Agenda

Dear Customer,

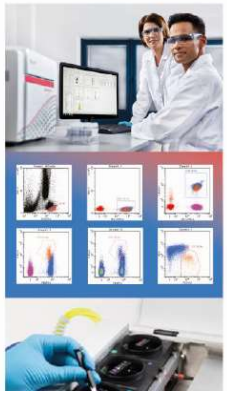
DxFLEX from Beckman Coulter is the next generation in clinical flow cytometry providing a key building block for your routine flow cytometry laboratory.

The DxFLEX compact design and ease of use along with its enhanced sensitivity and intuitive software, makes flow cytometry rigor and reproducibility achievable for both novice and expert clinical scientists.

Seven configurations are available with up to 3 lasers and 13 detectors, advanced detection technology, progressive application capabilities and upgrade-ready design makes this the most exciting new innovation in clinical flow cytometry.

We would like to demonstrate how easy it is to create new panels, adding new markers, facilitating accurate results and sample tracking – we hope to see you on our DxFLEX Roadshow.

Register now to secure your seat.



Your Beckman Coulter Life Sciences Team

CLICK HERE FOR REGISTRATION

13th January 2021 – 15:00 CET

AGENDA		
15:00	Welcome Address	BEC LS Host
15:05	DxFLEX – What makes the difference?	BEC LS FM
15:25	DxFLEX Live!	BEC LS Applications
15:55	Q&A and Closing Comments	All

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For Beckman Coulter's worldwide office locations and phone numbers, please visit Contact Us at beckman.com

FLOW-8017FLY10.20

FLOW-7996CP10.20

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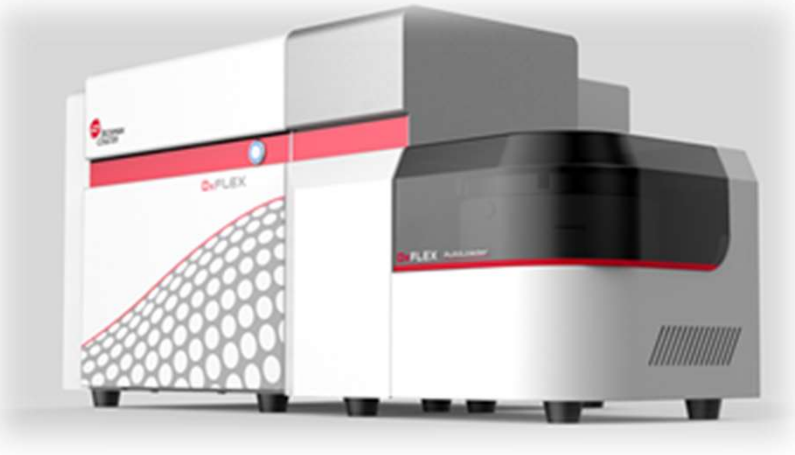
EMPOWER
life changing decisions.

Virtual DxFLEX Roadshow

13. Jenner 2021, ÖGFZ – “Jour Fixe”



DxFLEX flow Cytometer is CE marked for up to 13-color in vitro diagnostic use. This device is not available in all countries. Please check with your local sales representatives before placing your orders.

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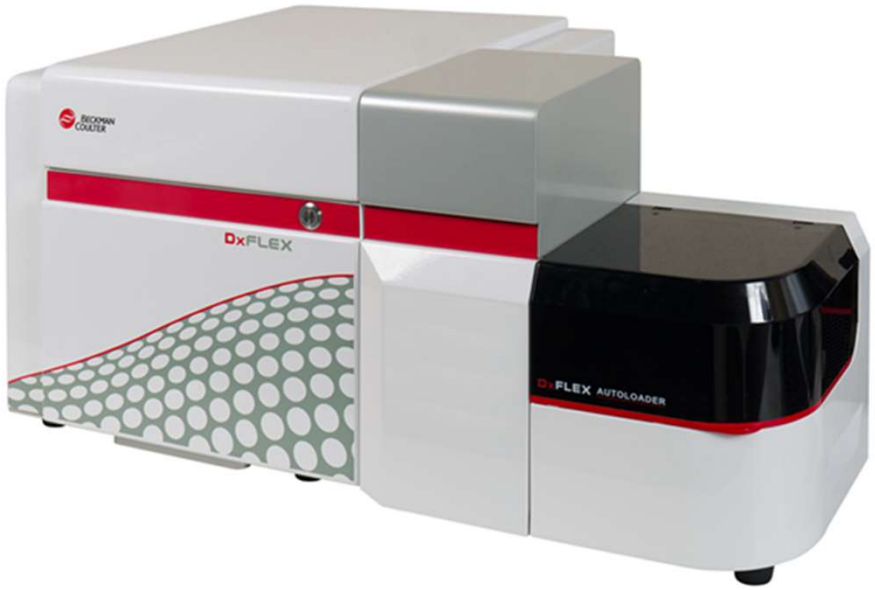
Agenda DxFLEX Roadshow

13. Jenner 2021

15:00 -16:00 Uhr

- Introduction
- Overview, Innovation and future
- **DxFLEX overview presentation**
- DxFLEX Live!
- Questions & Answers



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DxFLEX – System Overview

Beckman Coulter Life Sciences, Flow Cytometry

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DxFLEX E-Roadshow, Oct 2020

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Beckman Coulter Life Sciences: Trusted Name for 80 Years

BECKMAN COULTER Life Sciences

Accelerating answers

- Studying the complex biological underpinnings of disease, and exploring new therapies for drugs.
- Offer broad product portfolio of **flow cytometry**, particle characterization, centrifugation, automated liquid handling and genomics sample preparation.
- At the forefront of **flow cytometry** and centrifuge innovation and a pioneer in particle science.

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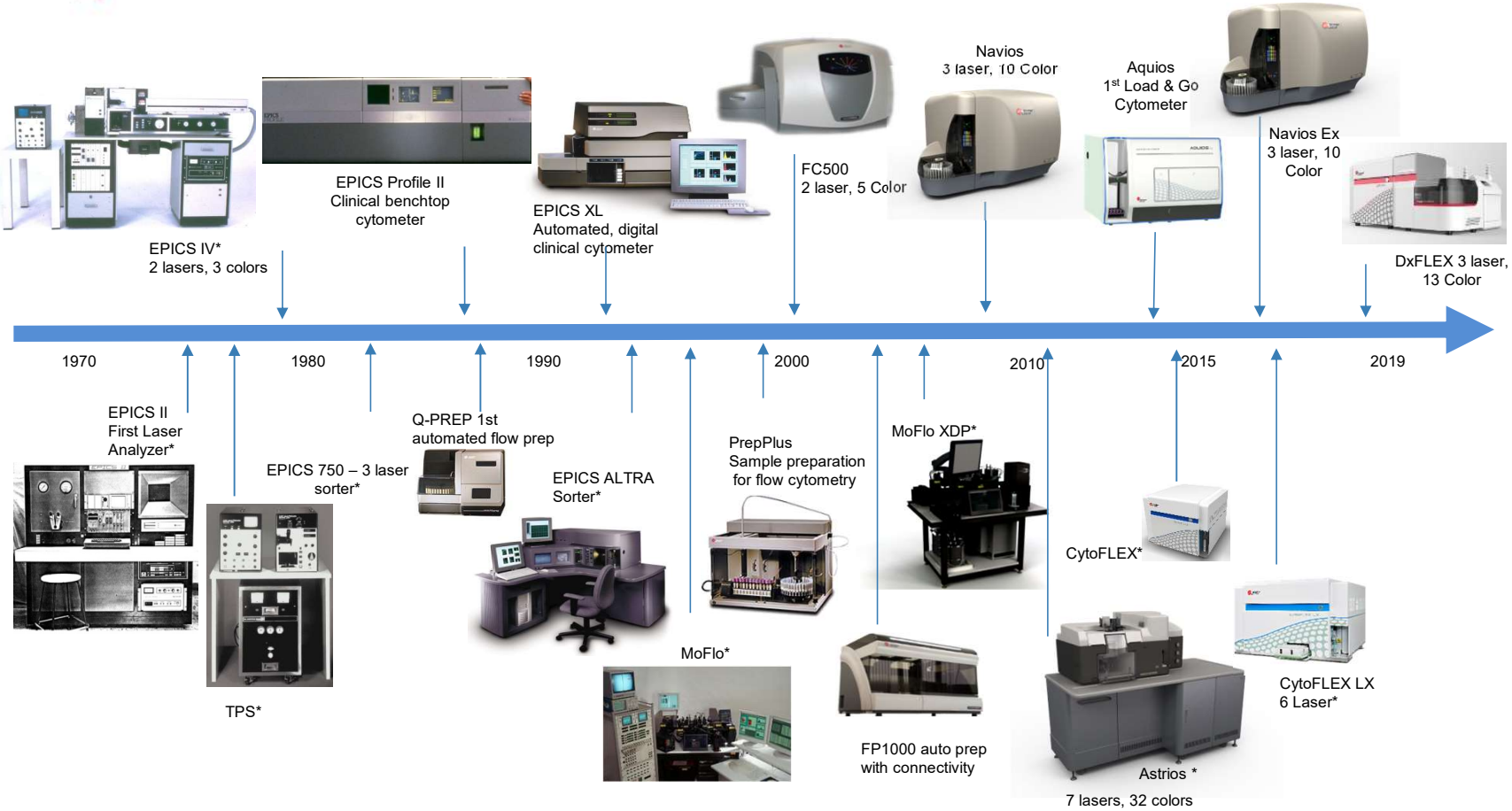
Beckman Coulter: Pioneers in Flow Cytometry



