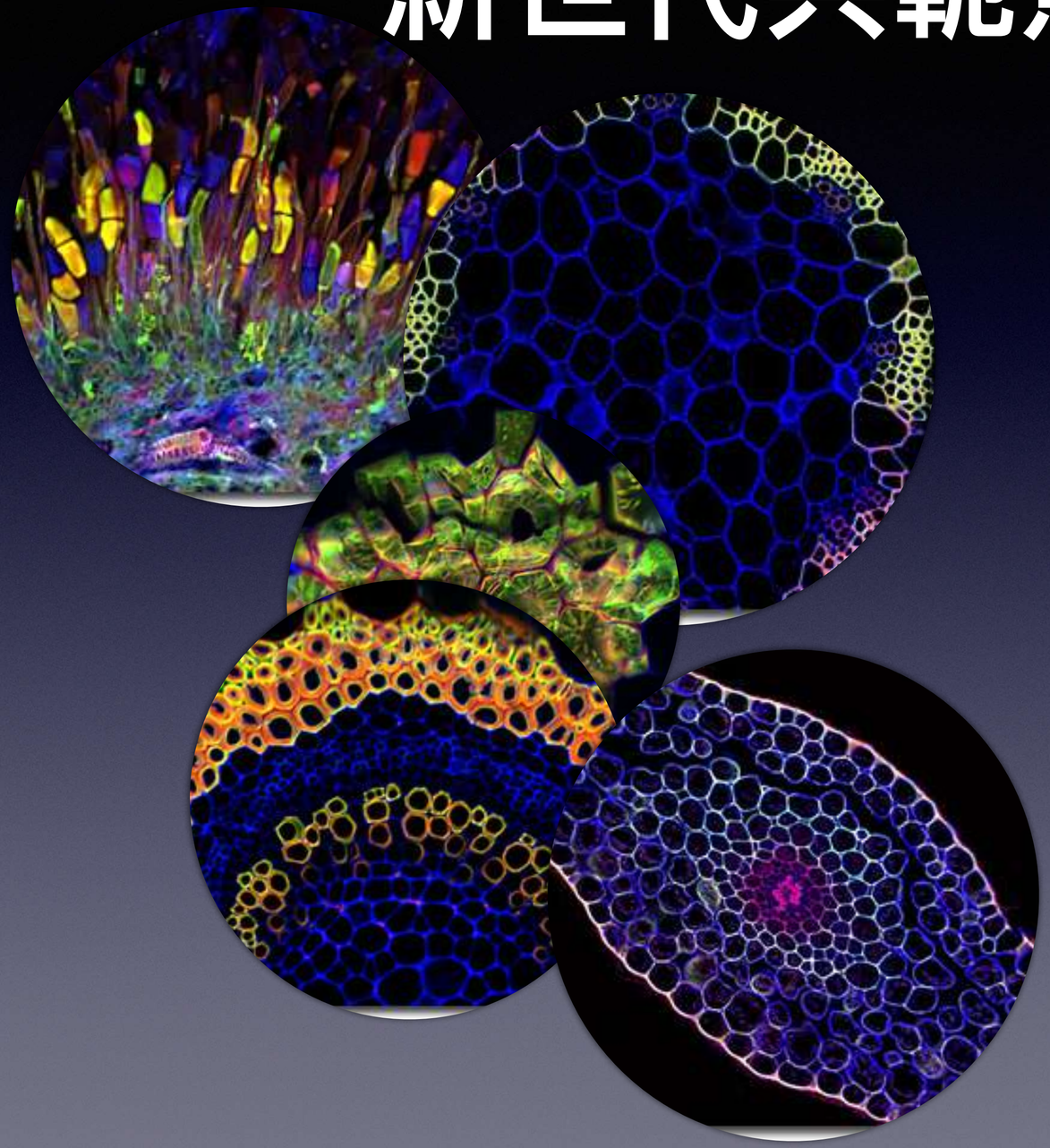
新世代共軛焦平台FV3000



大綱

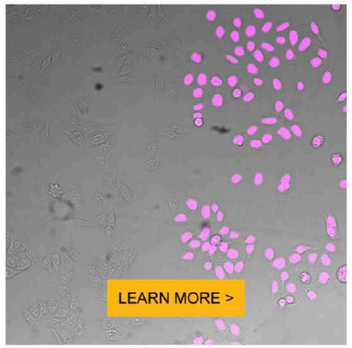
I.硬體規格

II.應用範例

III.影像分析-人工智慧模組

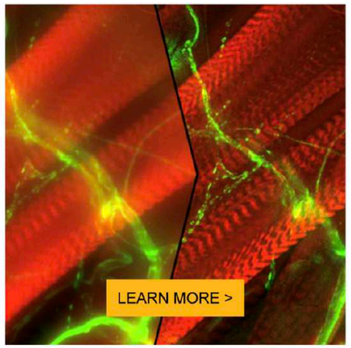
IV.總結

TRU AI



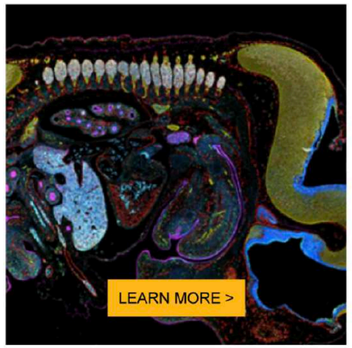
Accurate and Efficient Image Analysis based on Deep-Learning Technology

TRU SIGHT



Seamless Deconvolution for Clearer, Sharper Images

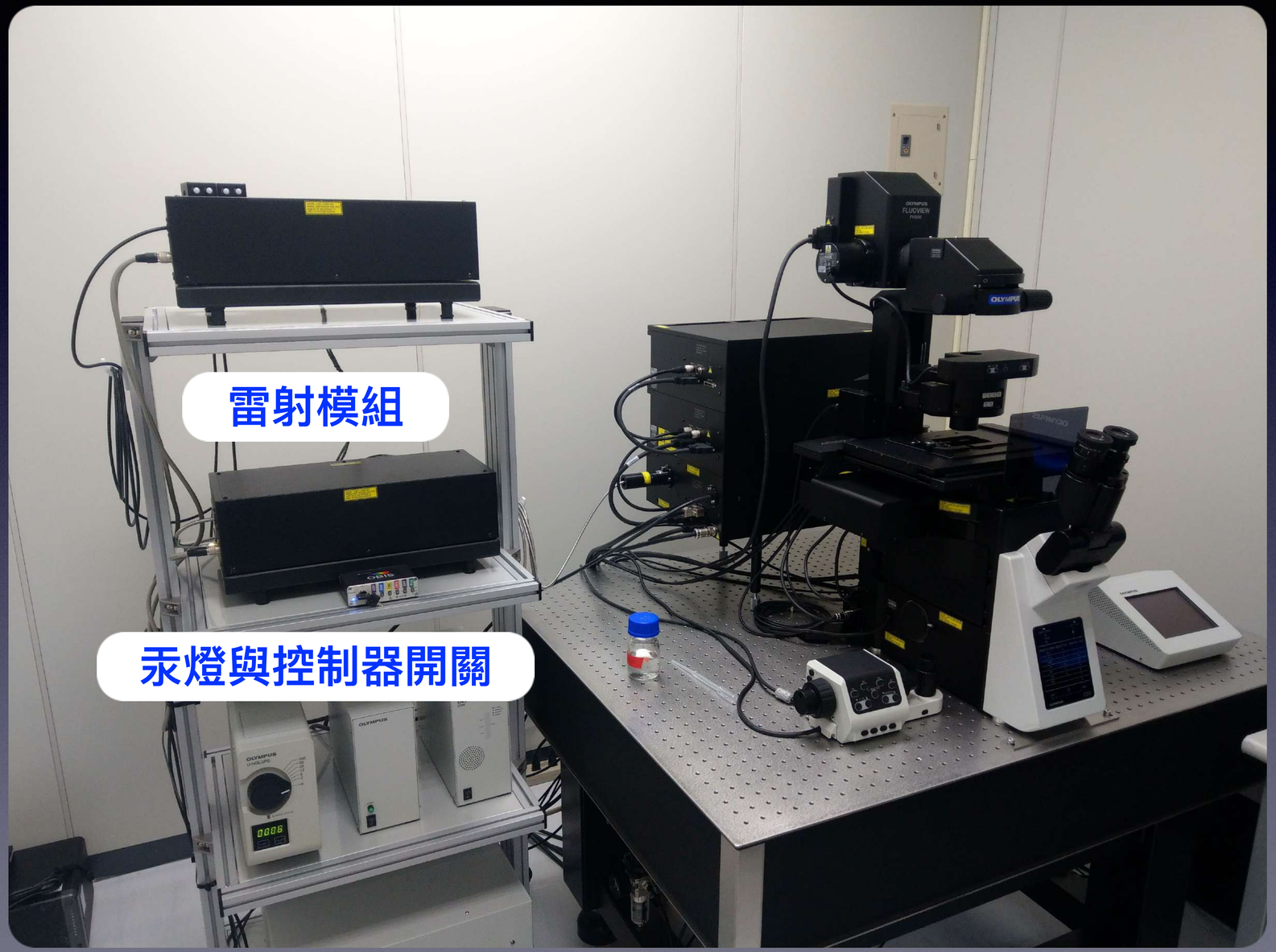
TRU SPECTRAL



High Light Efficiency for Bright, Precise Multi-colour Images

擺設

擺設



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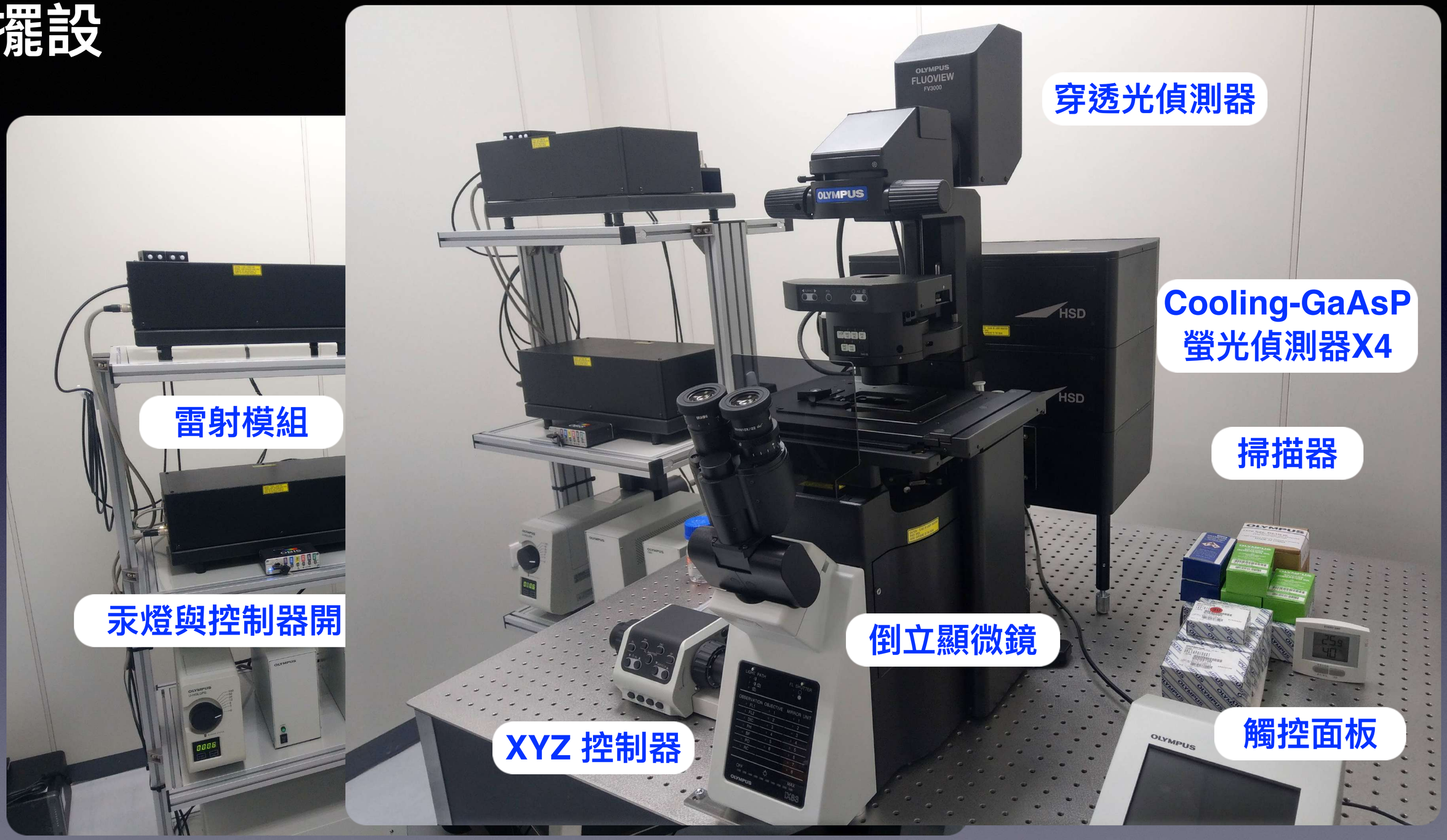
穿透光偵測器
Cooling-GaAsP
螢光偵測器X4
掃描器
雷射模組
汞燈與控制器開
倒立顯微鏡
XYZ 控制器
觸控面板
OLYMPUS
FLUOVIEW
FV3000
HSD
HSD

I.硬體規格-全電動倒立顯微鏡

XYZ 控制器

觸控面板

I.硬體規格-全電動倒立顯微鏡

觀察法：螢光, DIC(微分干涉差), 明視野

XYZ 控制器

觸控面板

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螢光濾片組：DAPI, GFP, RFP
CFP, YFP, mCherry

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螢光濾片組：DAPI, GFP, RFP
CFP, YFP, mCherry

DIC ：10X, 20X, 30X, 40X, 60X, 100X

XYZ 控制器

觸控面板

I.硬體規格-高解析物鏡組

	倍率	應用	備註
空氣鏡	1.25X 10X 20X	超廣視野或拼圖	勿沾到**水或油**
水鏡	40X 60X	一般共軛焦影像擷取	
油鏡	100X	高N.A. 適合超解析影像	請用**玻璃容器**
矽油鏡	30X 40X 60X 100X	針對較厚組織或是 活細胞長時間實驗	請用**少量即可**

I.硬體規格-超廣視野拼圖

小鼠腦切片
(兩張拼圖)

I.硬體規格-超廣視野拼圖

APO 1.25X

小鼠腦切片
(兩張拼圖)

I.硬體規格-超廣視野拼圖

APO 1.25X

小鼠腦切片
(兩張拼圖)

I.硬體規格-矽油鏡組

	W.D. (mm)	MAG.	OFN*	NA	Applications
UPLSAPO100XS	0.2	100X	22	1.35	High-resolution for subcellular imaging
UPLSAPO60XS2	0.3	60X	22	1.30	High-resolution and long-term time-lapse imaging of single cells
UPLSAPO40XS	0.3	40X	22	1.25	Multiple cell imaging with submicron resolution
UPLSAPO30XS	0.8	30X	22	1.05	Deeper tissue imaging with a wider field of view

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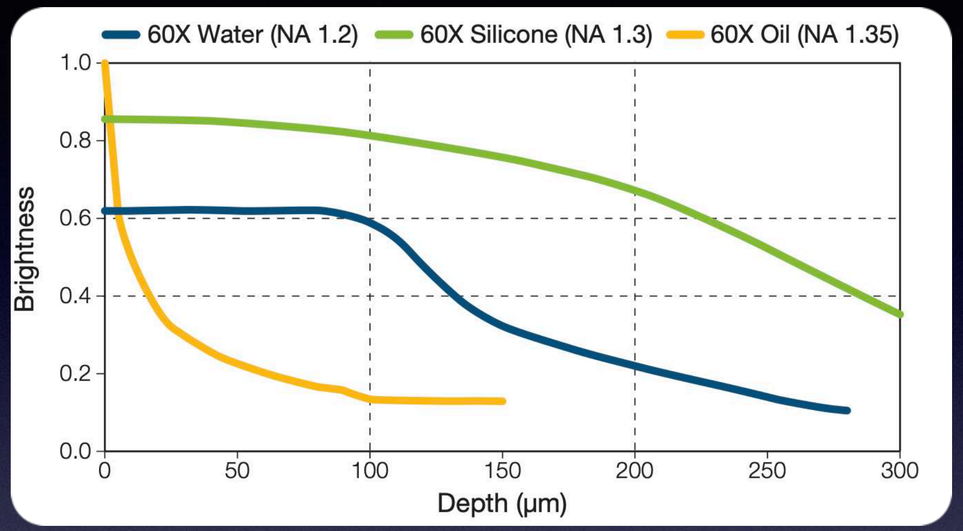

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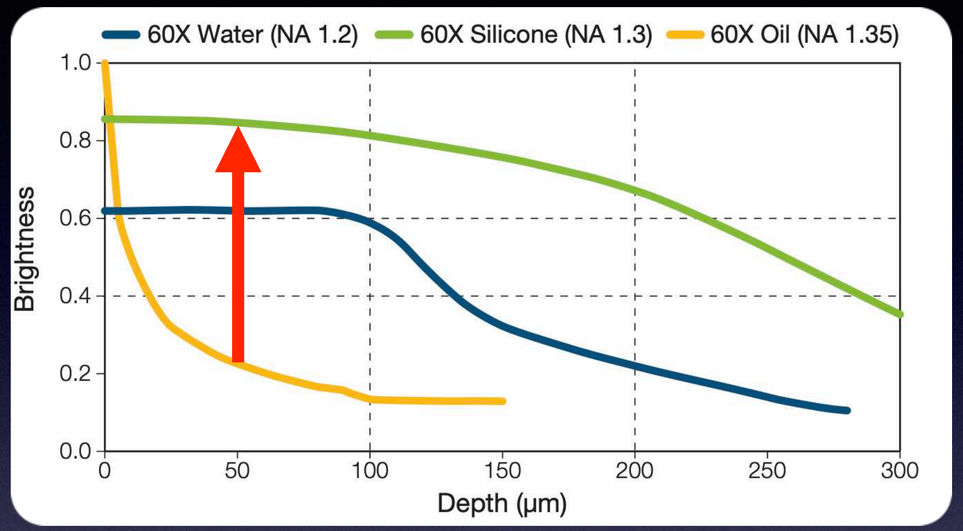

亮度為一般油鏡4倍以上!

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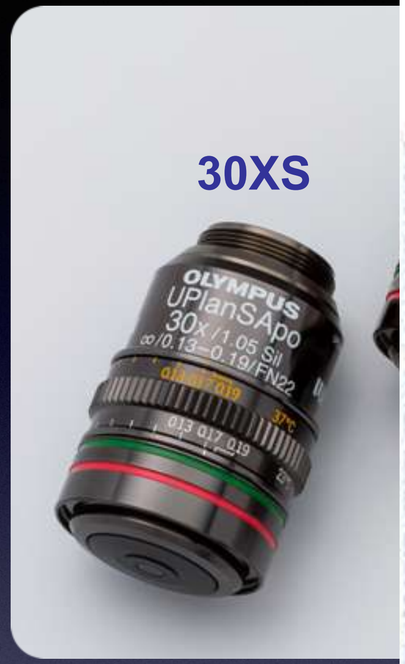
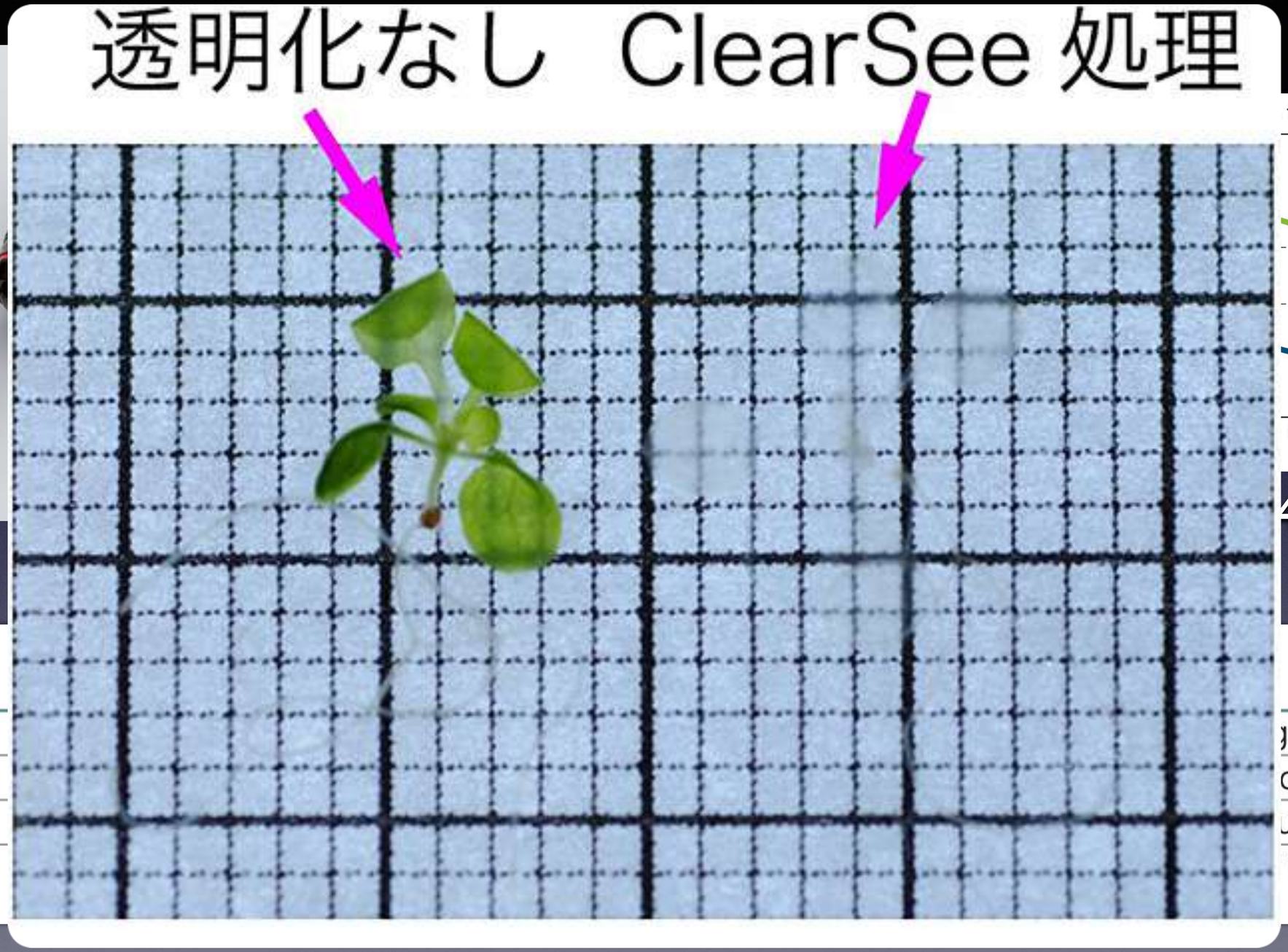
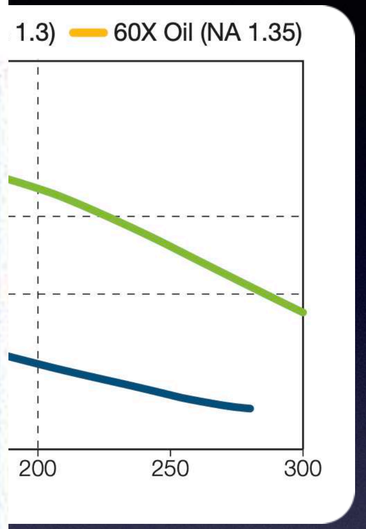


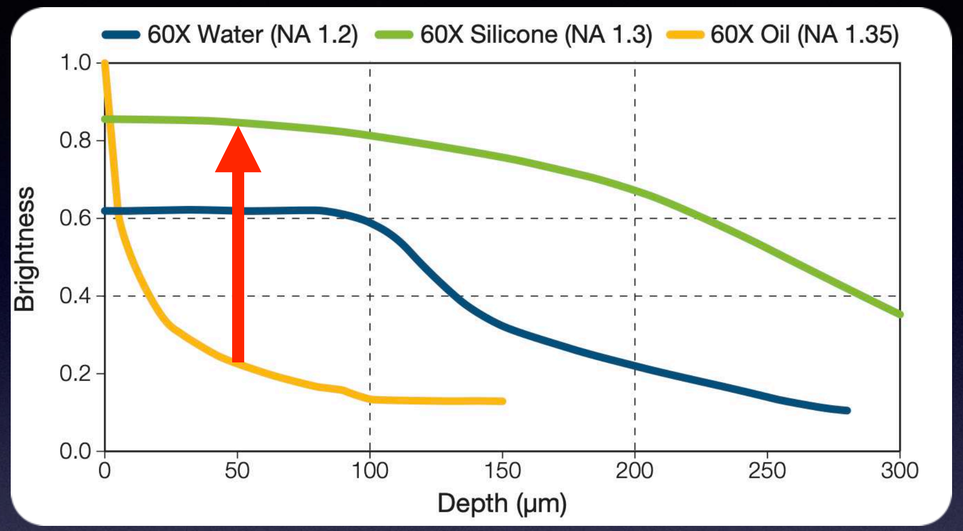




4倍以上!

