

Synergy H1

Microplate Reader and Absorbance
微量盤分析儀與吸光值

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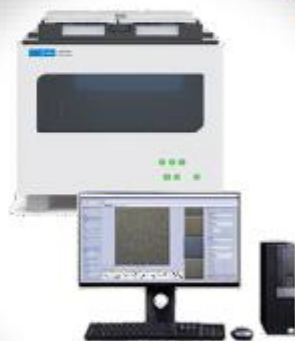
進 階 生 物 科 技
Level Biotechnology Inc.

安捷倫細胞分析產品

Building a comprehensive story



Seahorse XF
海馬生物能量分析儀



xCelligence RTCA
實時細胞行為分析儀



NovoCyte
流式細胞分析儀



BioTek
自動化影像系統與檢測儀

安捷倫細胞分析整合平台





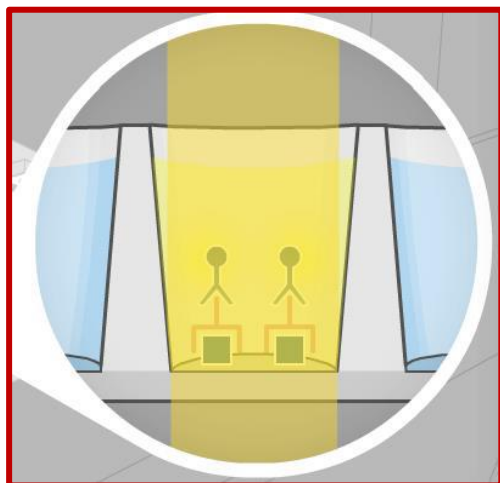
Synergy H1

偵測方式

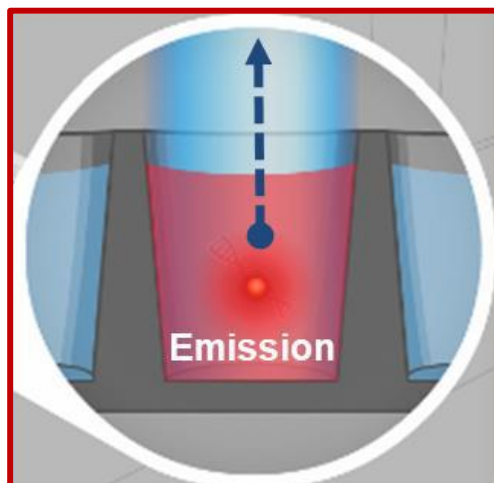
偵測方式

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

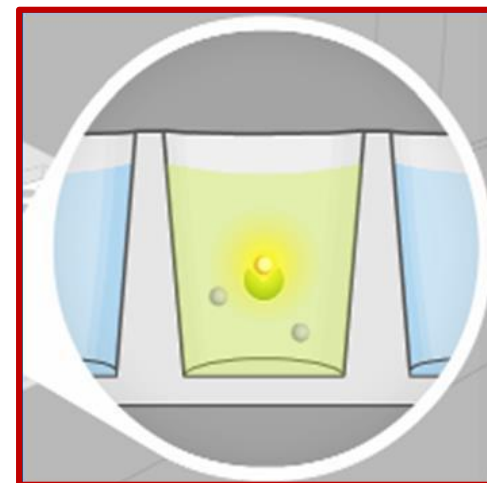
Absorbance
吸收光



Fluorescence
螢光



Luminescence
冷光

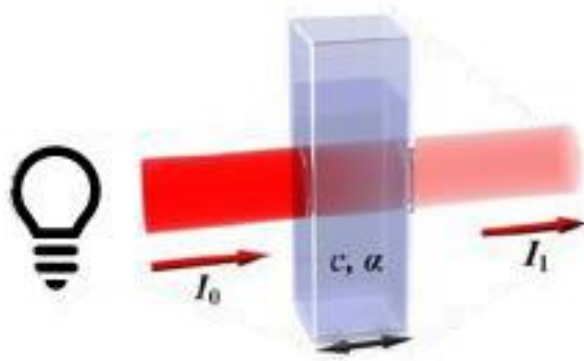


比爾定律Beer's law

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

當光穿透樣品溶液時，光的吸收度(A)與吸收係數(ϵ)、光徑長(l)、濃度(c)三者均呈正比：

$$A = \epsilon l c$$

原本光入射線強度為 I_0 ，穿透光線強度變為 I_1 ，此時光的穿透度為 T (Transmittance)，定義光的被吸收度 A 為：

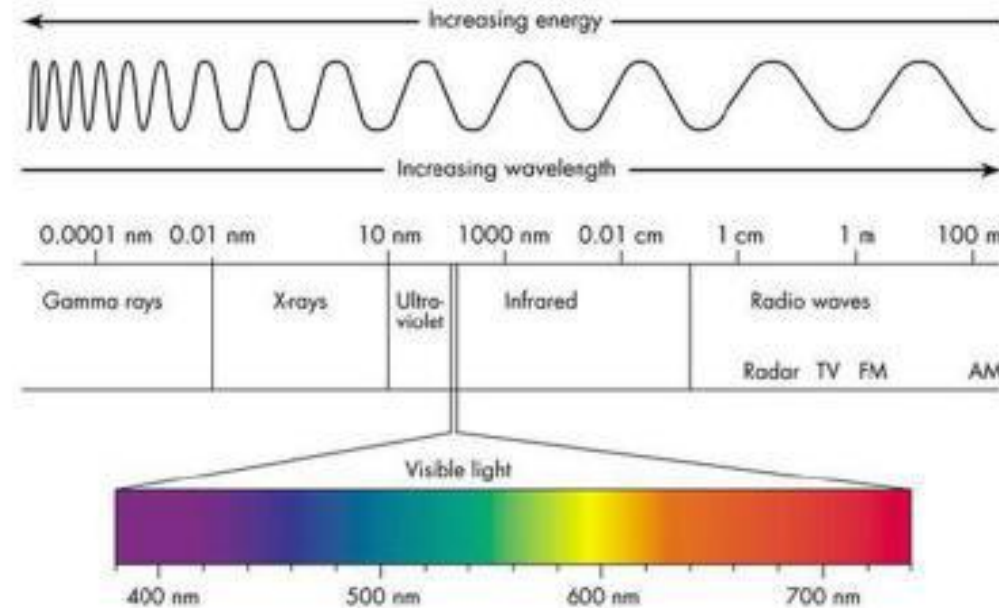
$$A = -\log T = -\log \frac{I_0}{I_1}$$

OD值 Optical Density

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

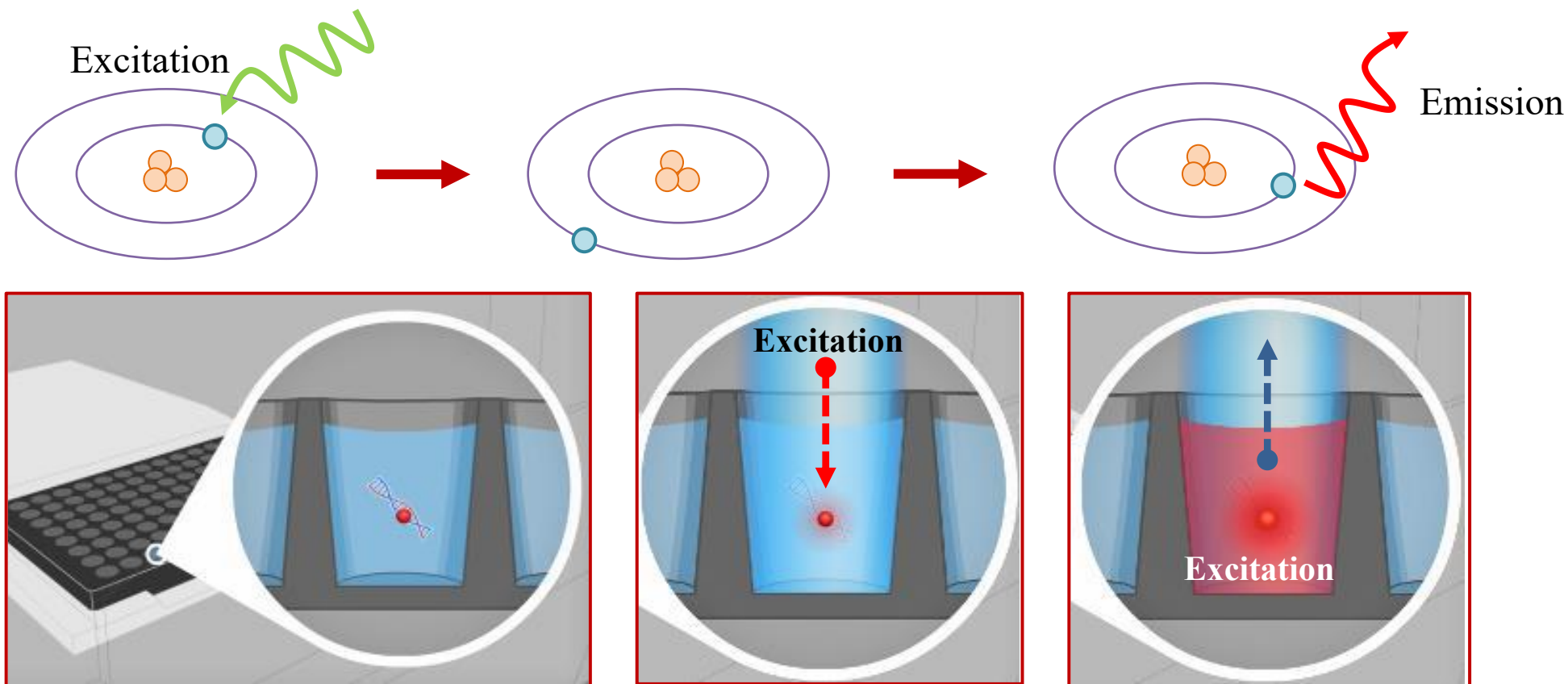
每種物質對特定波長的光有不同的吸收特性

OD 值表示光穿透樣品後被吸收的程度，數值越高，透過的光越少。



螢光原理與應用

