



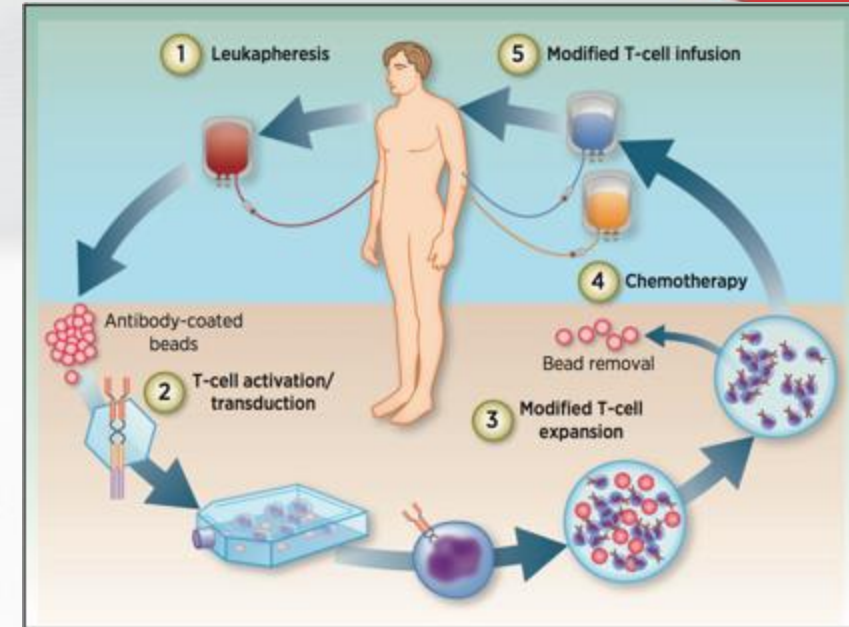
*Migration platform for: On demand Process Analytics*

*CAR TCR Summit*

*Boston, MA 2018*

# Framing the “unmet need”

- The production of engineered T – Cells – A complex process.
- Regulatory approval – the process of generating the drug product.
- In this case “process is the product”.
- A critical requirement - the control of the production process through monitoring and measurement.
- A failure in process control can have disastrous consequences.



# Regulatory: FDA Briefing Document

Oncologic Drugs Advisory Committee Meeting BLA 125646 Tisagenlecleucel  
Novartis Pharmaceuticals Corporation

- *“In order to control the manufacturing process for consistency, it is necessary to thoroughly understand the manufacturing process and critical product quality attributes unique to the autologous CAR T cell products. It is also critical to understand and address sources of variability seen in the individual products. This can be a challenging issue given the complex and labor-intensive manufacturing processes involved with making a CAR T cell product.”*

# Current Conundrum

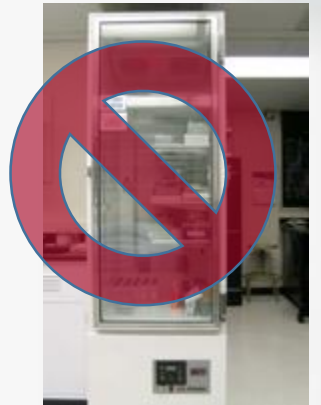
- The methods and material currently in use:
  - Lab scale infrastructure requirements.
  - Highly trained personnel to run and maintain systems.
- Deploying the tests and procedures at the “processing floor”
  - A big barrier to scaling.
- Accellix developed systems and solutions:
  - Migrating existing assays to a format suitable for use on the production floor



# Characteristics of Accellix system solutions

- Accellix solutions are assay delivery platforms:
  - Migrate existing cell and immuno assay protocols for use on-site and on-demand – migration deployed in weeks.
  - Deployed during clinical trials and routine manufacturing.
- In migrating an assay to the delivery platform:
  - Underlying science behind the assay protocol is preserved.
  - Reporters and concentrations are optimized for Accellix.
  - Pre-formulated, unitized, standardized and dried reagents enable on-site, on-demand delivery of results, 24/7.
- Cartridge with unitized and standardized reagents:
  - No-prep, push button implementation of the solution.
  - Standardization across centers and systems.