UPLSAPO100XS	g
UPLSAPO60XS2	of single cells
UPLSAPO40XS	ution
UPLSAPO30XS	view

I.硬體規格-矽油鏡組



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I.硬體規格-激發雷射組

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Coherent OBIS series

I.硬體規格-激發雷射組

Coherent OBIS series

超長壽命: **20,000** hrs

I.硬體規格-激發雷射組

Coherent OBIS series

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高品質 & 穩定性

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高品質 & 穩定性

每支雷射均有獨立開關

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405nm DPAI, hoechst

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445nm ECFP, Lucifer Yellow

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514nm EYFP, Alexa514

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488nm FITC, EGFP

514nm EYFP, Alexa514

561nm TRITC, DsRed

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405nm DPAI, hoechst

445nm ECFP, Lucifer Yellow

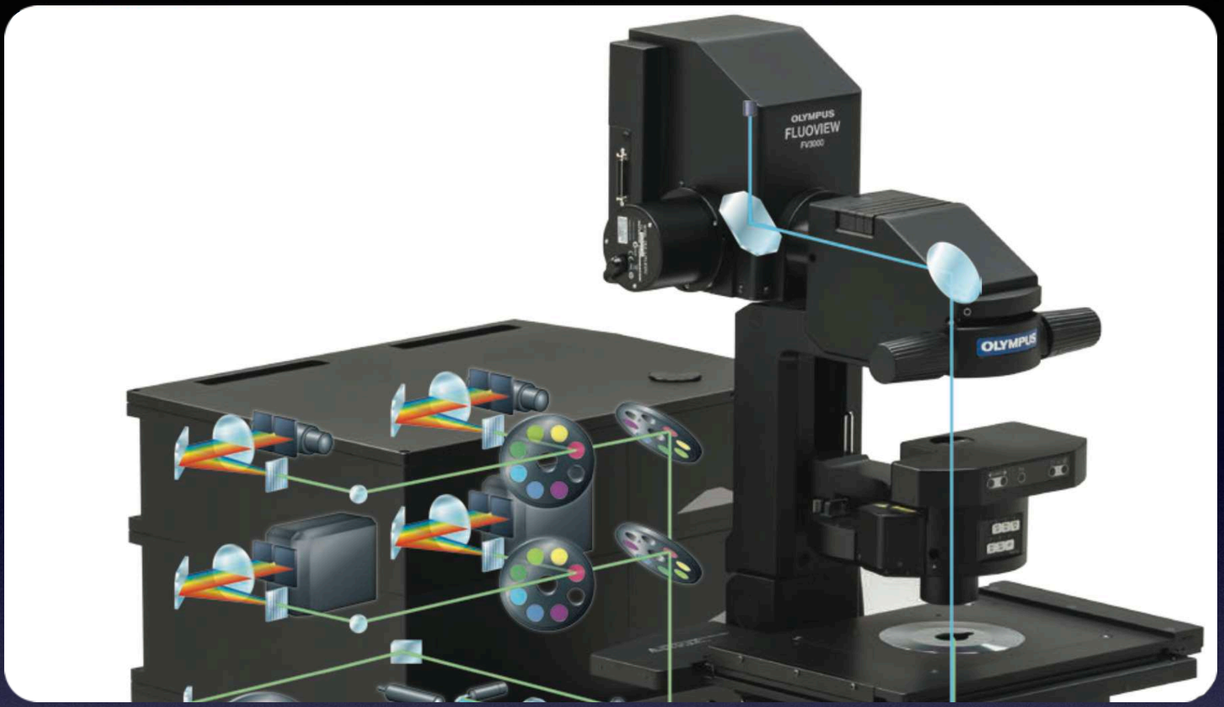
488nm FITC, EGFP

514nm EYFP, Alexa514

561nm TRITC, DsRed

640nm Alexa640, Cy5

I.硬體規格-掃描器與高靈敏偵測器



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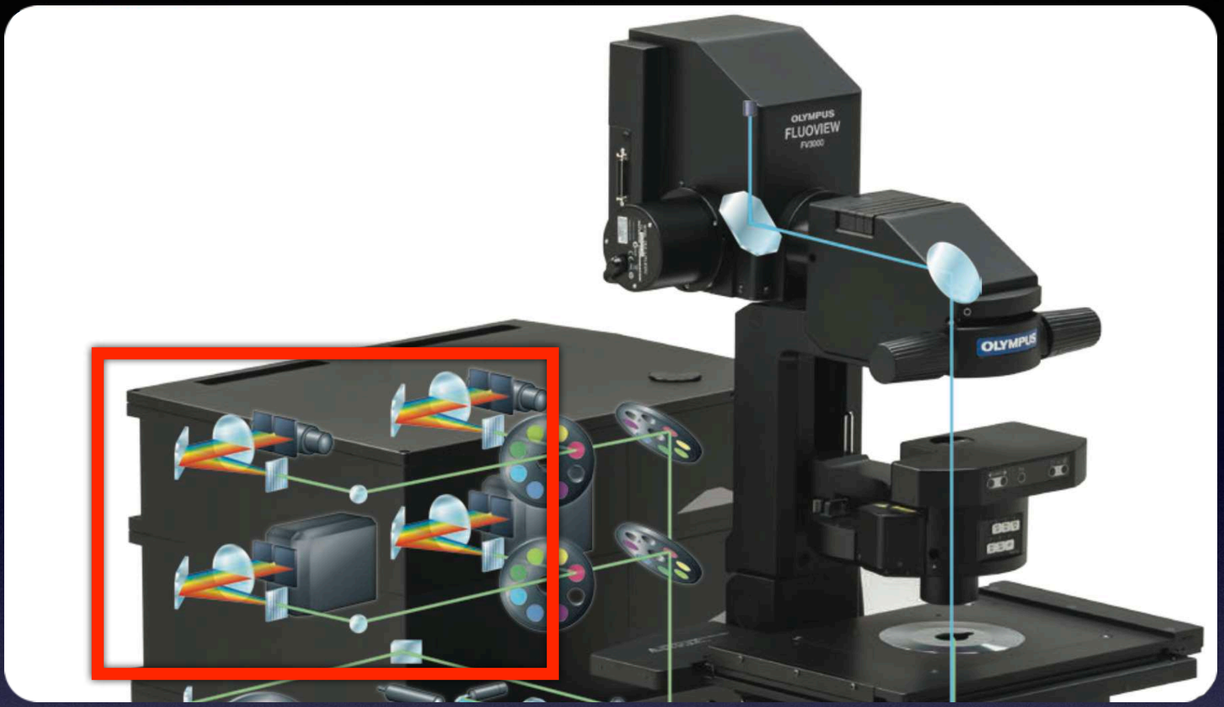

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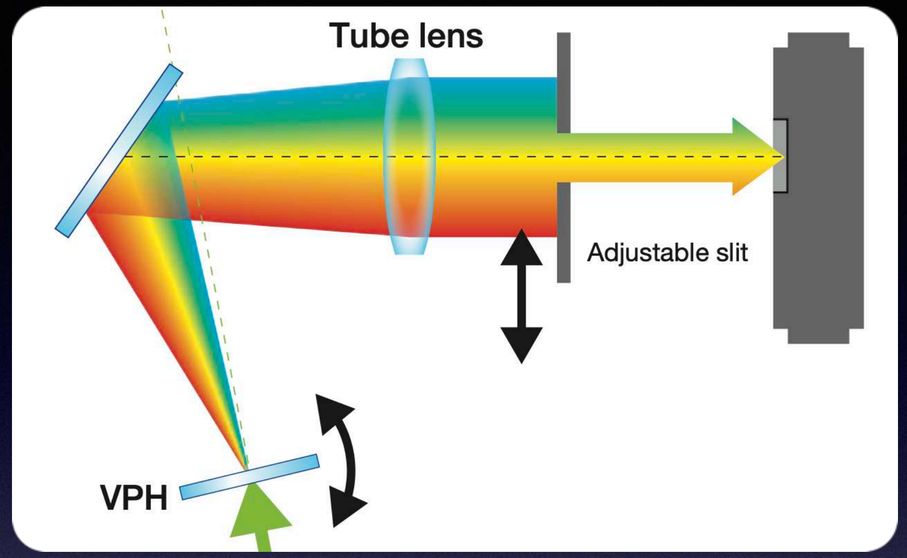

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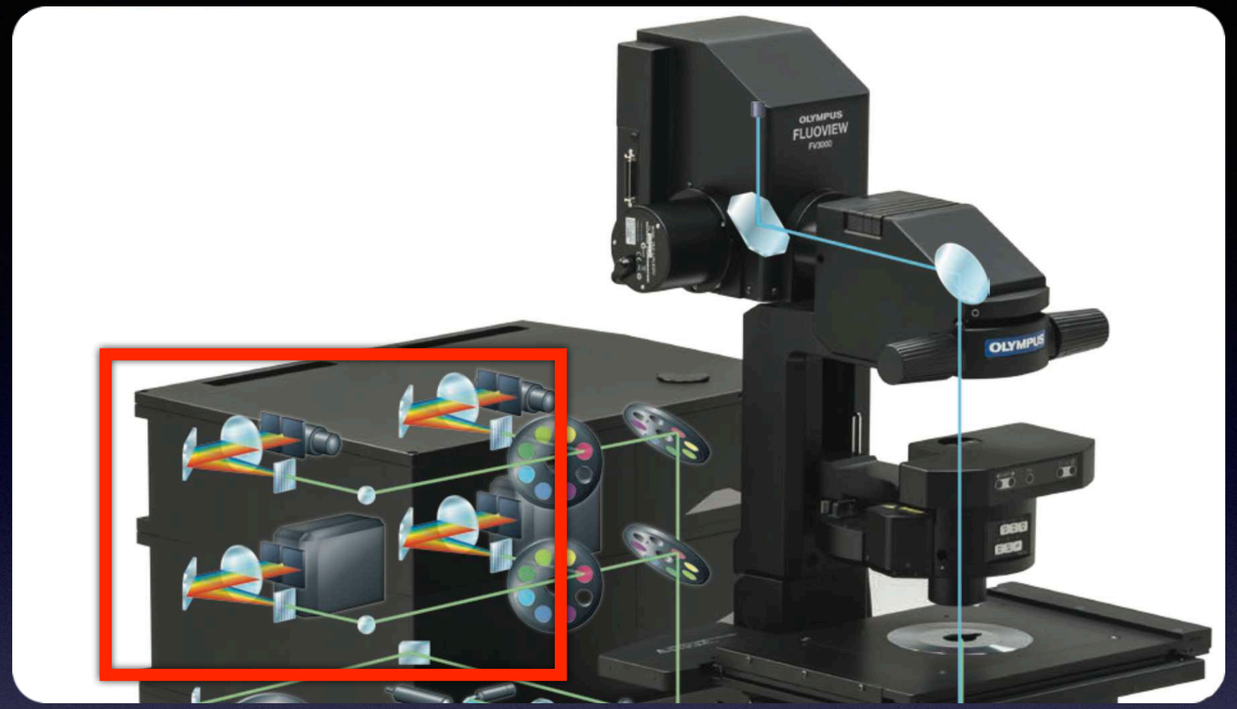

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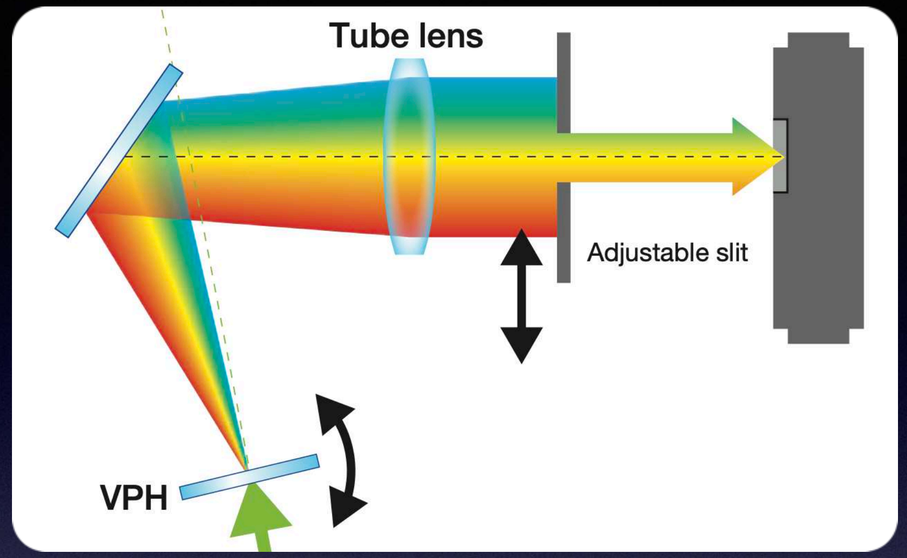

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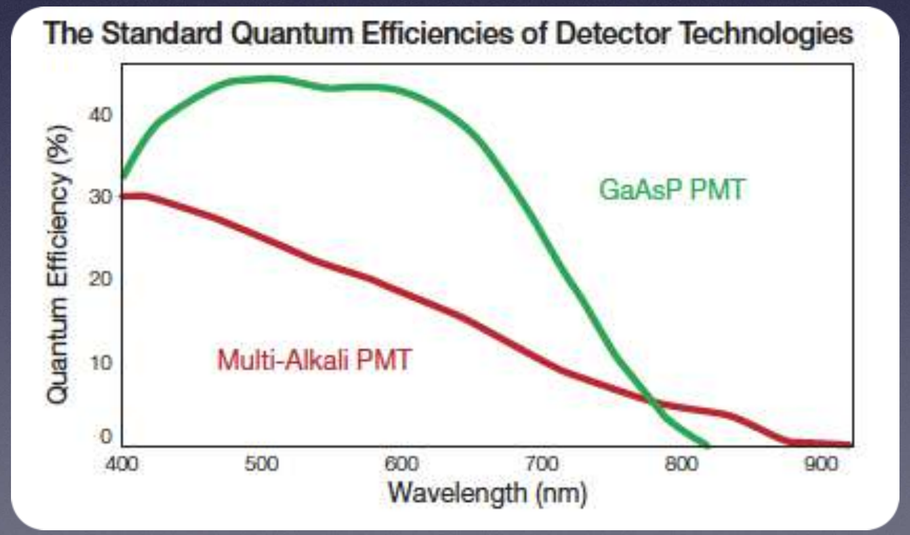
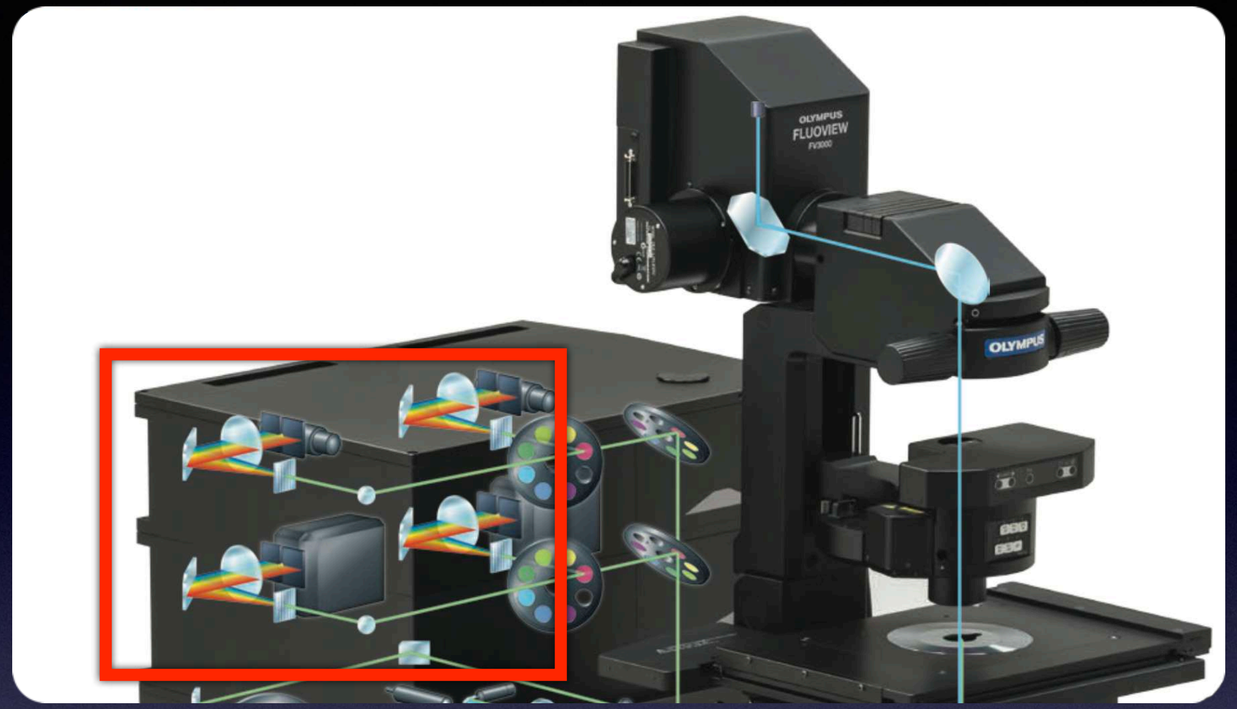


高靈敏度,收光效率更高



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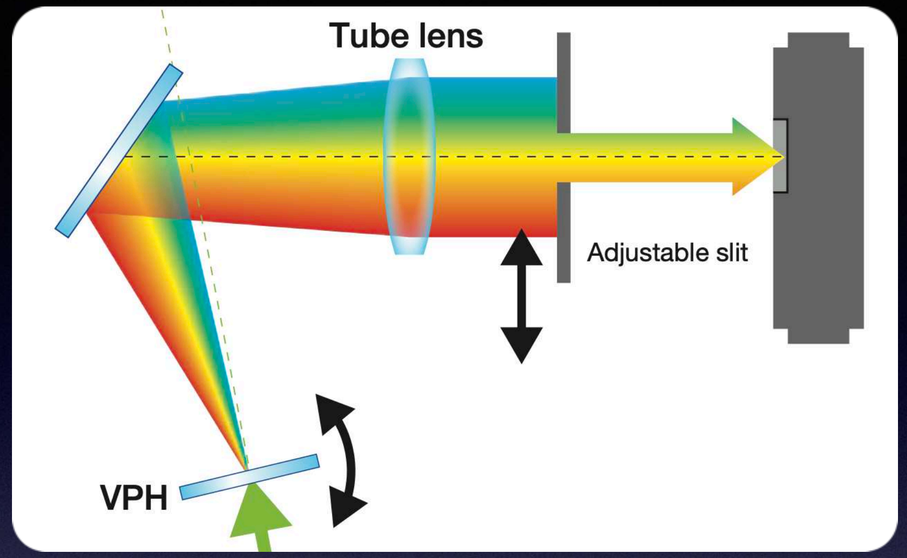