偵測方式: 吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5 軟體分析

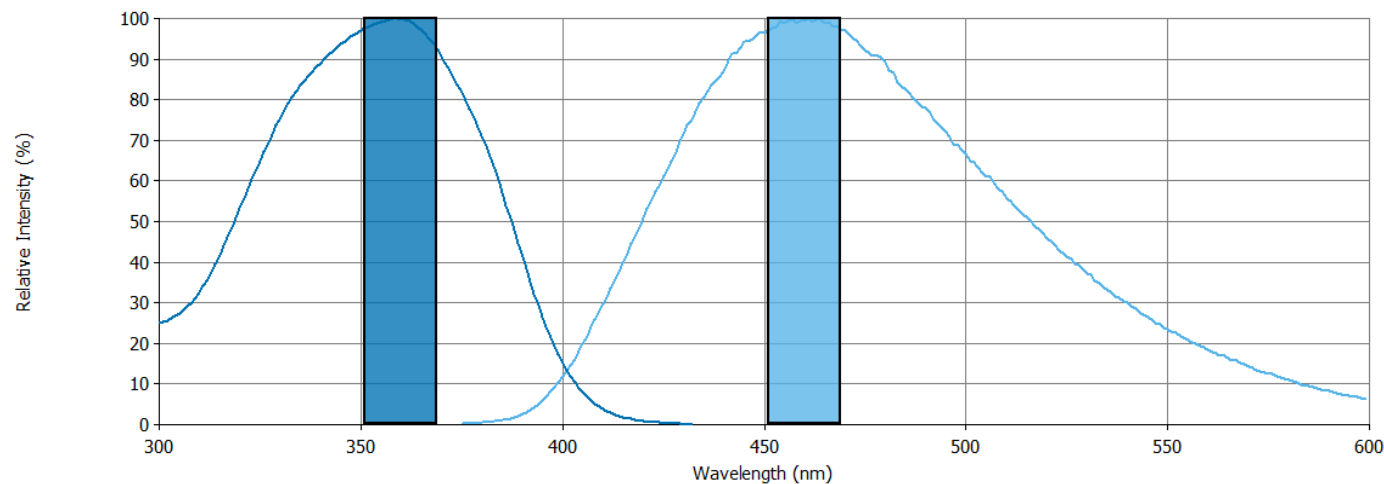


Unit : **RFU** (**R**elative **F**luorescence **U**nits)

螢光原理與應用

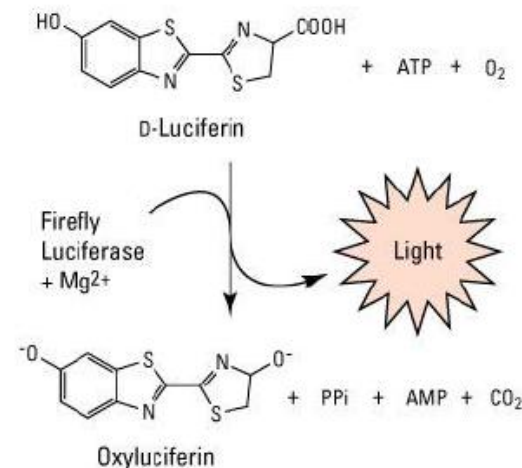
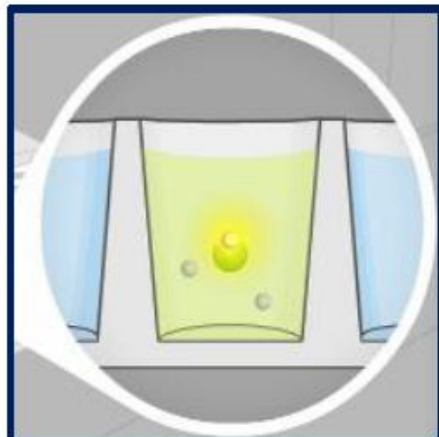
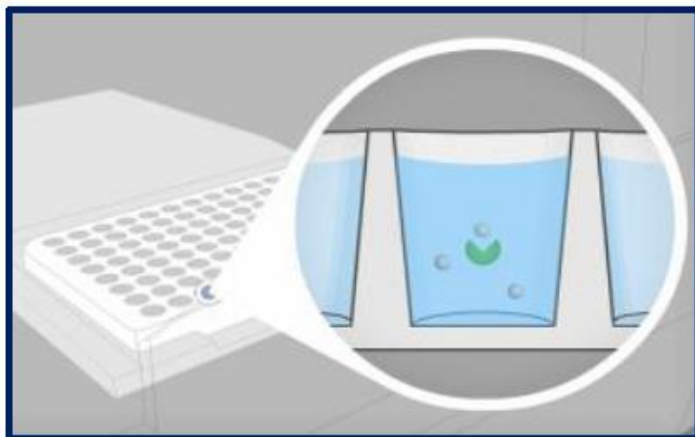
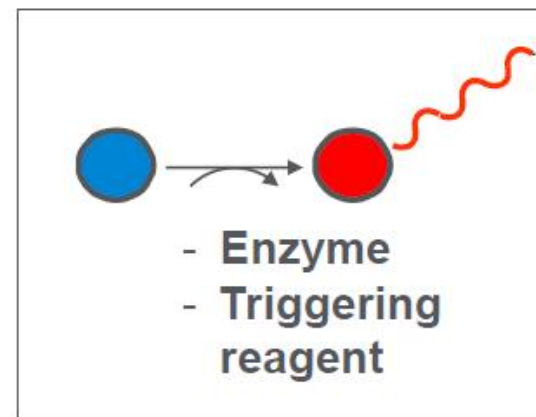
偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

- Excitation 激發光
光源激發螢光分子
- Emission 散射光
螢光分子產生散射光
- 儀器偵測的是?
Emission 激發光的數值
- Bandpass?
波長可通過的範圍
- 460/40 代表
440~480 nm 範圍可通過濾鏡



冷光原理與應用

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



Unit : **RLU** (Relative Luminescence Units)



Synergy H1

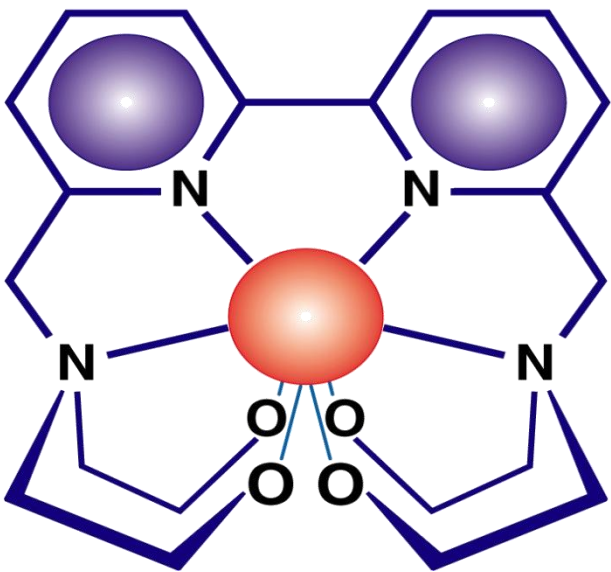
應用

實驗應用-TRF 時差式螢光(Time-Resolved Fluorescence)

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

Binding Arm

- Isothiocyanate (ITC)
- Iodoacetamido (IA)
- Amino
- Dichlorotriazine (DTA)



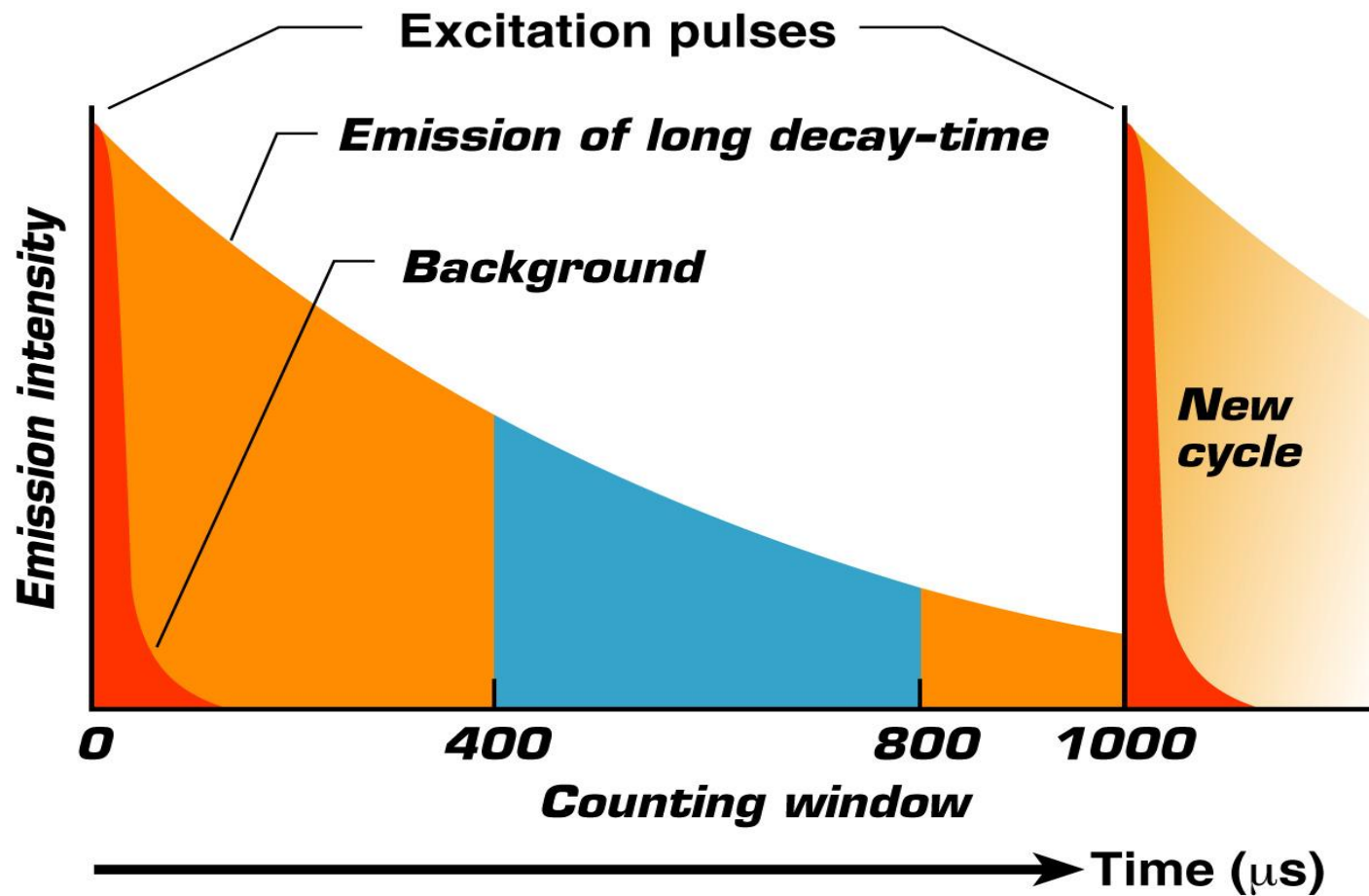
Chelate

- N1 (DTTA)
- DTPA
- W2014
- W1024
- W8044
- W14016

Sc														
Y														
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

實驗應用-TRF 時差式螢光(Time-Resolved Fluorescence)