No cold storage  
Requirements



## The Accellix Platform



## The Accellix Cartridge



## Foundations of the technology

*Multispectral high sensitivity  
fluorescent event detection  
reader system*

*Pre-formulated unitized and  
dried precision reagents*



*Universal Cartridge that  
enables sample processing  
and analysis*


*Application specific  
automated data processing  
and result generation*

# Accellix – The figure of Merit

- The unique figures of merit of this platform are:
  - No prep, push-button fluorescent event detection platform with several key benefits:
    - On-site, on-demand, real time access to data analytics.
    - Measurement and characterization spanning labeled cells and beads,
    - Versatility in evaluating multiple markers in a single cartridge and
    - Simplicity of use with automated data analysis.



Please see also the [Accellix Video](#)



What is enabled  
by assay migration to the  
Accellix platform?

# ON-DEMAND PROCESS ANALYTICS

EASY TO USE

RAPID RESULTS

AVAILABLE 24/7

## Point of Use Analytics

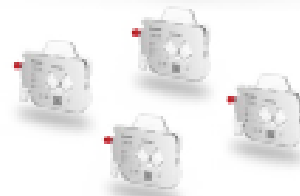
**Workflow automation**  
Access to complex assays

**Multiplexed detection**  
Cell and bead based assays

**Single use cartridge**  
Built in controls

**Dried reagent technology**  
Stable ambient storage

  
Accellix



## Migrate Your Assay

**Your assay protocol**  
Implemented in the cartridge

**Unitized & standardized reagents**  
System to system uniformity

**Automated analysis & results**  
Available on demand and on time

**Standardized analytics**  
In weeks not months

[www.accellix.com](http://www.accellix.com)

