SpectraMax XPS & SpectraMax L Microplate Reader

金萬林企業股份有限公司

產品專員 朱家均 Mavis

Introduction of KimForest

金萬林企業股份有限公司
台北 新竹 台中 台南 高雄
服務專線:0800-009695
Http://www.kimforest.com
Email:kimforst@gmail.com

Gene On Link

讓您的研究
點石成金
點數破萬
見樹又見林

Consultable
Comprehensive
Customized

applied biosystems by Thermo Fisher Scientific · MOLECULAR DEVICES · freeslate · integenX · BECKMAN COULTER · IFI · SARTORIUS
DiscoveRx · M·T·T·I · DNASTAR® · enzymatics · gen O way · proteinsimple

DANAHER

WHO WE ARE | HOW WE WORK | OUR BUSINESSES | INVESTORS | NEWS | CAREERS

BUSINESS DIRECTORY

Looking for the world's most innovative science and technology companies? You'll find them here.

BECKMAN COULTER Life Sciences

MOLECULAR DEVICES

SCIEX

IDT INTEGRATED DNA TECHNOLOGIES

Leica MICROSYSTEMS

phenomenex® ...breaking with tradition℠

PALL Pall Corporation

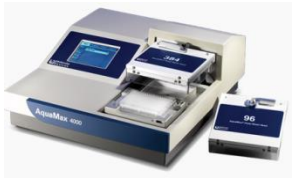
cytiva

Product Portfolio in Global Market

BioResearch

- Leader in detection
- Focus on gov't and acad. research
- Modular and integrated systems

Microplate reader & Washer



Axon® Conventional Electrophysiology

GenePix® Microarray Analysis

Drug Discovery

- Leaders in niche markets
- Focus on pharma and biotech
- Complete automated solutions

ImageXpress® HCS screening

Reagents & Consumables

FLIPR® HTS screening

IonWorks® Automated Electrophysiology

Biotherapeutics

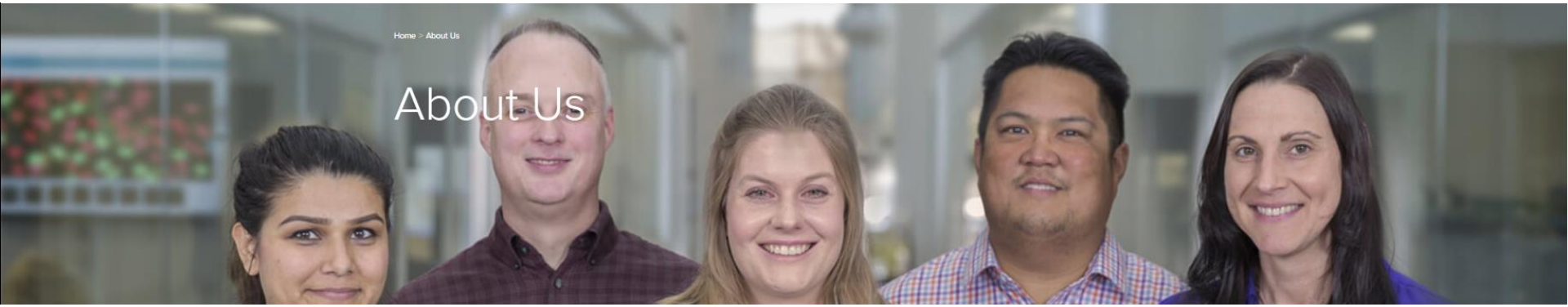
- Industry standard for cell line, protein and antibody development
- Complete automated solutions

ClonePix™ 2 Cell Line Development

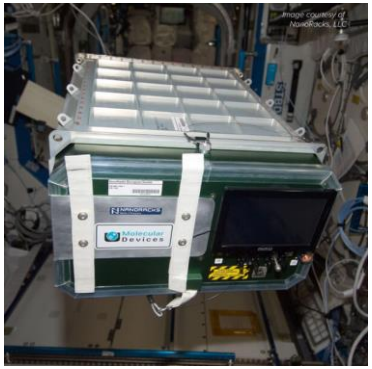
CloneSelect™ Imager

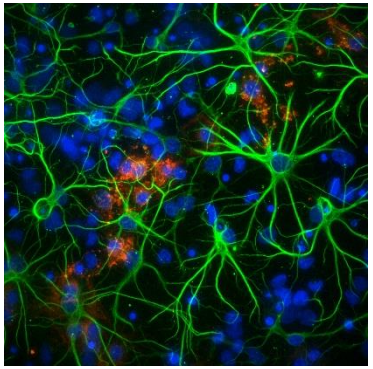
QPix™ - Ab & Protein Development

DispenCell™ Single-Cell Dispenser



Providing innovative solutions for over 40 years





Publish Like a Pro

Molecular Devices by the numbers - *some of the industry's most cited instruments

SpectraMax	FLIPR	GenePix	ImageXpress	FlexStation	SoftMax Pro	Axon	MetaMorph
42,500	10,300	22,000	1,460	3,810	9,240	76,700	54,400

Push the boundaries of basic research, translational research, drug discovery, and bioproduct development using products that thousands of scientists around the globe have already used in their publications.

To help you unravel the complexity of biological systems, we provide innovative protein and cell biology solutions that enable you to see more, do more, and publish more. Our instruments are some of the industry's most cited. From microplate readers to imaging systems, we have a wide range of solutions to help you publish like a pro.

Latest Citations

Basic Research

Find Your Own Microplate Reader

FlexStation 3

i3x

iD3s (w/o screen) /iD5e

Mini

FilterMax

M2-M5

SpectraMax XPS Multi Mode Reader

Microplate

- ✓ Fluorescence Intensity
- ✓ Time-Resolved Fluorescence
- ✓ Luminescence

SpectraMax XPS Specifications

- **Microplates:** 6, 12, 24, 48, 96, and 384 well

- **Light source:**
  - ✓ **Xenon flash lamp** (1 joule/ flash)
  - ✓ Lifetime of **1 billion flashes** ~ 1 million endpoint microplates

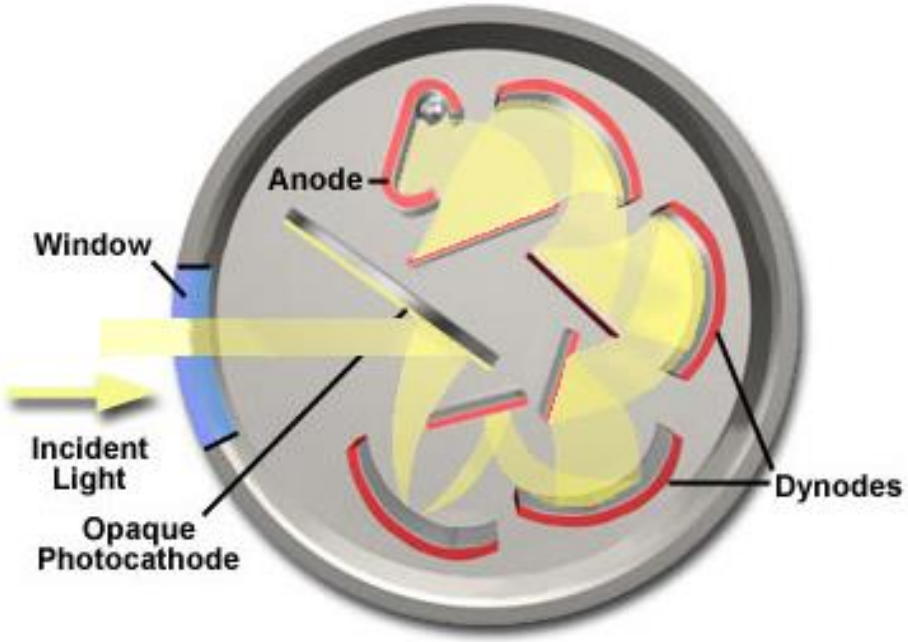
- **Wavelengths Supported**
  - ✓ Fluorescence Intensity: EX: **250 – 850** nm
    EM: **360 – 850** nm
  - ✓ Time-Resolved Fluorescence: **360 – 850** nm
  - ✓ Luminescence: **360 – 850** nm