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



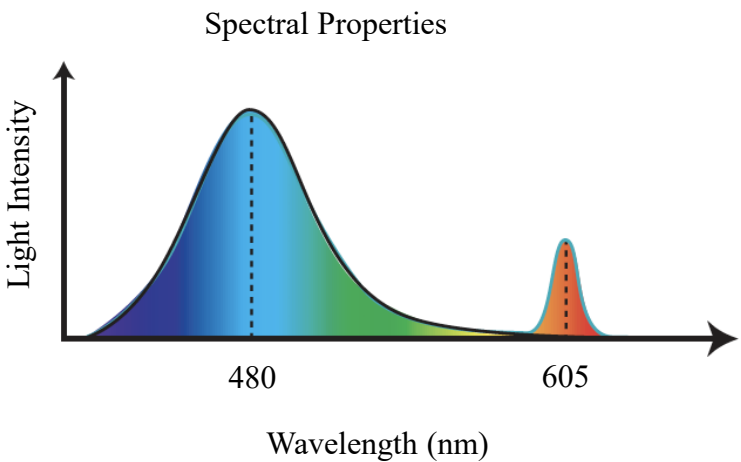
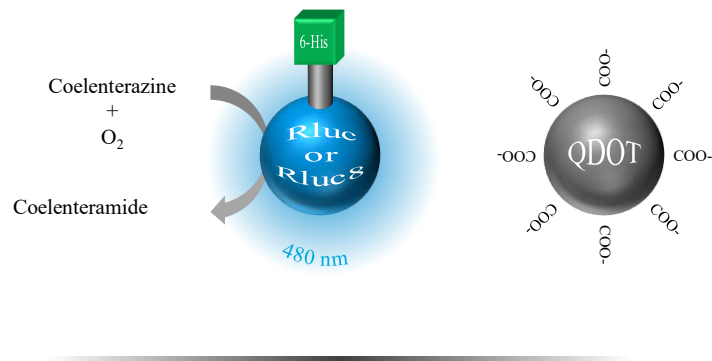
- ✓ Filter
- ✓ Monochromator

Background fluorescence is very low due to the time delay between excitation and plate reading

實驗應用-FRET 螢光共振能量傳遞(Fluorescence Resonance Energy Transfer)

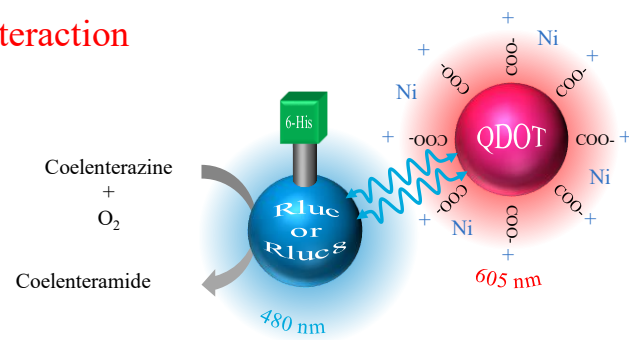
偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

No Interaction



- ✓ Filter
- ✓ Monochromator

Interaction



Other Compatible Acceptors
Other QDs

EXAMPLE APPLICATION

- Detection of proteases

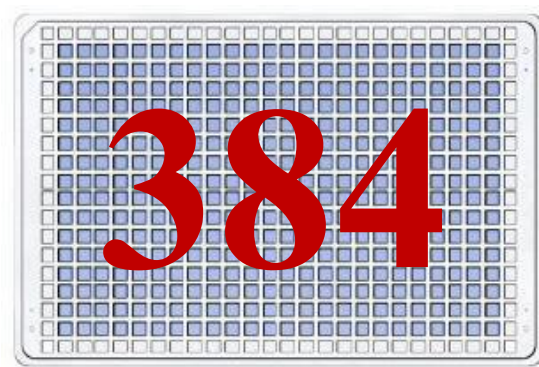
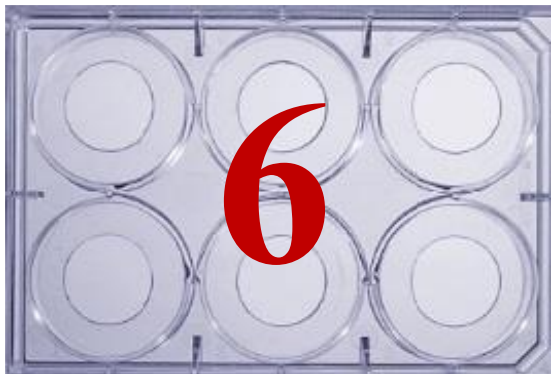


