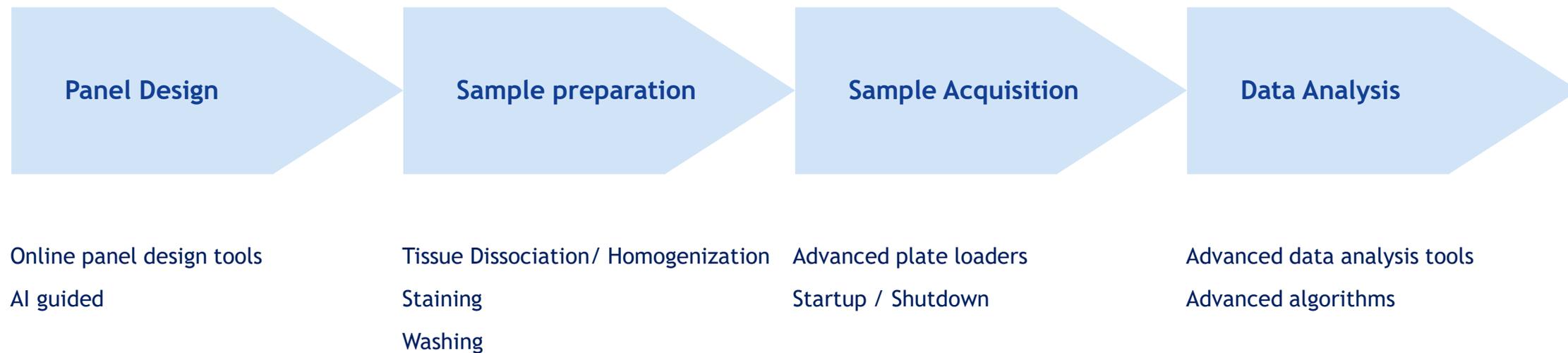




5. Automation

Automation

- Automation is transforming every step of the experimental workflow



Panel Design

- Online panel design tools with “AI” option
 - Fluorofinder - *IntelliPanel*
 - Easypanel

The screenshot displays the FluoroFinder website interface. At the top, there is a navigation bar with 'Dashboards', 'Apps', and 'Resources'. Below this is a 'Flow Cytometry Tools' section with a sub-header 'By integrating experiment design tools featuring preloaded instrument configurations with a comprehensive antibody database, FluoroFinder's panel builder speeds up flow cytometry experiments while consuming mistakes.' A navigation bar below this includes 'Flow Cytometry Panel Builder', 'Flow Cytometry Spectra Viewer', 'Antibody Search', 'Dye Directory', 'Cell Types', and 'eLearning'. The main content area is split into two columns: 'Panel Builder' on the left and 'Spectra Viewer' on the right. The 'Panel Builder' section features 'Automated Panel Design' (IntelliPanel), 'All Instruments, All Reagents', and 'Integrated Inventory and Preferences'. The 'Spectra Viewer' section offers 'Comprehensive Fluorophores', 'Quick Reference Guides', and 'Discover Alternative Dyes'. Below the main content are several tool links: 'Cell Types Tool', 'Instrument Directory', 'Product Search', 'Validated Panels', 'Webinars', and 'Articles'. The bottom section shows the 'Dotmatics EasyPanel' interface, which includes a 'Your EasyPanel Quality Score™' of 7.6/10 and a 'Fully Computed Panel' score of 10/10. It also provides 'Recommendations' and a 'Normalized Emission (%)' graph showing multiple spectral curves. A legend at the bottom identifies various fluorophores by color and name.

AI-Powered Fluorescent Experiment Design
Automated Flow Cytometry and Microscopy Solutions

Flow Cytometry Tools
By integrating experiment design tools featuring preloaded instrument configurations with a comprehensive antibody database, FluoroFinder's panel builder speeds up flow cytometry experiments while consuming mistakes.