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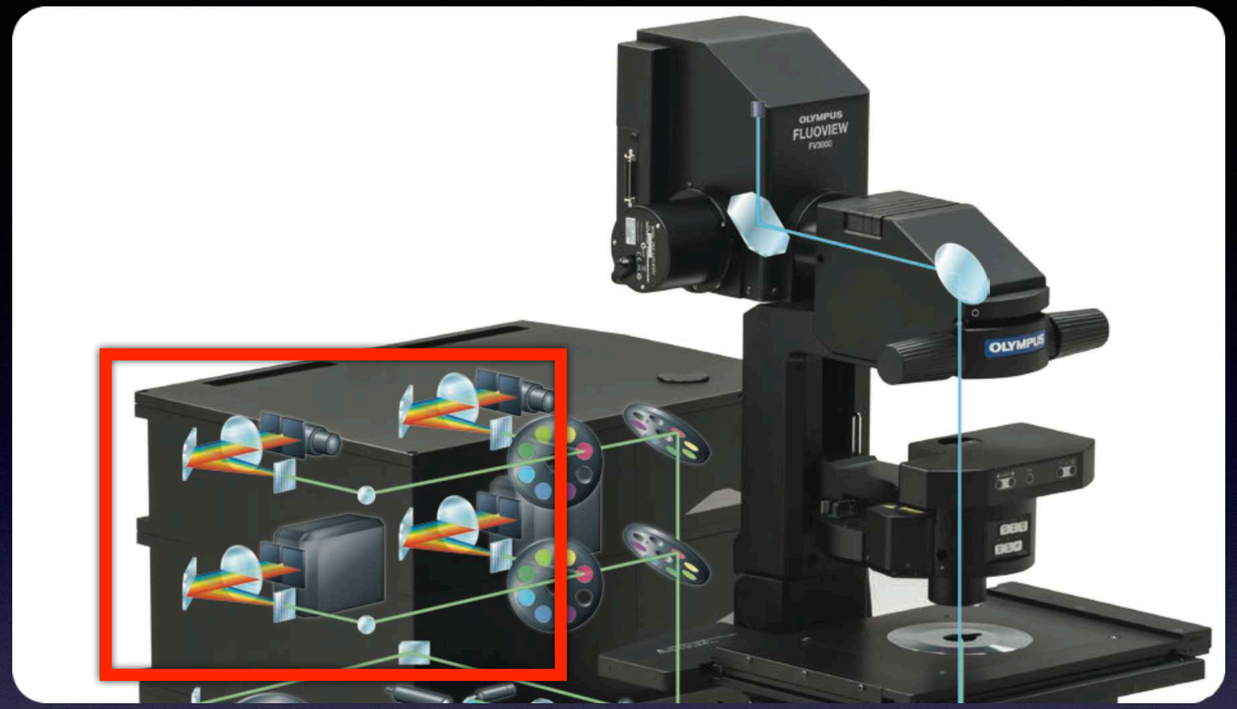

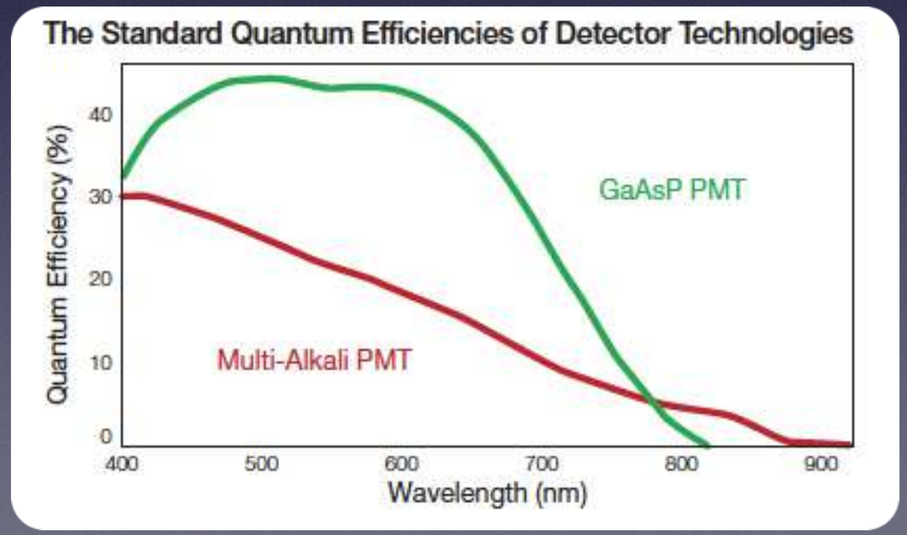

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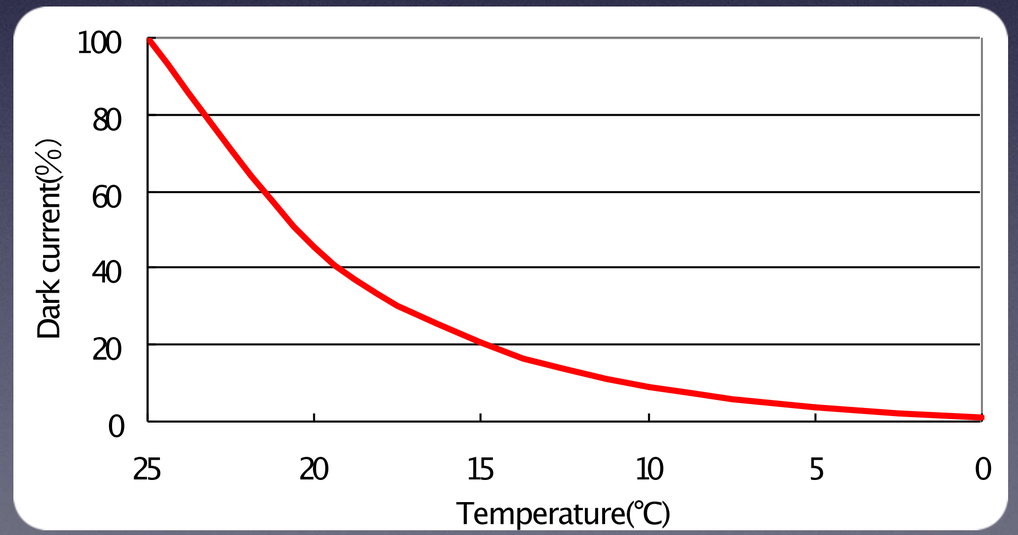
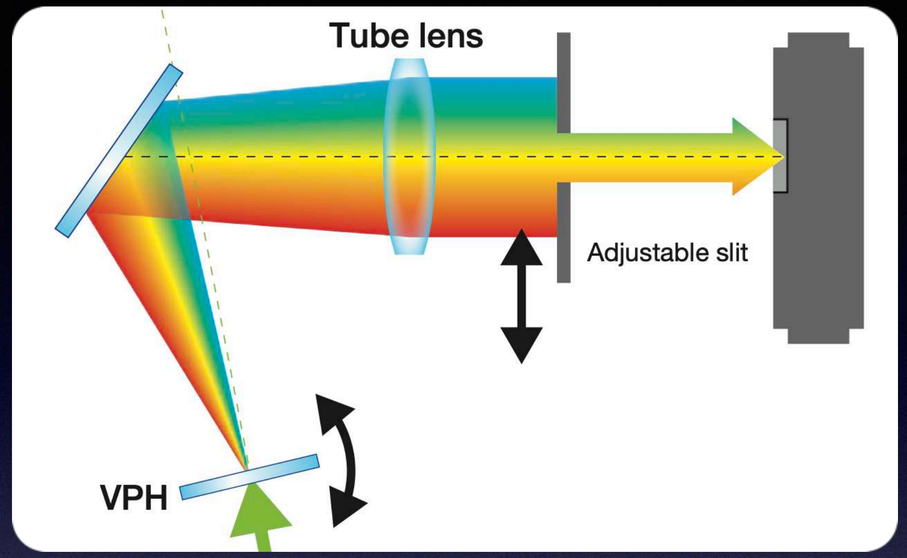


獨家冷卻裝置,降低雜訊

I.硬體規格-掃描器與高靈敏偵測器



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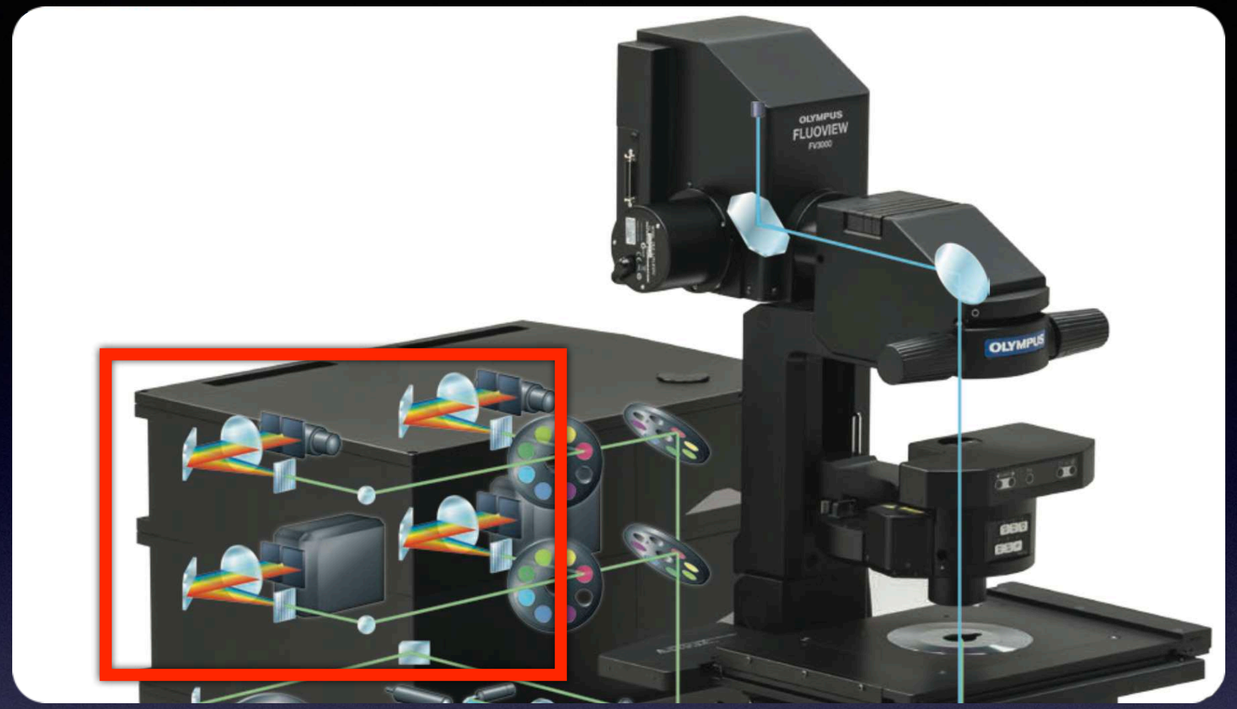

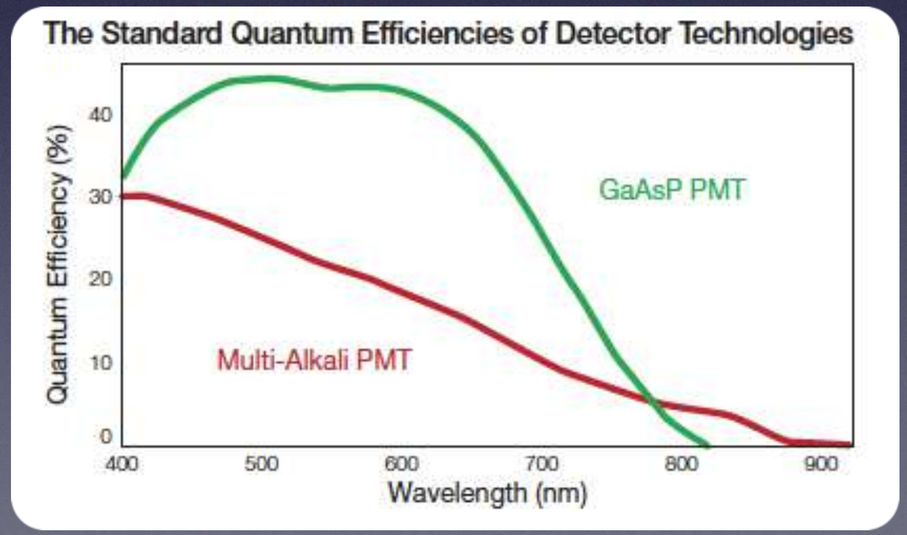

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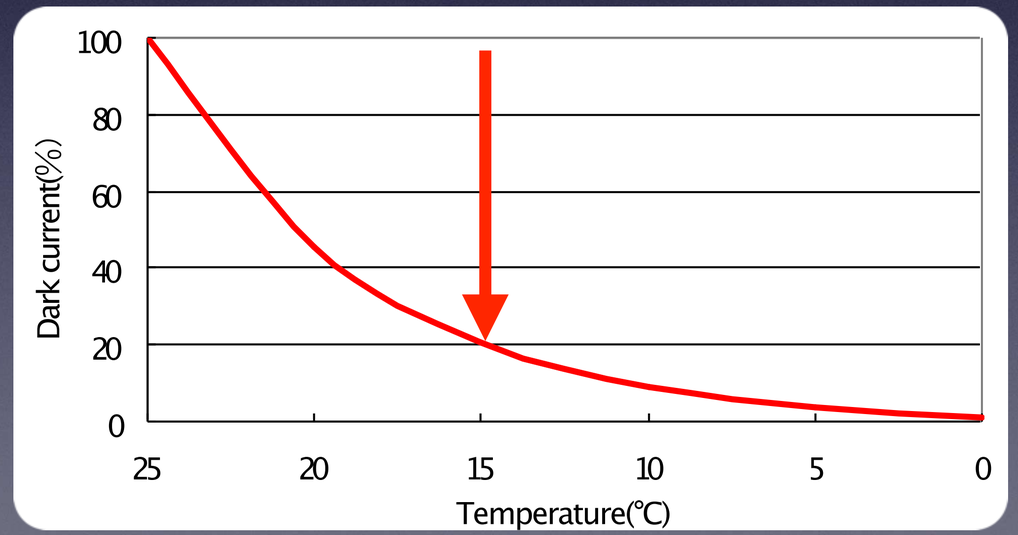

獨家冷卻裝置,降低雜訊

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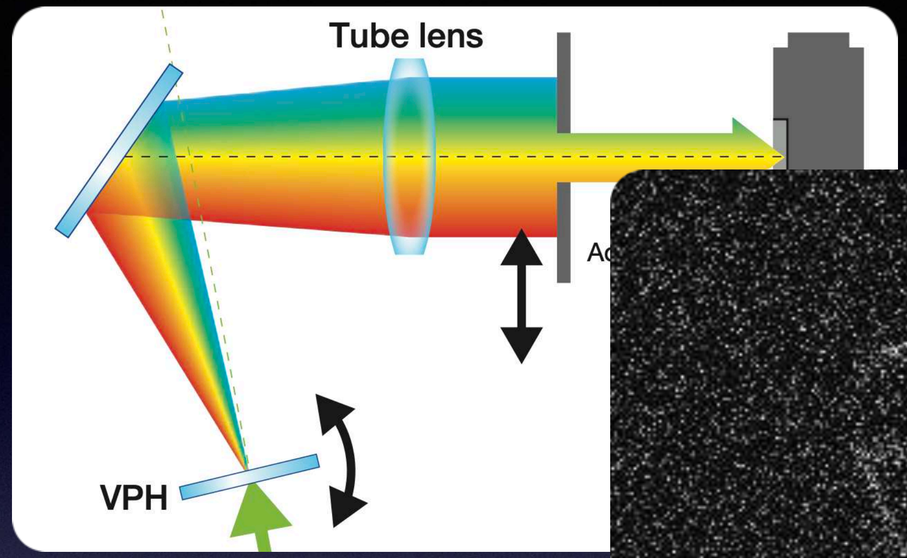

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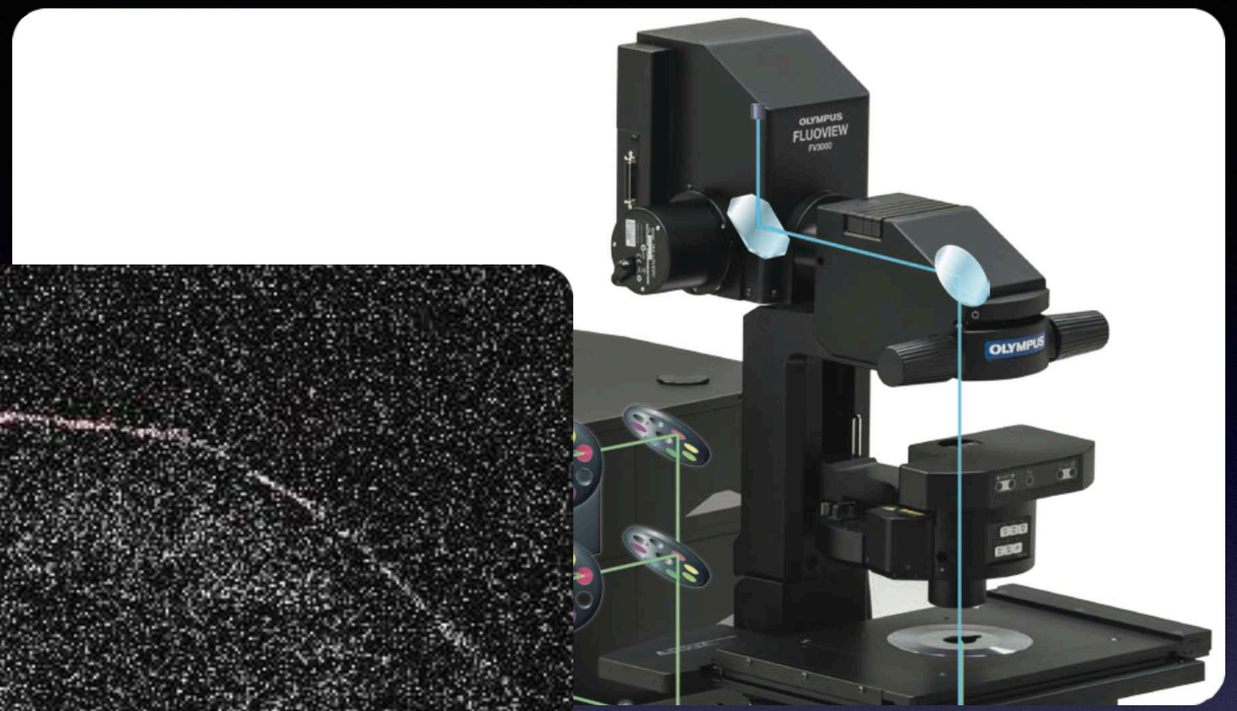