SpectraMax XPS Specifications

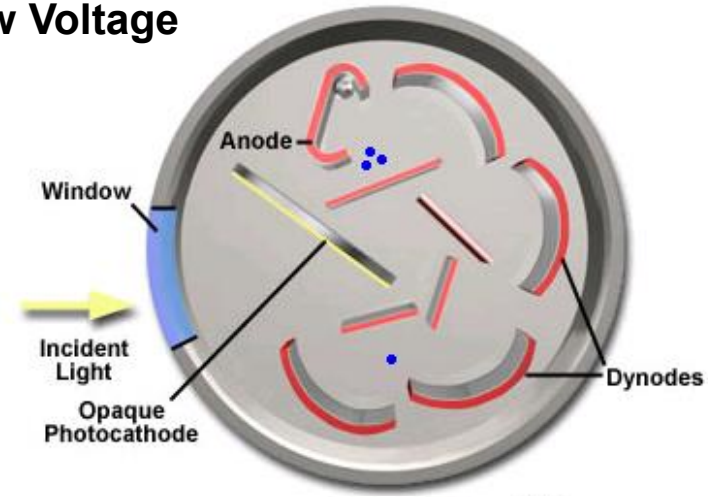
- **Dual monochromators**
  - ✓ Two scanning monochromators determine optimal excitation and emission settings
  - ✓ No need for expensive filters
- **Detectors**
  - ✓ Photomultiplier (PMT)
- **Shaker time:** 1 to 999 seconds
- **Temperature control:**
  - ✓ 4℃ above ambient to 45℃
  - ✓ Temperature regulation: 4 sensors

Patented AutoPMT Optimization System

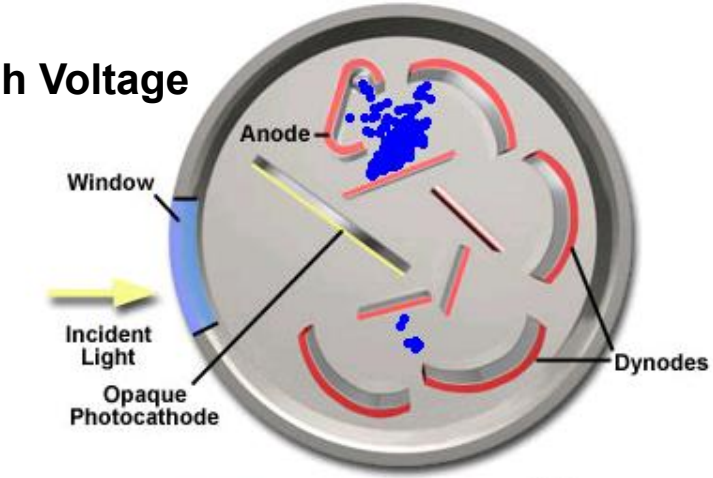
Photoelectric Effect

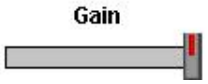


Low Voltage



High Voltage





MOLECULAR DEVICES

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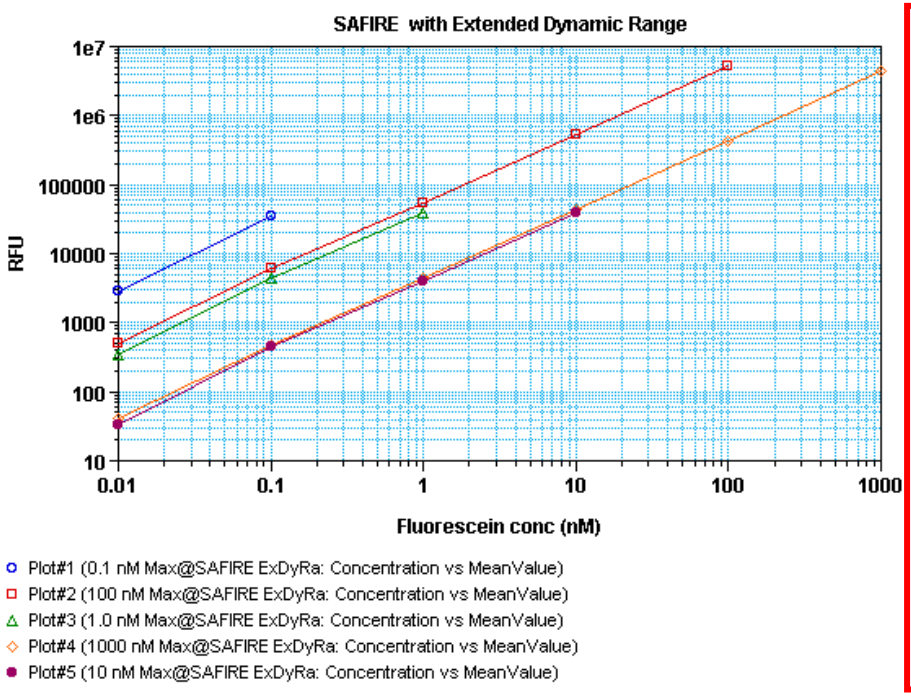
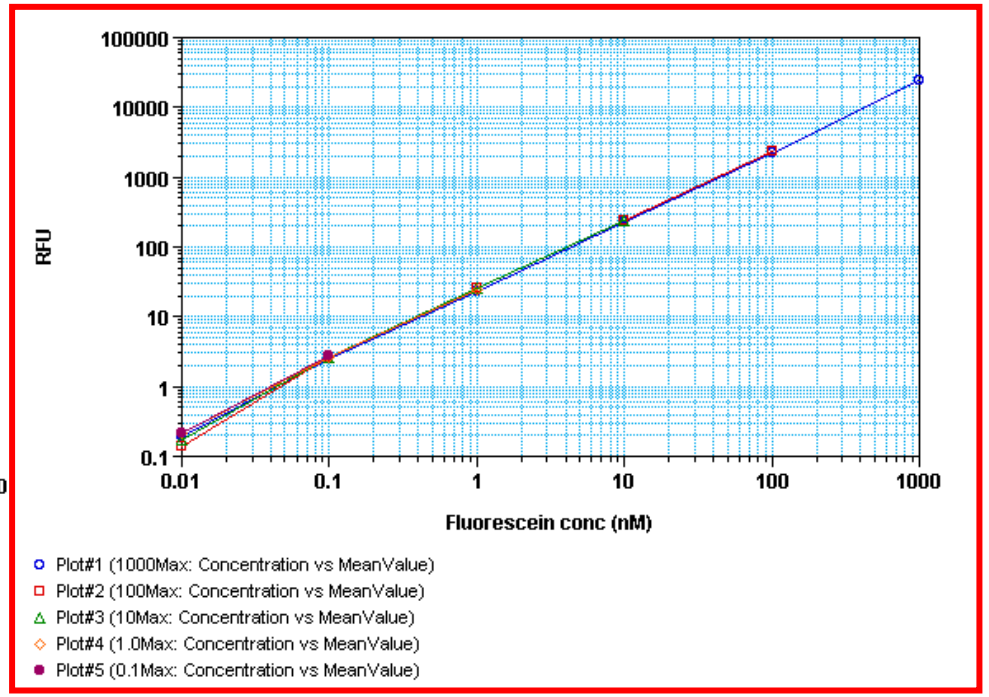
Patented AutoPMT Optimization System