Flow Cytometry Panel Builder | Flow Cytometry Spectra Viewer | Antibody Search | Dye Directory | Cell Types | eLearning

Panel Builder
Automated Panel Design
IntelliPanel optimizes panels to minimize spillover
All Instruments, All Reagents
Unlimited panel design with all cytometers and antibodies in one platform
Integrated Inventory and Preferences
Designs around your reagents and preferences

Spectra Viewer
Comprehensive Fluorophores
Over 1300 fluorophores and growing
Quick Reference Guides
Visualize spectra alongside your instrument configurations
Discover Alternative Dyes
Explore new dyes that provide alternative options to traditional or expensive dyes

Cell Types Tool | Instrument Directory | Product Search | Validated Panels | Webinars | Articles

Dotmatics EasyPanel | EasyPanel | EasyInventory | Spectrum Viewer | Integrations | More

Edit Panel Manually | Get Quotation | Share | Export To Excel

Your EasyPanel Quality Score™
7.6/10
Details | Similarity Matrix | Hotspot Matrix
Computation Mode: Balanced

EasyPanel Quality Score™ For Fully Computed Panel
10/10
Details | View

Recommendations

- It is recommended to use Brilliant Stain Buffer (BD Cat Number 563794) because your panel includes 2 or more Brilliant reagents.
- Use Super Bright Complete Staining Buffer (ThermoFisher SB-4401-75) because your panel includes 1 or more Super Bright dyes.
- It is recommended when selecting hybridoma antibodies to block non-specific Fc-mediated interactions by adding Fc Block Reagents (matching the species of your cells) because your panel includes CD16 and/or CD32.

Normalized Emission (%)

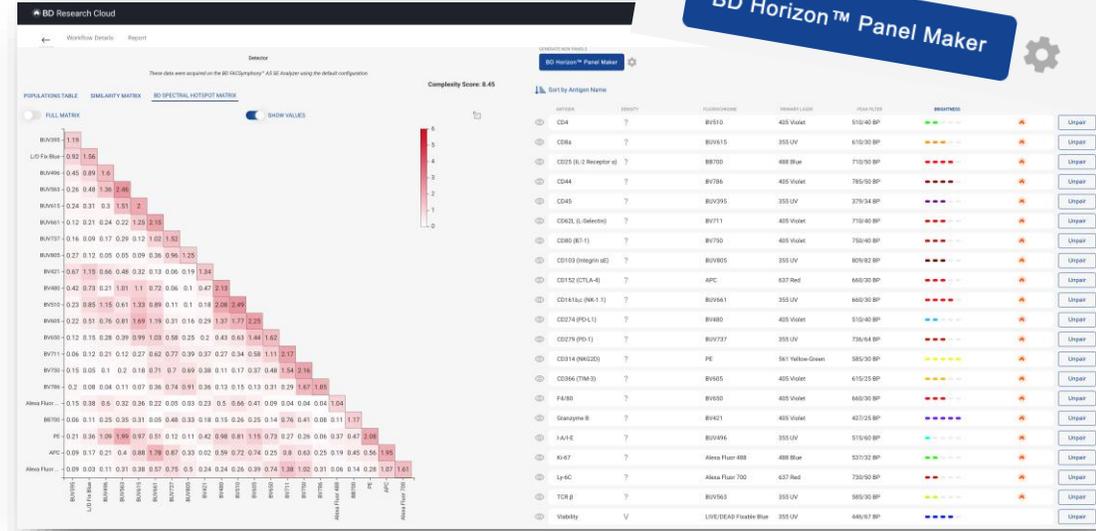
Wavelength (nm)

BLU905 | BLU935 | Live-Dead Fixable Blue | BLU496 | BLU563 | BLU615 | BLU661 | BLU737 | Super Bright 436 | BV421 | eFluor 450 | BV480 | BV510 | Spark Violet 538 | BV570 | BV505 | BV565 | PerCP | BV711 | BV750 | BV785 | BBS15
cFluor B532 | Spark Blue 550 | PerCP-Cy5.5 | PerCP-Vio700 | Viabromin 561 | cFluor YG584 | PE | cFluor YG610 | PE-Dazzl694 | PECy5 | cFluor Biotin | PECy7 | APC | AlexaFluor647 | Spark NR 685 | cFluor FITC | APC-H7 | APC-Fire 810

Disclaimer: EasyPanel cannot guarantee the performance of the suggested panels. Although suggested panels are theoretically optimized, they still do require experimental validation (including antibody titration) on your machine.