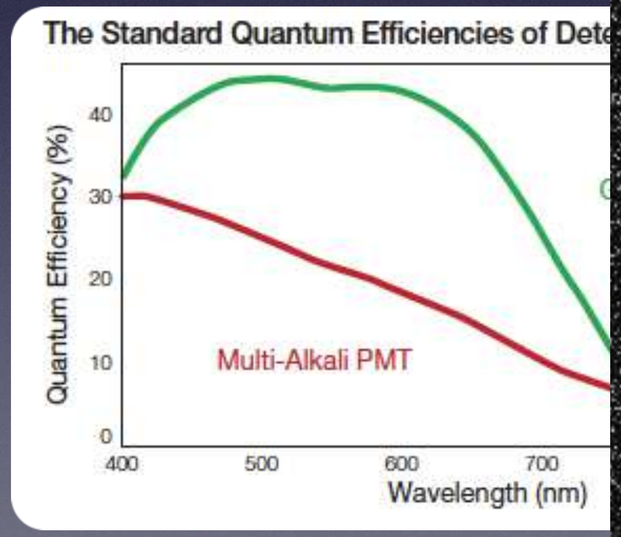

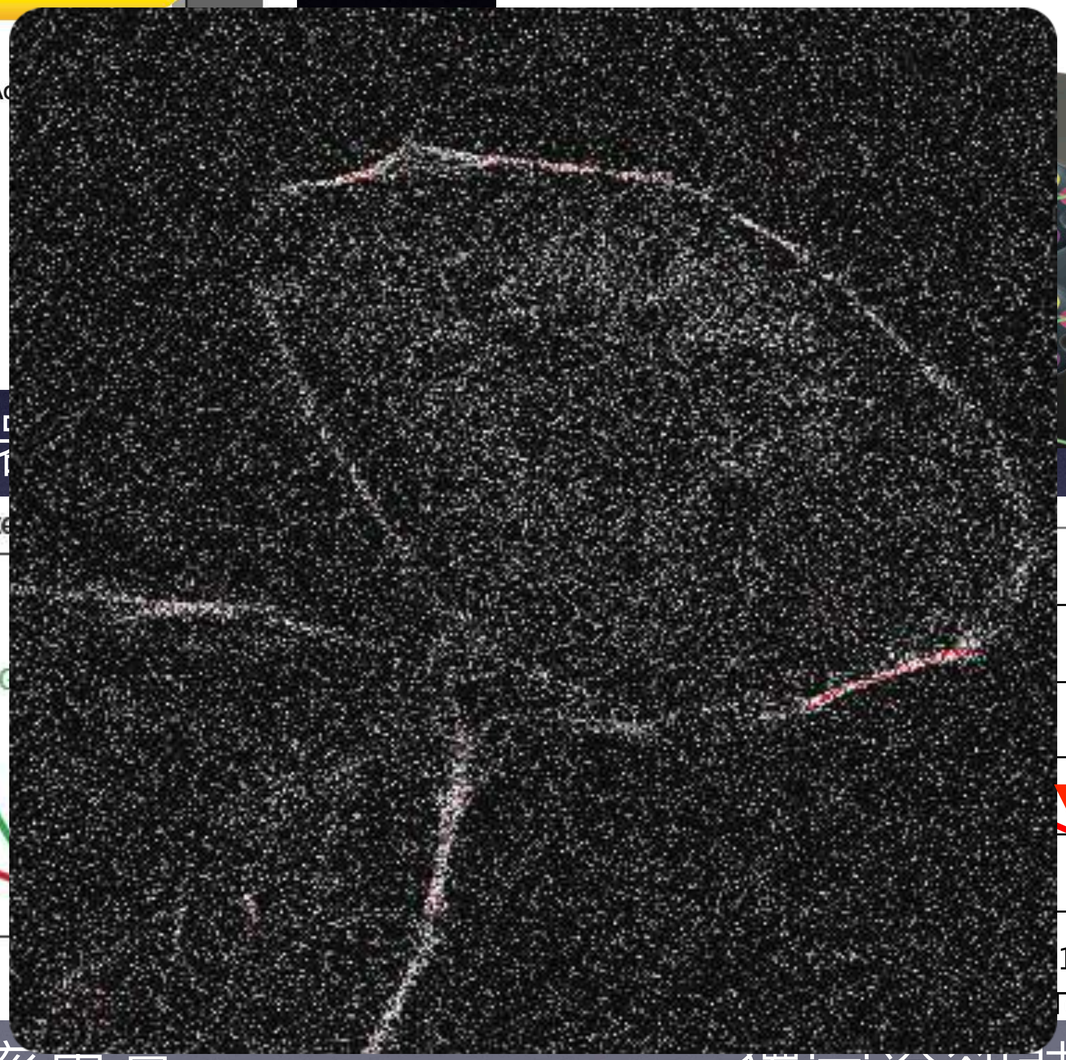

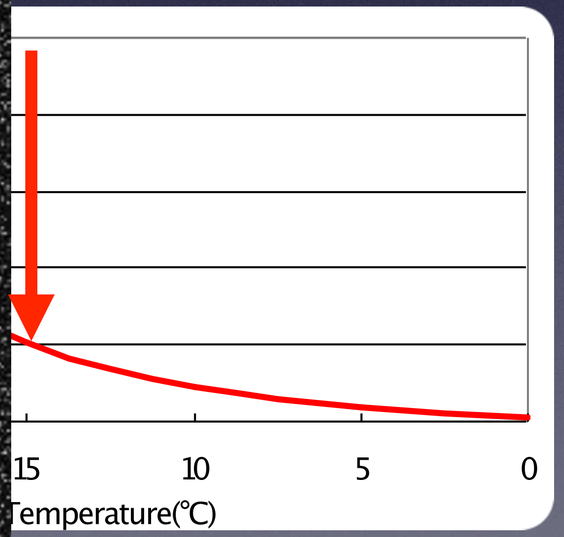

高靈敏度,收光效率更高

獨家冷卻裝置,降低雜訊

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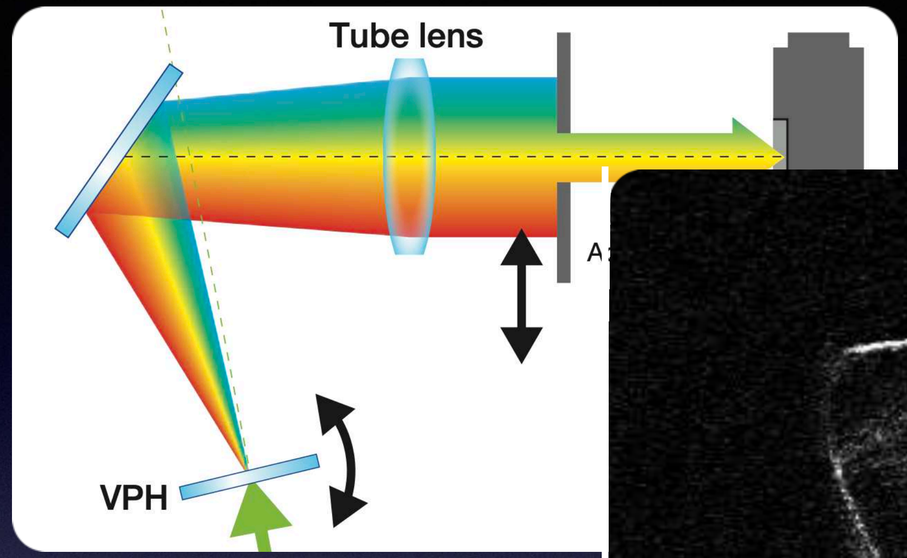
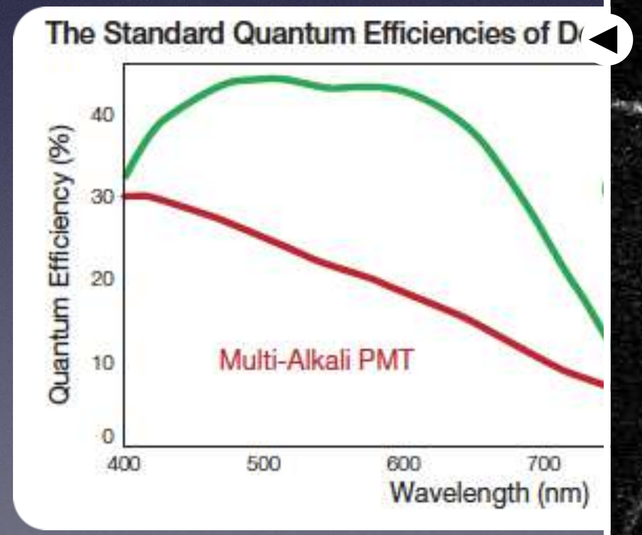
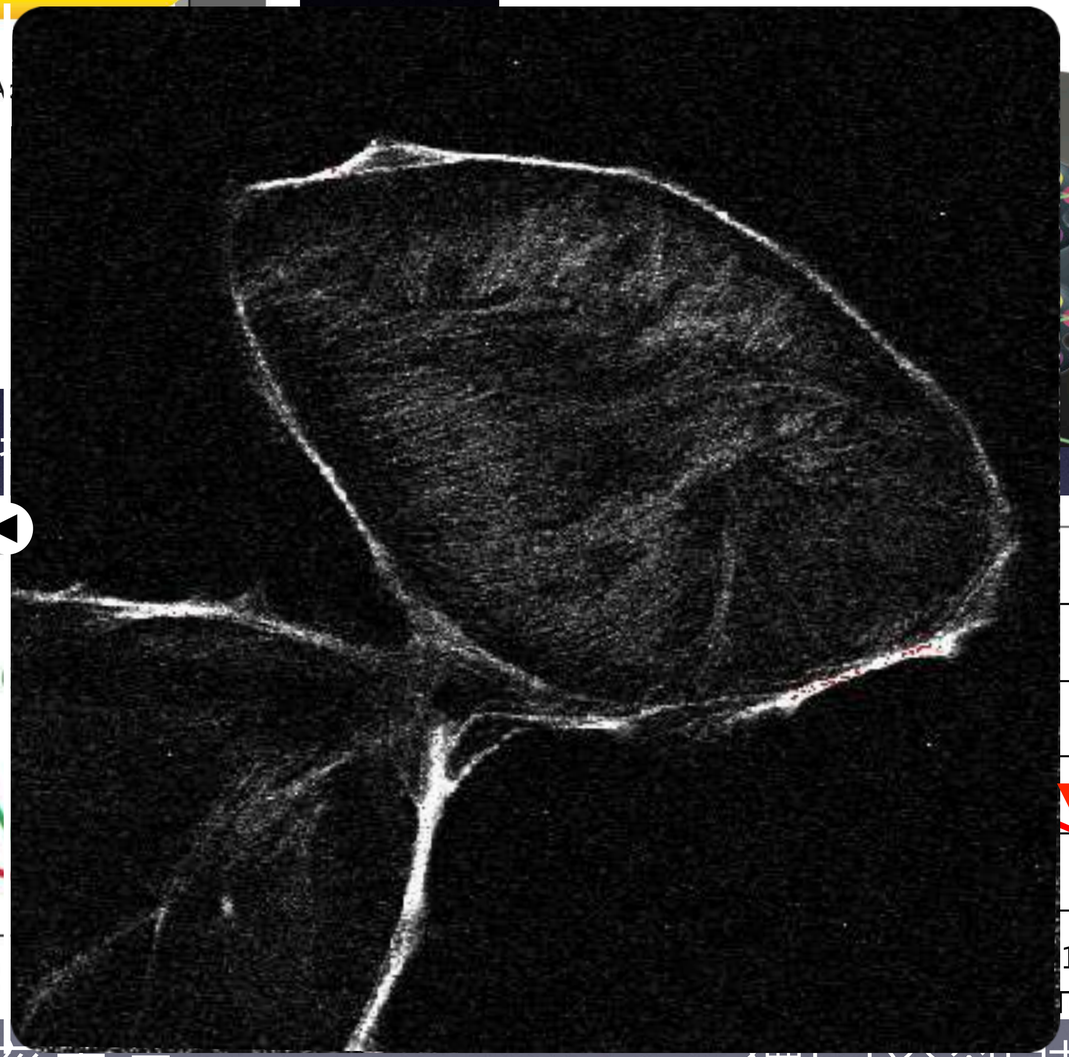
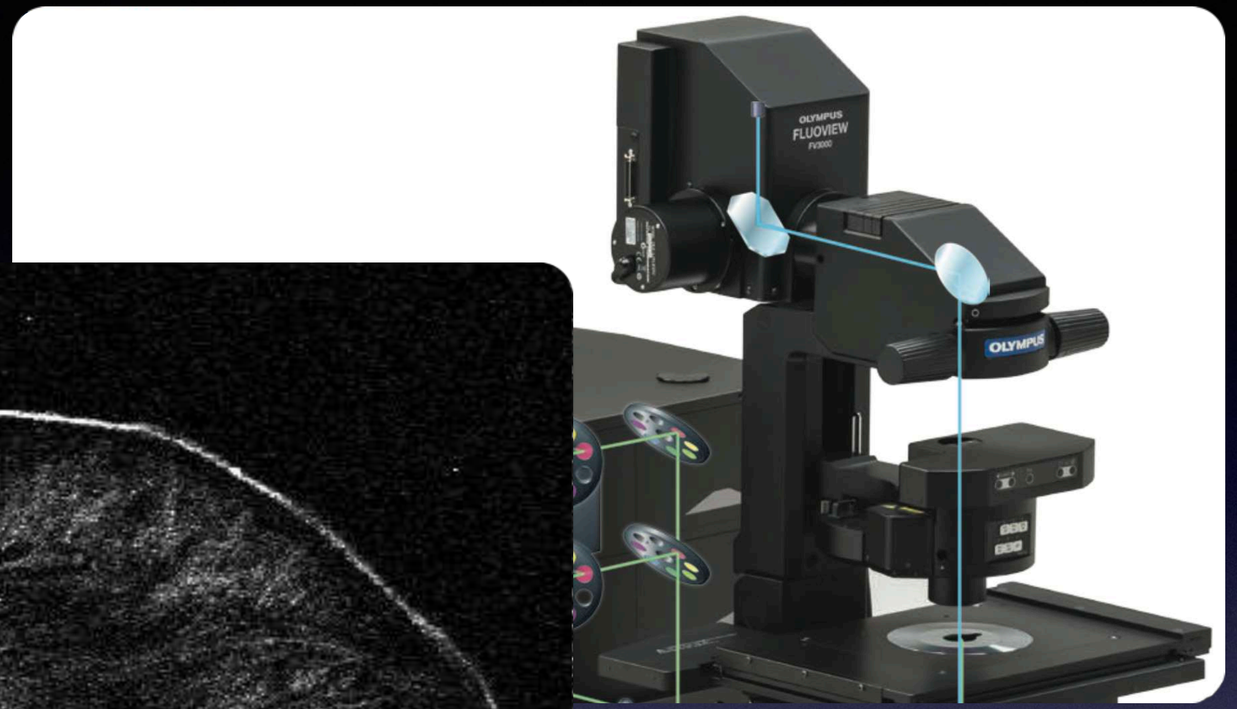


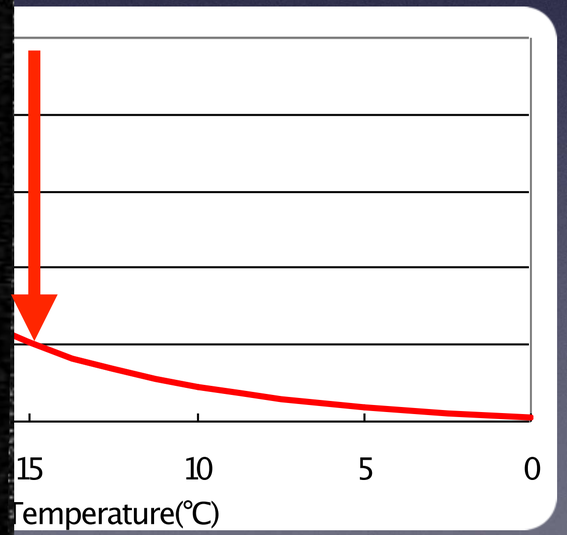
光譜式偵測



高靈敏度,收光效率更高







獨家冷卻裝置,降低雜訊

I.硬體規格-掃描器與高靈敏偵測器

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掃描尺寸：point to 4096 x 4096

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掃描速度：16 fps

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光學放大倍率：1 ~ 50x

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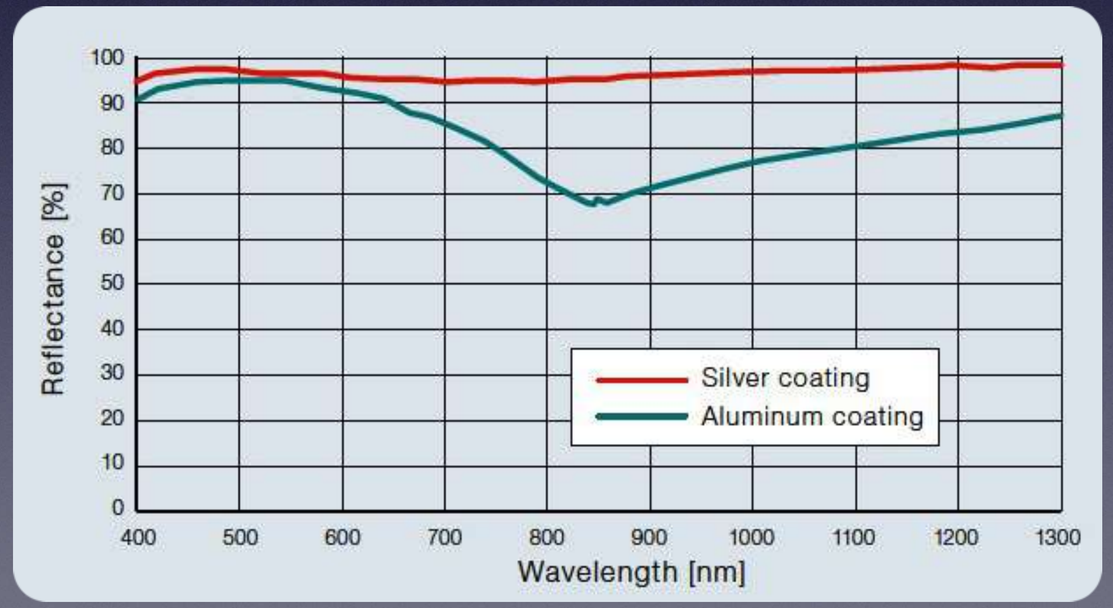

鍍銀式掃描器 擁有更高反射效率

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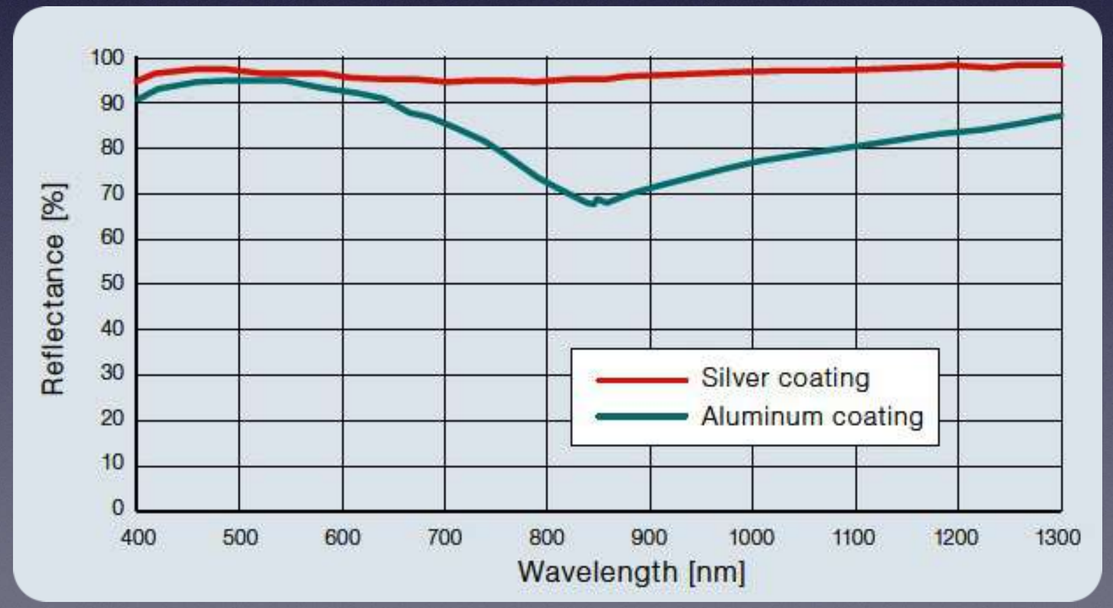

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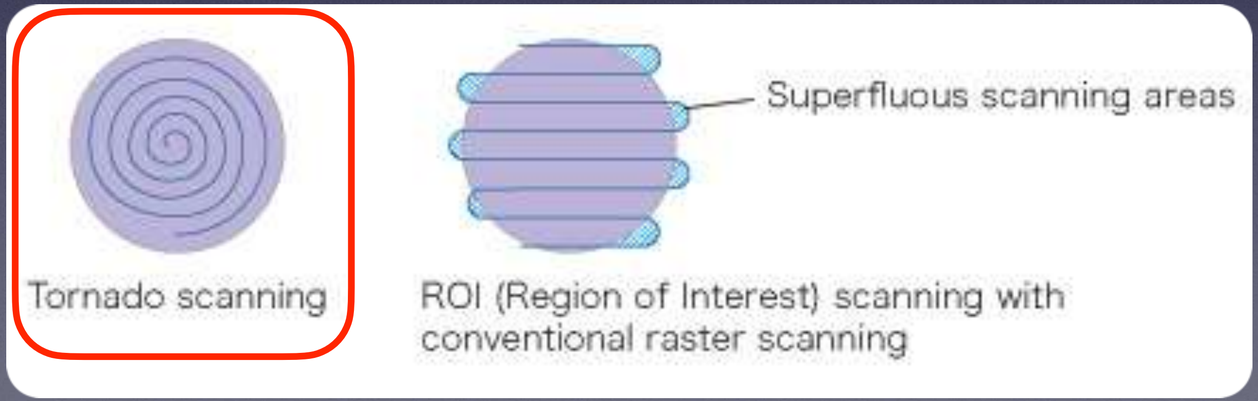
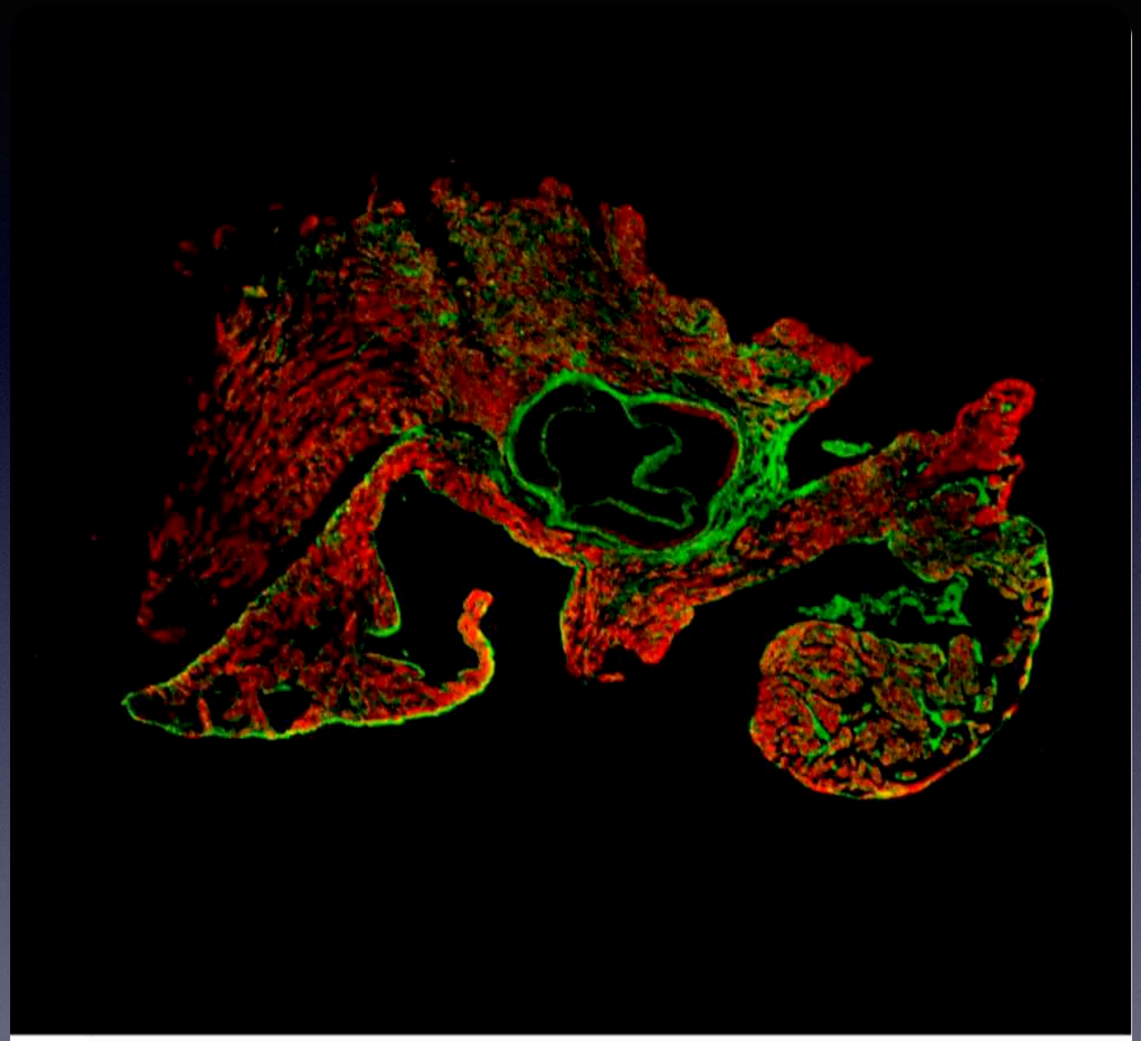