✓自動切換最適電壓

–允許最大濃度範圍樣品在同一盤檢測中

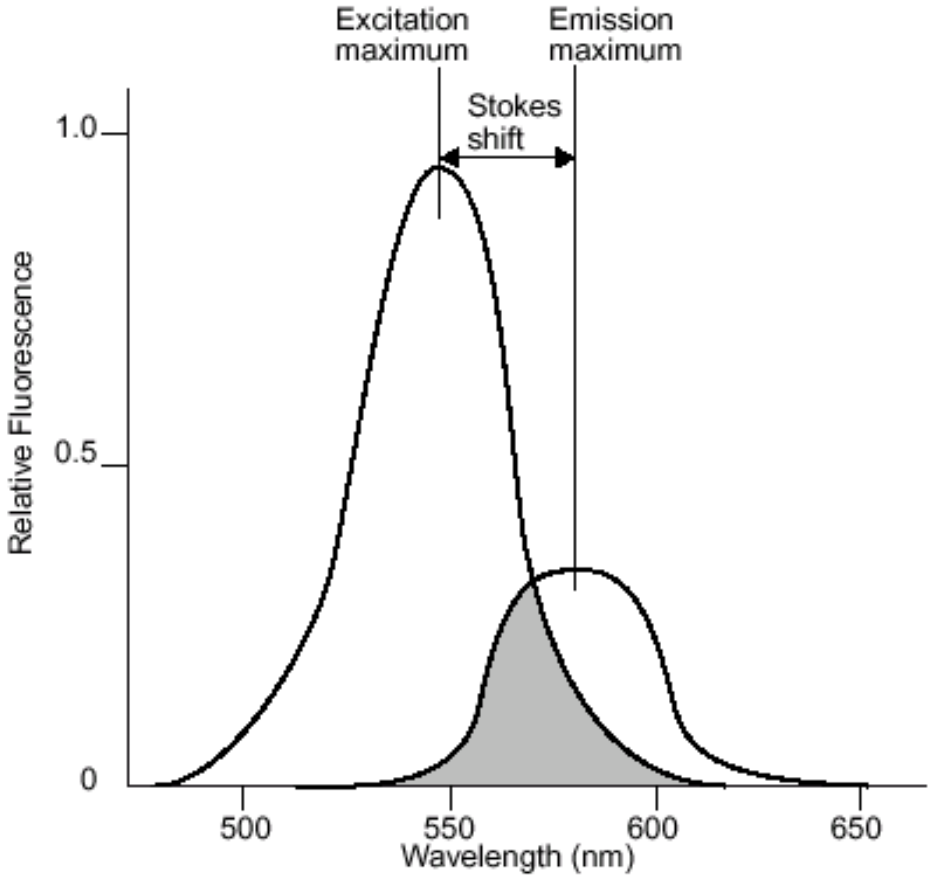
✓自動換算數據

–無須帶入不同曲線換算gain值，避免繁瑣工作

Auto Cutoff - Emission Cutoff Filter

Why Cut-Off Filters?

- Excitation light is **10,000** X brighter than Emission light.
- Spectral separation needed to reduce interference of Ex with Em light.

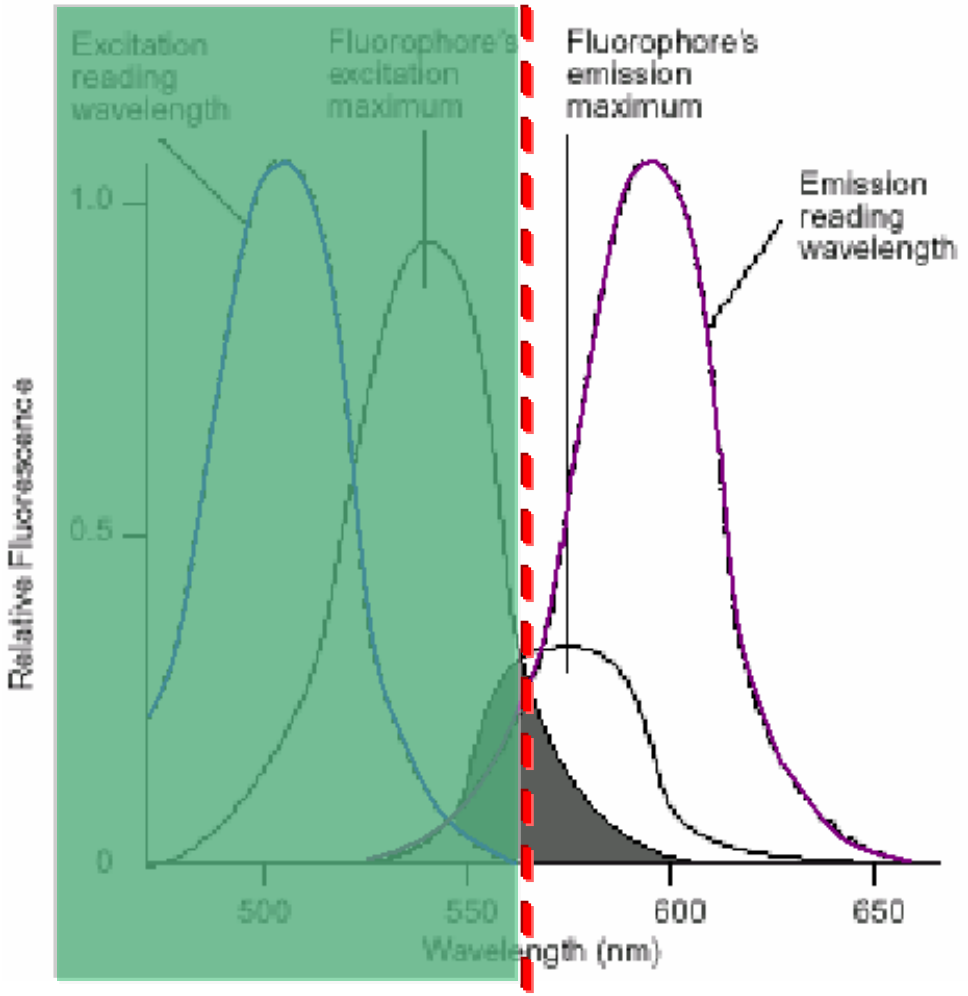


Auto Cutoff - Emission Cutoff Filter

Optimizing Wavelength Selection

- Using Ex wavelength below Ex max and Em wavelength above Em max may provide best signal/noise ratio.

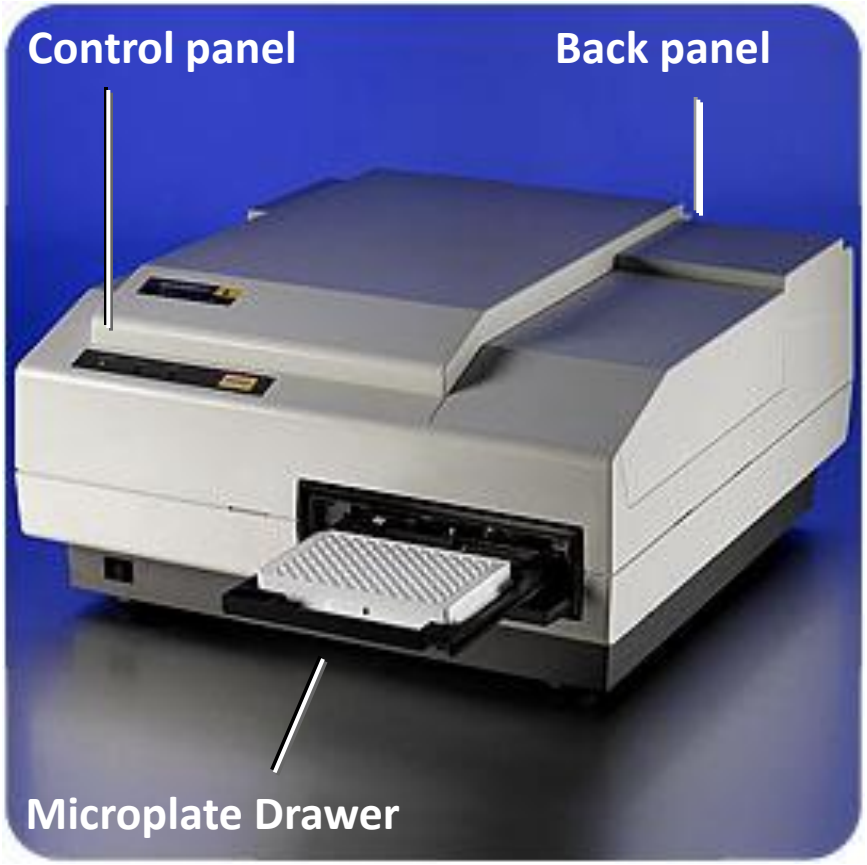
- Cutoffs cause less Ex light mixing with Em light at the PMT.