# Customized Assay migration

## Implemented and in use:

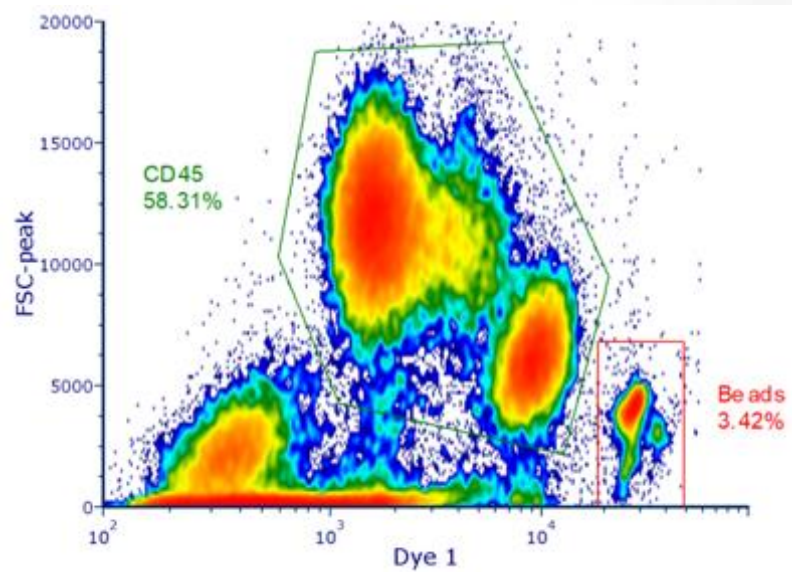
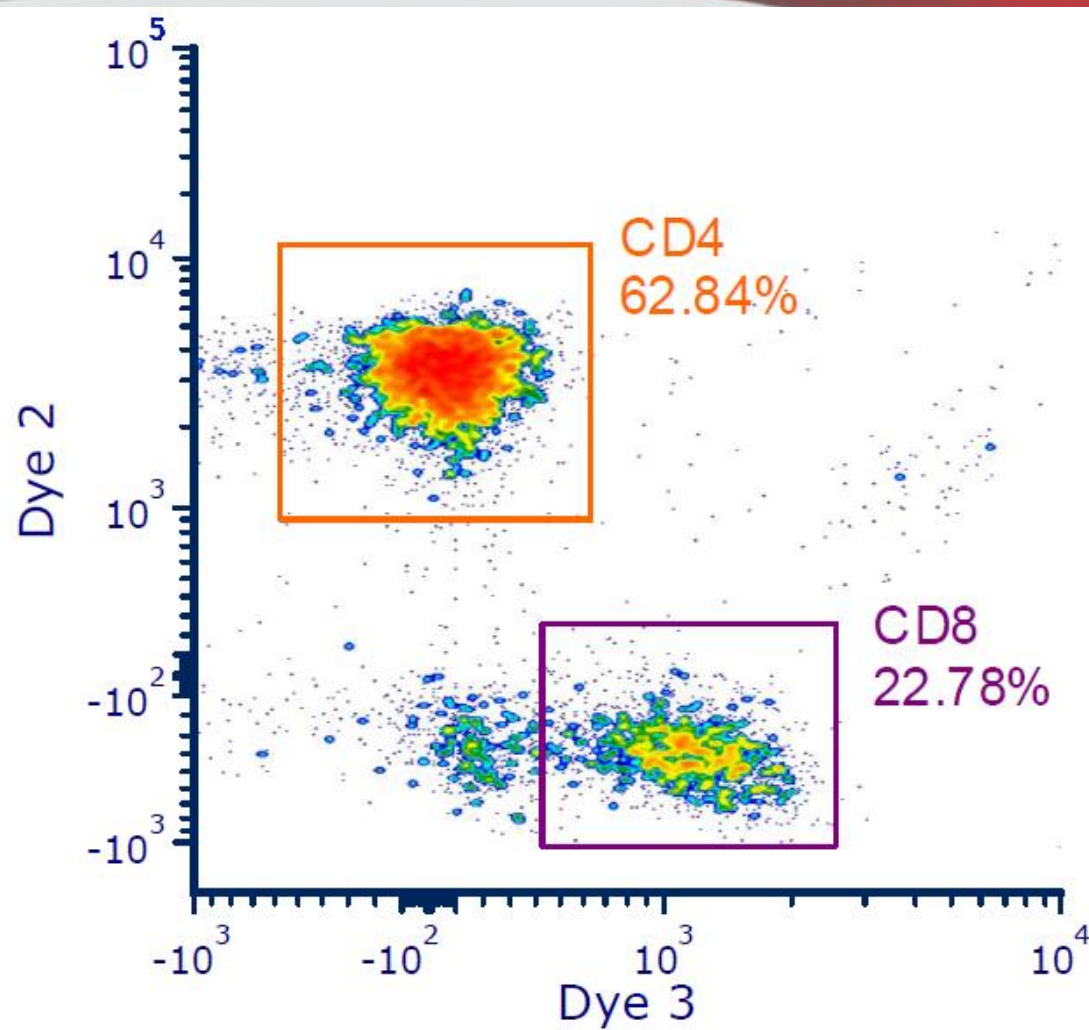
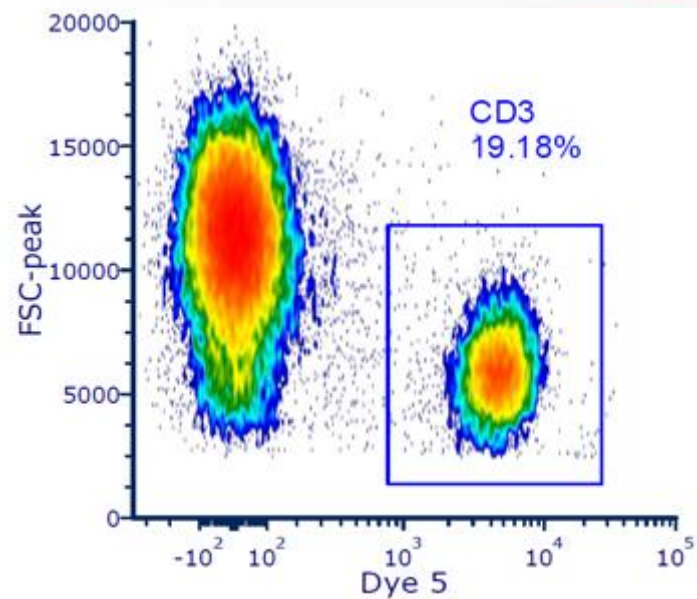
- T- Cell subset enumeration – 5 color assay
- CD34+ Stem Cell enumeration in whole blood as well as in Aphaeresis product – Absolute count