獨家龍捲風掃描模式 最適合光漂白實驗

II.應用範例

Marco Tile
XYZ
XYT
Photo-activation
FRAP FRET
Super-Resolution

II.應用範例—Macro to micro / 大範圍拼圖



CNS markers in normal mice, Slices: 32 X 38

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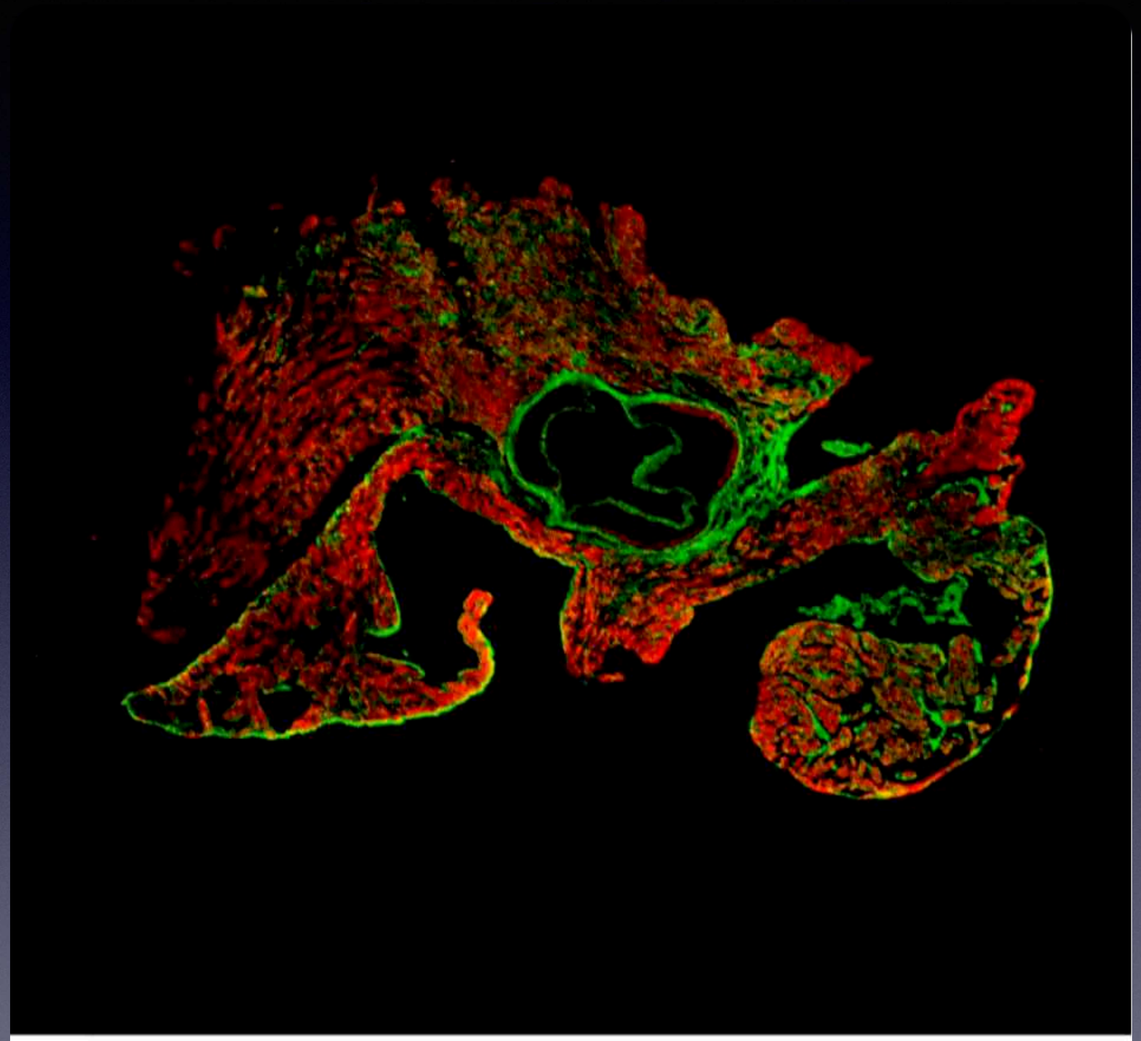

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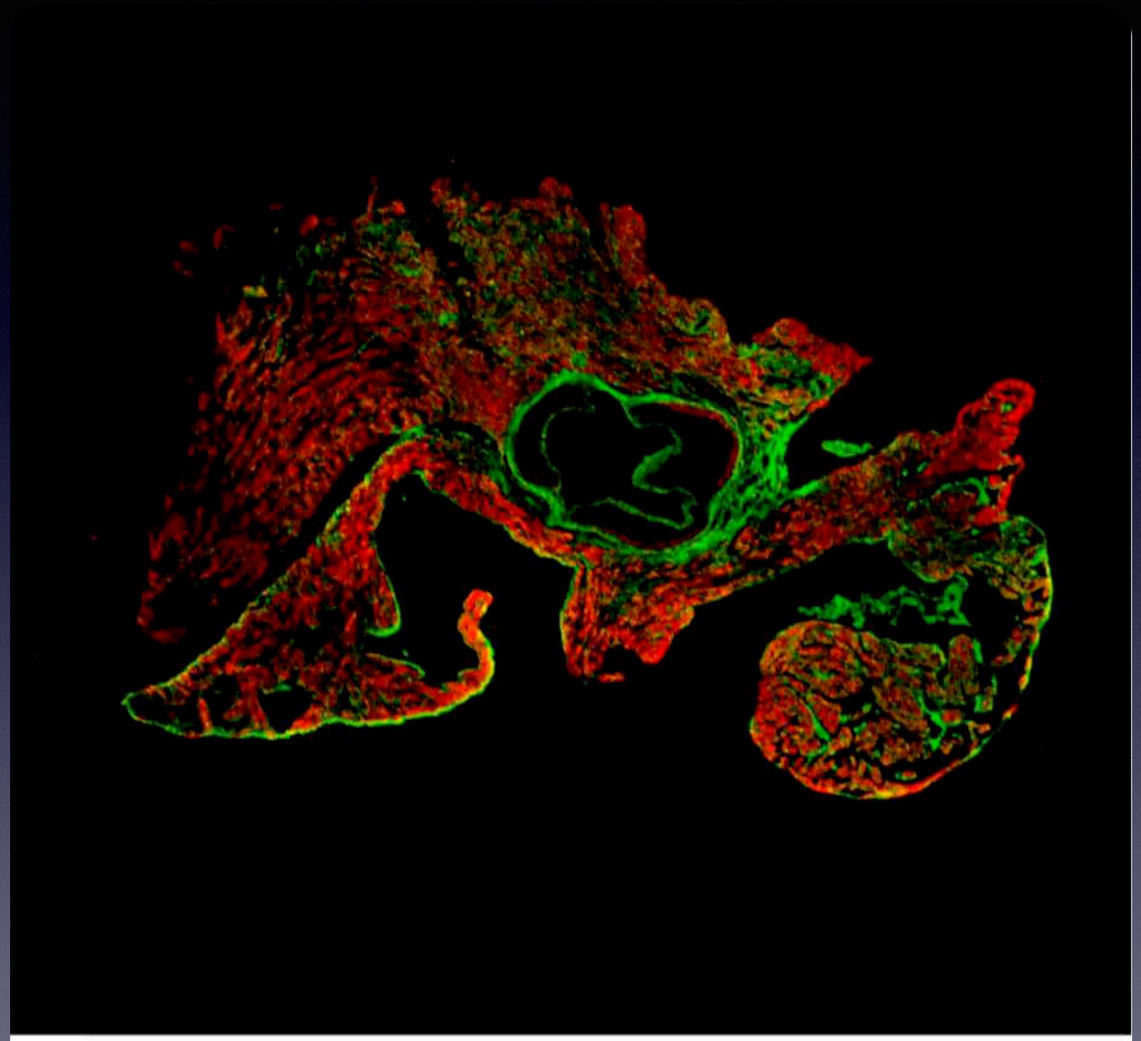

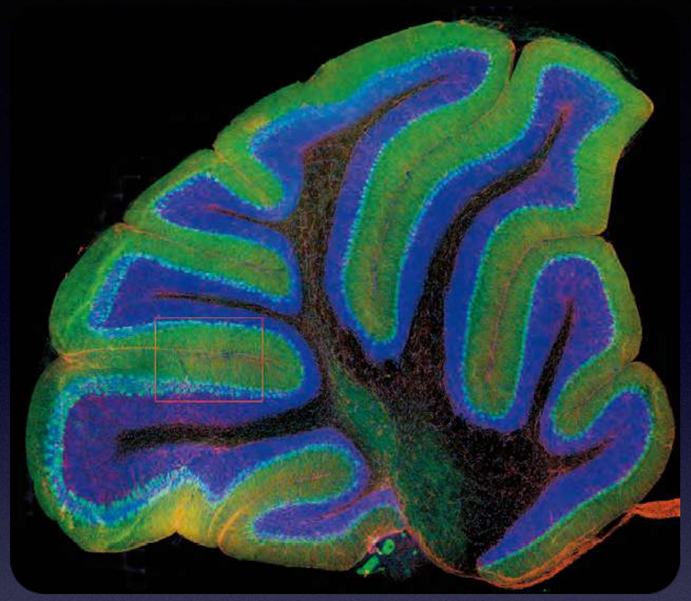

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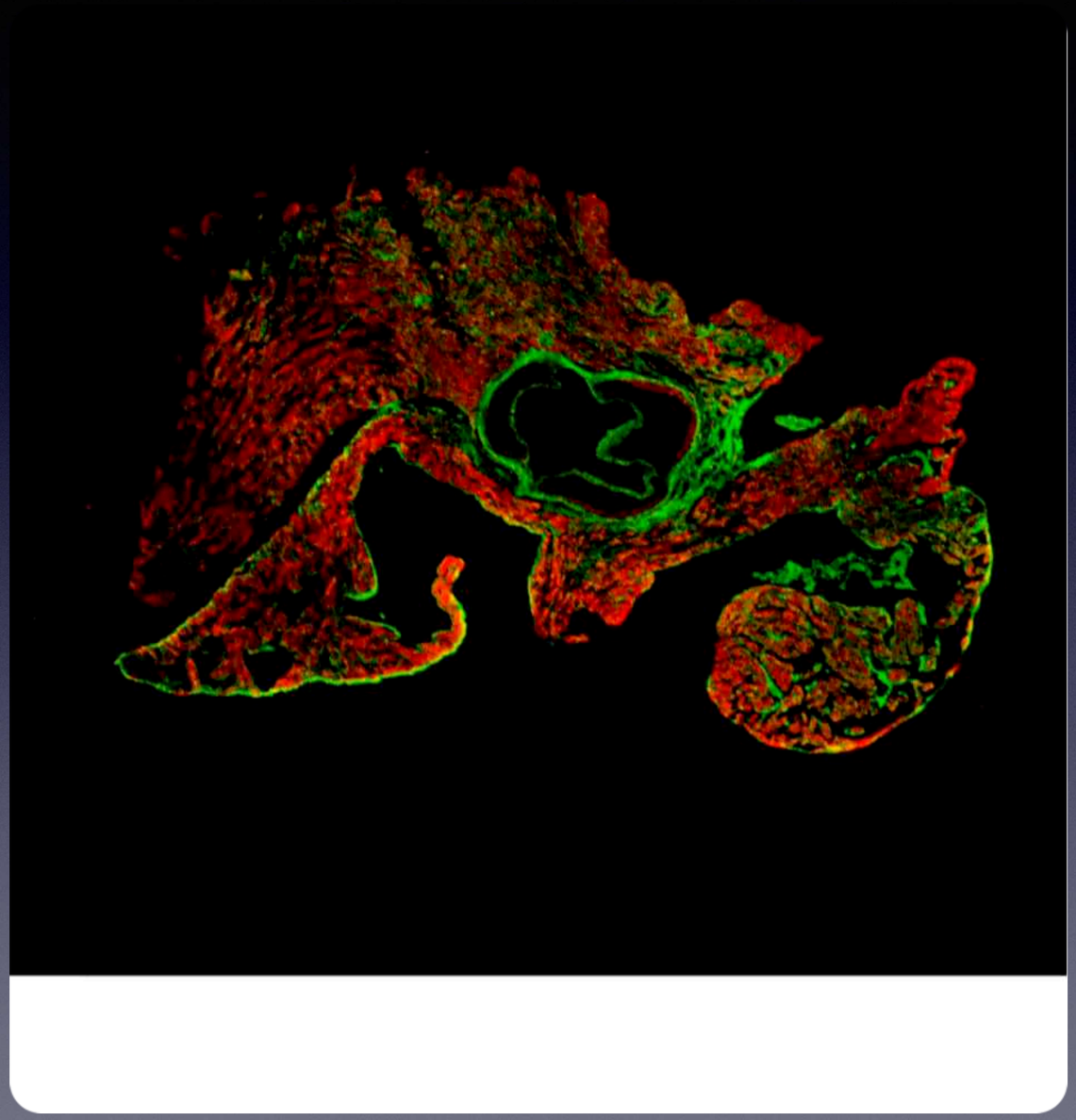

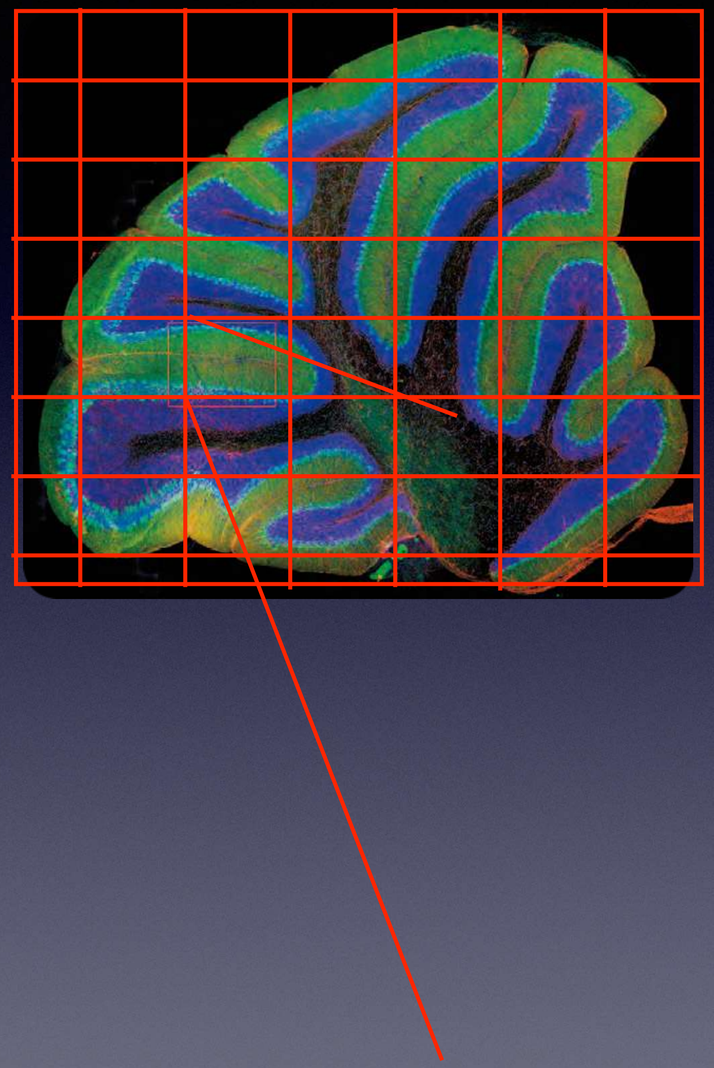

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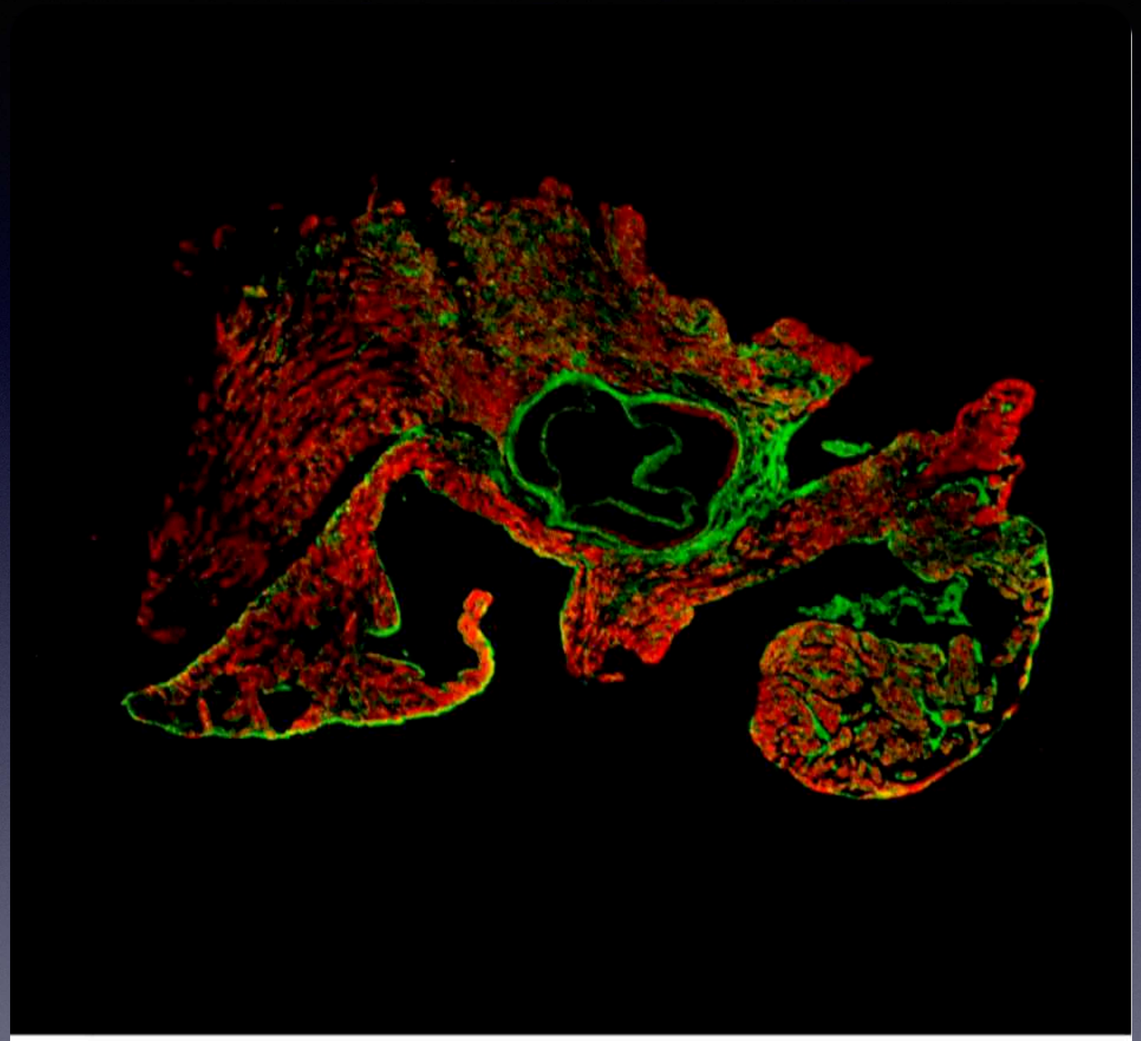