Applications of SpectraMax XPS

- **Fluorescence assays:**
  - ✓ Nucleic acid quantitation
  - ✓ Enzyme assay
  - ✓ ELISA
  - ✓ Cell proliferation & viability
  - ✓ GFP
  - ✓ SNP
  - ✓ FRET assay

SpectraMax L Microplate Reader



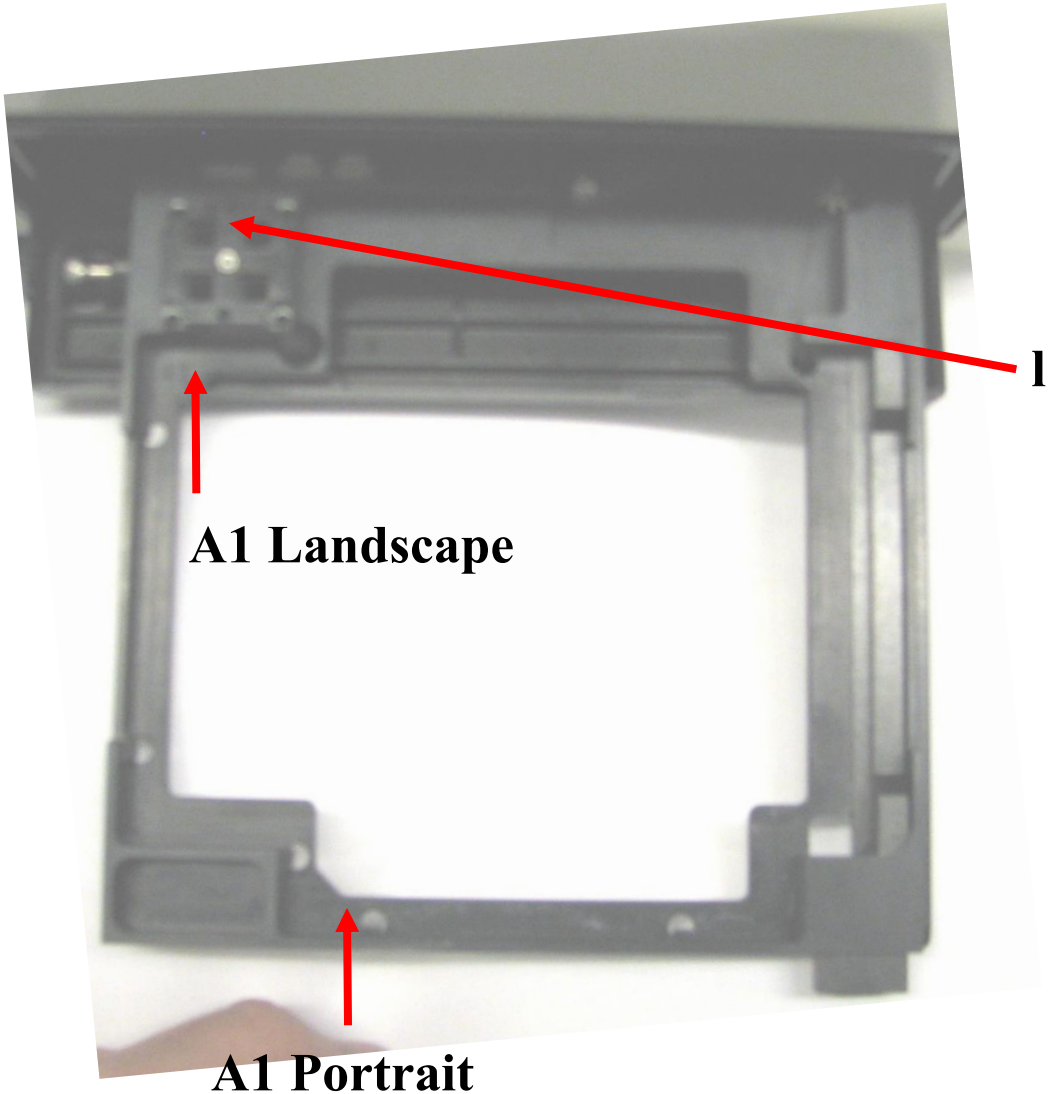
Wavelength:
380 – 630 nm

Microplate formats:
96 and 384 well

Read mode:
Top read - Luminescence

Read type:
- Endpoint
- Dual-Read
- Kinetic
- Fast Kinetic

Plate Drawer



Features of SpectraMax L

(1) Auto-PMT :

- **High sensitivity luminescence detection <0.2 fg firefly luciferase per well**
- **Simultaneous photon counting and analog detection for extended dynamic range**

(2) Aperture Design :

Low Background and crosstalk

- **$3x10^{-5}$ (white plate)**

(3) Upgradeable :

- **Dual injectors for flash luminescence**
- **Multi-detector configurations for higher throughput**

Luminescence Detection by PMT

- Measuring Luminescence :
  - Photomultiplier tubes (PMT) convert incoming photons to electrons
  - Incoming photon strikes photocathode → generates electron
  - Electron flows through a series of electron multipliers (dynodes) to the anode
  - Current flowing from the anode is proportional to the number of photons at the photocathode
  - Amount of amplification a PMT can produce depends on 1) the number of dynodes and 2) voltage applied to it

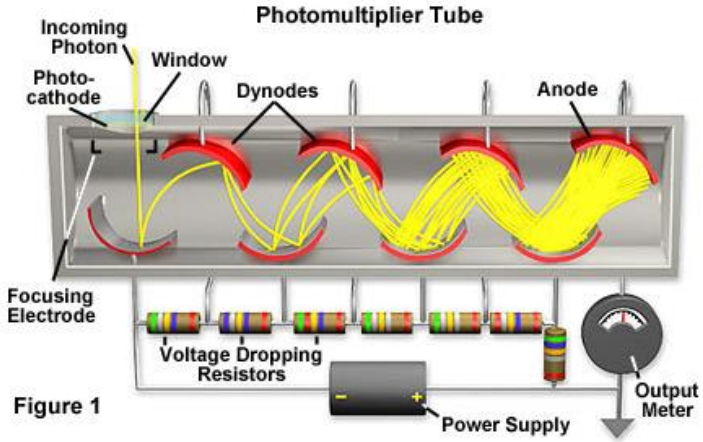


Figure 1

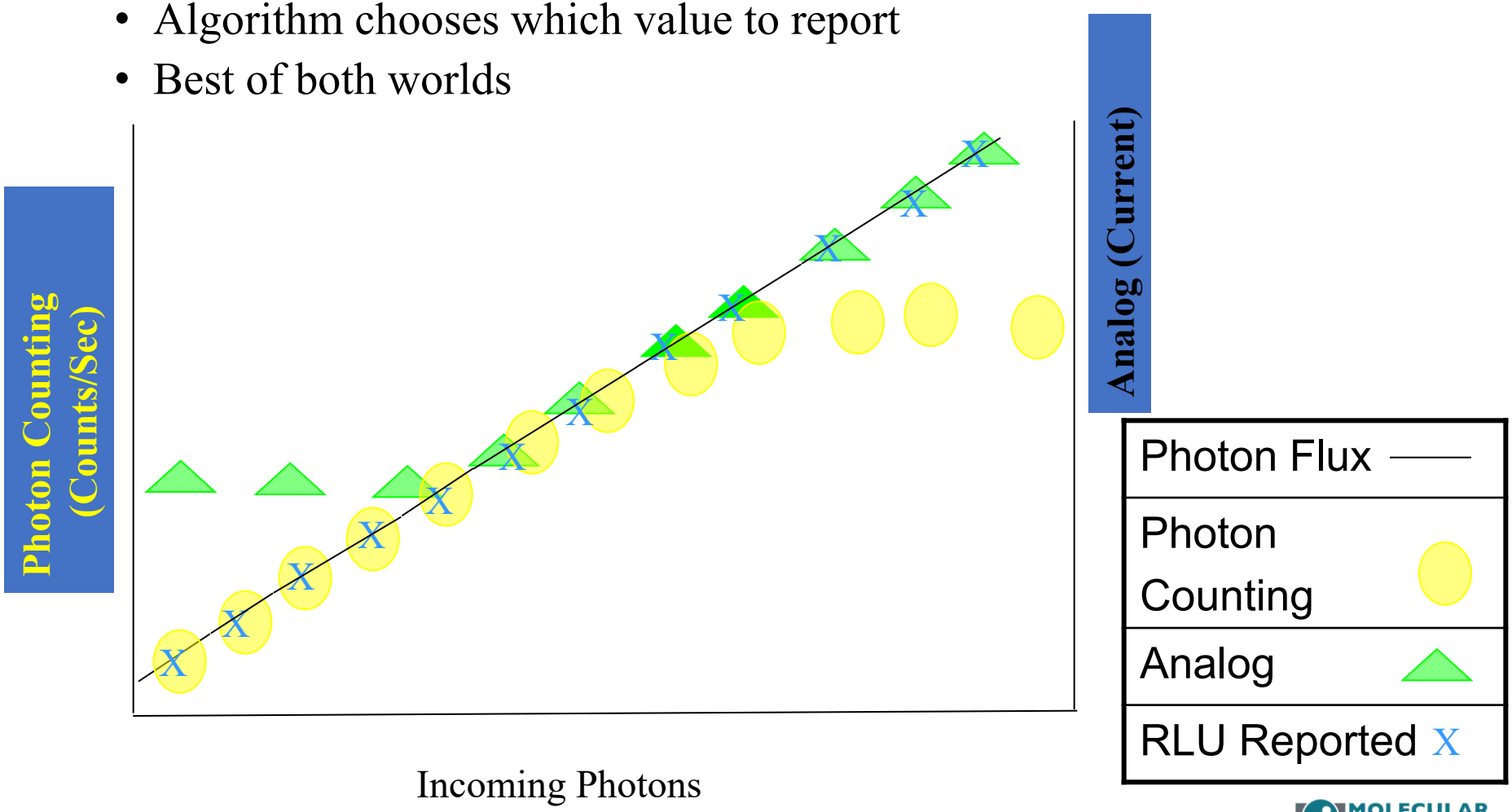
PMT Sensitivity: How PMT Current Is Measured