The journey continues…

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For Research Use Only. Not for use in diagnostic procedures

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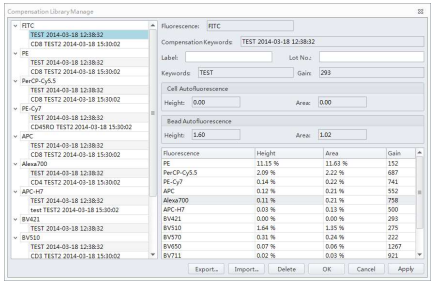
DxFLEX: Additional Features (over CytoFLEX*)

- Key features:
  - CE-marked for clinical use for up to 13 “colors“
  - 4 upgradable configurations: 1L5C, 2L6C, 2L9C, 3L13C
  - Optional Autoloader for 32 position MCL carousel

- New clinical **CytExpert for DxFLEX software**:
  - User and account management
  - Experiment and report templates
  - Panel experiments and flagging of out-of-range results
  - …



DxFLEX is based on the highly successful CytoFLEX* technology, but includes additional features needed for clinical work

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DxFLEX is not available in all countries. Not available in the US.

* For Research Use Only. Not for use in diagnostic procedures.

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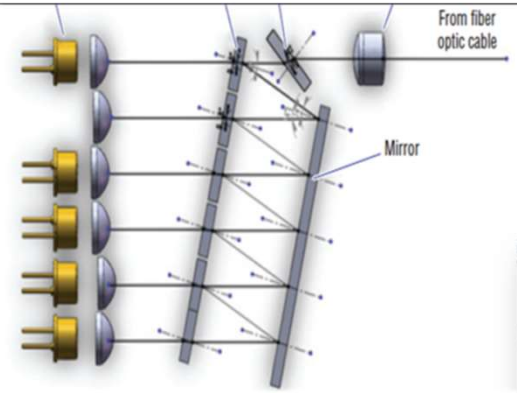
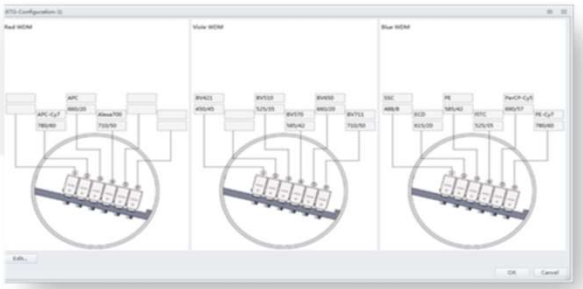
What is different about DxFLEX compared to other clinical flow devices available on the market?

- Wavelength Division Multiplexer (WDM)
  - Compact design with short travel distance of fluorescence detection between the detectors
  - High yield light transmission concept without dichroic filters

Bandpass only for flexibility and efficiency



Mirror band pass filters instead of dichroic/bandpass pairs



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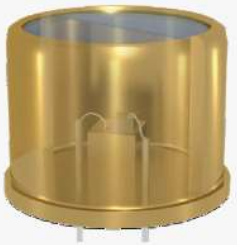
Inside the WDM Detector Modules

Detectors: Semiconductor APDs (avalanche photodiode)

High quantum efficiency compared to PMT devices

1. Better far red sensitivity
2. Less fluorescence spreading
3. Linearity response to gain variation



Avalanche Photodiode. The DxFLEX flow cytometer uses Avalanche Photodiode detectors instead of PMTs. The low electronic noise contributes to the resolution capabilities of the instrument.

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Inside the WDM Detector Modules

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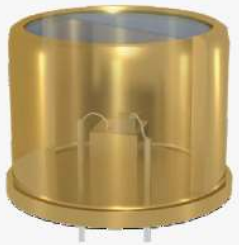

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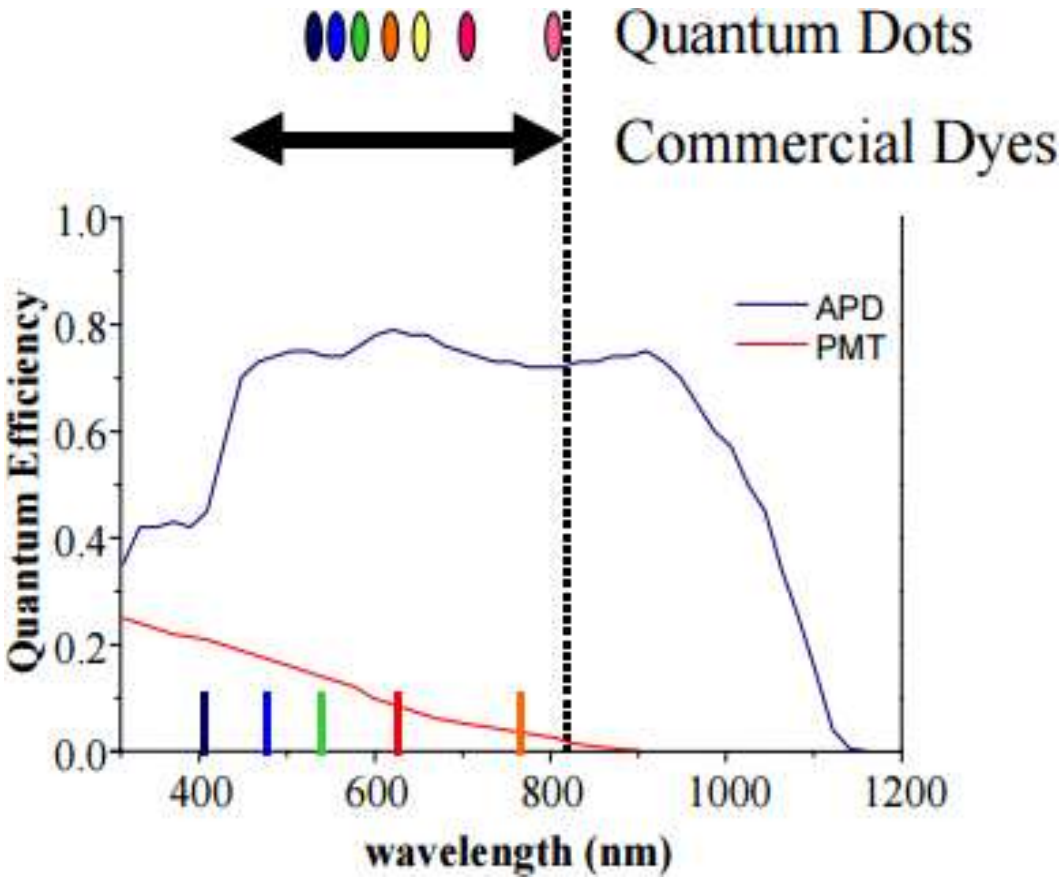
Ad 1: Better sensitivity in the far red fluorescence channels



Why are APDs better than PMTs?