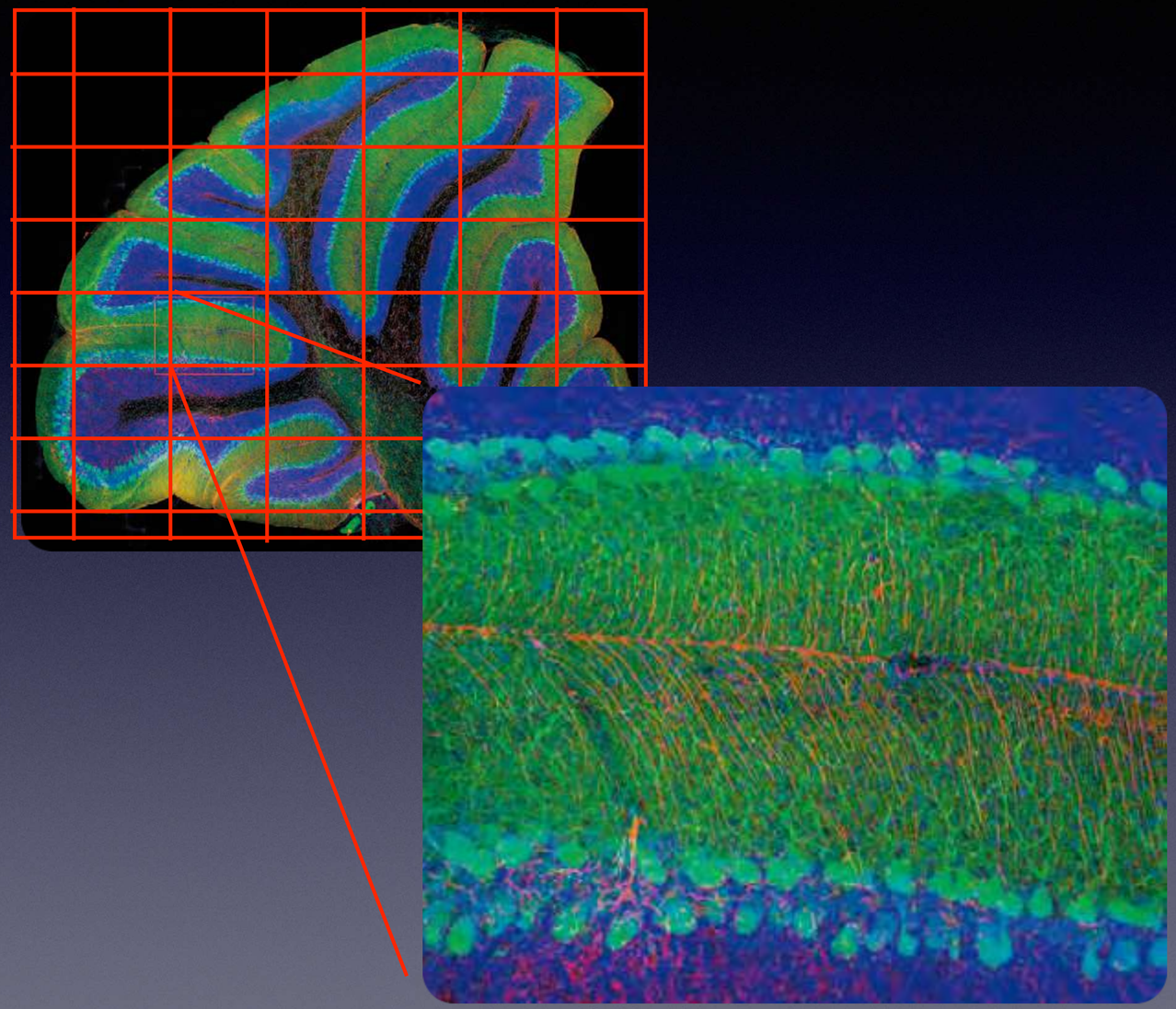

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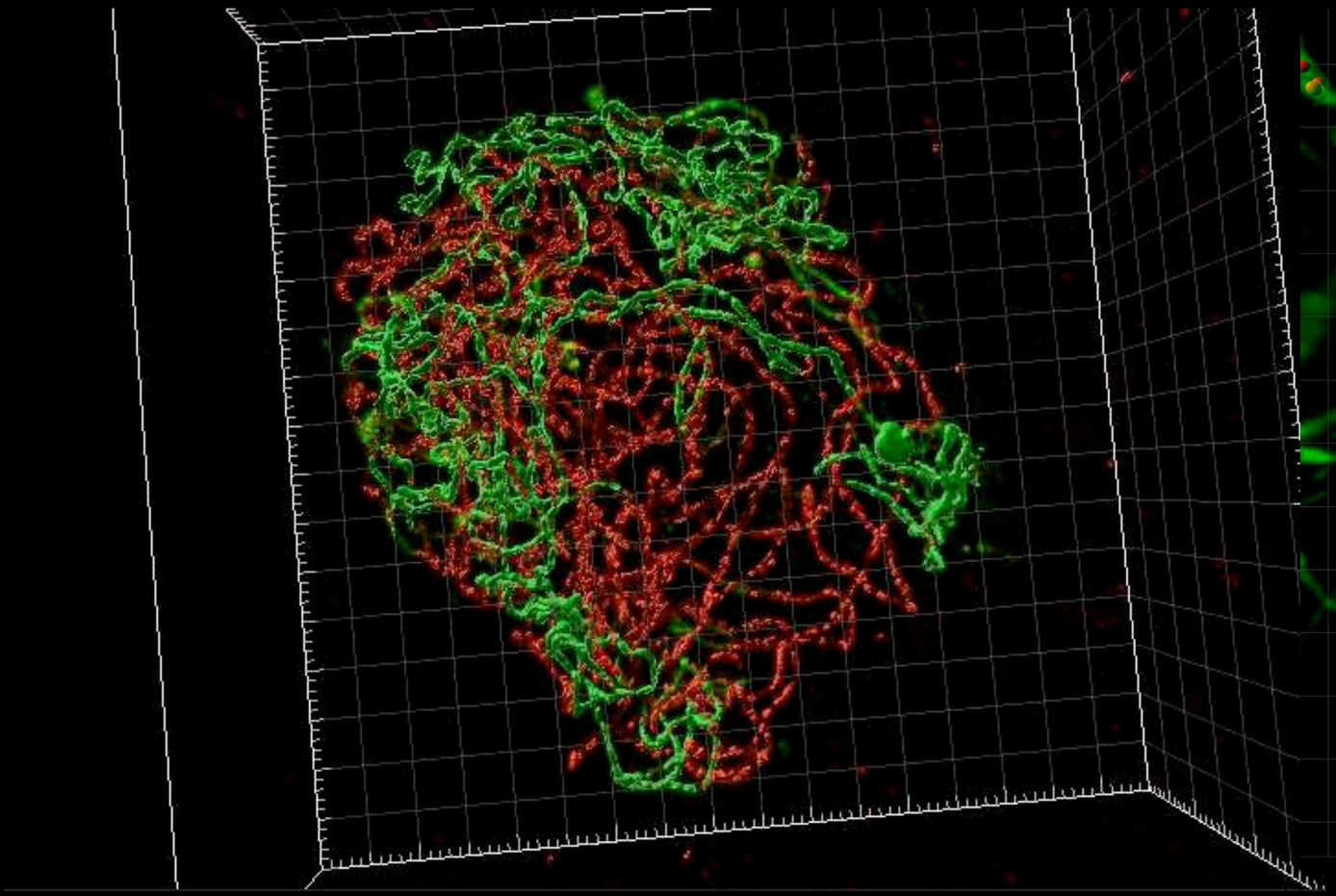
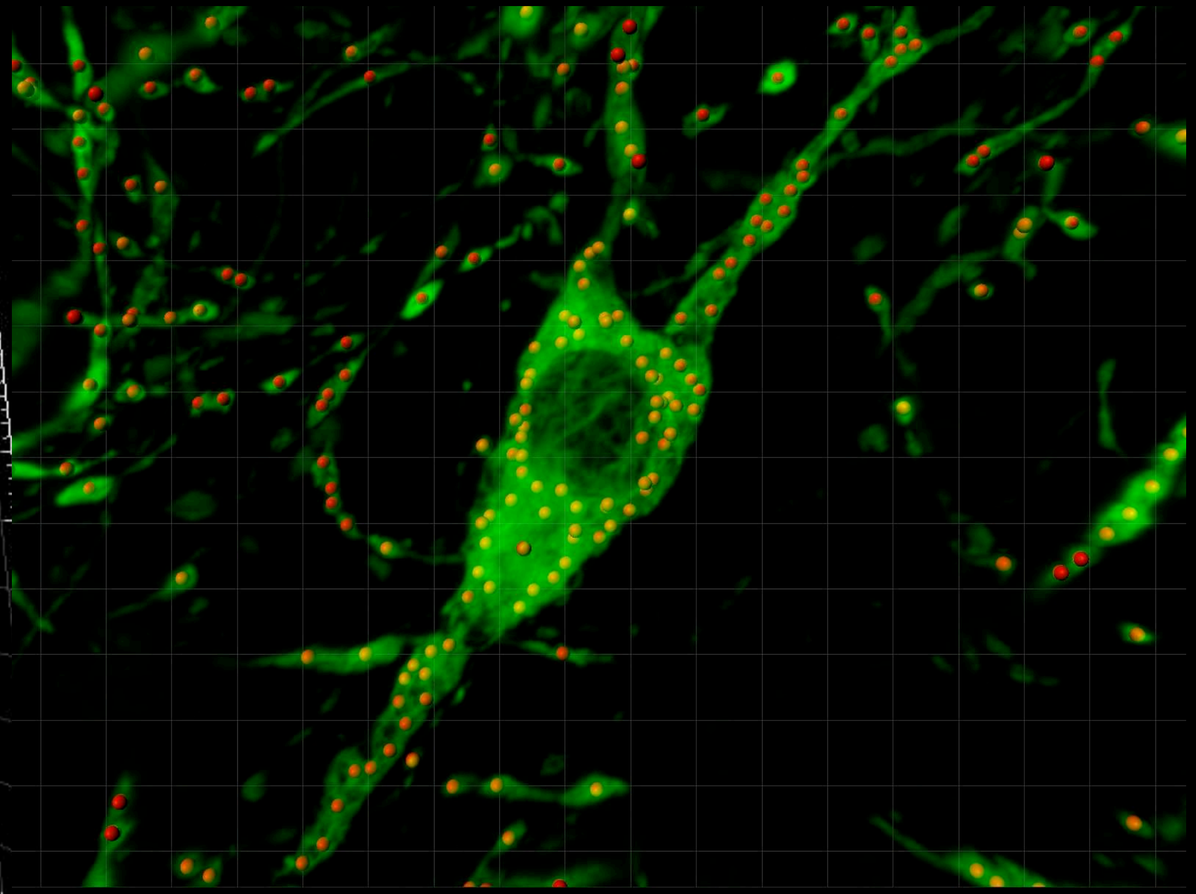
II.應用範例—XYZ



Synaptonemal complex



Neuron cells

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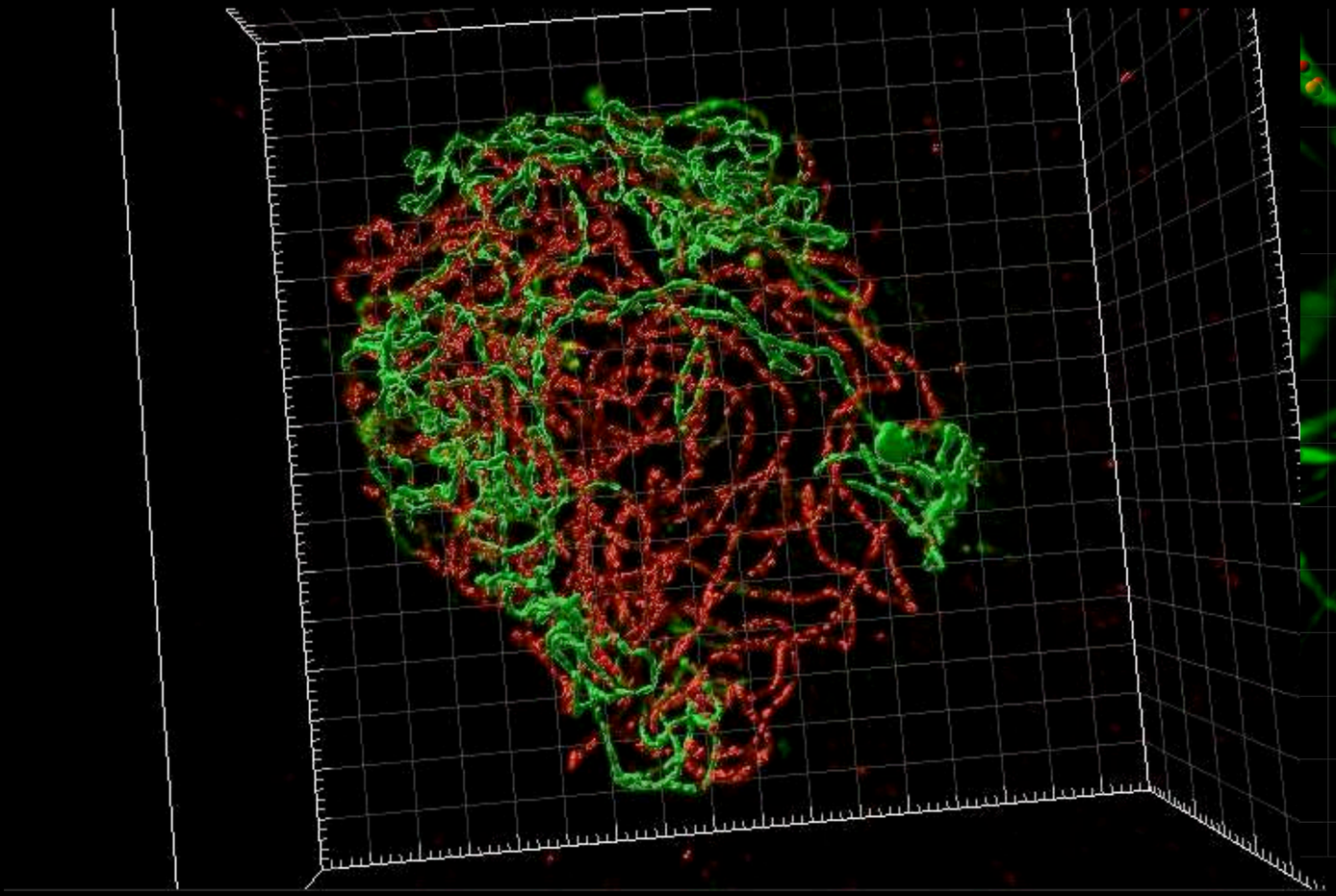

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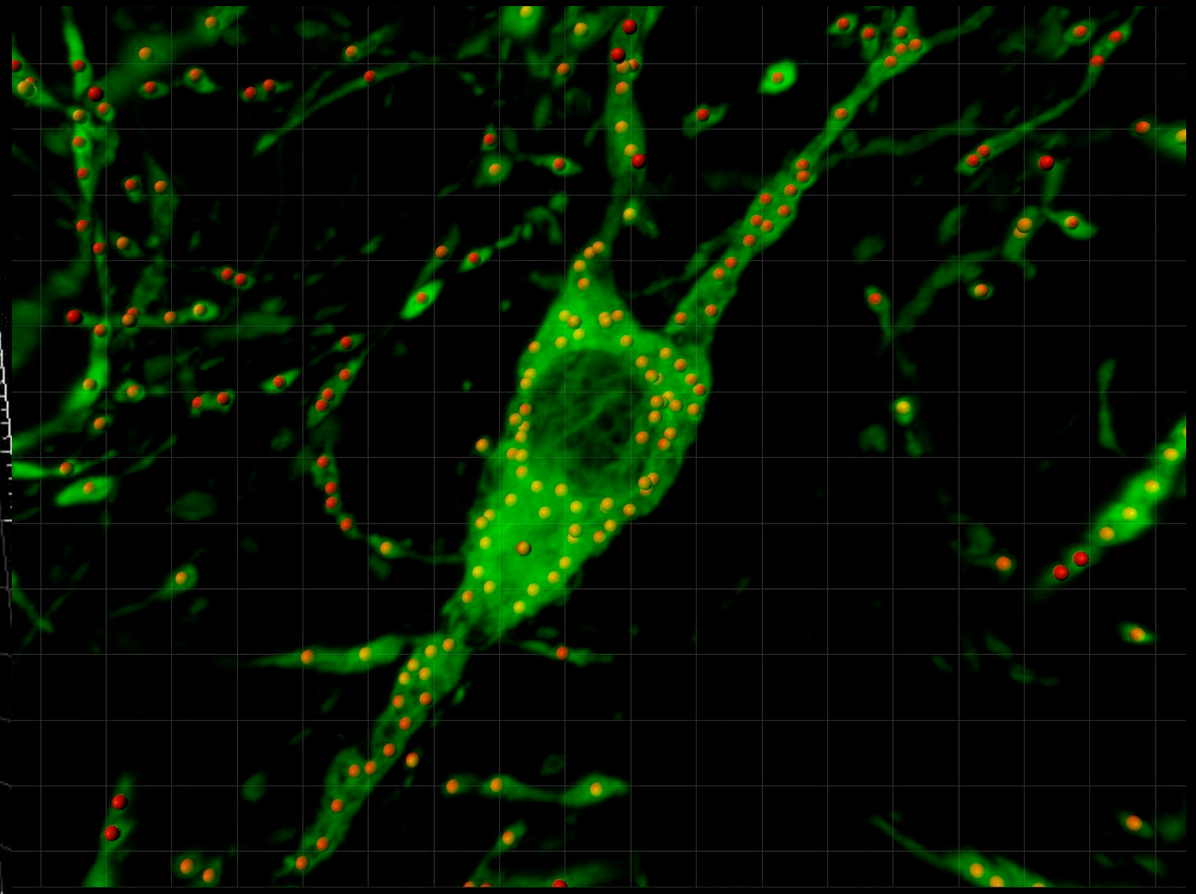

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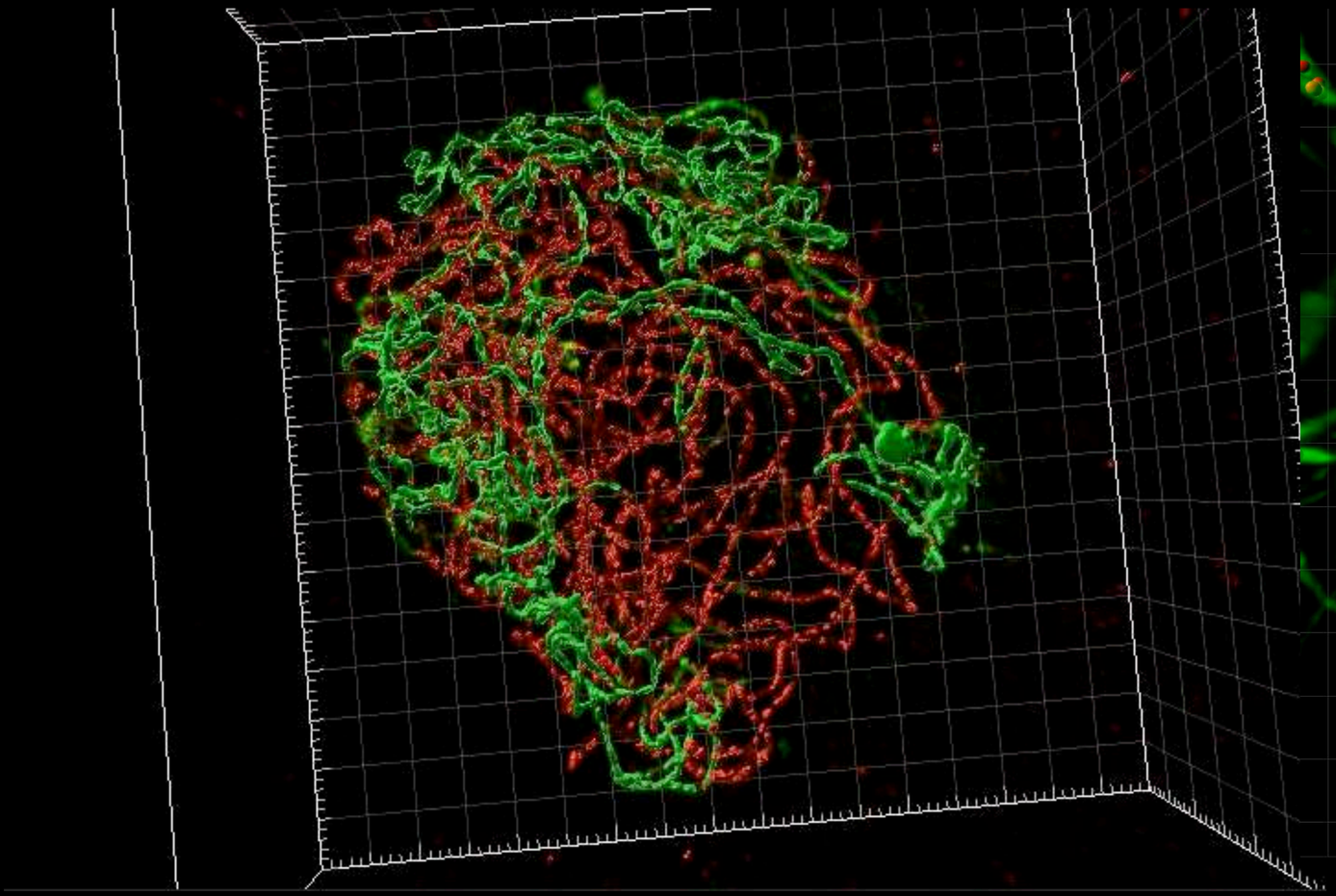

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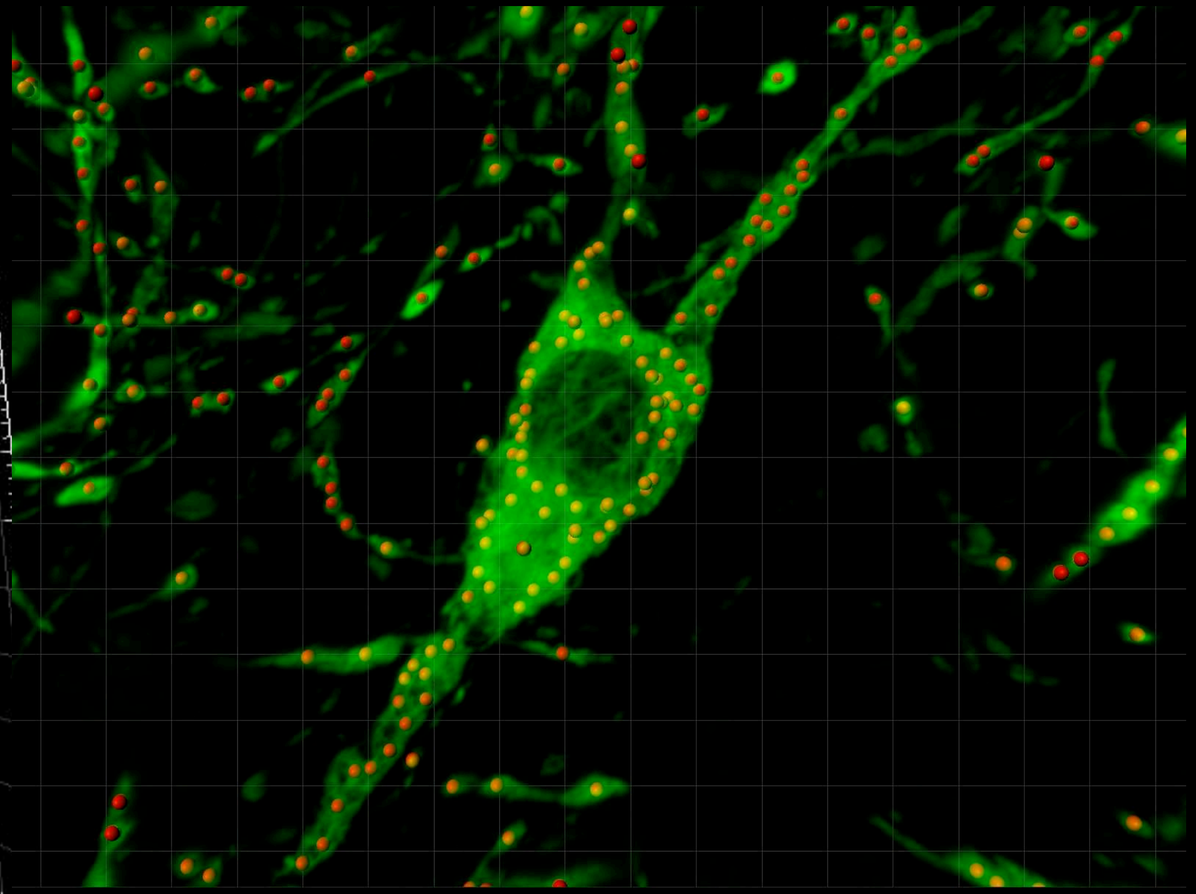
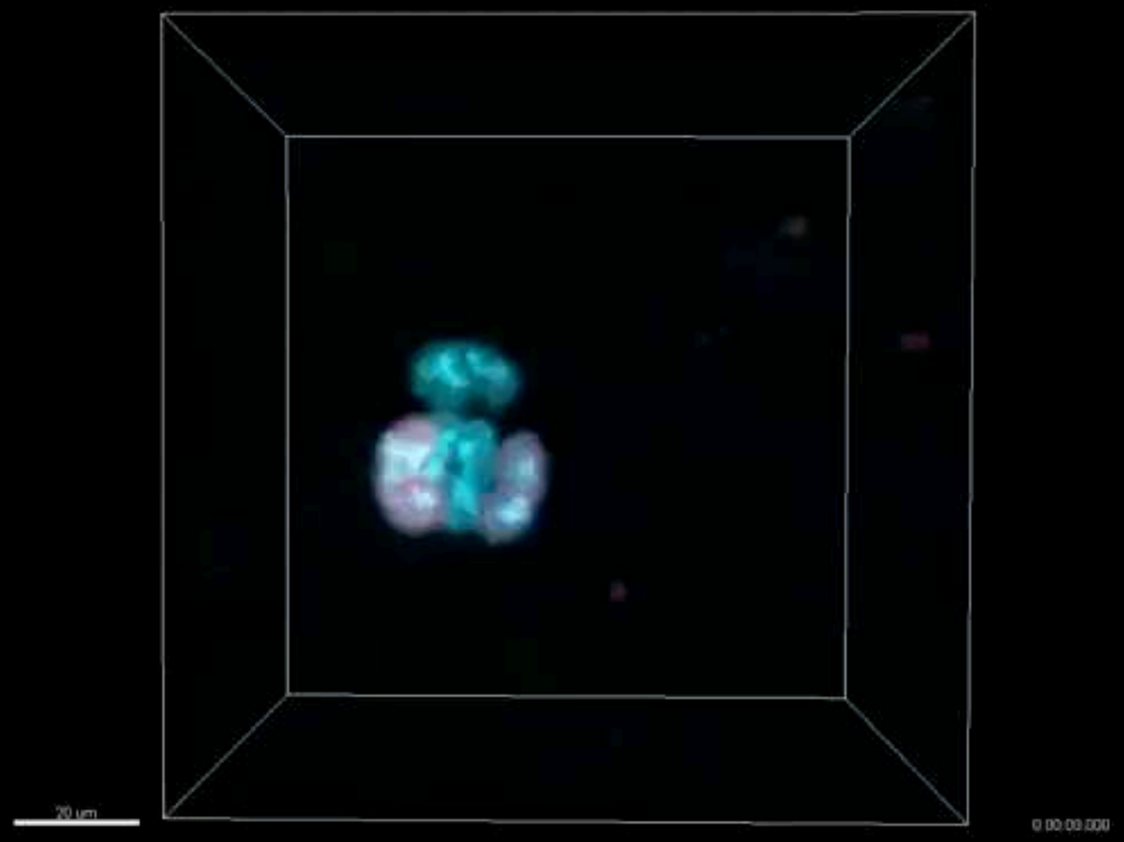