- **Analog**
  - Wide dynamic range achieved by converting PMT pulses into current
  - Downside – Loss of sensitivity because of difficulties in separating signal from noise

- **Photon Counting**
  - Excellent sensitivity achieved by converting PMT signal into digital pulses, pulses are then digitally filtered, only pulses larger than a threshold are counted.
  - Digital filtering of pulses does a great job of discriminating between signal and noise, resulting is high sensitivity
  - Downside – Photon counting has a limited linear range compared to analog detection

PMT Sensitivity: MaxRange PMT Setting

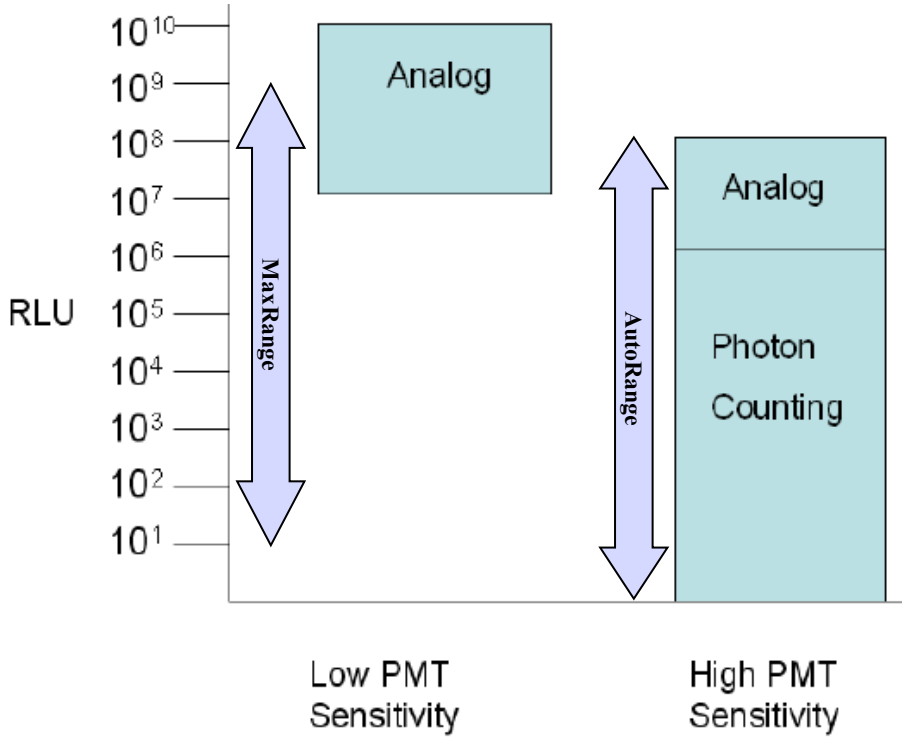
- Simultaneous Photon Counting and Analog Detection
  - Algorithm chooses which value to report
  - Best of both worlds



Extended Dynamic Range

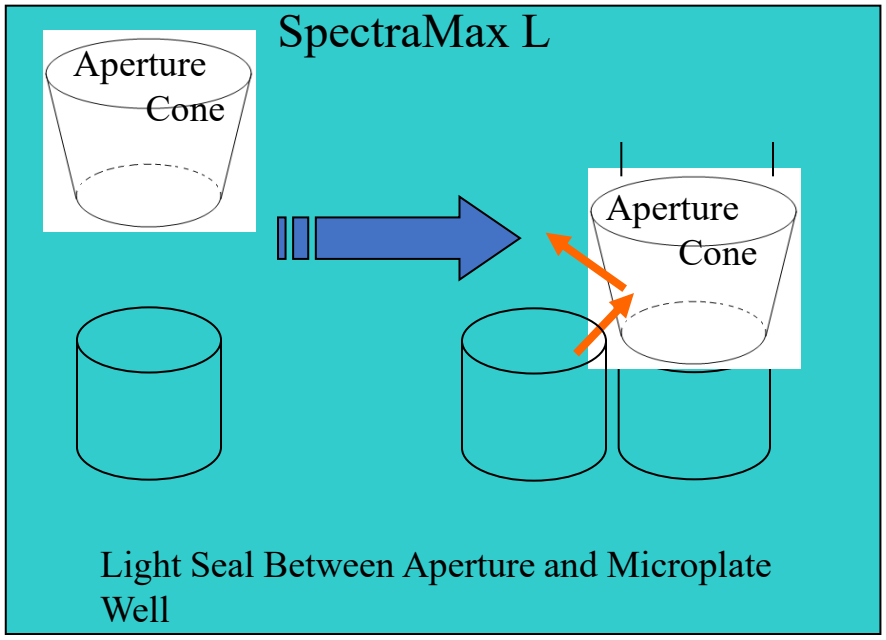
4 PMT Settings

- Analog Only: Ideal for very bright signals above 1.6 x 10^7 RLU (low PMT voltage)
- Photon Counting: Ideal for very dim and medium signals below 2.5 x 10^6 RLU (digital)
- AutoRange: Extends range of Photon Counting mode by adding Analog (high PMT voltage)
- MaxRange: Combines AutoRange and Analog Only modes
  - Captures entire dynamic range
  - **10 to 10^9 RLU**



SpectraMax L Aperture Design

- By design, the SpectraMax® L luminometer offers **higher sensitivity** and **lower crosstalk** by capturing the maximum amount of light from a test well and physically limiting light from adjacent wells.
- The aperture design does limit the types of plates that can be used on the system. (see known issues)



A Configurable System

Available in different configurations and depot-upgradeable for changing assay requirements

- Single detector (PMT):
  0 or 2 injectors
- 2-detectors:
  0, 2, or 4 injectors
- 6-detectors:
  0 or 12 injectors