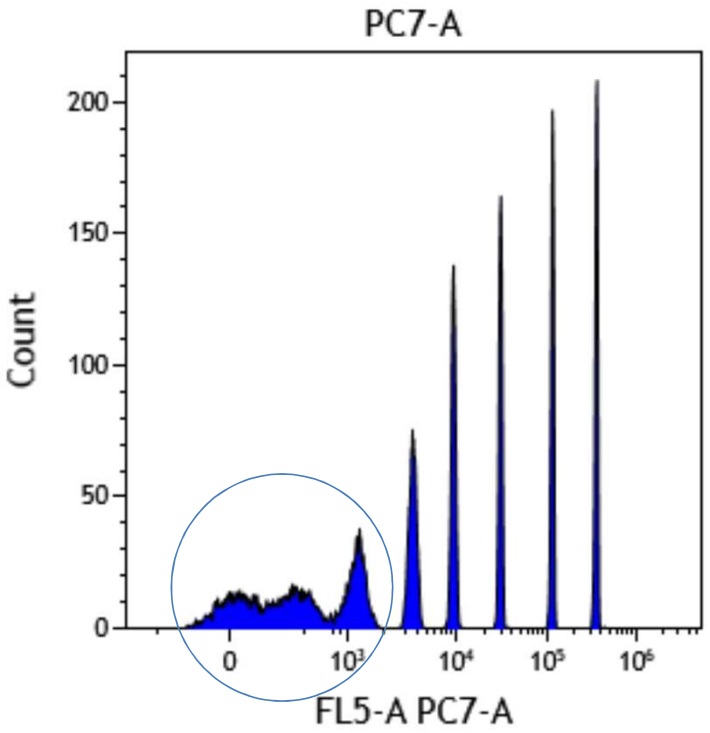
Because the quantum efficiency of APDs in the spectrum of commercial available dyes is higher

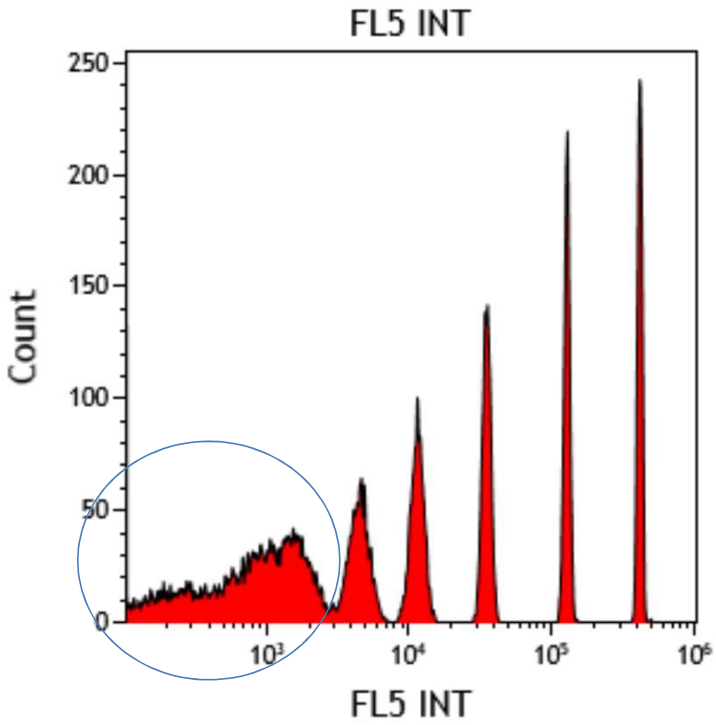
This is especially true for higher wavelength.

Image comes from “Introduction to Beckman Coulter`s CytoFLEX* Research Flow Cytometer Platform” presentation. FLOW-3070CP09.17
* For Research Use Only. Not for use in diagnostic procedures

Ad 1: What does it mean for your daily work?

Better sensitivity to analyze dim populations in all fluorescence channels





- Blue – APD (DxFLEX)
- Red - PMT (Navios)

Rainbow 8 peak beads analysis: FL5 (Blue Laser)

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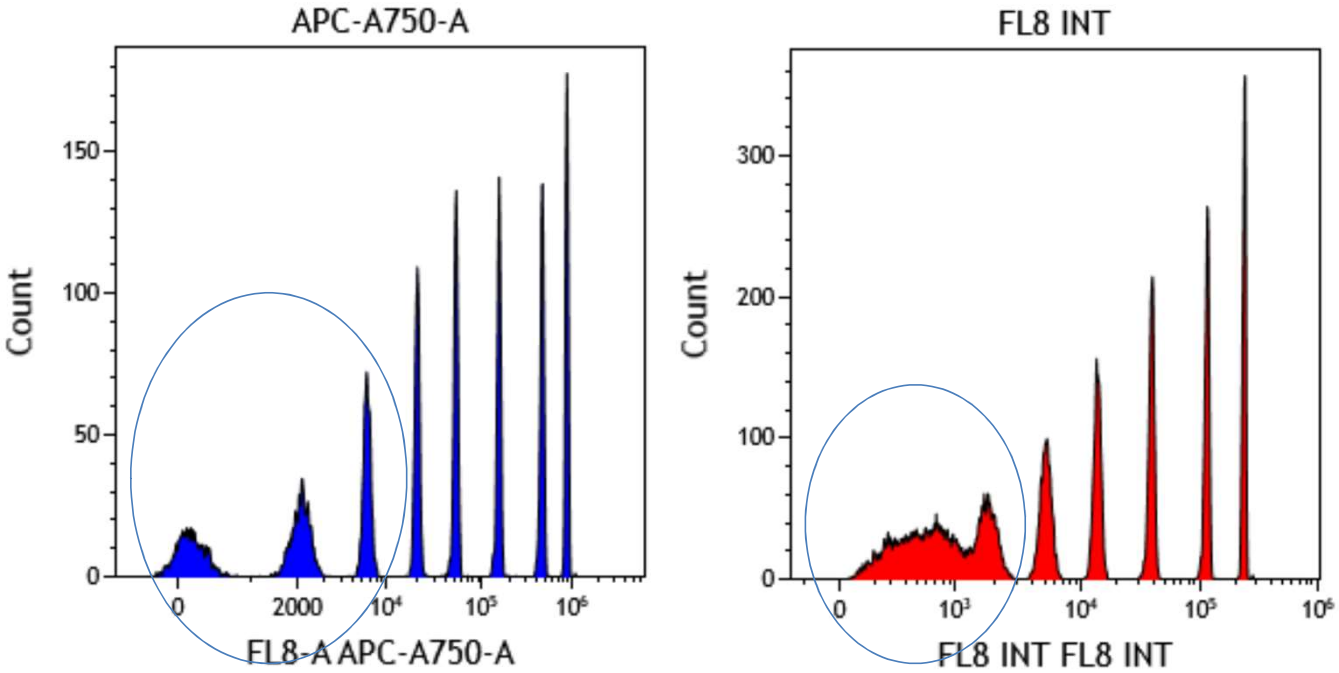
Ad 1: What does it mean for your daily work?