Neuron cells

II.Application—XYT



Live-cell imaging of zygote division and embryogenesis, 66hrs

Time-lapse observation of mouse ES cells labeled with Fucci(CA) 2.1, 57hrs

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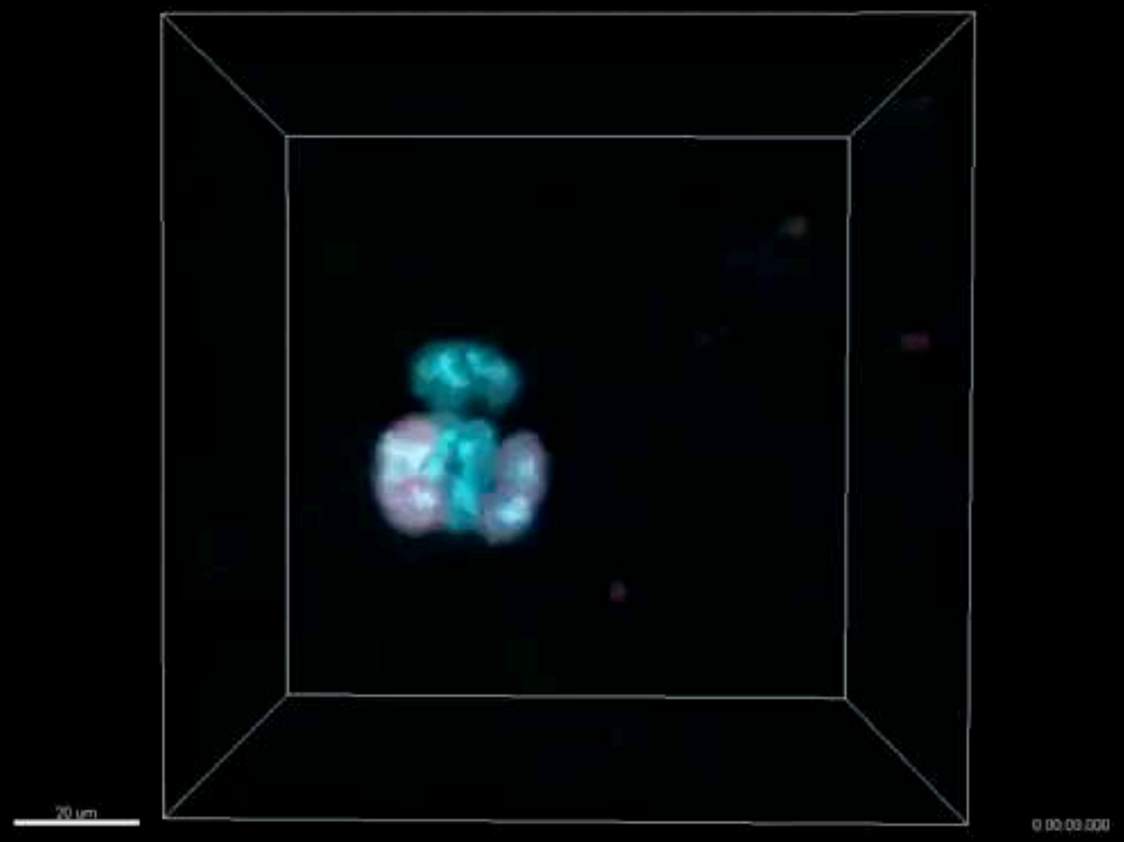

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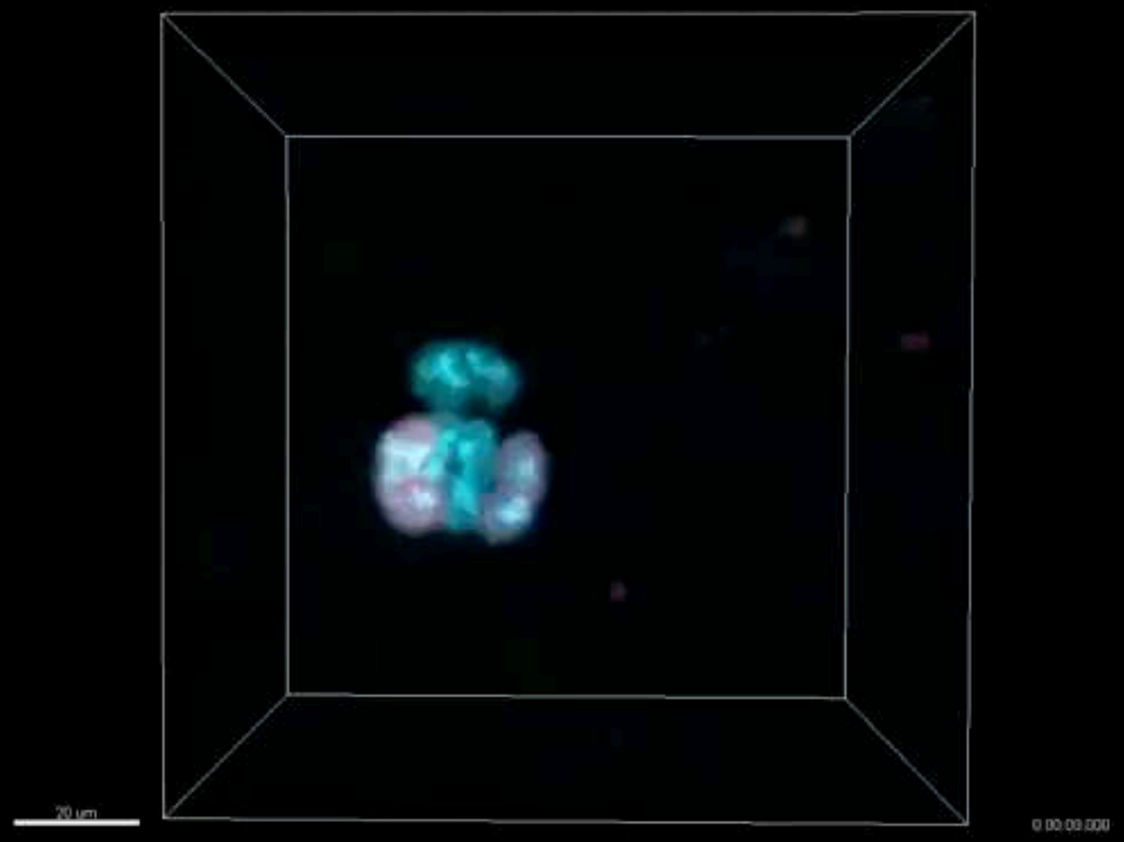

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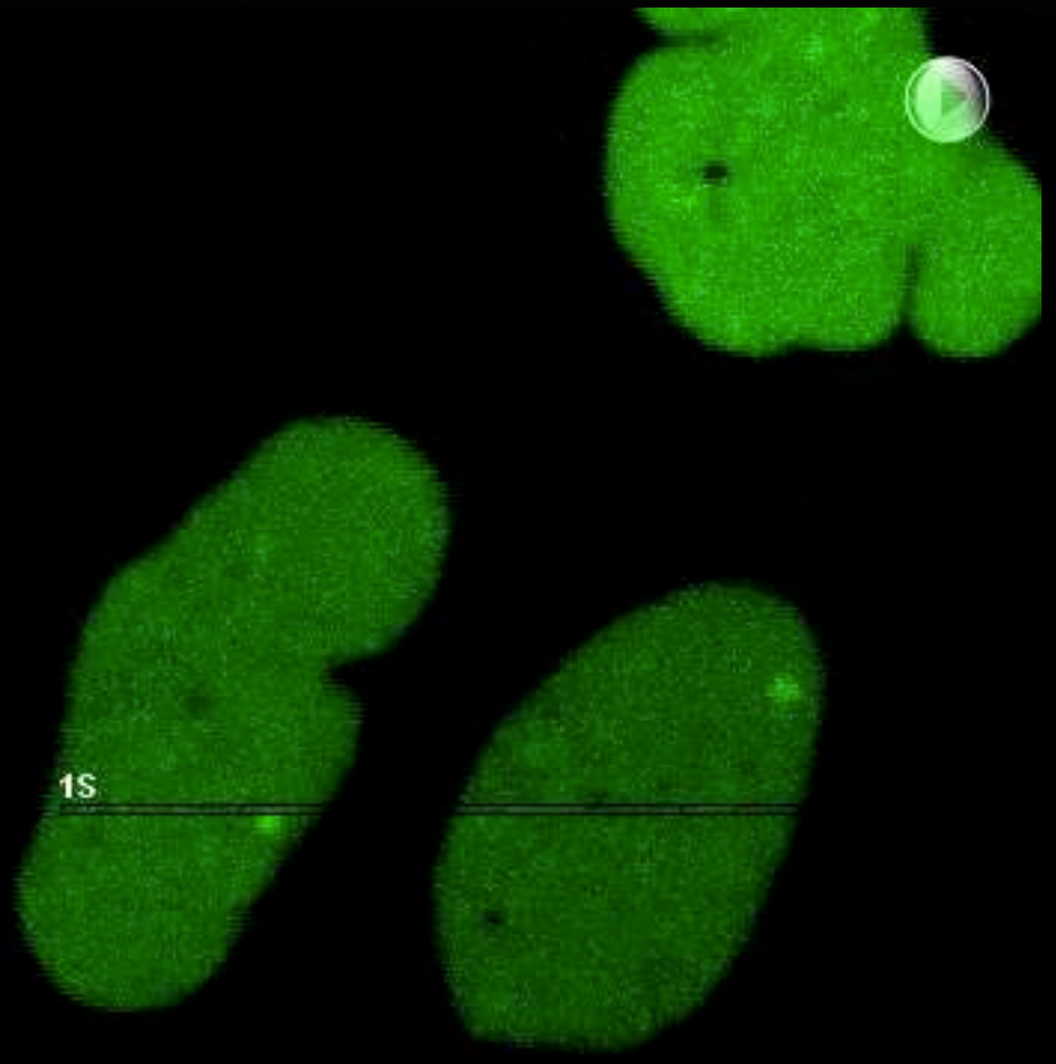
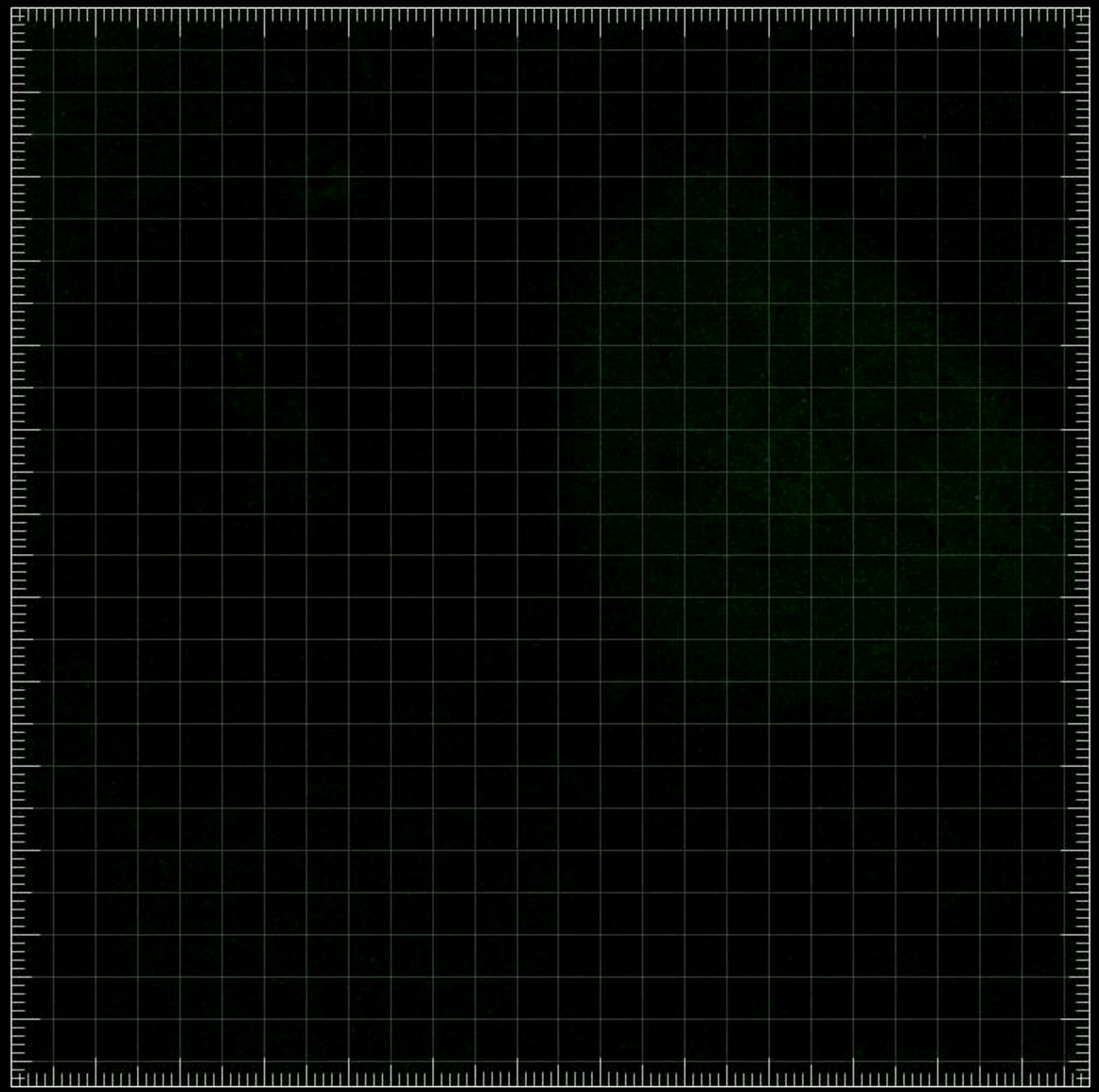


DNA Damage Response, MRE11
405nm laser bleaching



PA-GFP

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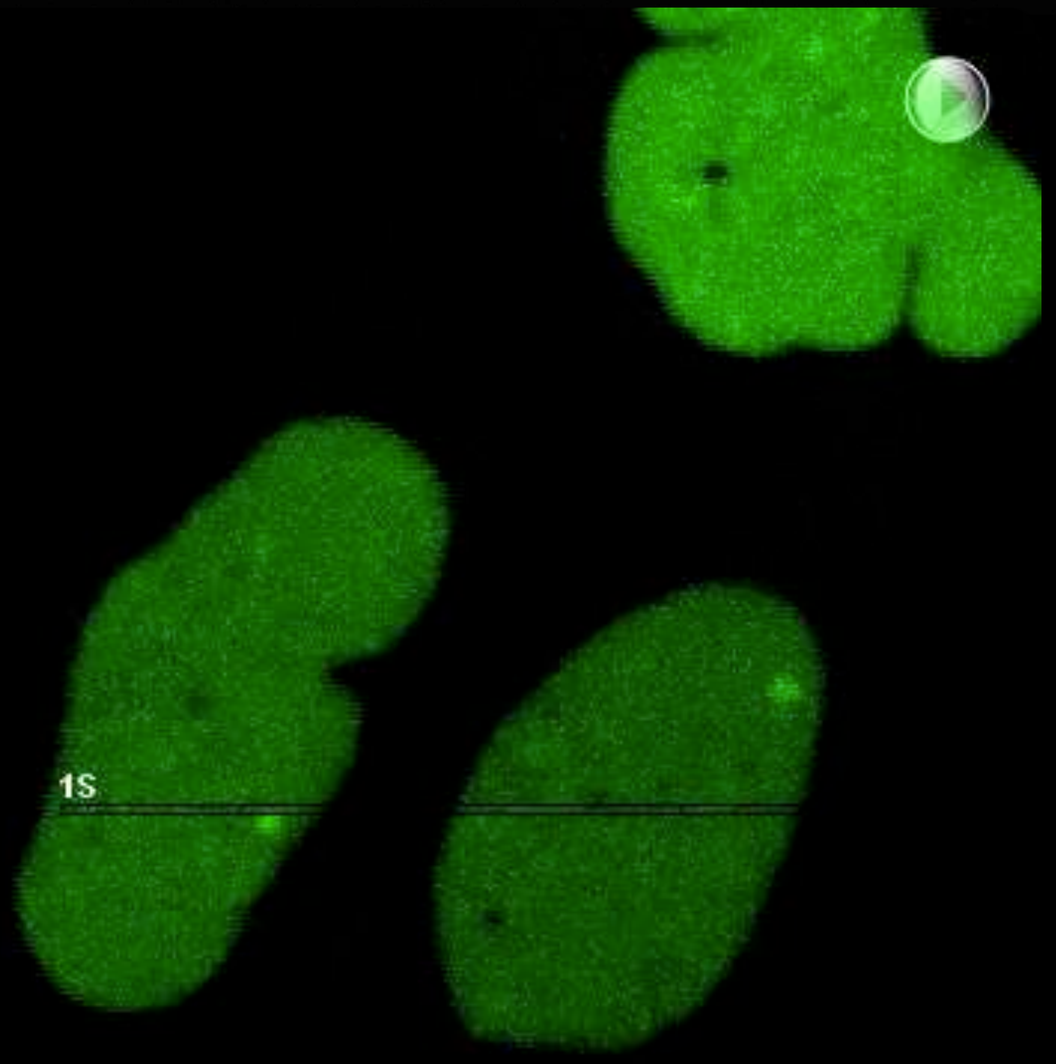

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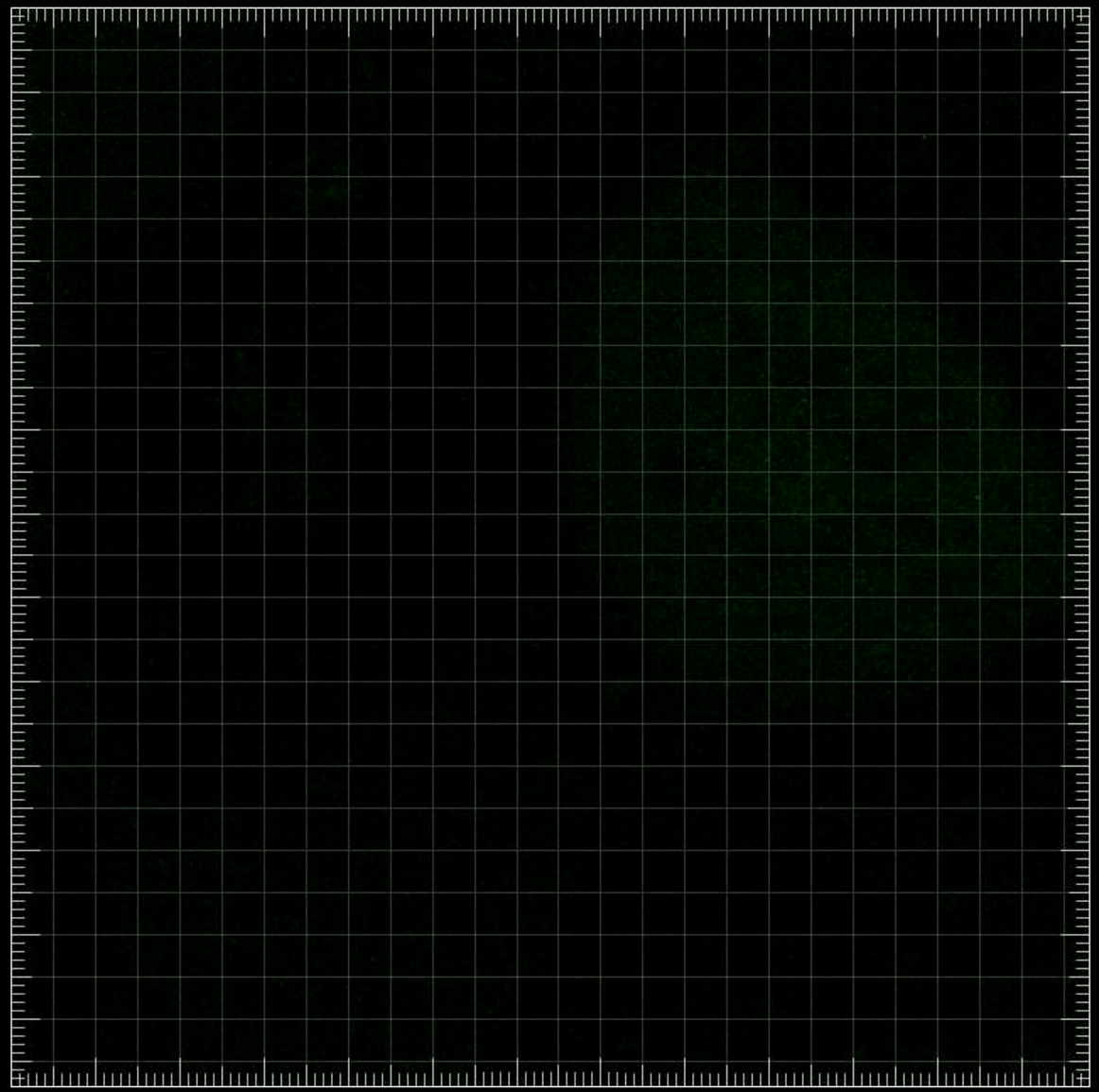