- With injectors → flash
- Without injectors → glow

Types of Luminescence Assays

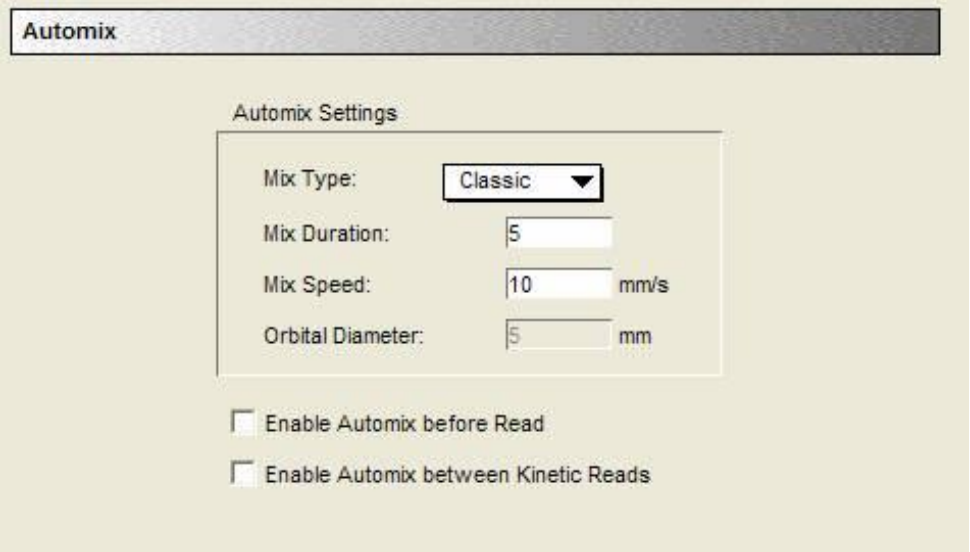
- **Glow**
  - Reaction kinetics are slow
  - Reagents can be added by hand
  - Plate will emit light for 20 minutes up to several hours

- **Flash**
  - Reaction kinetics fast enough to require an injector
  - Slow enough for injection followed by readhead movement and then read

- **“Extremely Fast Flash”**
  - Requires an injector in same position as readhead
  - Acridinium ester

Four Mode Mixing

- **Classic**
  - Same as AutoMix on most SpectraMax readers
  - Shakes along axis from front of instrument to back
- **Single Axis**
  - Shakes along same axis as Classic, but frequency doesn't change
- **Dual Axis**
  - Shakes In "L" pattern
- **Orbital**
  - Shakes in Circle pattern



SpectraMax® L Applications

- ELISAs and Immunoassays
- Reporter Gene Assays
- Bioluminescence Resonance Energy Transfer (BRET)
- Enzyme Assays
- Cell Viability, Proliferation, and Cytotoxicity
- Aequorin Assays
- ATP Detection
- Mycoplasma monitoring

SoftMax Pro 7 *Features*

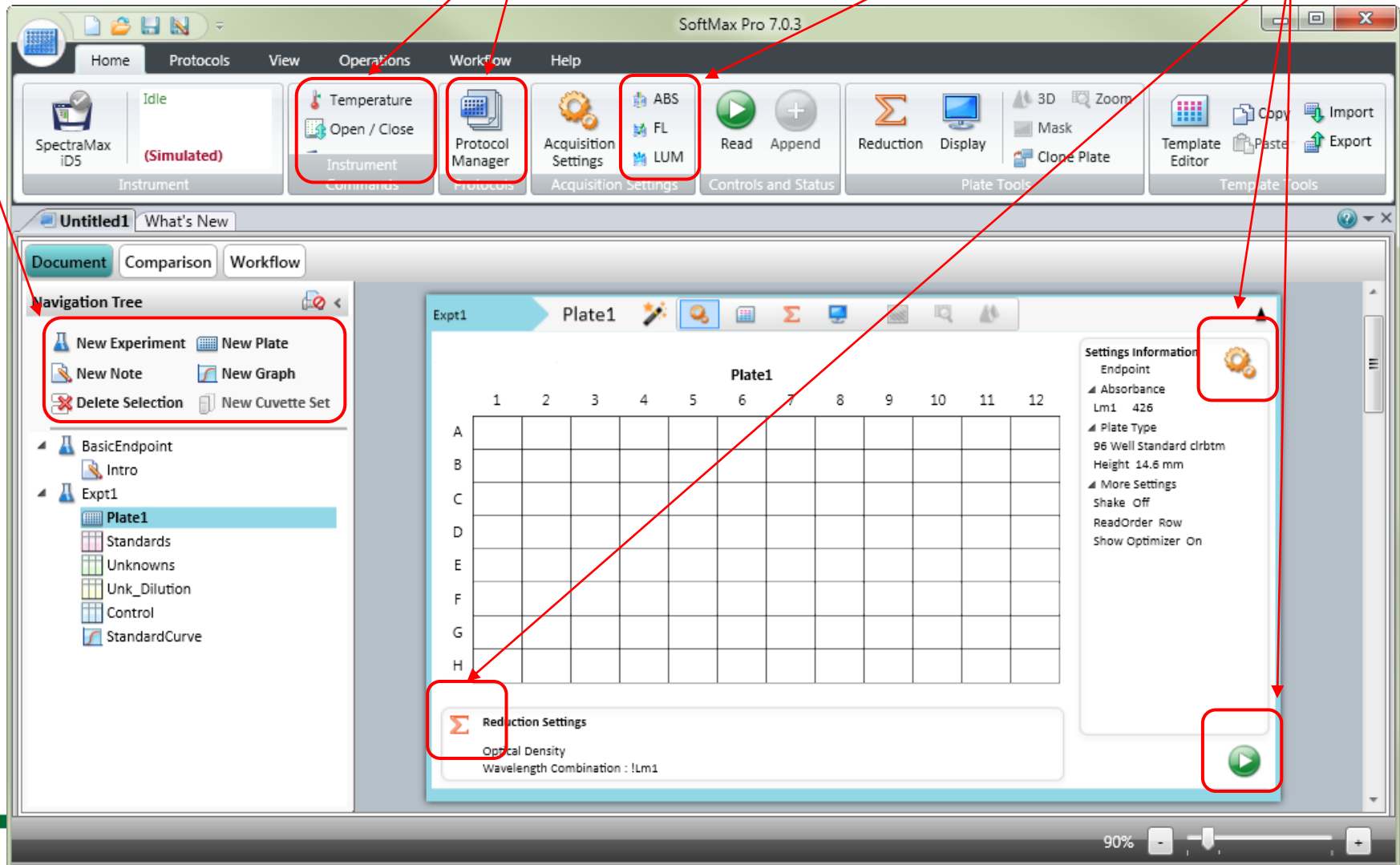
Software Interface

The New Experiment icons moved into the Navigation Tree

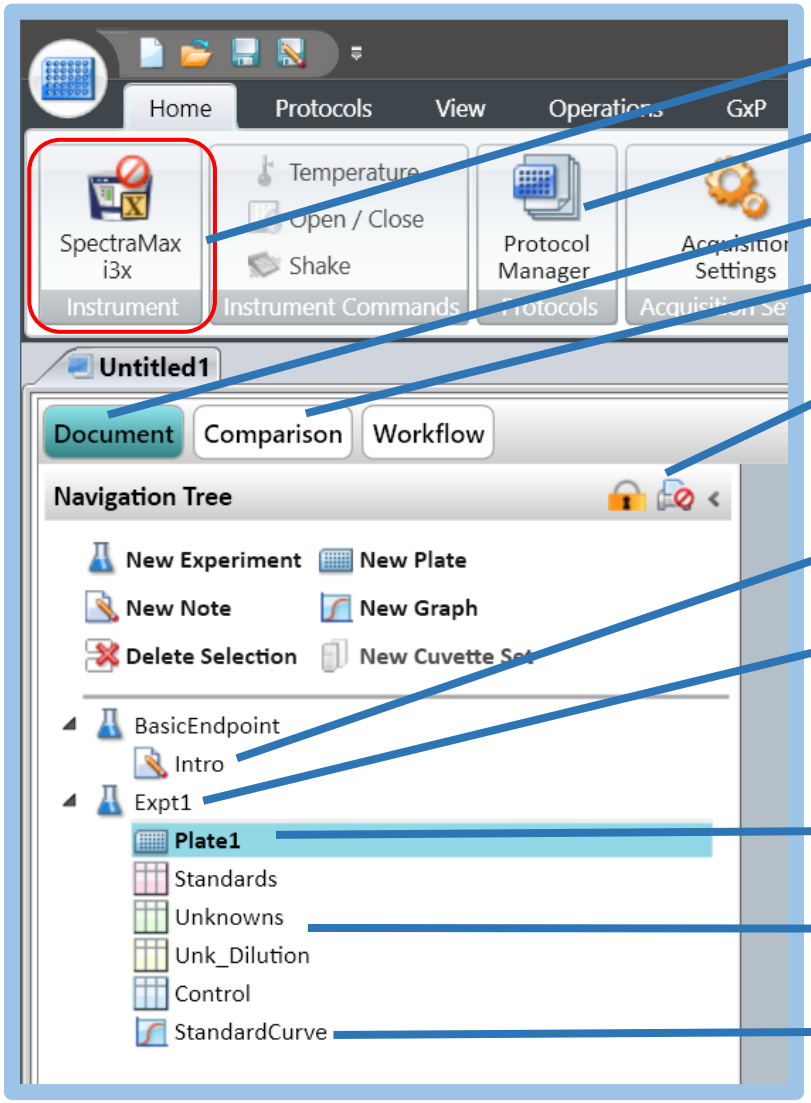
Frequently used Icons moved from the operations tab into the Home tab