Better sensitivity to analyze dim populations in all fluorescence channels

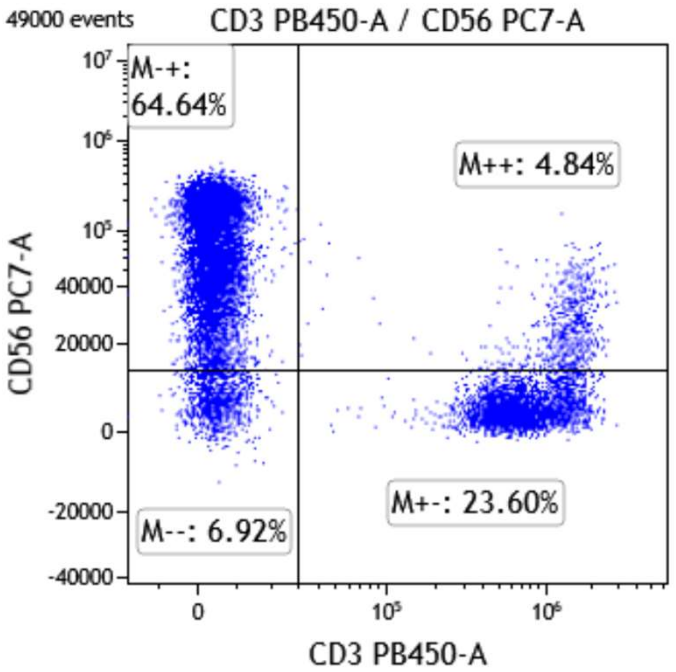


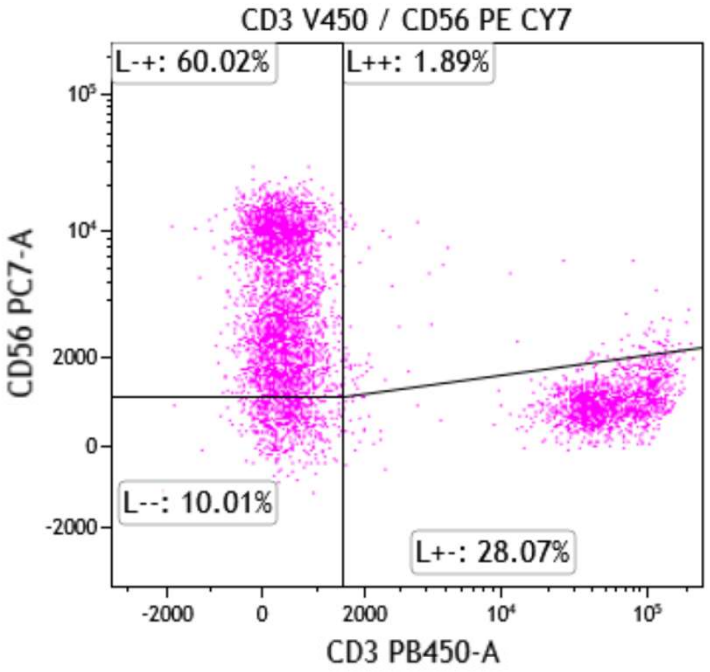
- Blue – APD (DxFLEX)
- Red - PMT (Navios)

Rainbow 8 peak beads analysis: FL8 (Red Laser)

FLOW-7996CP10.20

Ad 1: Sensitivity APD vs PMT Technology





Whole blood analysis of the same prepared sample to analyse NK cells

CD56-PC7 vs CD3-PB

- Blue - DxFLEX
- Purple - FACSCanto

Better APD sensitivity especially in the far red channels.

Data kindly provided by Dottoressa Bertaina, Hospital Bambin Gesù - Rome

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* The scales of representation of the axes cannot be set at the same values because the different number of logarithmic scales available for displaying the data by the systems (DxFLEX 7 decades VS FACSCanto 5 decades)

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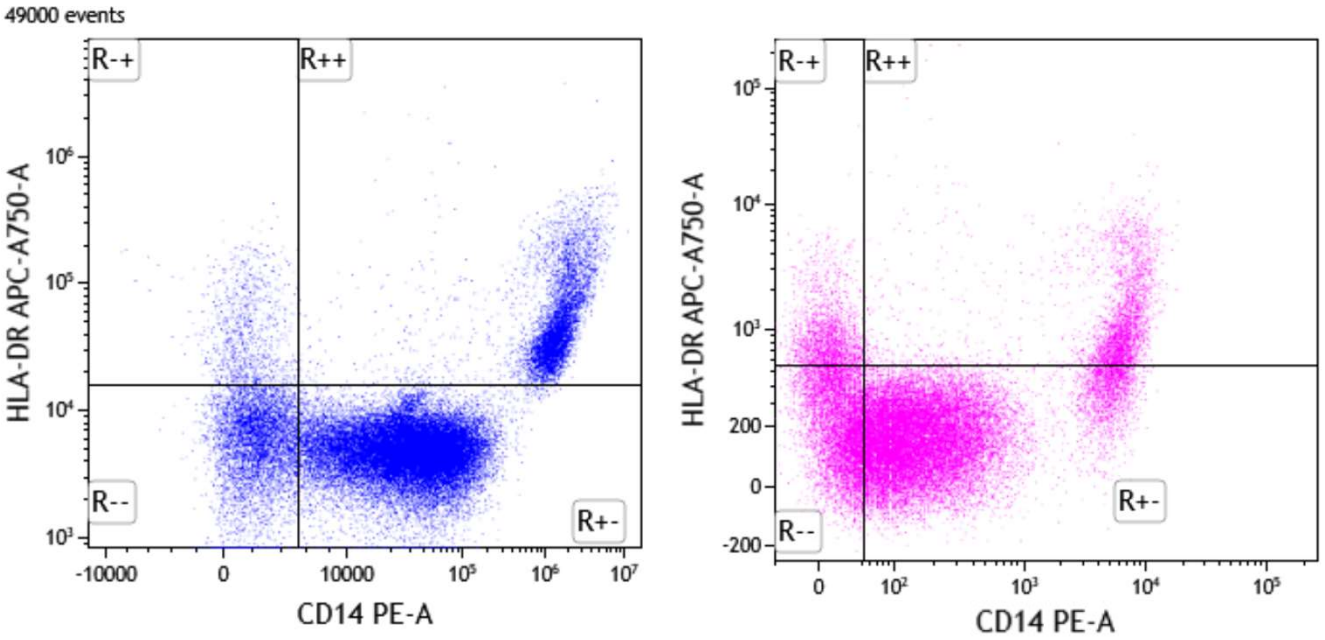
Ad 1: Sensitivity APD vs PMT Technology



Whole blood analysis of the same prepared sample to analyse Monocytes

CD14 PE Vs
HLA-DR APC-A750

- Blue - DxFLEX
- Purple - FACSCanto

Better APD sensitivity especially in the far red channels*.