Synergy H1

功能

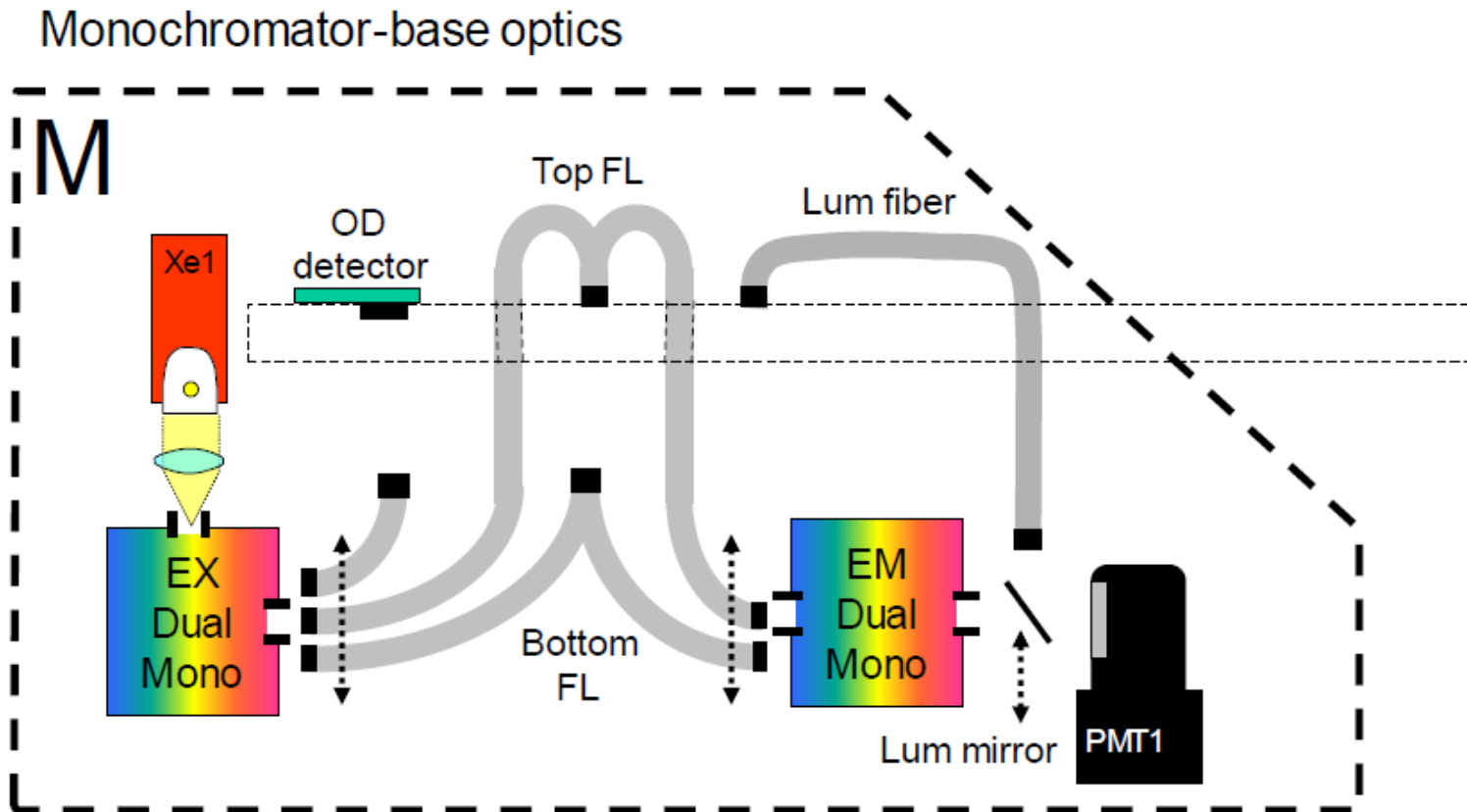
微量盤類型

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



偵測模組

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



光柵式全光譜

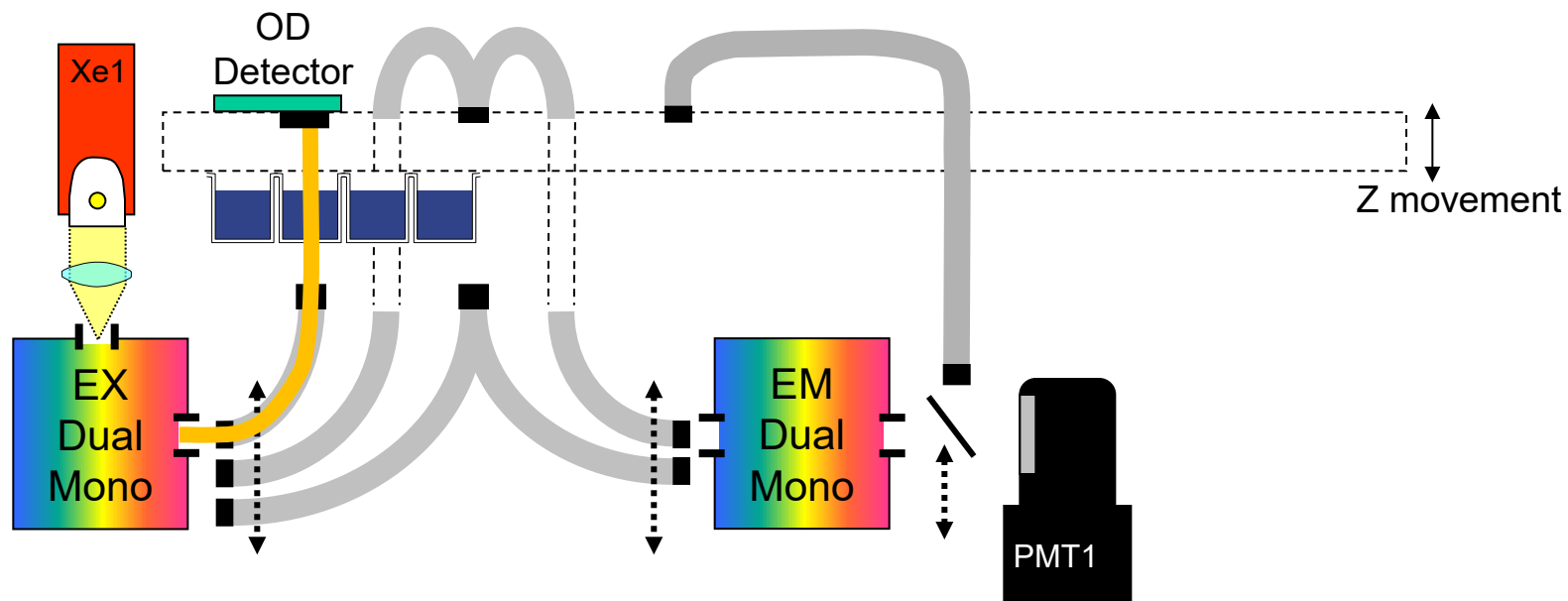
吸收光 230-999 nm

螢光 250-700nm

冷光

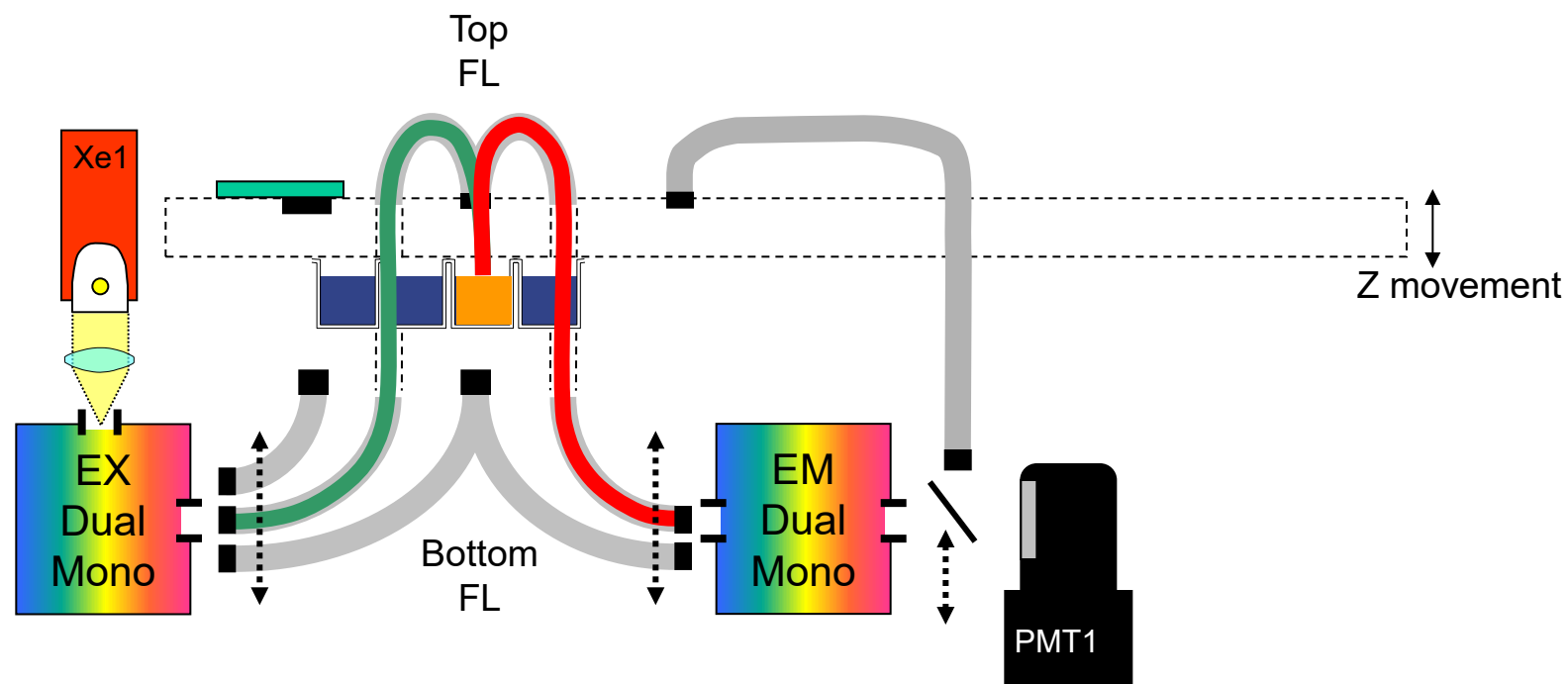
偵測模組-吸收光

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



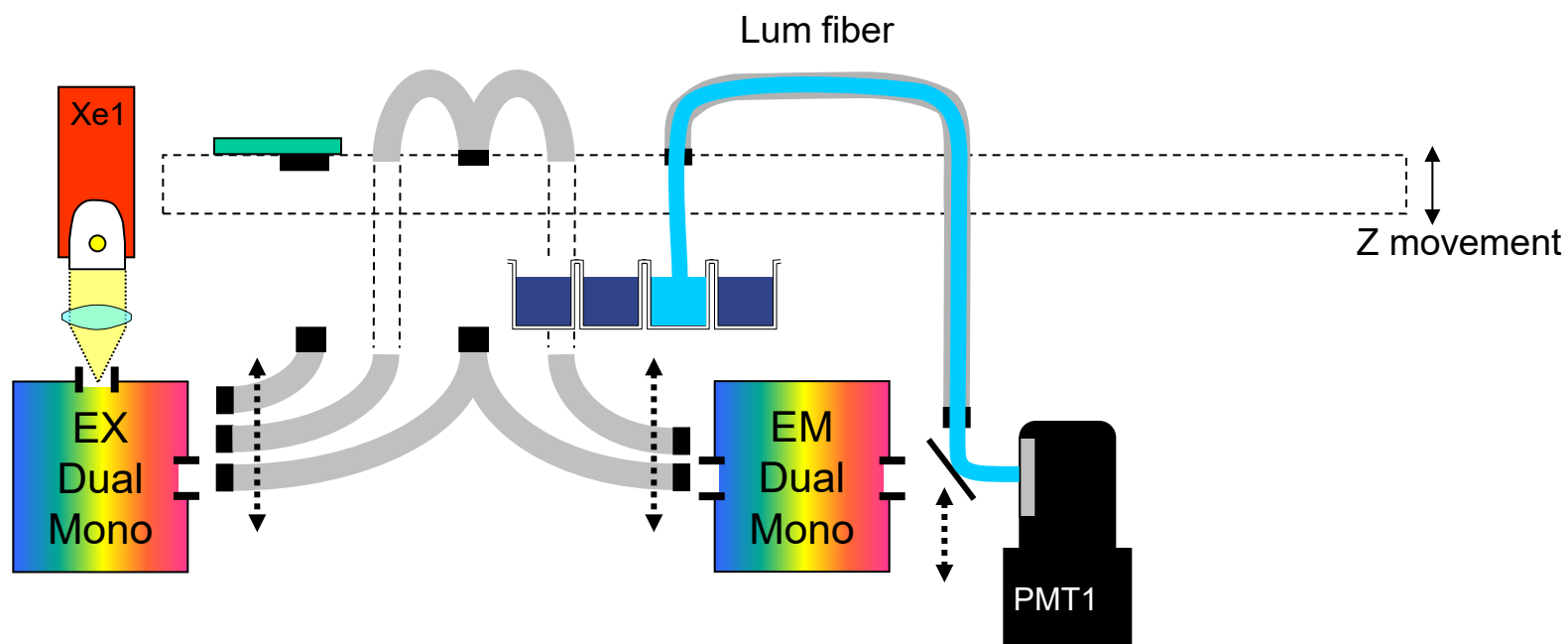
偵測模組-螢光

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



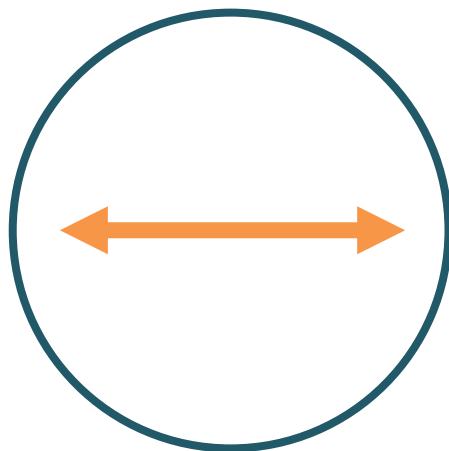
偵測模組-冷光

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



震盪功能

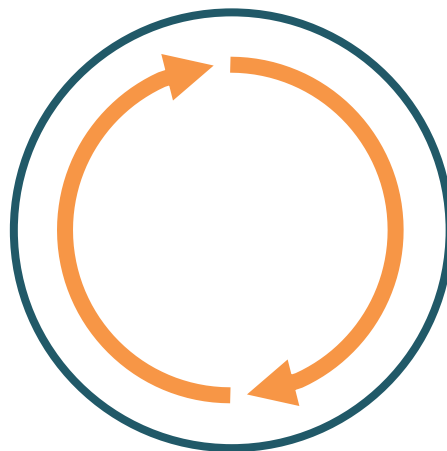
偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析