New Quick Start reads

Easy access buttons



Project Oriented Interface



軟體連線情況

檔案管理

分頁模式

比較模式

可獨立設定"編輯性" or "是否列印"

註解/摘要報告

不同實驗混編

原始資料(Raw Data)

分析資料(Meta Data)

曲線擬合/統計

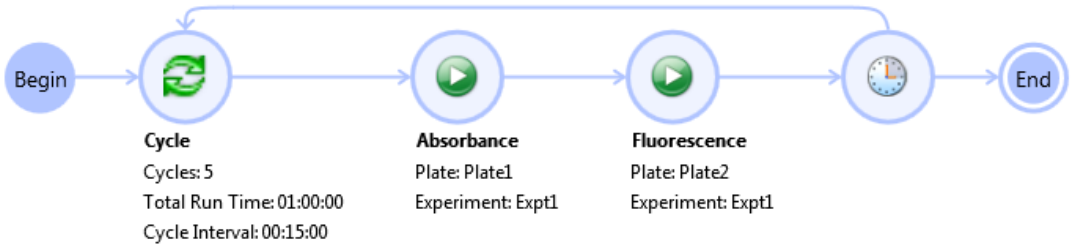
Advanced Acquisition

Multitask Kinetics Benefits

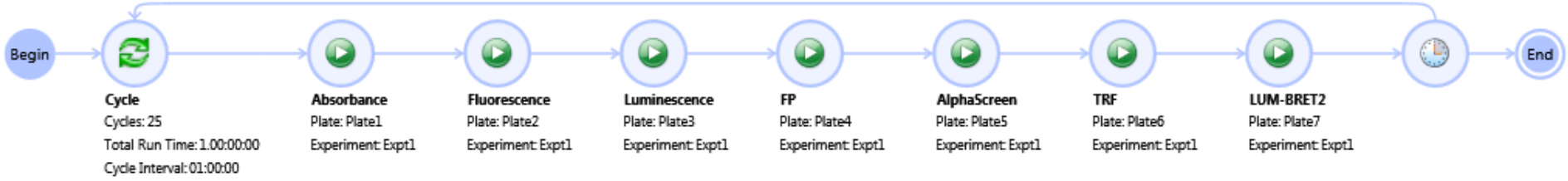
- Customize kinetic cycle tasks using the new Workflow Editor
  - **Say goodbye to Excel Workflows!**
- Run multi-day kinetic assays
- Works with all supported readers that have kinetic mode

Multitask Kinetics Benefits

- **Set up multi-mode kinetic reads**
  - Alternate between absorbance and fluorescence

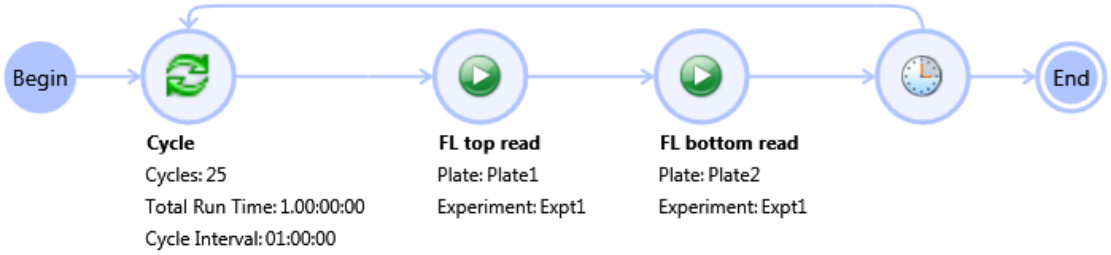


  - Alternate between absorbance, fluorescence, luminescence, FP, TRF, cartridges, etc