## Ready for customized migration:

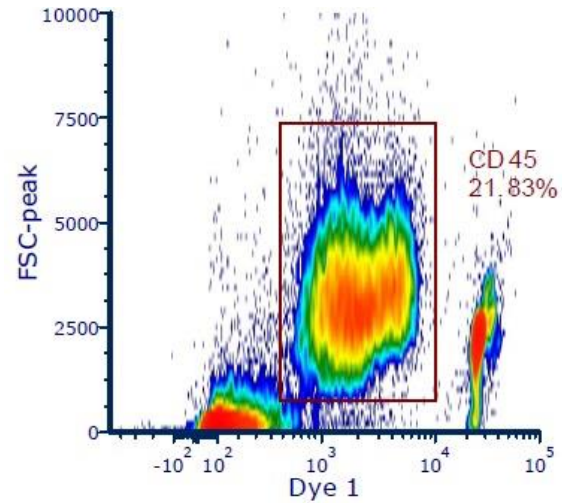
- Cell Health Panel
- Bead based cytokine measurement – sensitivity < 1pg/mL

## Customized assays under development:

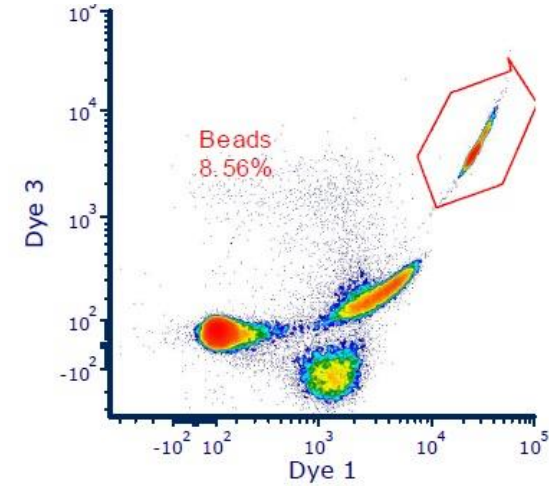
- CAR Specific T- Cell subset analysis
- Functional release testing



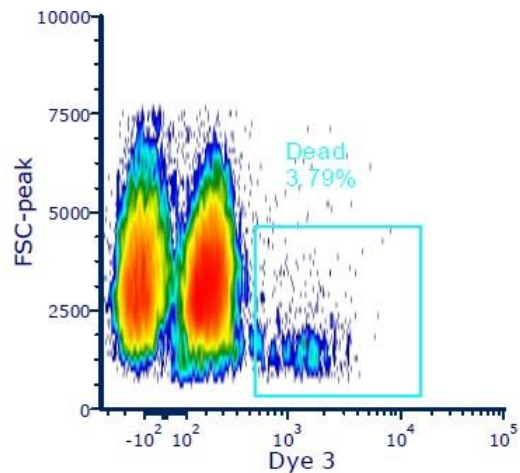
## Identification of CD45+ cells from all events



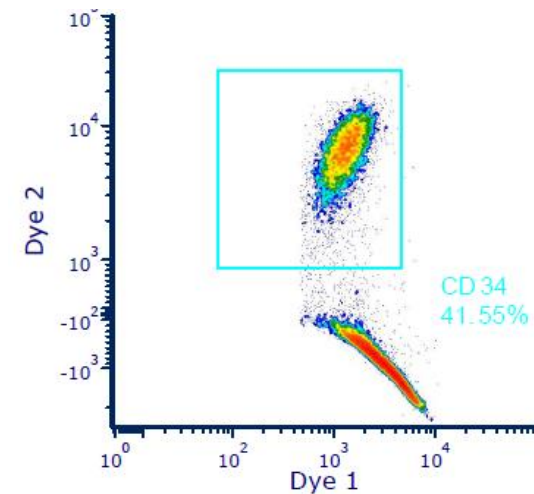
## Counting bead determination from all events