Panel Design

- Online panel design tools with “AI” option
 - Fluorofinder - *IntelliPanel*
 - Easypanel
 - BD Research Cloud - *BD Horizon™ Panel Maker*
 - Cytek cloud - *SpectroPanel™*



Explore Cytek Tools

Full Spectrum Viewer
Explore fluorochrome combinations easily

Automated Panel Builder
Design panels with confidence using SpectroPanel™

Experiment Builder
Save time by preparing experiment templates in advance

Search Panels
Access and search OMPs and other Cytek pre-designed panels

My Reagents
Manage your reagents for use in Panel Builder

Dashboard

Tools

- Full Spectrum Viewer
- Panel Builder
- Experiment Builder
- Quote Builder
- Library

Welcome to Cytek® Cloud

	Basic	Academic Pro
Full Spectrum Viewer		
Normalized Spectra Viewer	✓	✓
Similarity and Complexity Indices	✓	✓
Configuration-Specific Spectral Signatures	✓	✓
Data-Backed Spread Estimation	✗	✓
Export Fluorescent Tag Details	✗	✓
Panel Builder		
Manual Panel Design <small>Use Basic Features to manually design panels</small>	✓	✓
Explore and Build Off of OMPs <small>Search OMPs to find pre-optimized panels</small>	✓	✓
Duplicate Existing Panels <small>Iterate on your previous panels by creating copies</small>	✗	✓
SpectroPanel™ Algorithm <small>Auto-generate quality panels in minutes</small>	✗	✓
Data-Backed Spread Estimation <small>Use SR and SSER to inform panel design</small>	✗	✓
Share Panels with Colleagues	✗	✓
Export Panel Details		
My Reagents <small>Build panels with your reagents</small>	✗	✓
Build Experiments from Panels <small>Push your markers and fluros to Experiment Builder</small>	✗	✓
Experiment Builder	✗	✓
Quote Builder <small>Get Quotes for Cytek and Partner Reagents</small>	✓	✓
Pricing	Complimentary	Buy Now or Request a Quote

Panel Design

Sample preparation

- Tissue dissociation / homogenization

- Semi automated Miltenyi GentleMACS

Goal: Standardization, reproducibility, contamination free

- Sample staining

- Automated staining robots
 - Commercialized for flow cytometry stainings:
 - Cytex Orion, BD FACSDuet™, Curiox C-FreePluto, Sysmex PS10
 - Liquid handlers
 - Dispindex I-DOT
 - Beckman Coulter Echo Acoustic dispenser
 - Traditional pipetting: Tecan, Hamilton, OpenTrons, Biomek, ...

Goal: Standardization / Reduce reagents / Walk-away / Minimize human error / Speed