Data kindly provided by Dottoressa Bertaina, Hospital Bambin Gesù - Rome

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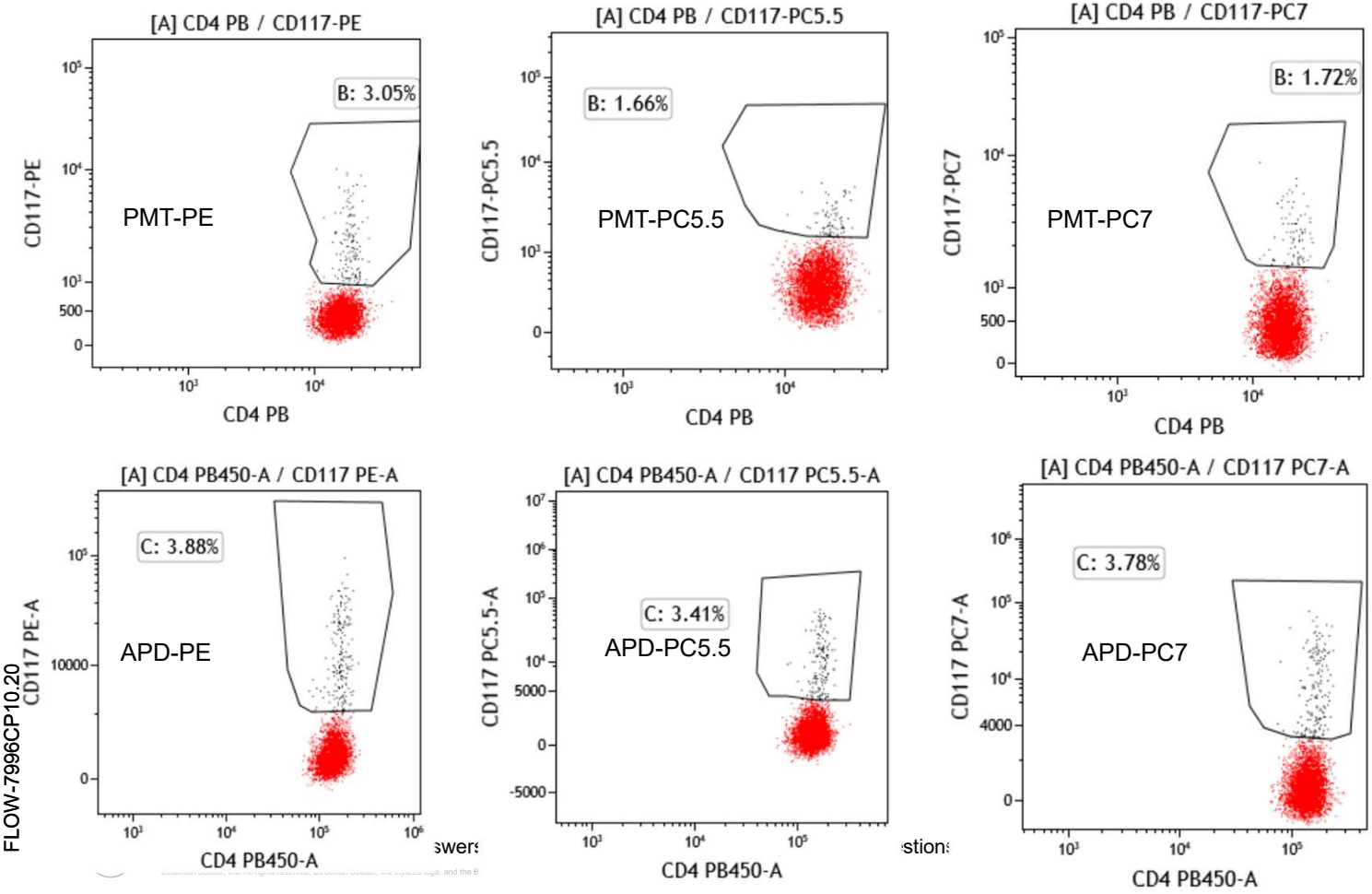
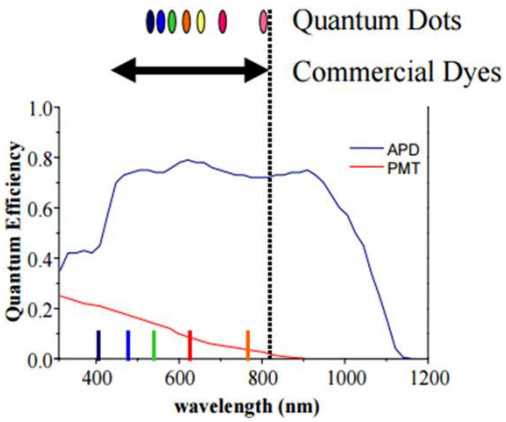
Ad 1. No Wavelength Dependency of Sensitivity





Less complexity in panel design

Data kindly provided by Bergonié Institute, Bordeaux

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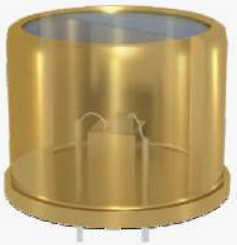
Inside the WDM Detector Modules

Detectors: Semiconductor APDs (avalanche photodiode)

High quantum efficiency compared to PMT devices

1. Better far red sensitivity
2. Less fluorescence spreading
3. Linearity response to gain variation



Avalanche Photodiode. The DxFLEX flow cytometer uses Avalanche Photodiode detectors instead of PMTs. The low electronic noise contributes to the resolution capabilities of the instrument.

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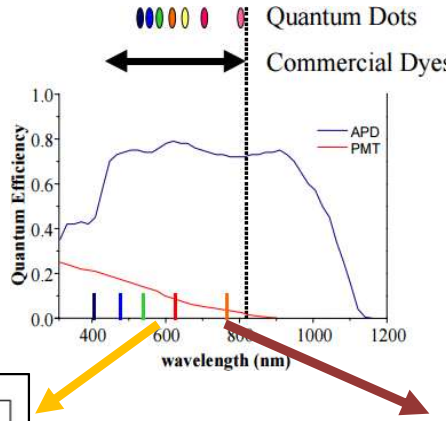
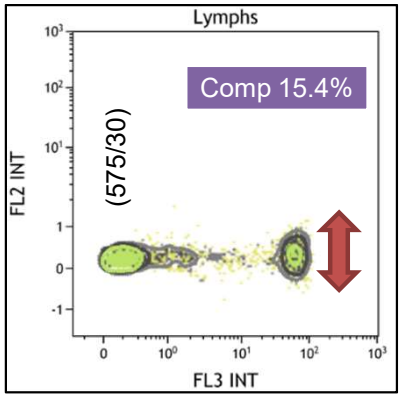
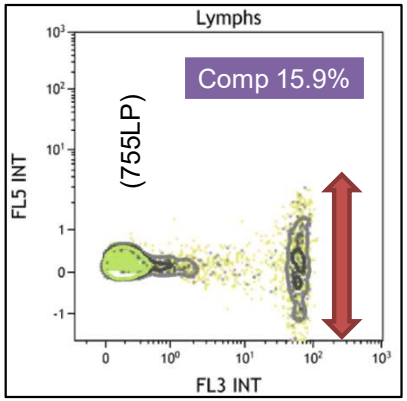
Spreading Depends On Bandpass Wavelength on PMT device



- Example of different spreading effects on PMT system at similar compensation values in the FL2 (575nm) and FL5 (755nm) channels



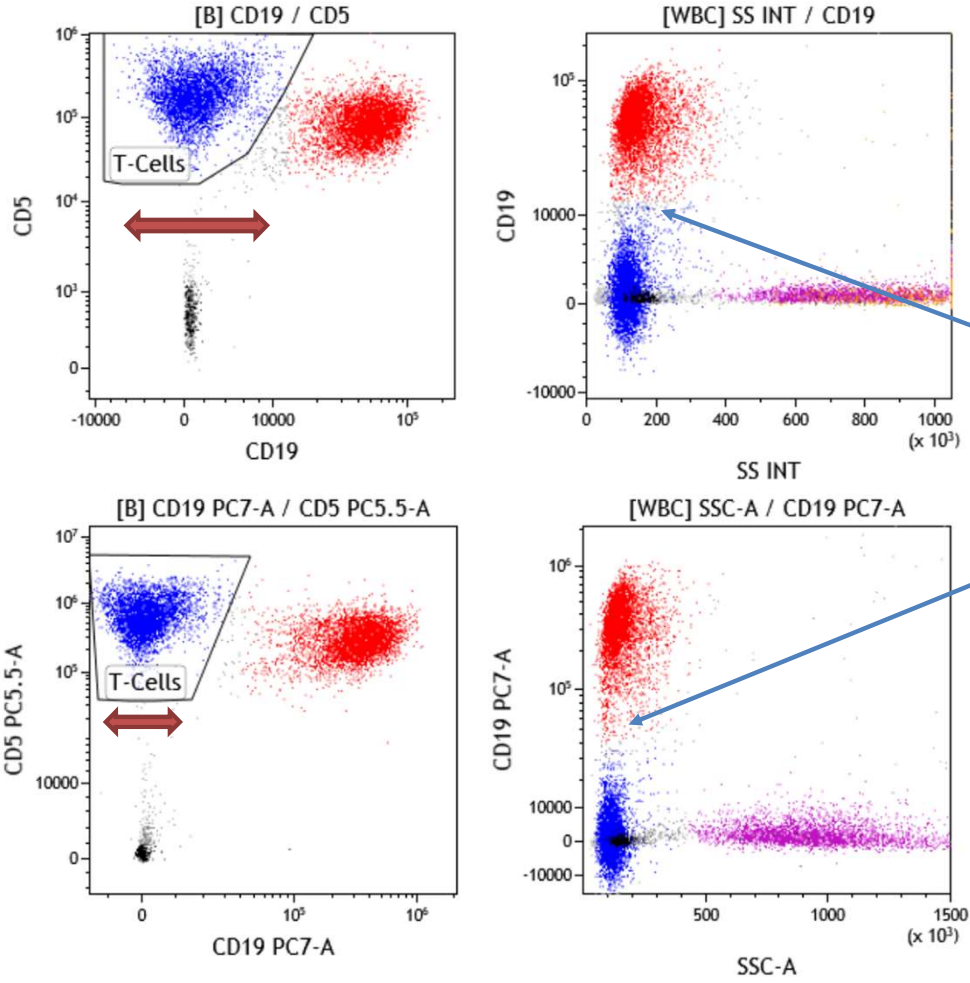
Low spreading



High spreading

Spillover causes much more spreading in the far red channel resulting from a decreasing photon-electron-conversion rate/QE (i.e. decreasing sensitivity)