Linear

強震盪

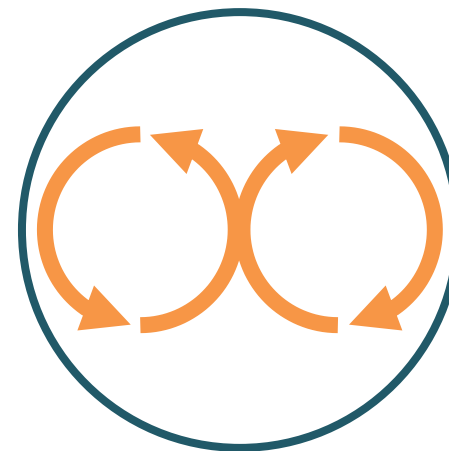
最強混和效果



Orbital

溫和混和效果

對細胞傷害最小



Double Orbital

可避免細胞聚集於

中間成團

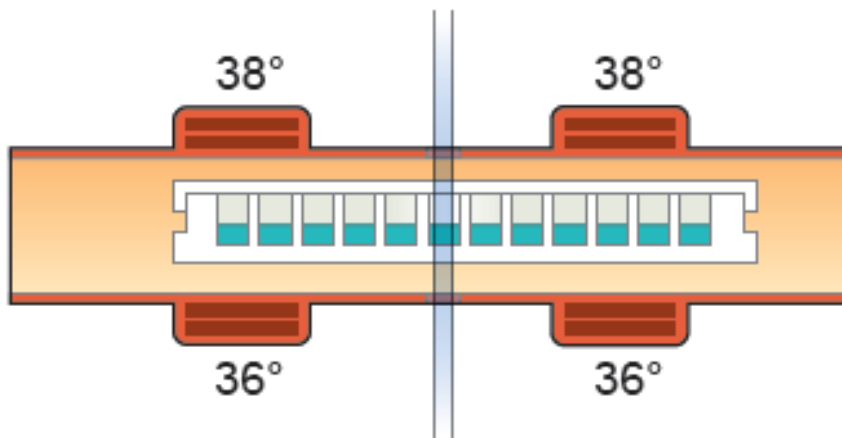
溫度控制-溫度梯度防止水氣凝結

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

專利技術

4-Zone溫度控制

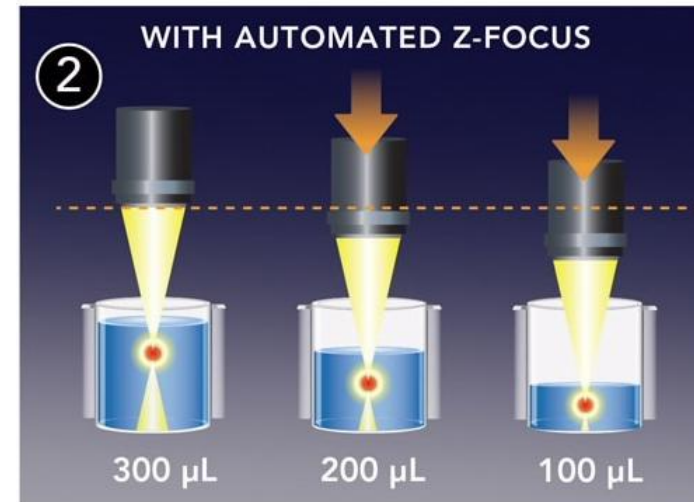
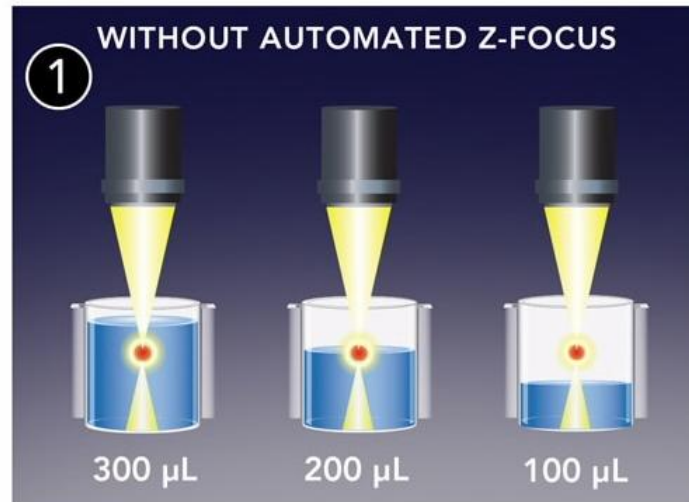
- 上下四區加熱板，均勻加熱
- 上下最多2°C溫差防止水氣凝結上蓋
- 可加溫至45°C