- Sample washing

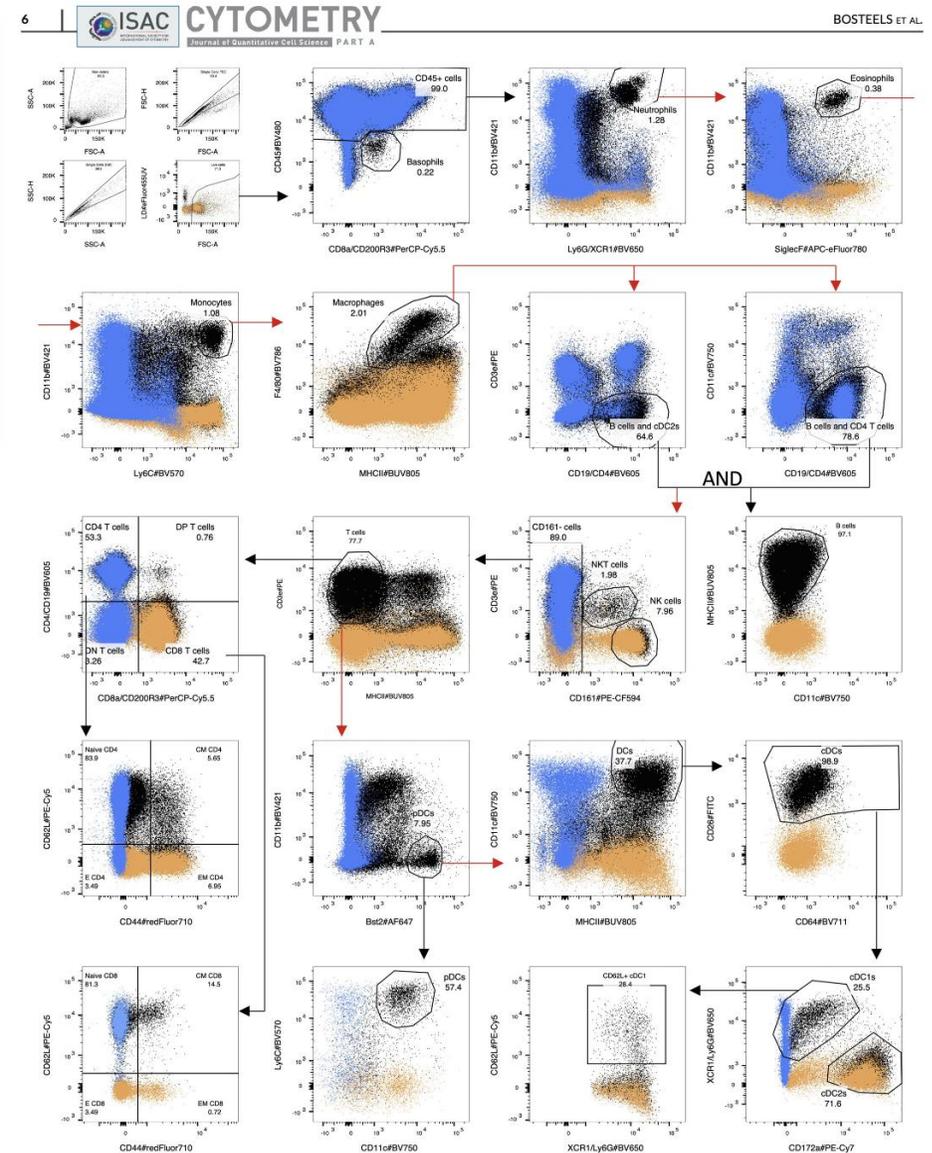
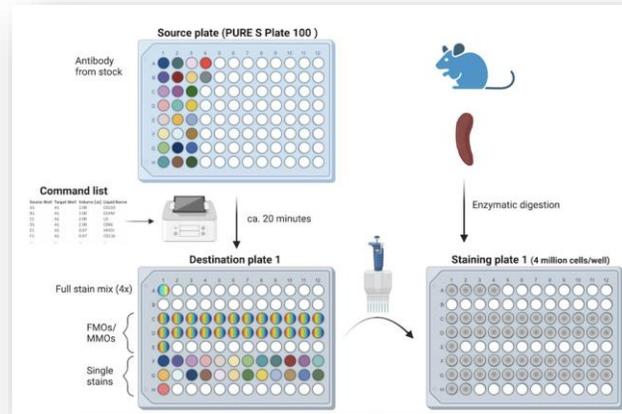
- BlueCatBio, Curiox,...

Goal: Replace centrifugation, less cell loss,....



Automated antibody dispensing

- 25 color test panel
 - All FMO's
 - Single stains on beads
 - Single stains on cells
 - Full stains
 - <20min



Received: 12 October 2023 | Revised: 2 February 2024 | Accepted: 22 February 2024
 DOI: 10.1002/cyto.a.24835

TECHNICAL NOTE



Automated antibody dispensing to improve high-parameter flow cytometry throughput and analysis

Victor Bosteels^{1,2} | Julie Van Duyse^{3,4} | Elien Ruysinck^{3,4} |
 Katrien Van der Borgh^{3,4} | Long Nguyen^{5,6} | Jannes Gavel^{1,7} |
 Sophie Janssens^{1,2} | Gert Van Isterdael^{3,4}

Panel Design

Sample preparation

Sample Acquisition

- Advanced plate loaders on FC Analyzers

- Sony ID7000
- BD FACSDiscover A8
- Agilent Novocyte Opteon / Penteon / Quanteon
- Cytek Aurora
- BC Cytotflex
- Thermo Fisher Xenith / Attune

Key features:

- 40 tube racks, 96-well, 384-well, deepwell plates
- Flow sensor, clog detection
- Automated washing
- Minimized dead volume, low carryover
- Temperature control, sample mixing
- Volumetric measurements

- Programmed start up and automated shutdown

- Some vendors have it (Sony, Agilent, Cytek,...)
- Start measurement at end of the day.