Ad 2: Spreading comparison - DxFLEX Vs PMT device



PMT Device

APD Device (DxFLEX)

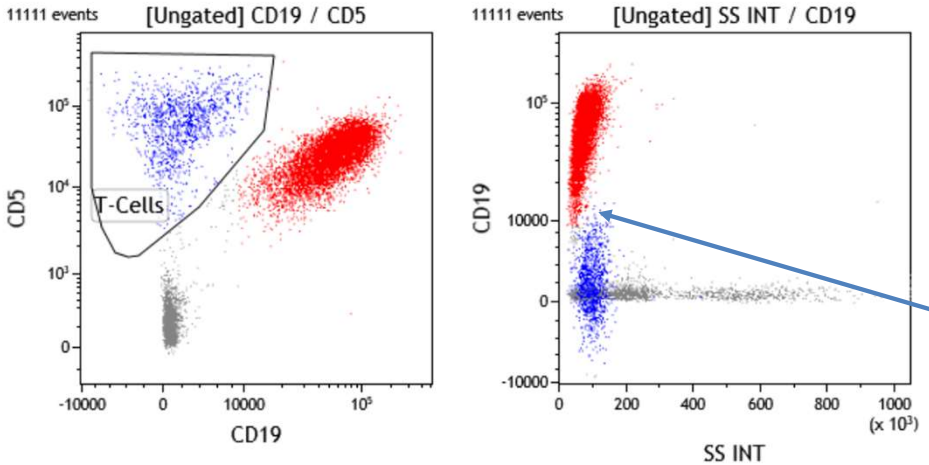
Spreading effect* on CD19 PC7 separation when stained together with CD5 PC5.5

When CD19 has bright expression the separation is still clear also with a PMT device

Whole blood analysis of the same prepared sample

*The spreading effect can be evaluated only from a visual point of view. Because the different number of logarithmic scales available for displaying the data doesn't allow a comparable statistical analysis.
Data kindly provided by Bergonié Institute, Bordeaux

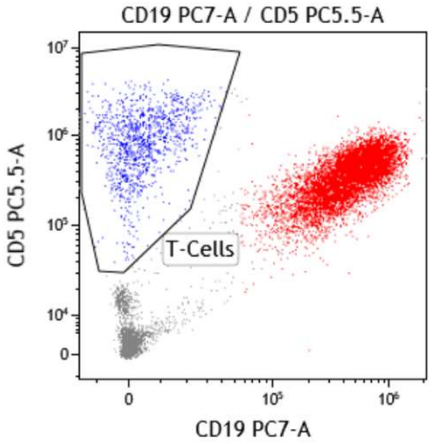
Ad2: Spreading comparison - DxFLEX Vs PMT device

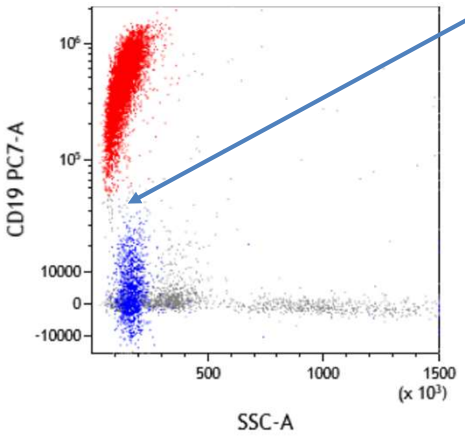


PMT Device

The weaker the expression of CD19 PC7, the lower the separation…

Whole blood analysis of the same prepared sample





APD Device
(DxFLEX)

*The spreading effect can be evaluated only from a visual point of view. Because the different number of logarithmic scales available for displaying the data doesn't allow a comparable statistical analysis.

Data kindly provided by Bergonié Institute, Bordeaux

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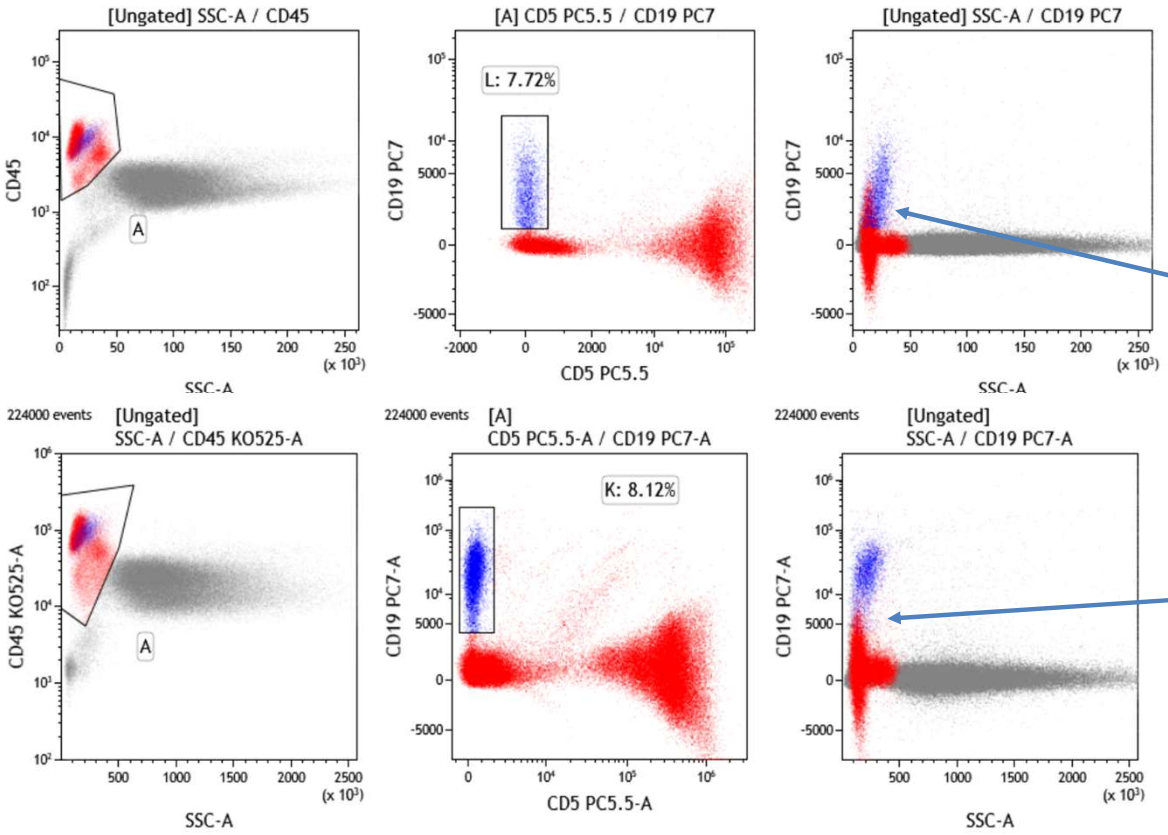
Ad 2: Spreading comparison - DxFLEX Vs PMT device



PMT Device

APD Device (DxFLEX)

…when an overlay occurs between the negative and the positive population. It will not be possible to identify a clear cluster of CD19 PC7 positive cells anymore (instrument equipped with PMTs).

Whole blood analysis of the same prepared sample

Data kindly provided by Ospedale Gemelli, Rome

*The spreading effect can be evaluated only from a visual point of view. Because the different number of logarithmic scales available for displaying the data doesn't allow a comparable statistical analysis.