## Separation of Dead cells in the CD45+ cell population



## Identification of CD34+ cells from CD45+ cells

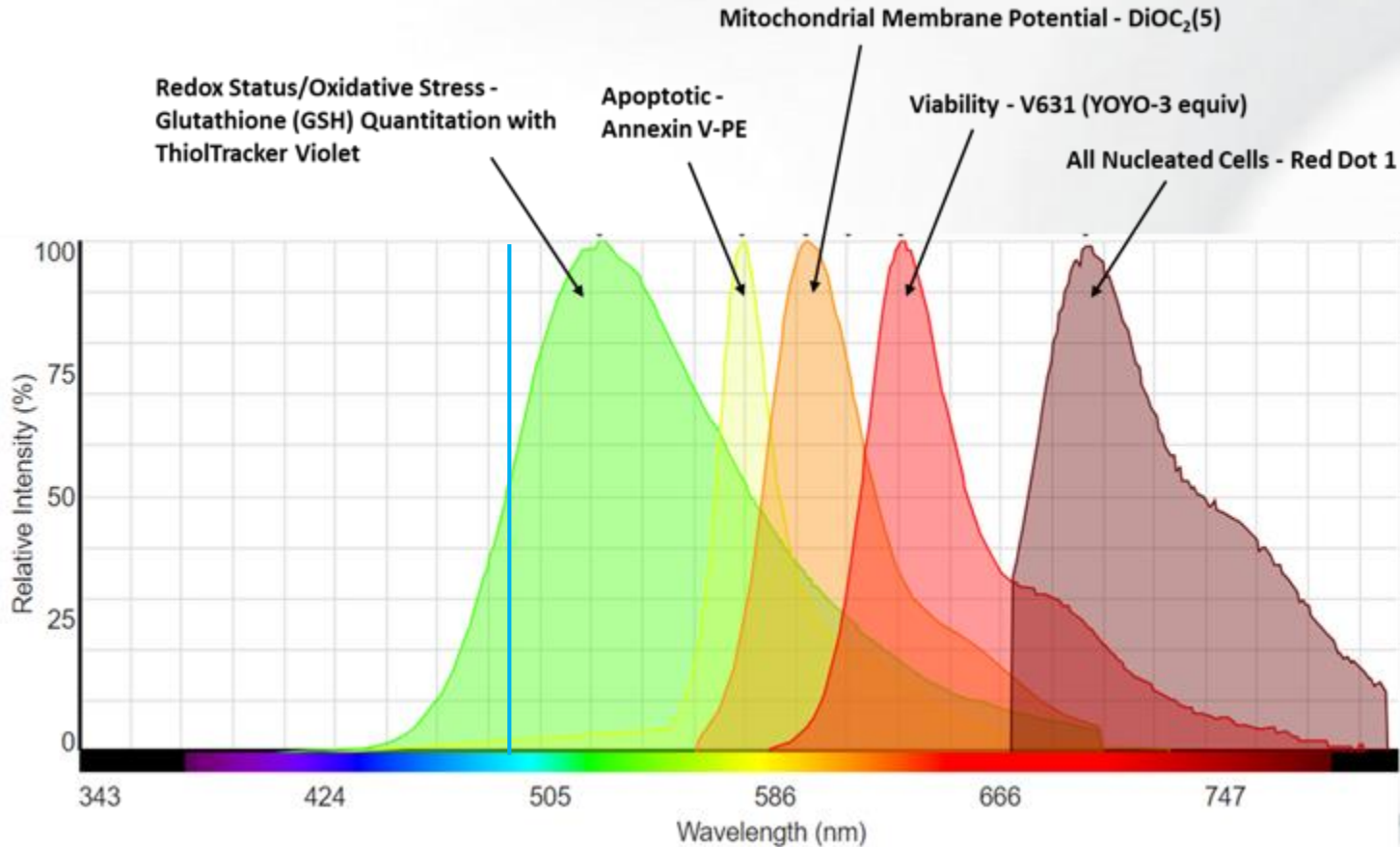


# Cell Health Panel Assay

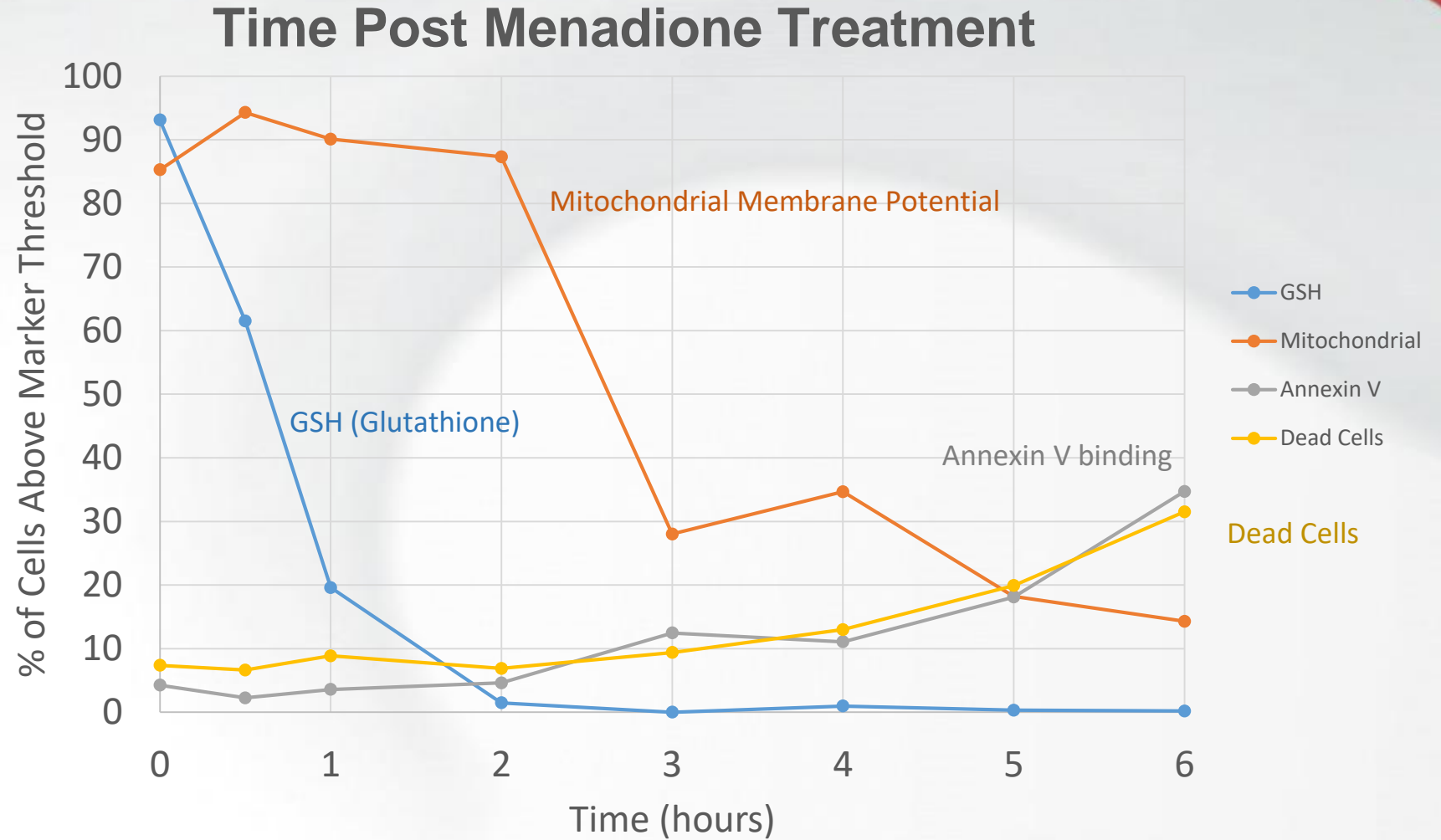
## Simultaneous 5 Parameter Cell Health Assessment

### Parameter Description

- 1) All Nucleated Cells Identification
- 2) Intracellular Glutathione (GSH) Quantitation
- 3) Mitochondrial Membrane Potential
- 4) Annexin V – Apoptosis
- 5) Viability – Membrane integrity