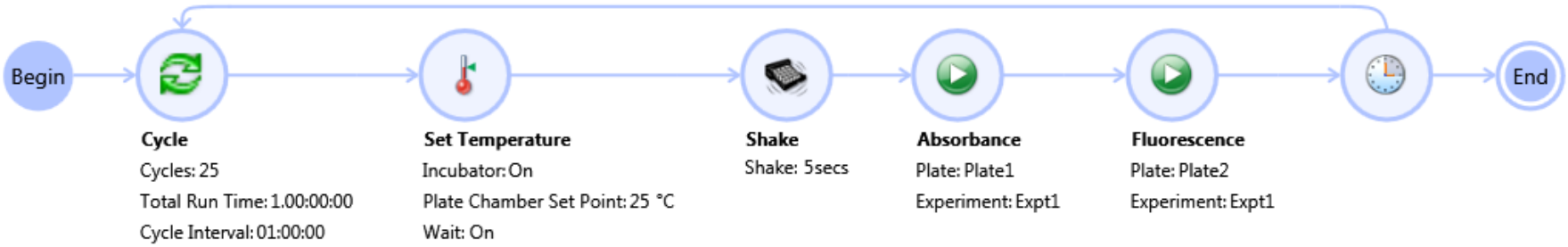


Multitask Kinetics Benefits

- **Can't decide if top read is better than bottom read? Try both!**

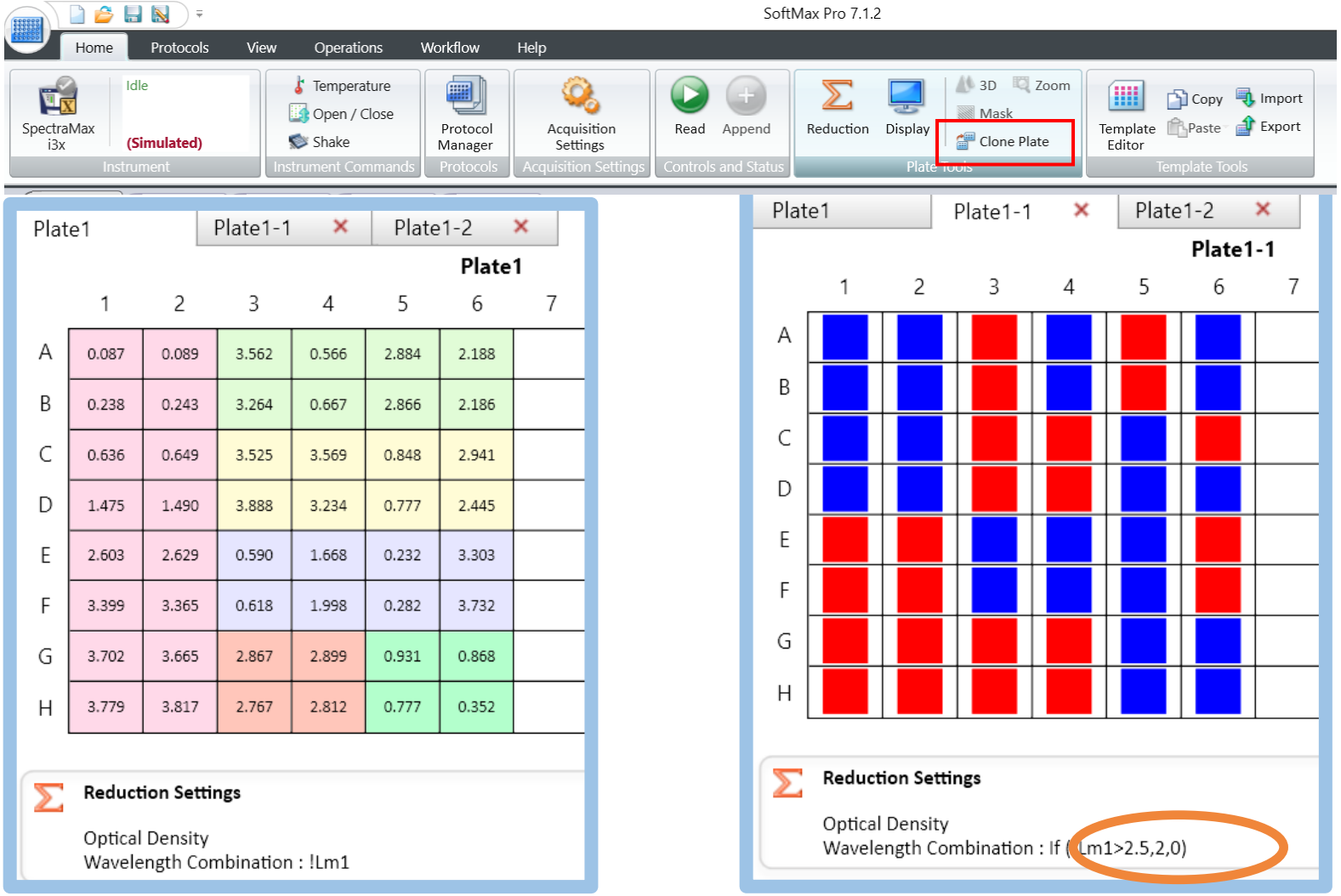


- **Add in tasks: delay, shake, open drawer**



Advanced Analysis

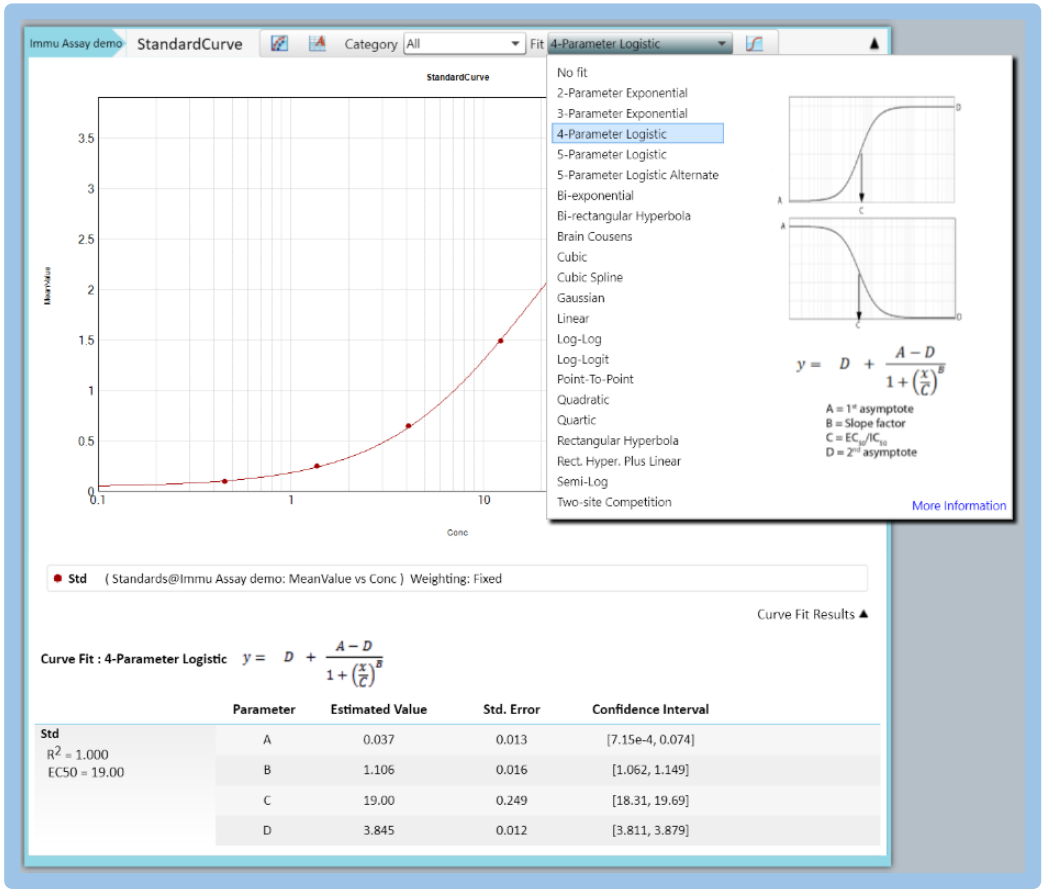
Powerful Formula system

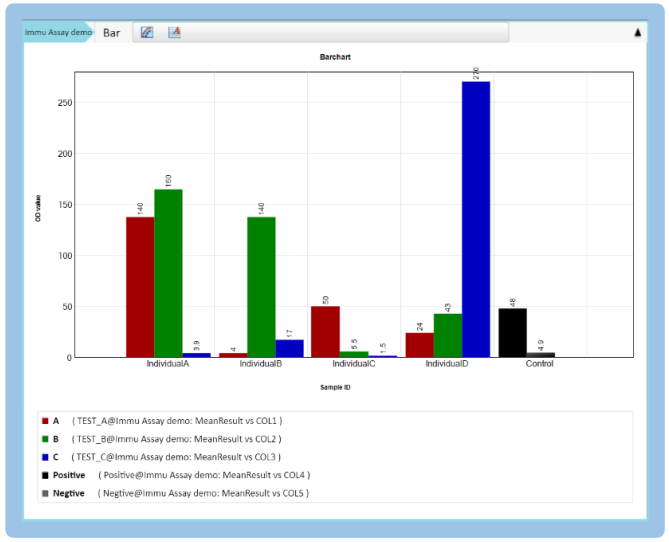


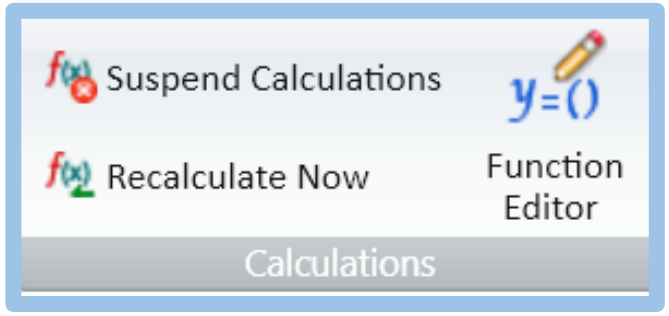
✓ RAW data

✓ QC Dashboard

Adaptable Graph system







21 Predefined Curve Fitting

Bar Chart

New Function Editor

Powerful Formula system

Immu Assay demo | TEST_A

TEST_A

Sample	Wells	COL1	Value	MeanValue	Risk Class 風險評比
01	A3 B3	1	3.562 3.264	3.413	危險
02	A4 B4	2	0.566 0.667	0.617	未檢出
03	A5 B5	3	2.884 2.866	2.875	偏高
04	A6 B6	4	2.188 2.186	2.187	正常

judgement criteria description (公式寫法)
//巢狀條件式，與Excel寫法極為相近

MeanValue>DUL@Positive,"危險",If (MeanValue>DLL@Positive,If ("偏高",If (MeanValue<NDL@Negtive,"未檢出","正常")))

- 檢出值 > Pos上限者 ==> 危險
- 檢出值 > Pos下限者 ==> 偏高
- 檢出值 < Pos下限者 ==> 正常
- 檢出值 < Neg限者 ==> 未檢出

Formula ☑ Syntax Helper

```
MeanValue>DUL@Positive,"危險",If (MeanValue>DLL@Positive,If ("偏高",If
(MeanValue<NDL@Negtive,"未檢出","正常")))
```

Mathematical | Statistical
Comparison | Condition
Peak analysis | Array analysis

Sample	Wells	Sample#	Lm_run	OD_read	PEAK_Judge
01	B1	1	401	2.527	-
			431	3.174	PEAK@2
			461	0.726	
			491	0.090	
			521	2.352	
			551	3.661	PEAK@6
			581	0.441	PEAK@7
			611	2.039	
			641	3.771	PEAK@9
			671	3.093	
			701	2.783	
			731	2.488	-

Number of read point 12

Thank you for your attention

產品專員 朱家均 Mavis

服務電話：0955-586-009

Email: mavis.chu@kimforest.com

金萬林企業股份有限公司
台北 新竹 台中 台南 高雄
服務專線：0800-009695
Http://www.kimforest.com
Email:kimforst@gmail.com

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