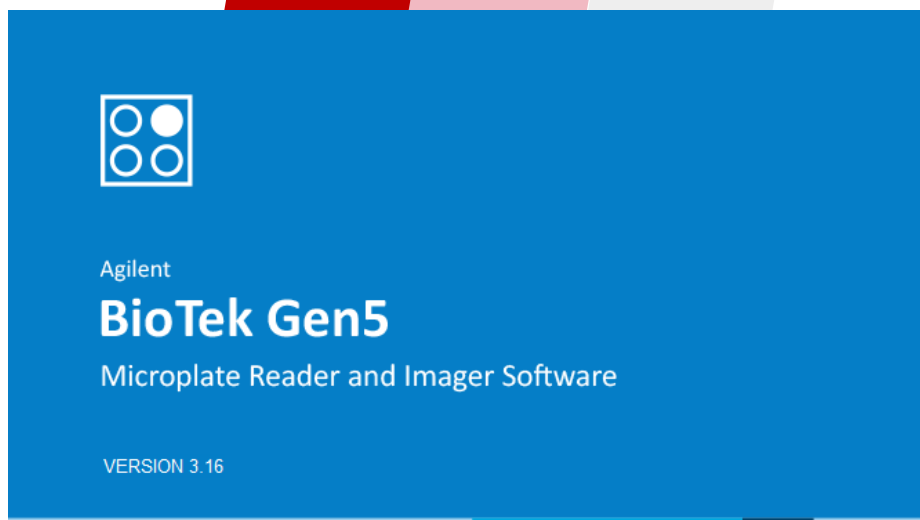


Z-Focuse

偵測方式:吸收光、螢光、冷光 -----> 應用 -----> 功能 -----> Gen 5軟體分析

可進行z軸自動對焦



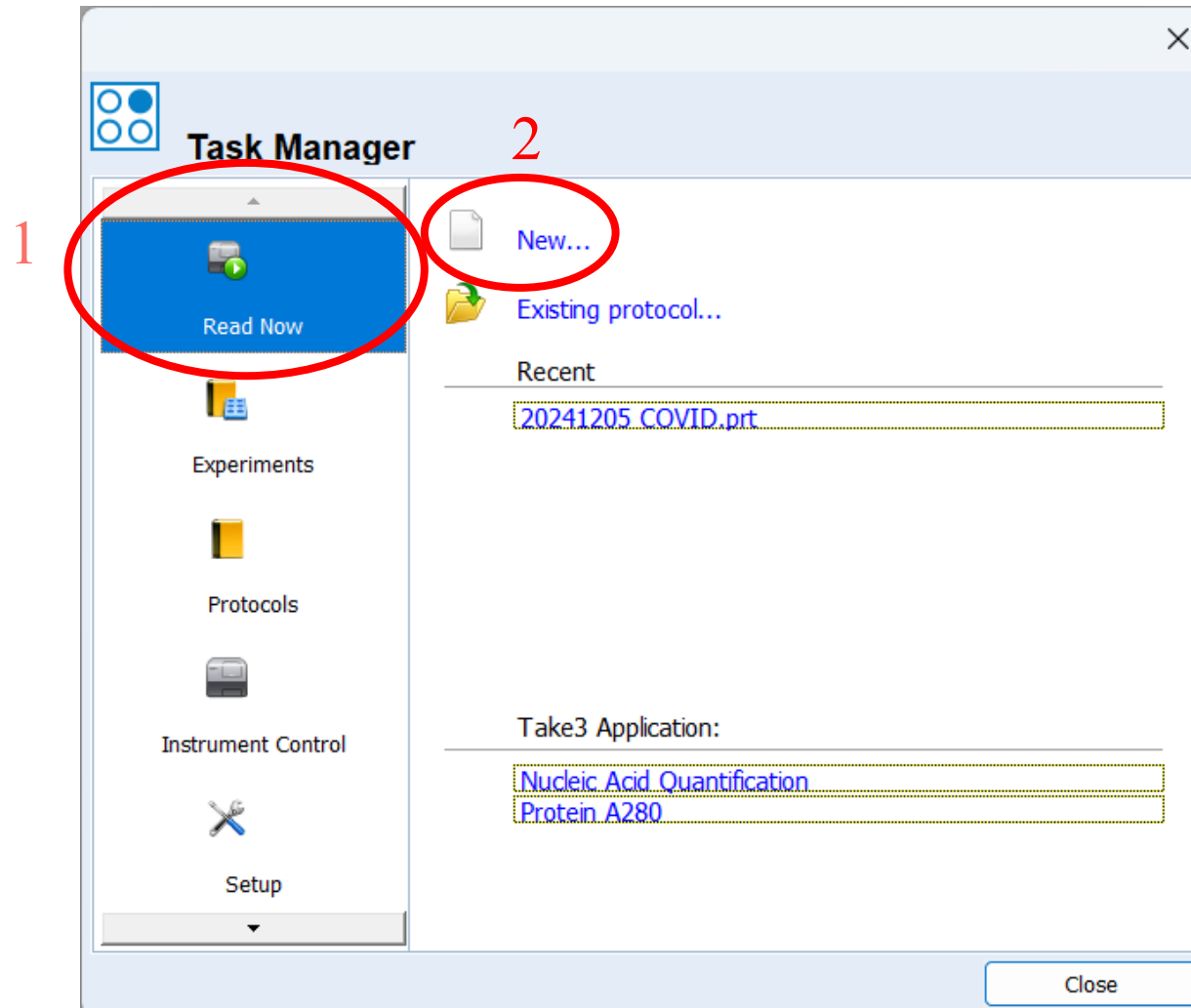


Gen 5

軟體分析

建立新實驗

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析

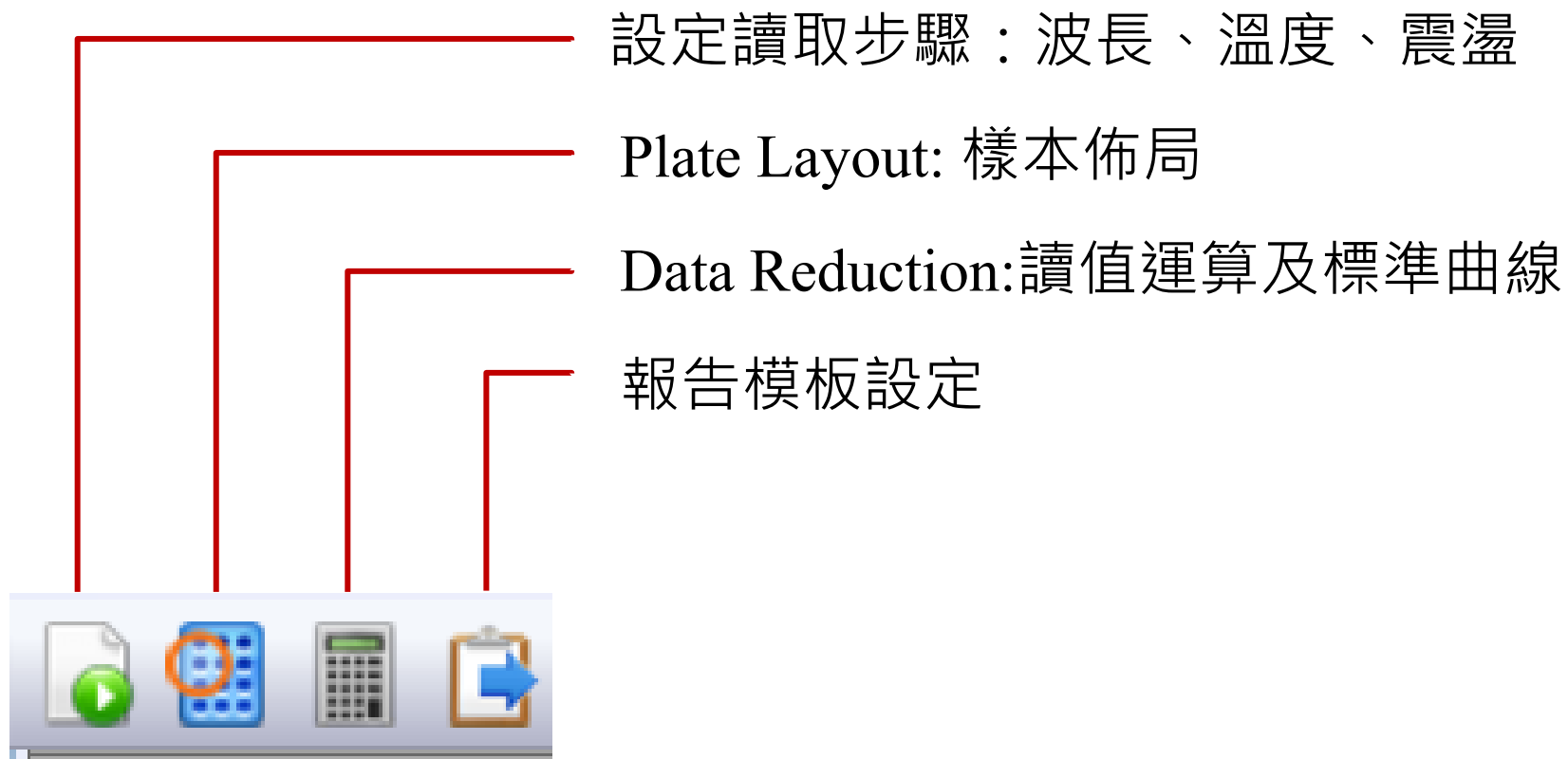


1. Read Now
2. 建立新的實驗

- Experiment
- Protocol

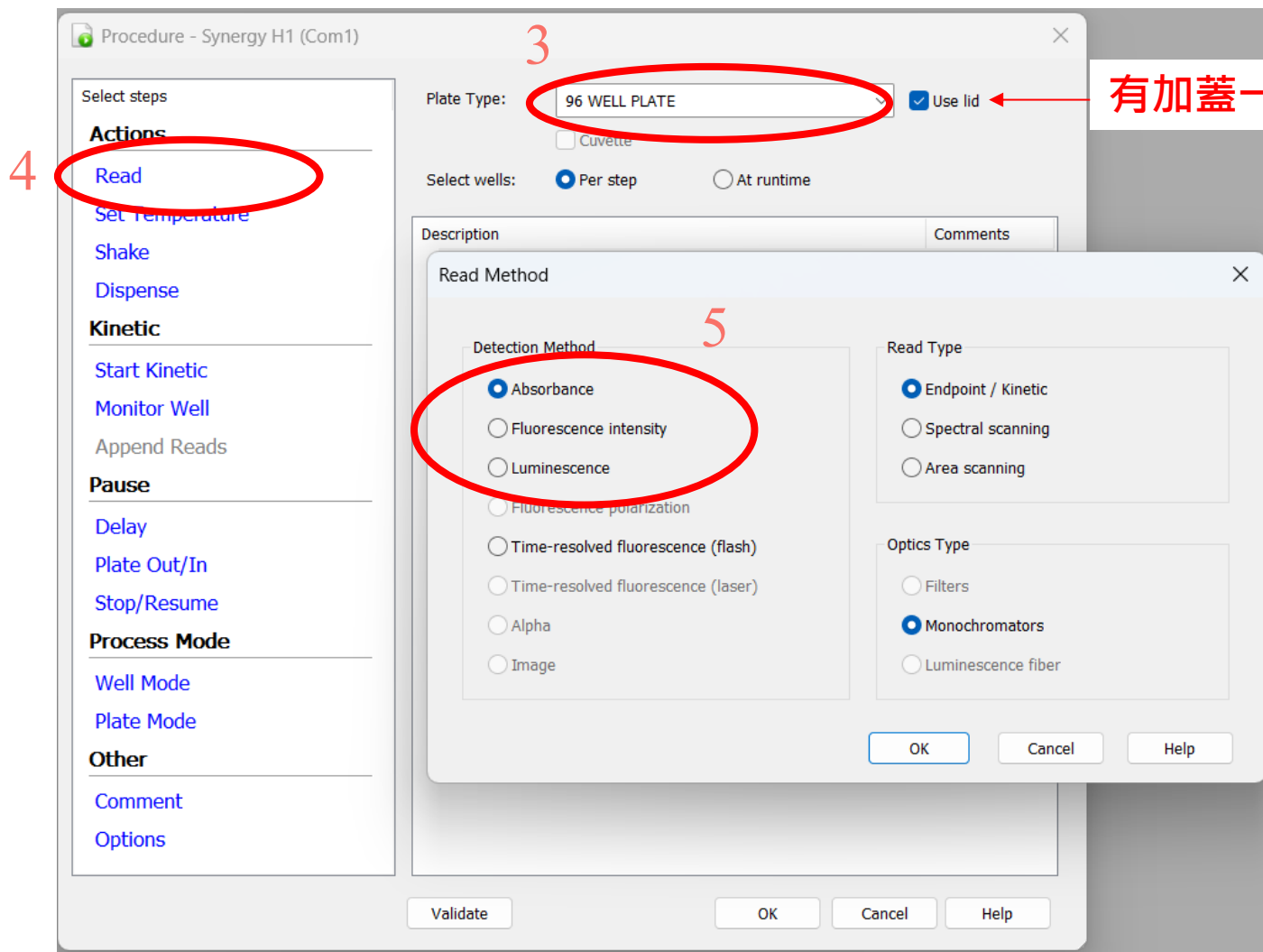
Gen 5軟體功能

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



建立新實驗

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



有加蓋一定要選!!

3.下拉式選單選擇盤型

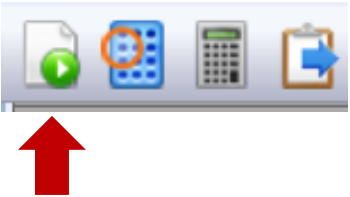
4.點選read

5.選擇讀取方式

(吸收光、螢光、冷光)

吸收光設定

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



Read Step

Step Label:

<default>

Full Plate

Wavelengths

1

450

2

3

4

5

6

選擇讀取範圍

Read Speed:

Normal

Edit

Pathlength Correction

Edit

OK

Cancel

Help

Current selection: Full Plate

	1	2	3	4	5	6	7	8	9	10	11	12
A												
B												
C												
D												
E												
F												
G												
H												

Select All

Clear All

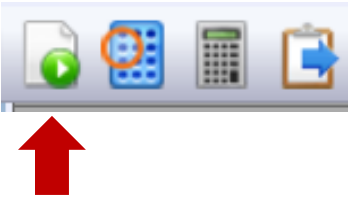
OK

Cancel

Help

螢/冷光設定

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



Read Step

Step Label: <default> Full Plate

Wavelengths

1 2 3 4 5 6

Fluorophore:

Excitation: 485

Emission: 528

Optics Position: Top

Gain: <extended>

☐ Wavelength Switching per Well

Read Speed: Normal Edit

Time resolved options: Edit

Read Height: 7.00 mm Auto-Adjust...

OK Cancel Help

- 螢光波長設定
- 讀取位置

Read Step

Step Label: <default> Full Plate

Wavelengths

1 2 3 4 5 6

Excitation:

Emission:

Optics Position:

Gain: 135 Options...

☐ Wavelength Switching per Well

Integration Time: 0:01.00 MM:SS.ss Edit

Read Height: 4.50 mm Auto-Adjust...