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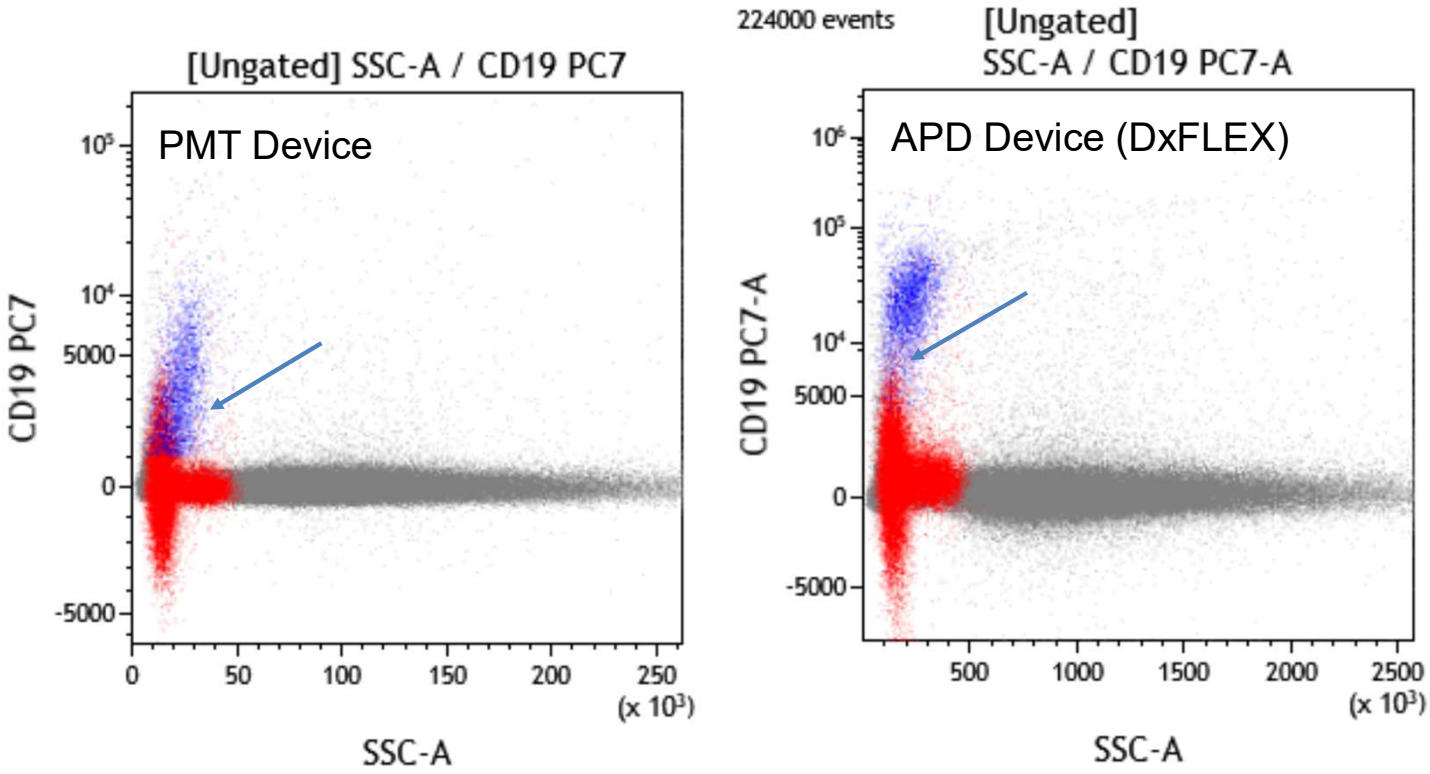
Spreading can cause less sensitivity



The APD device supplies a better resolution and allows the user to more easily identify the gating definition

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Inside the WDM Detector Modules

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High quantum efficiency compared to PMT devices

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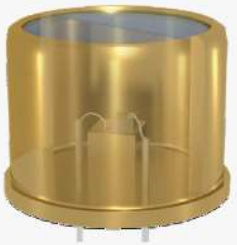

Avalanche Photodiode. The DxFLEX flow cytometer uses Avalanche Photodiode detectors instead of PMTs. The low electronic noise contributes to the resolution capabilities of the instrument.

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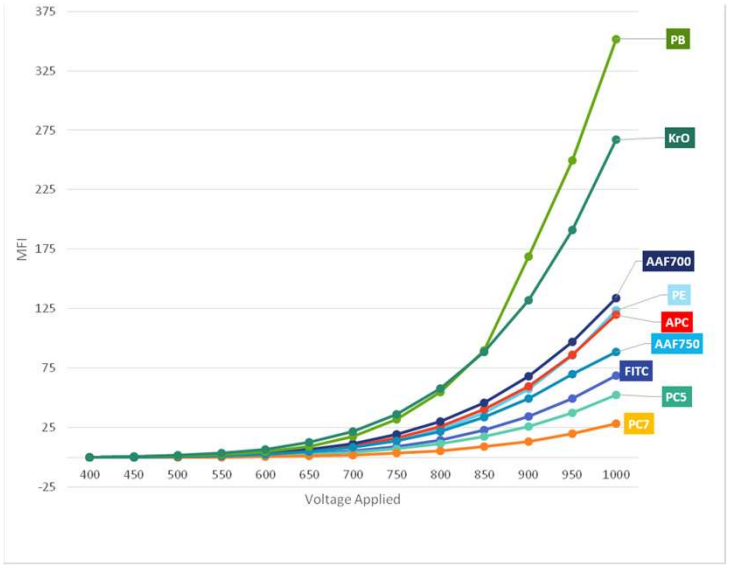
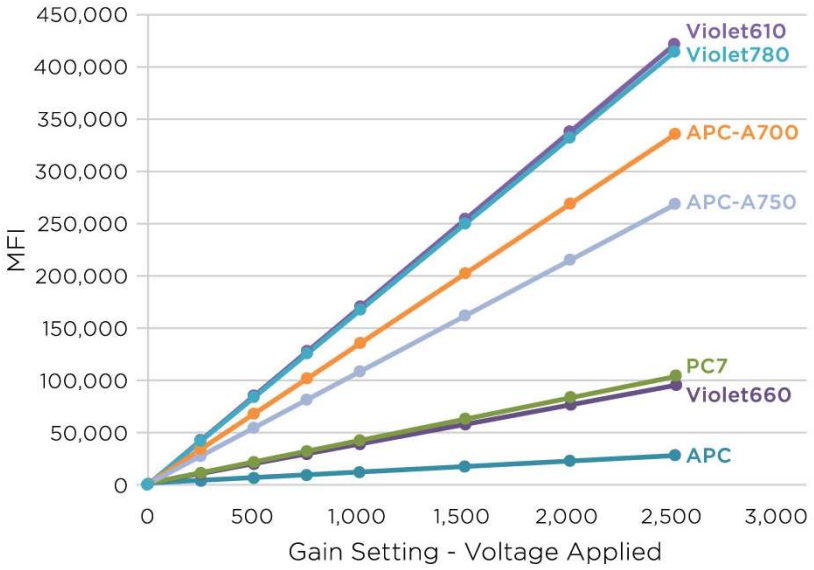
Signal Intensity vs Gain setting - PMT vs APD

PMT Based Detection - MFI vs Voltage Applied



APD Based Detection - MFI vs Voltage Applied



Non-linear detection means that compensation needs to be empirically measured at every setting for each experiment.

Linear detection means that a compensation matrix obtained at one gain setting can be used for actual experiments at different gain settings.