# Time Course Results Tracking Cell Health Panel Markers

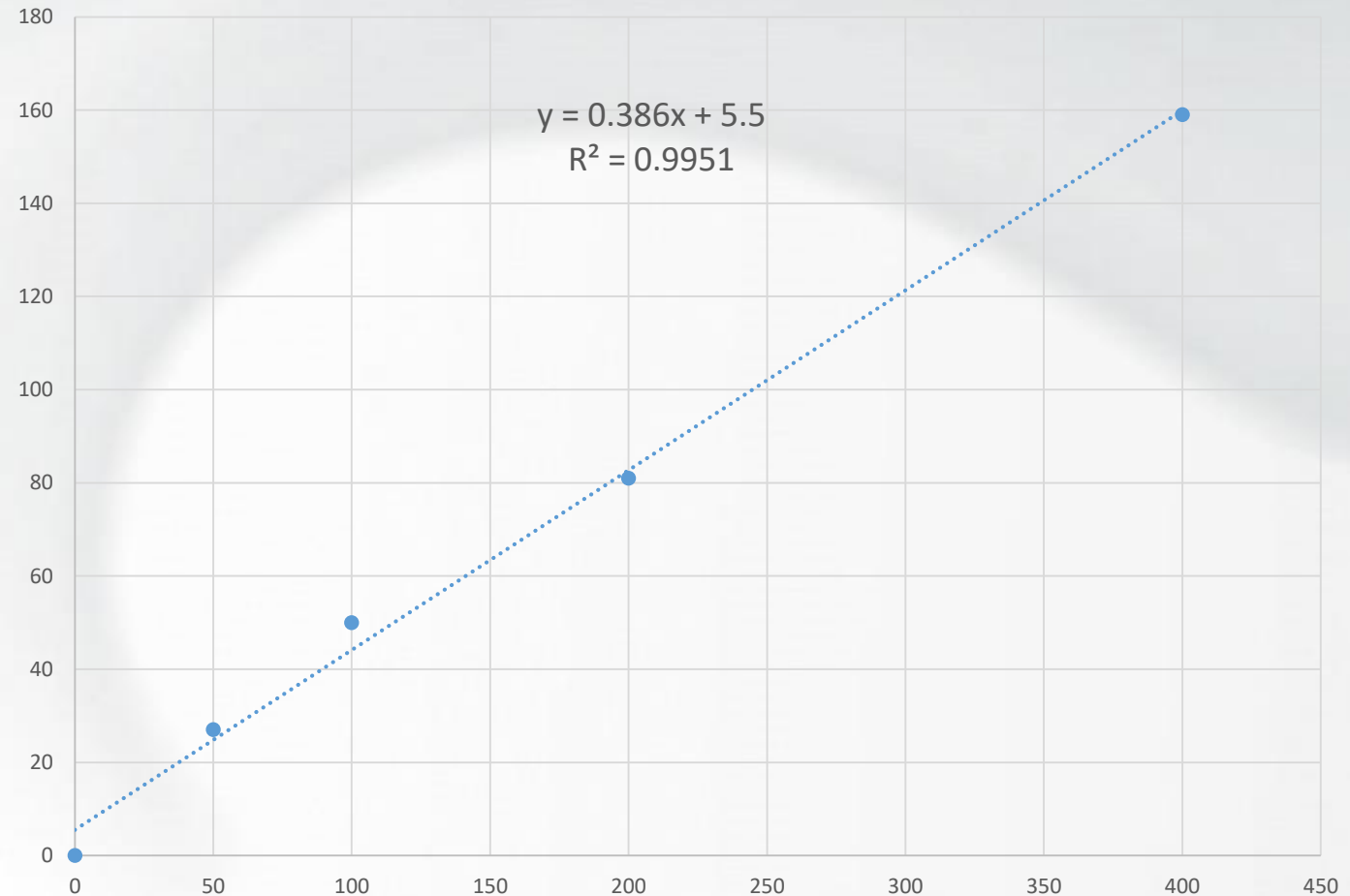




# Bead based Immunoassays

# Immunoassay on an Accellix cartridge

Sample No.	IL-6 Concentr (pg/ml)	Molarity (fM)	Mean Fluorescence Intensity	Normalized Fluorescence Intensity
0	0	0	251	0
1	1.25	50	278	27
2	2.5	100	301	50
3	5	200	332	81
4	10	400	410	159



# The Opportunities enabled by Accellix

- Accellix technology enables:
  - Complex set of QA and QC tests on the cell processing floor (now).
  - Point of need “characterization of the immune system” at the point of acquisition of the input material (in the near future).
  - Near patient real time monitoring during and after transfusion (on the horizon).
- The unification of:
  - Measurement platform
  - Universal capillary cartridge
  - Dry reagents
  - Automated data analysis
- Enables delivery of “turnkey point of use” solutions when and where needed.

# Thank You

Contact:  
LeukoDx Inc.  
2385 Bering Drive  
San Jose, CA 95131

“Bala S. Manian” [bmanian@accellix.com](mailto:bmanian@accellix.com)  
“Michael Hodges” [mhodes@accellix.com](mailto:mhodes@accellix.com)