Sony ID7000



Agilent NovoCyte



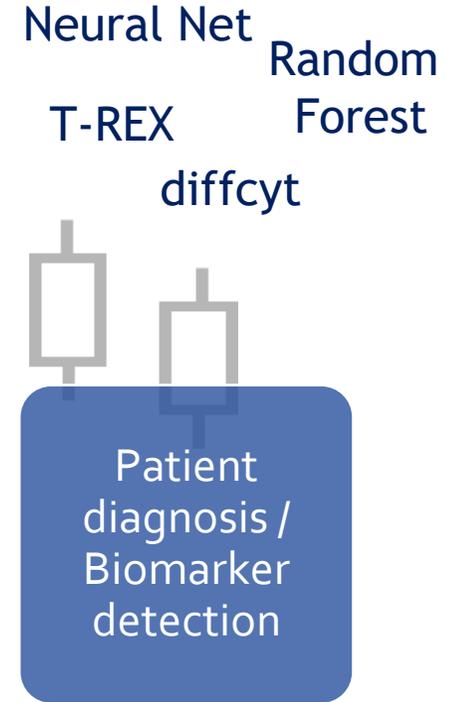
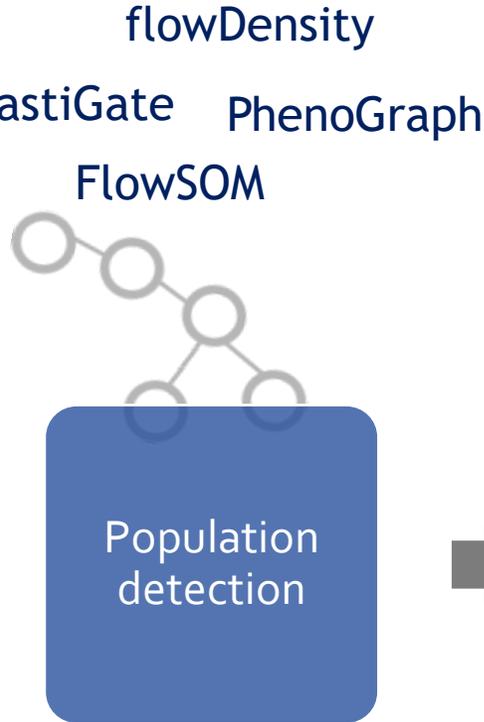
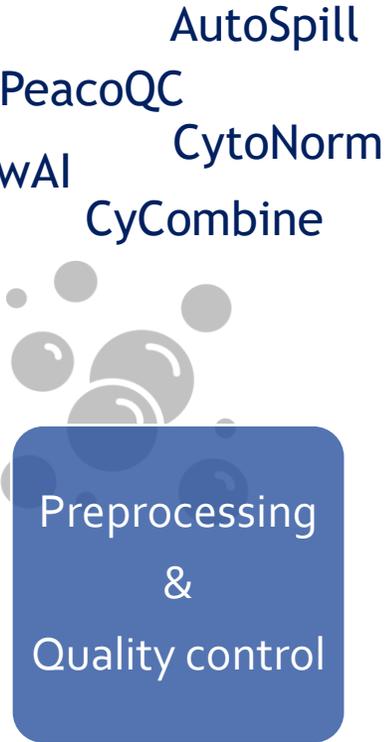
Panel Design

High-Throughput Data Analysis

Sample Preparation

Sample Acquisition

Data Analysis



Scatter plot

Heatmap

tSNE

UMAP

Data Analysis

High-Throughput Data Analysis

Manual

Gate on a specific population of interest

Intuitive interpretation

Less practical for high-dimensional data
(e.g. Time vs all parameters)

Inconsistency between scientists
(e.g. small shifts in gates)

Manual adjustment of gates

Computational

Look at all cells/parameters simultaneously

Less straightforward interpretation of results

Automated steps possible

Reproducible
(given same input and hyperparameters)

More sensitive to batch effects/changes

6. Take-Home messages



Take-Home messages

- Flow cytometry field is changing at **laser** light speed
- Automation and AI will dramatically change our way of working
- More advanced data analysis is needed –lots of opportunities!
- Flow Core facilities are evolving into technology & training hubs

VIB Flow Core is ready for the future!

Spectral Flow Cytometers

Sony ID7000

2x BD FACSDiscover A8

Cytek Aurora

Imaging Flow Cytometer

Cytek ImageStream X

**Technical and data
analysis expertise**

Spectral + Imaging Sorter

BD FACSDiscover S8

Cartridge based Sorter

Miltenyi Tyto Lux

VIB Flow Core: An Open and Future-Ready Facility

Interested in one of **our services** or want to try one of our state-of-the-art devices?

Flow Cytometry
Consultancy



FACS
Consultancy



Connect website -
request training





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