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Source: DxFLEX - GAIN INDEPENDENT COMPENSATION Flyer - FLOW-6210FLY11.19

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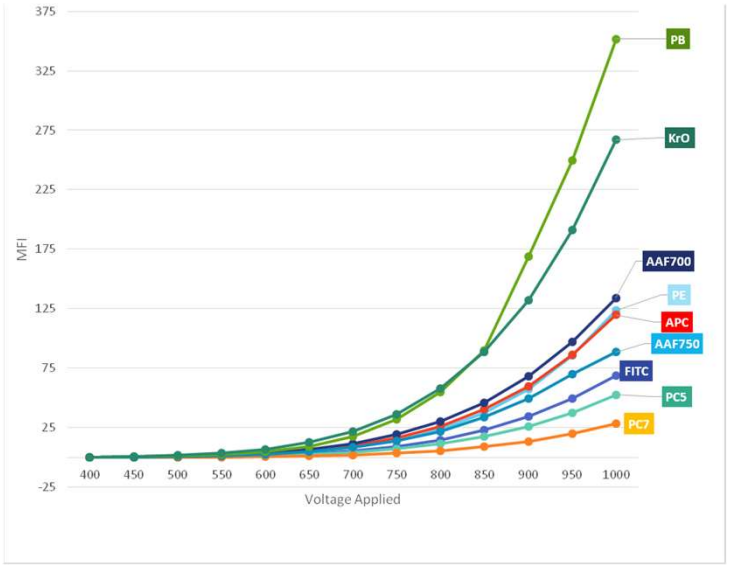
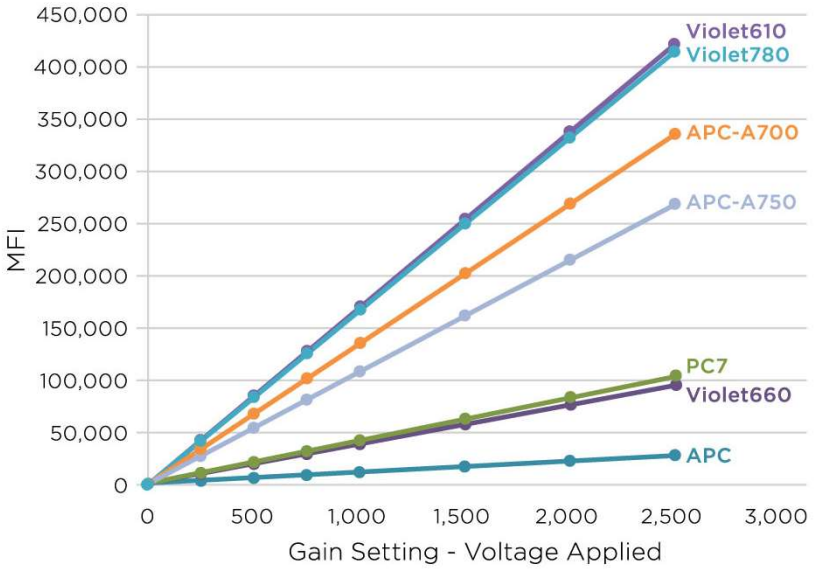
Signal Intensity vs Gain setting - PMT vs APD

PMT Based Detection - MFI vs Voltage Applied



APD Based Detection - MFI vs Voltage Applied



Compensation matrix can be converted to match the new experiment gains.

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Source: DxFLEX - GAIN INDEPENDENT COMPENSATION Flyer - FLOW-6210FLY11.19

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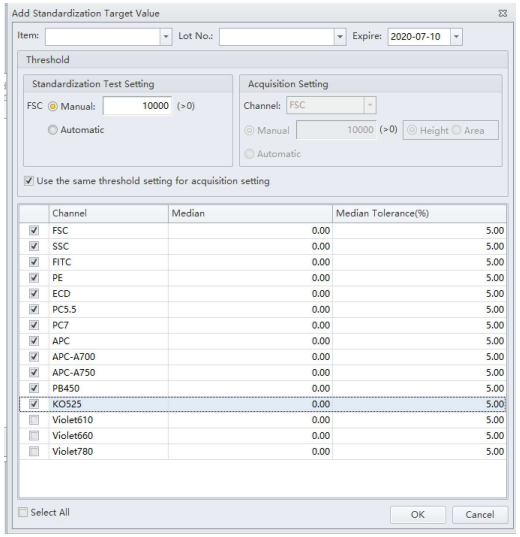
Ad 3: Standardization of two instruments without running the compensation tubes.

Panel to implement on DxFLEX 2

1

Import target settings from DxFLEX 1 to DxFLEX 2

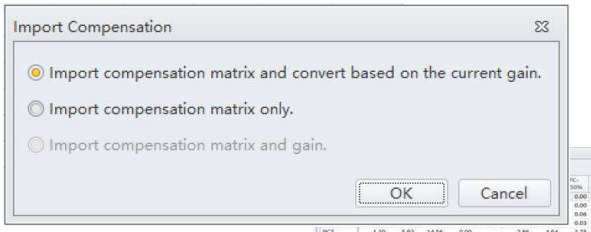


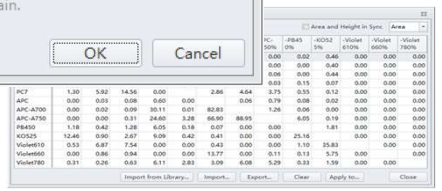
2

Acquire DxFLEX QC beads on DxFLEX 2

3

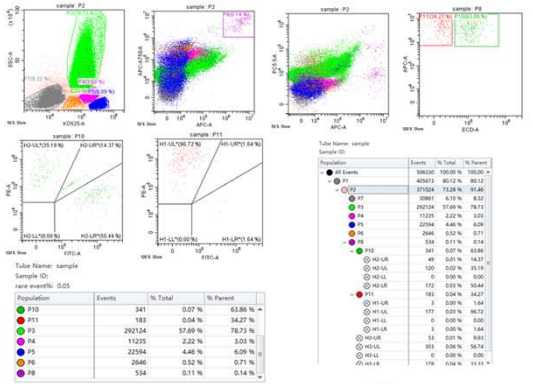
Import compensation





4

Acquire sample



FLOW-7996CP10.20

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A real case in real life…

- My lab manager asks me to implement a new experiment adding one more color compared to the existing experiment we use in our laboratory on a daily basis.

- Example panel*: 8 colors, without a marker on PC5.5

405 nm		488 nm					633 nm				
PB	KrO	FITC	PE	ECD	PC5.5	PC7	APC	AF647	AF700	APC-AF700	APC-AF750
-	CD45	CD16	CD56	CD19	-	CD14	CD4	-	CD8	-	CD3

- We want to implement HLA-DR-PC5.5.

- My current instrument has been set to run experiments with 8 colors only.

Now we show you the time and the procedures needed to implement this new fluorochrome to the experiment.

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*For demonstration only. Not for use in diagnostic procedures

Conclusions

1. Better sensitivity due to the improved APD Quantum Efficiency.
   - ➢ Better separation of dim populations especially in the Far Red channels.
   - ➢ Less complexity in panel design.
2. Less fluorescence spreading
   - ➢ Better resolution of dim fluorescent populations.
3. Linearity response to gain variation
   - ➢ Gains can be changed at any time because compensations are automatically updated.
   - ➢ Simplified workflow process for compensation setup.

Avalanche Photodiode. The DxFLEX flow cytometer uses Avalanche Photodiode detectors instead of PMTs. The low electronic noise contributes to the resolution capabilities of the instrument.

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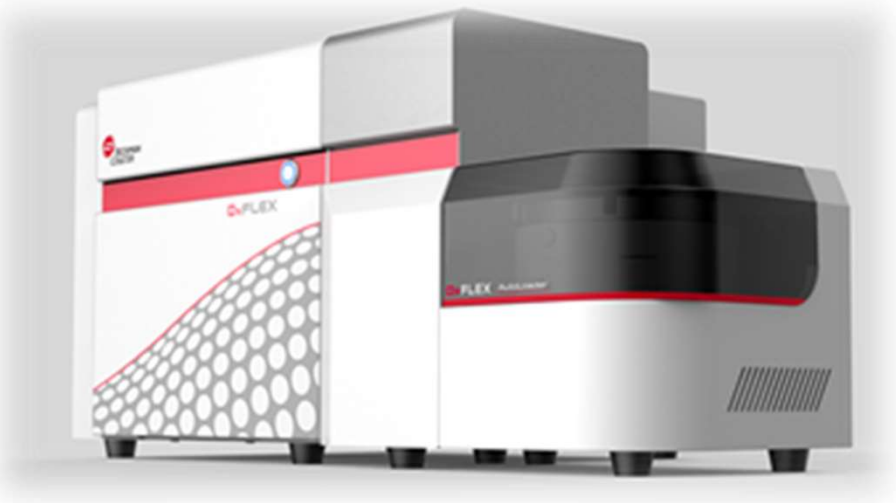

Unser Team:

Sales: Gerhard Kurz gkurz@beckman.com
Applikation: Matthias Eidkum meidkum@beckman.com

Applikation Mgmt: Pierre Paolini ppaolini@beckman.com
Marketing Mgmt: Michael Braun mbraun@beckman.com

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