OK Cancel Help

冷光設定

光譜掃描

偵測方式: 吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5 軟體分析



Read Step

Step Label: Full Plate

Wavelengths

Start: nm ☒ Calibrate Before Read

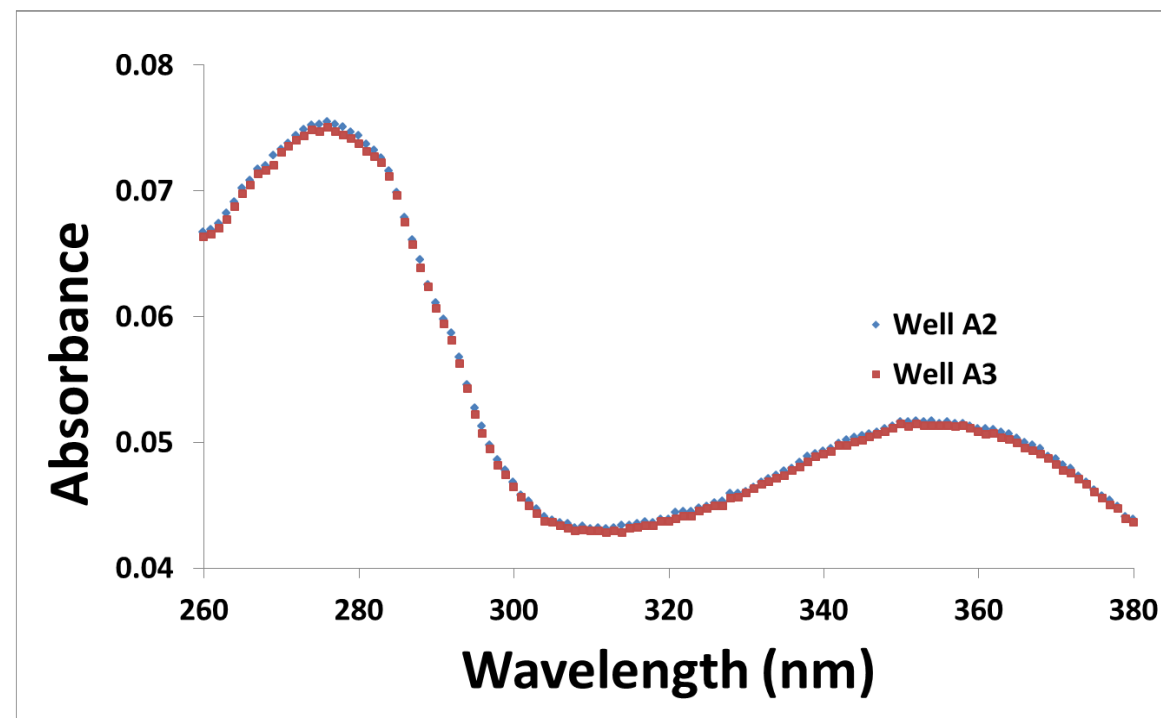
Stop: nm

Step: nm

Read Speed: Normal Edit

OK Cancel Help

設定開始/結束讀取波長



孔域掃描

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



Absorbance Area Scan

Step Label: <default> Full Plate

Wavelength: 450

Read Speed: Normal Edit

Area Scan Options

☒ Equally space points within the well

Number of points: 5 x 5

Point spacing (microns): 1099 1099

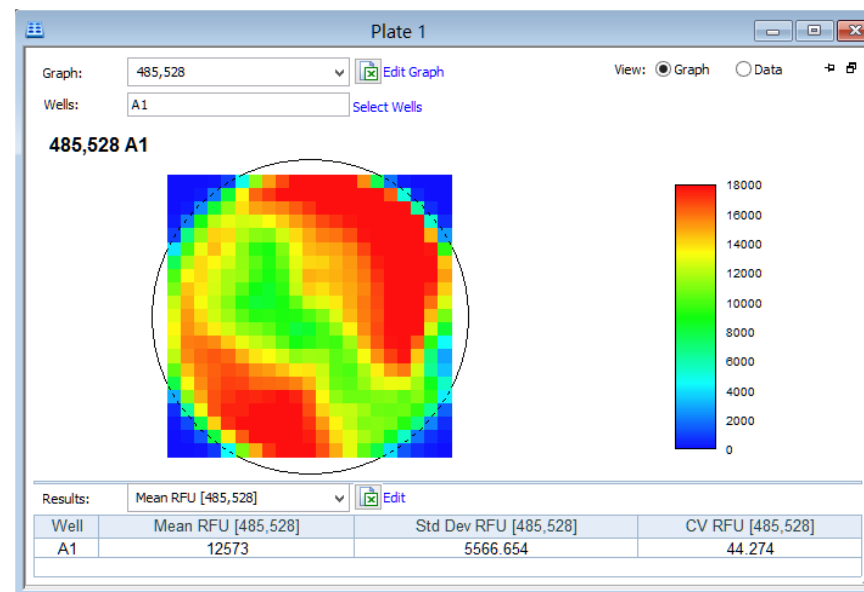
Well diameter: 6604 microns

Probe diameter: 1400 microns

☐ Ignore well and carrier limitations

Valid well range: A1-H12

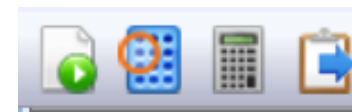
OK Cancel Help



設定掃描孔域點數

溫度/震盪設定

偵測方式: 吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5 軟體分析



Temperature Step



☐ Incubator Off

☒ Incubator On

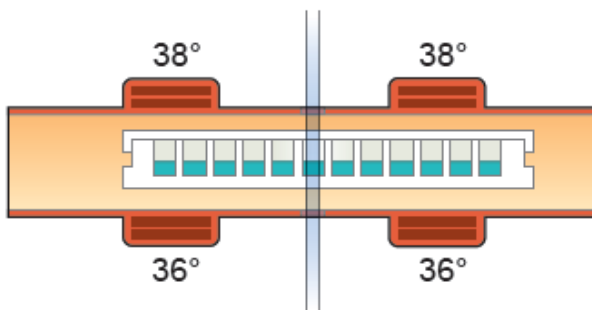
Temperature: °C Gradient: °C

☒ Preheat before continuing with next step

OK

Cancel

Help



Shake Step



Shake Mode:

Linear

Duration:

0:01

MM:SS

☐ Continuous Shake

Linear Frequency:

Slower

Faster

567 cpm (3 mm)

Orbital Speed:

☒ Slow

☐ Fast

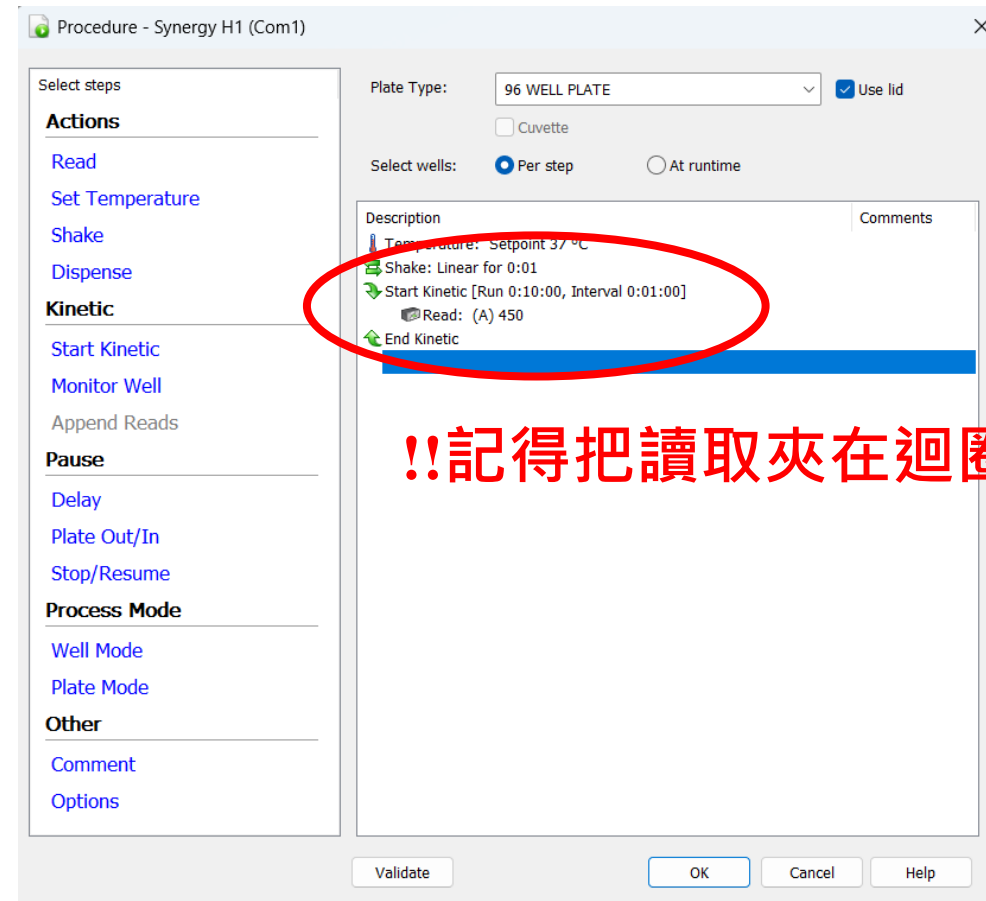
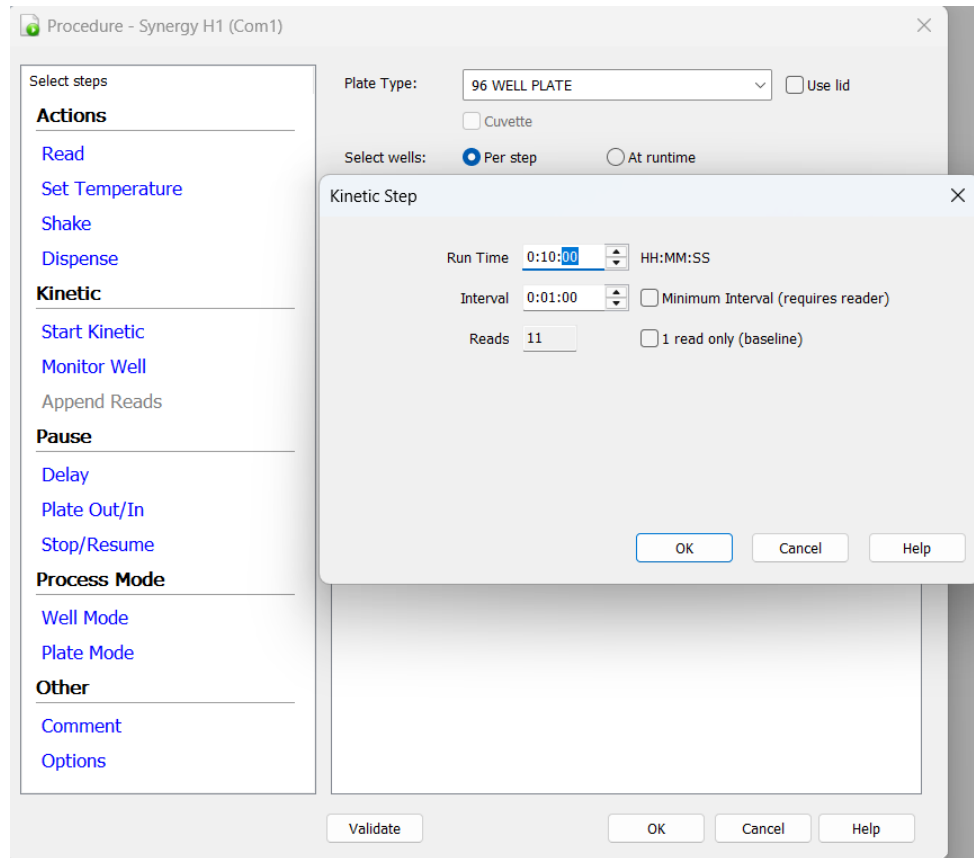
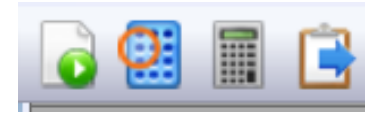
OK

Cancel

Help

Kinetic

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



步驟順序

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



Procedure - Synergy H1 (Com1)

Select steps

Actions

- Read
- Set Temperature
- Shake
- Dispense

Kinetic

- Start Kinetic
- Monitor Well
- Append Reads

Pause

- Delay
- Plate Out/In
- Stop/Resume

Process Mode

- Well Mode
- Plate Mode

Other

- Comment
- Options

Plate Type: 96 WELL PLATE ☒ Use lid
☐ Cuvette

Select wells: ☒ Per step ☐ At runtime

Description	Comments
Temperature: Setpoint 37 °C	
Shake: Linear for 0:01	
Start Kinetic [Run 0:10:00, Interval 0:01:00]	
Read: (A) 450	
End Kinetic	

Validate OK Cancel Help

依步驟順序排列

可檢視動作是否可執行

Plate Layout

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析

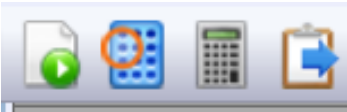


Plate Layout Wizard

Select well types

☐ Blanks
Used for background signal subtraction

☐ Assay Controls
Negative, Positive, Calibrators,... or serially diluted controls

Used for assay validation, cut-off analysis, normalization, or to generate reference curves (toxicology, curve comparison).

Number of different control types: 1

☐ Standard Curves
Required to generate standard curves and calculate unknown concentrations.

☐ Use multiple Standard Curves: 2

☒ Samples
Test wells requiring data analysis (calculation of concentration, EC50,...)

☐ Sample Controls
SPLC1 associated with Sample 1, SPLC2 associated with Sample 2,...
Can be used as individual sample blanks, spikes...

< 上一步(B)

下一步(N) >

取消

☐ Do not show wizard again

Plate Layout

Select a Well ID in the list on the left, then assign to the matrix.

Add...Delete

<Empty>

STD (x10)

50 (x2)

5 (x2)

0.5 (x2)

0.05 (x2)

0.005 (x2)

Sample

SPL1 (x2)

SPL2 (x2)

SPL3 (x2)

SPL4 (x2)

SPL5 (x2)

SPL6

	1	2	3	4	5	6	7	8	9	10	11	12
A	STD1 50	STD1 50	SPL1	SPL1								
B	STD2 5	STD2 5	SPL2	SPL2								
C	STD3 0.5	STD3 0.5	SPL3	SPL3								
D	STD4 0.05	STD4 0.05	SPL4	SPL4								
E	STD5 0.005	STD5 0.005	SPL5	SPL5								
F												
G												
H												

Serial Assignment

Replicates: 2

☐ Next Dil.

☒ Auto Select Next ID

Import

Export

Undo

Print

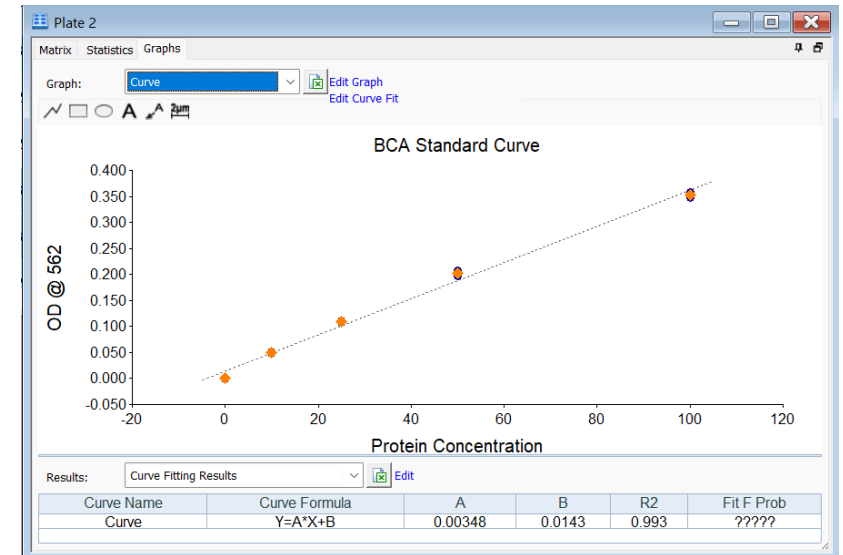
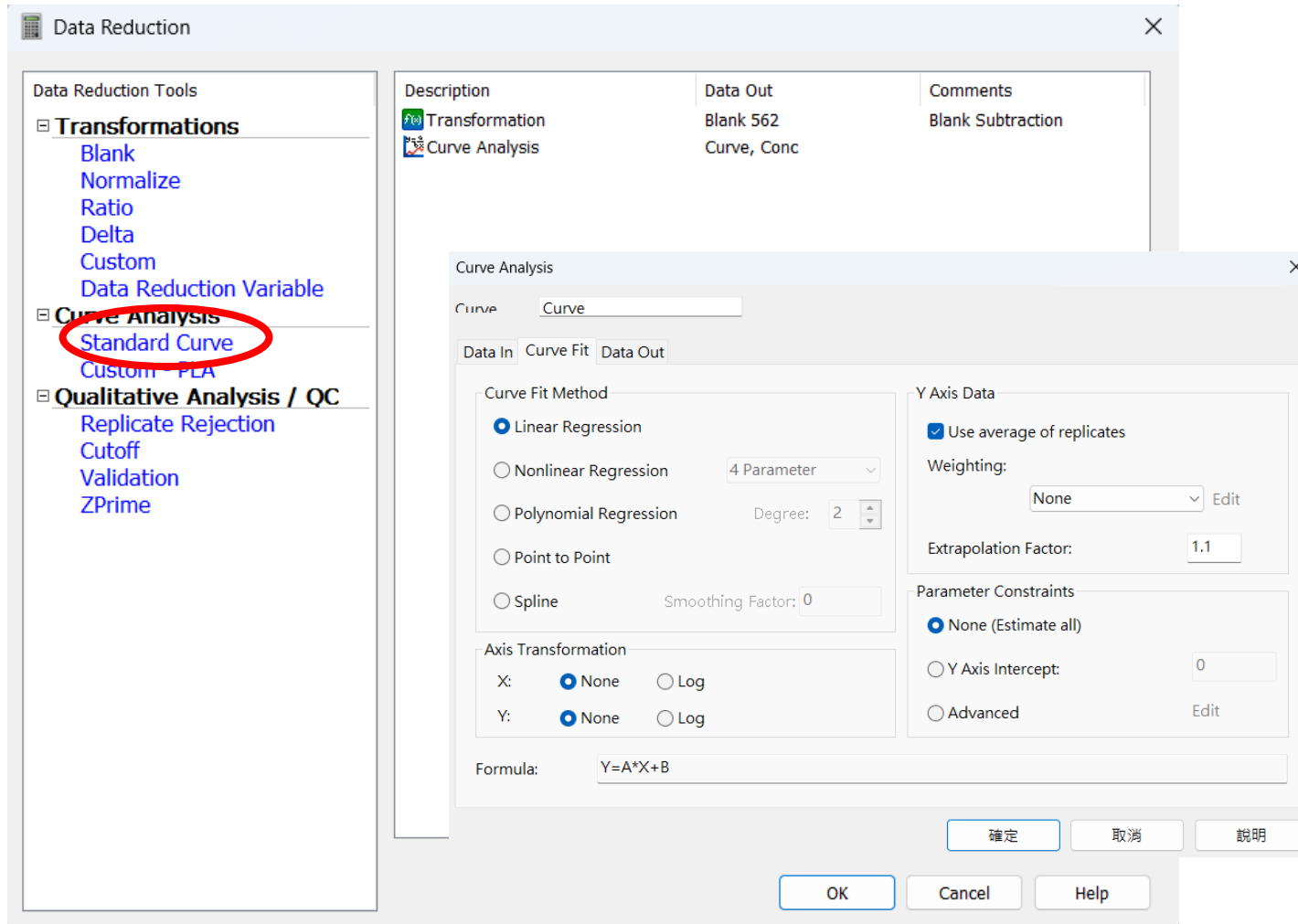
OK

Cancel

Help

Data Reduction

偵測方式: 吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5 軟體分析

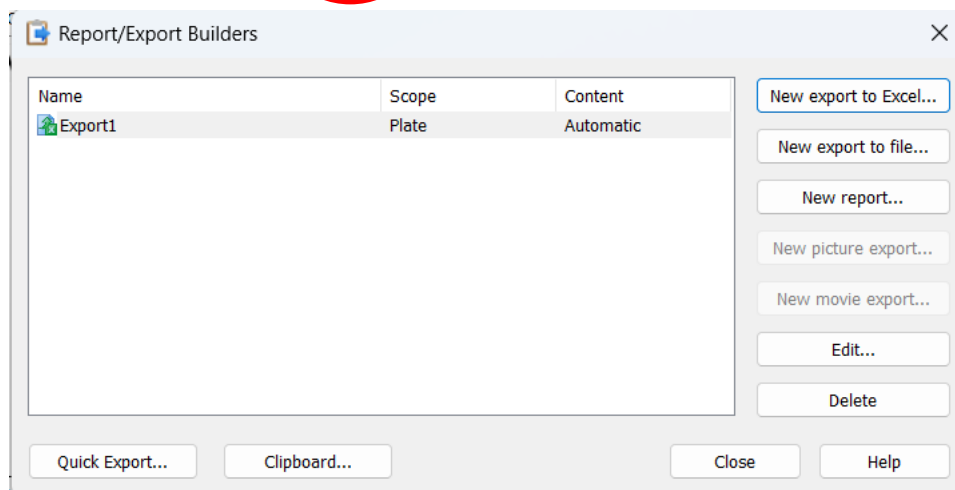


匯出報告

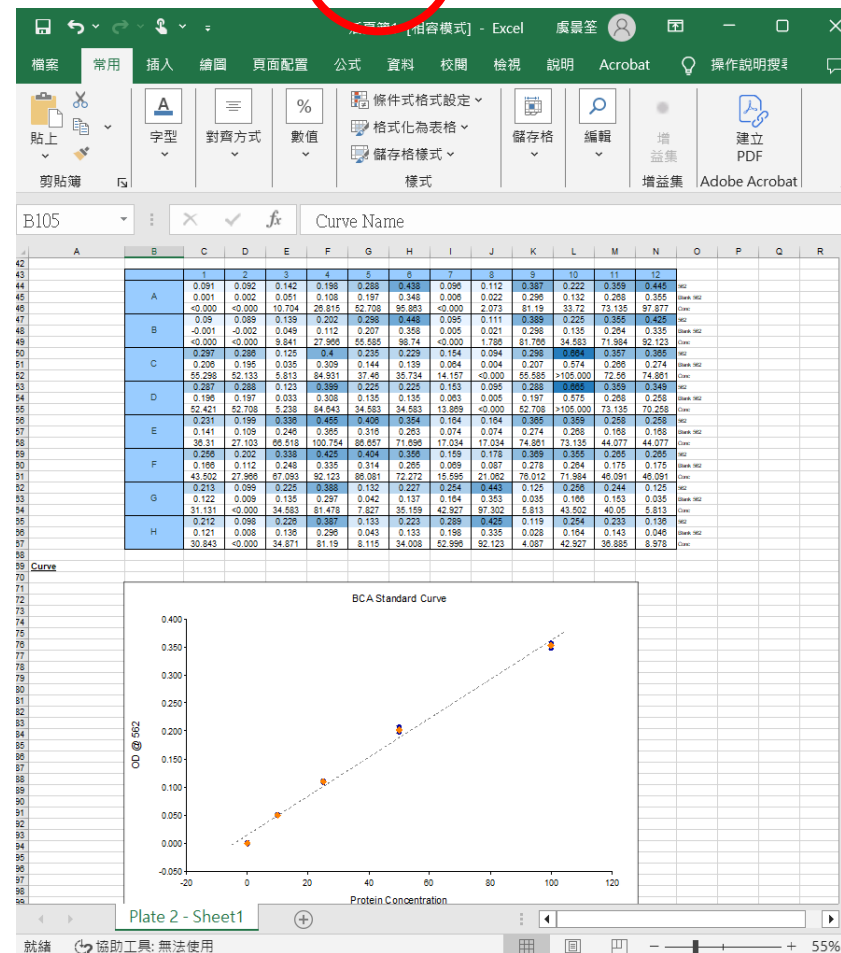
偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析



報告模板設定



匯出報告



注意事項提醒

偵測方式:吸收光、螢光、冷光 -----> 功能 -----> 應用 -----> Gen 5軟體分析

- 若有加蓋請務必勾選Use lid
- 若不慎卡盤，請將儀器**電源關閉**，再將盤子移出，勿直接在開機狀態下硬拉，以免毀損馬達
- 設定完Procedure請重複確認步驟順序是否正確，以免影響實驗。

感謝聆聽

The End



進階官網



FB粉絲團



進階生物科技
Level Biotechnology Inc.