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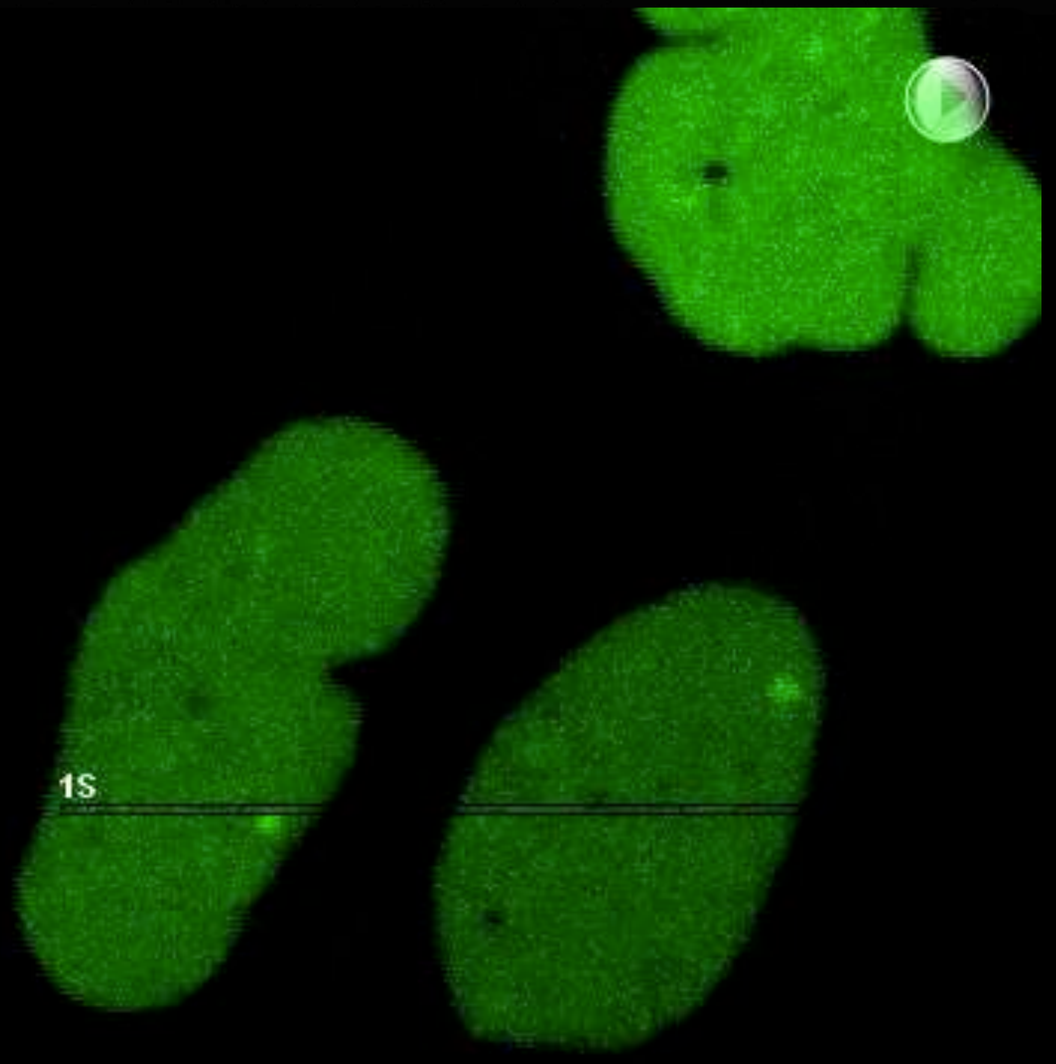

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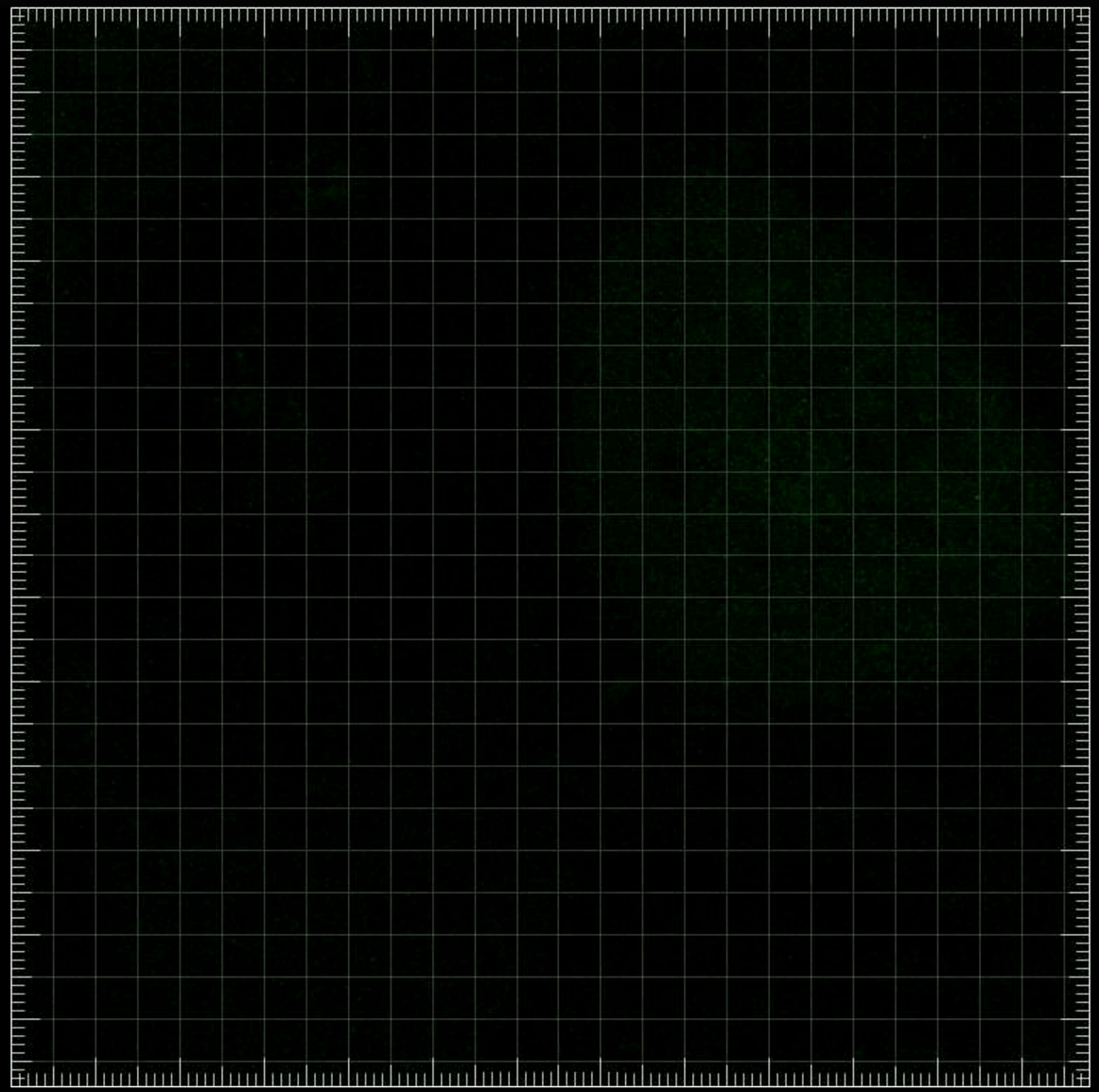

PA-GFP

II.應用範例—FRAP & FRET

FRAP experiment with tornado scanning

ERK activation visualized by an increase in the FRET/CFP ratio

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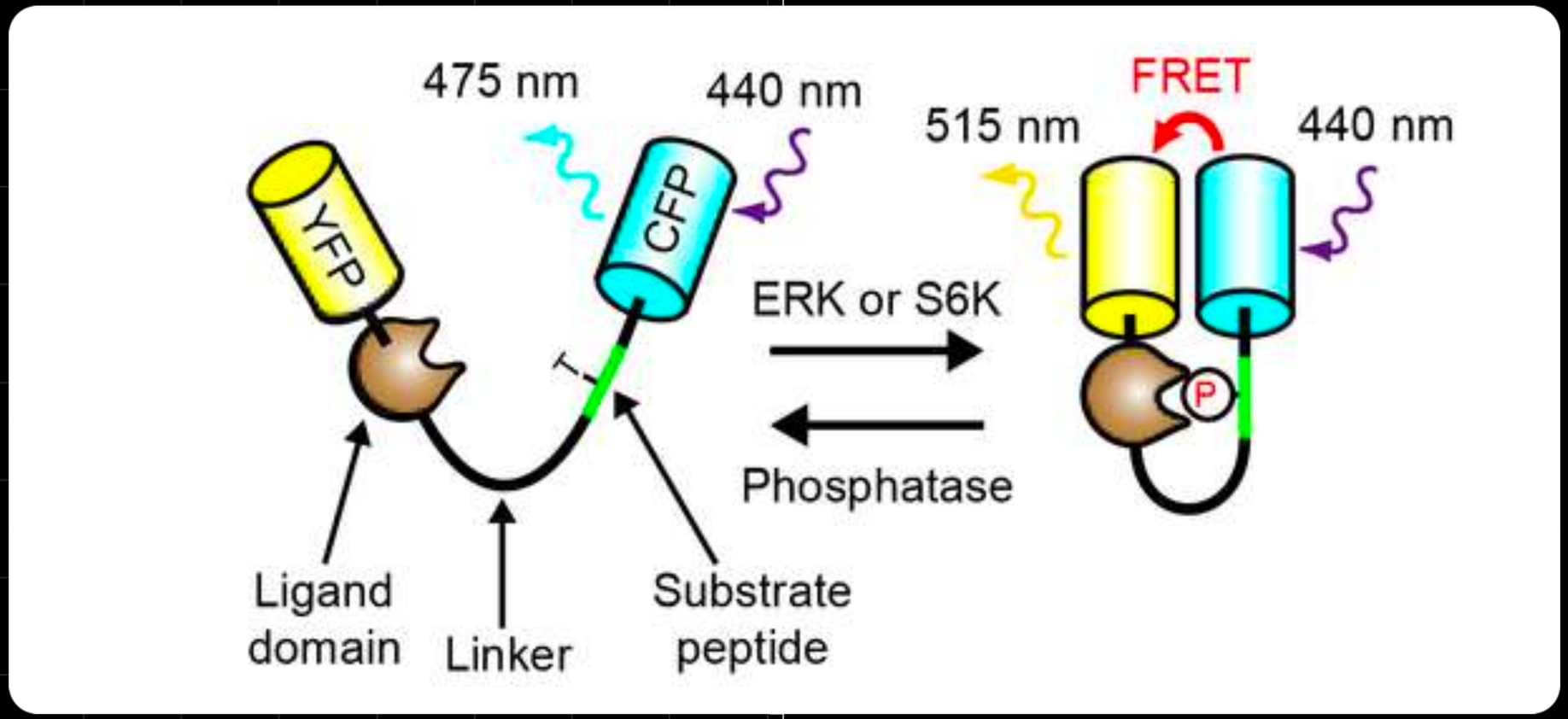

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II.應用範例—Super-resolution

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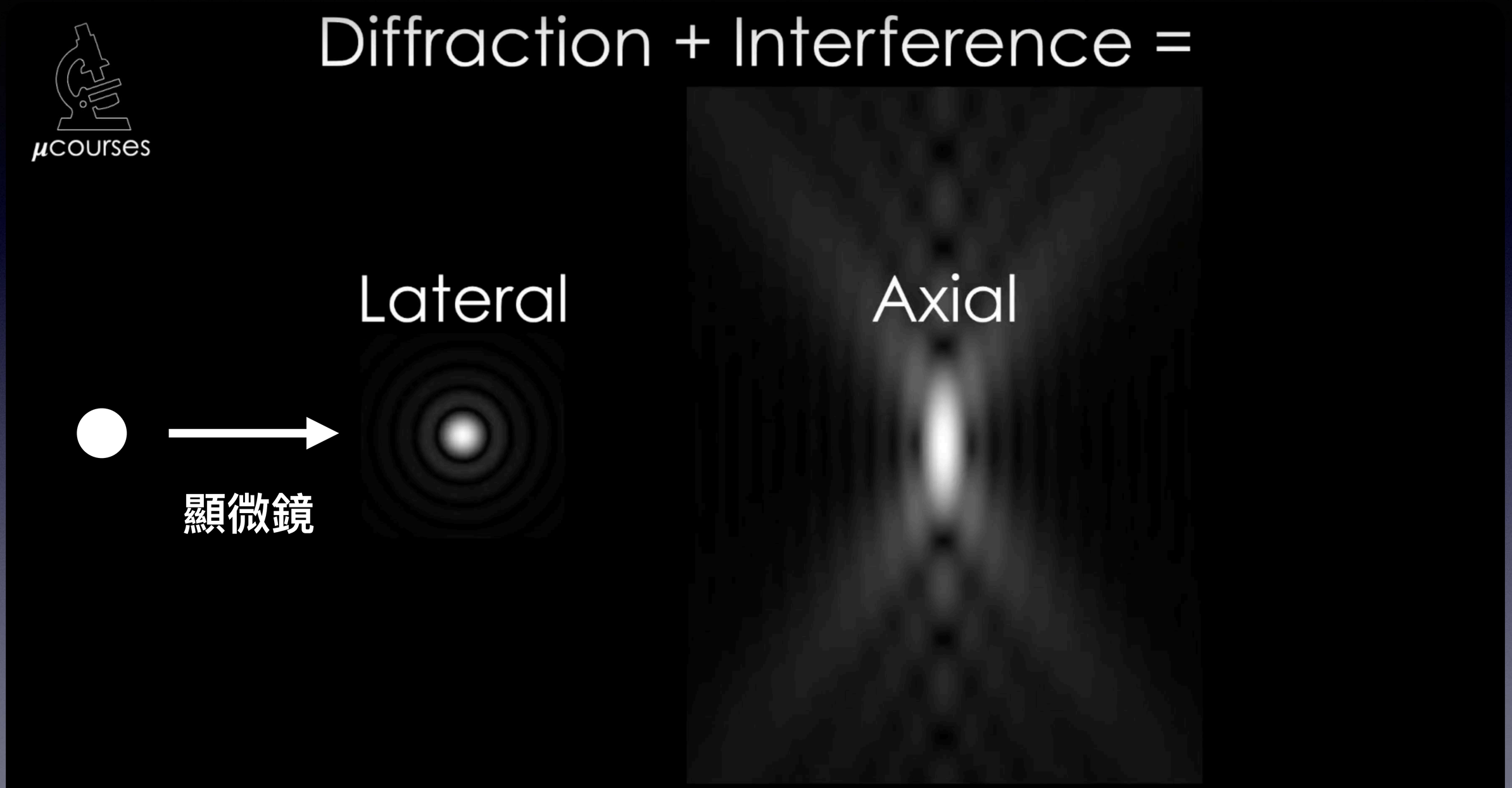

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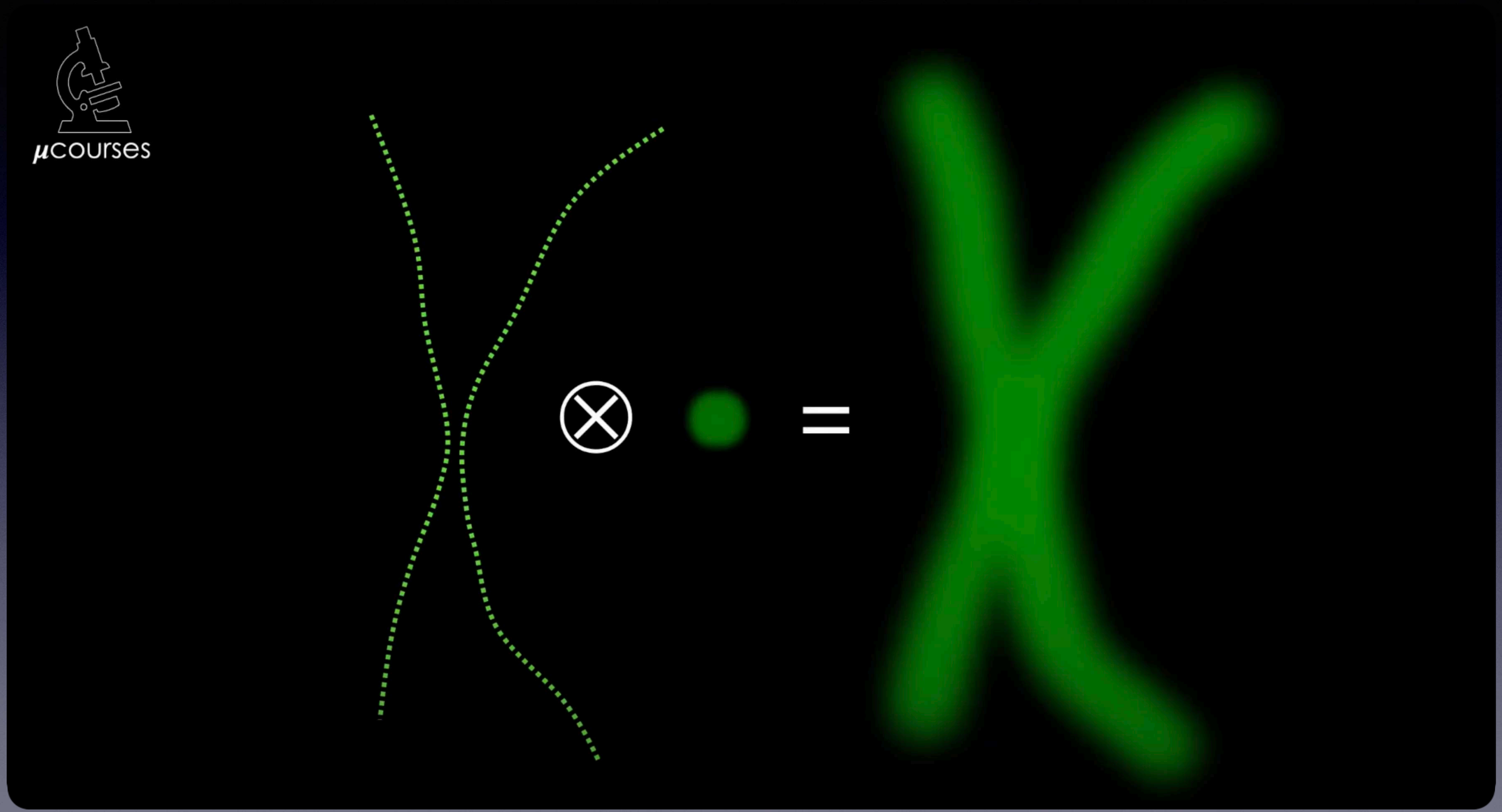
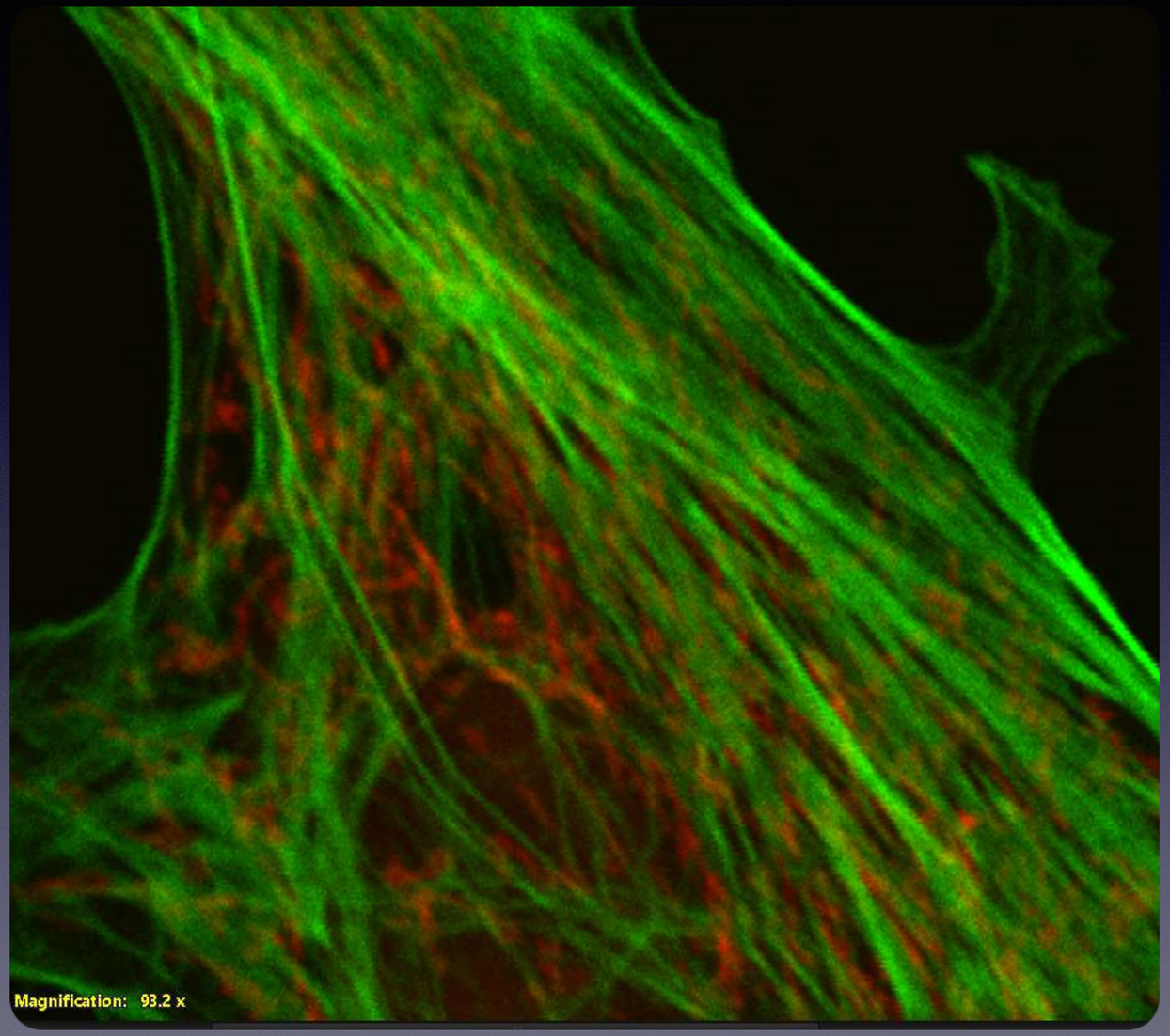


II.應用範例—Super-resolution with **TruSight**



40X obj, zoom 2.33X (0.8AU)

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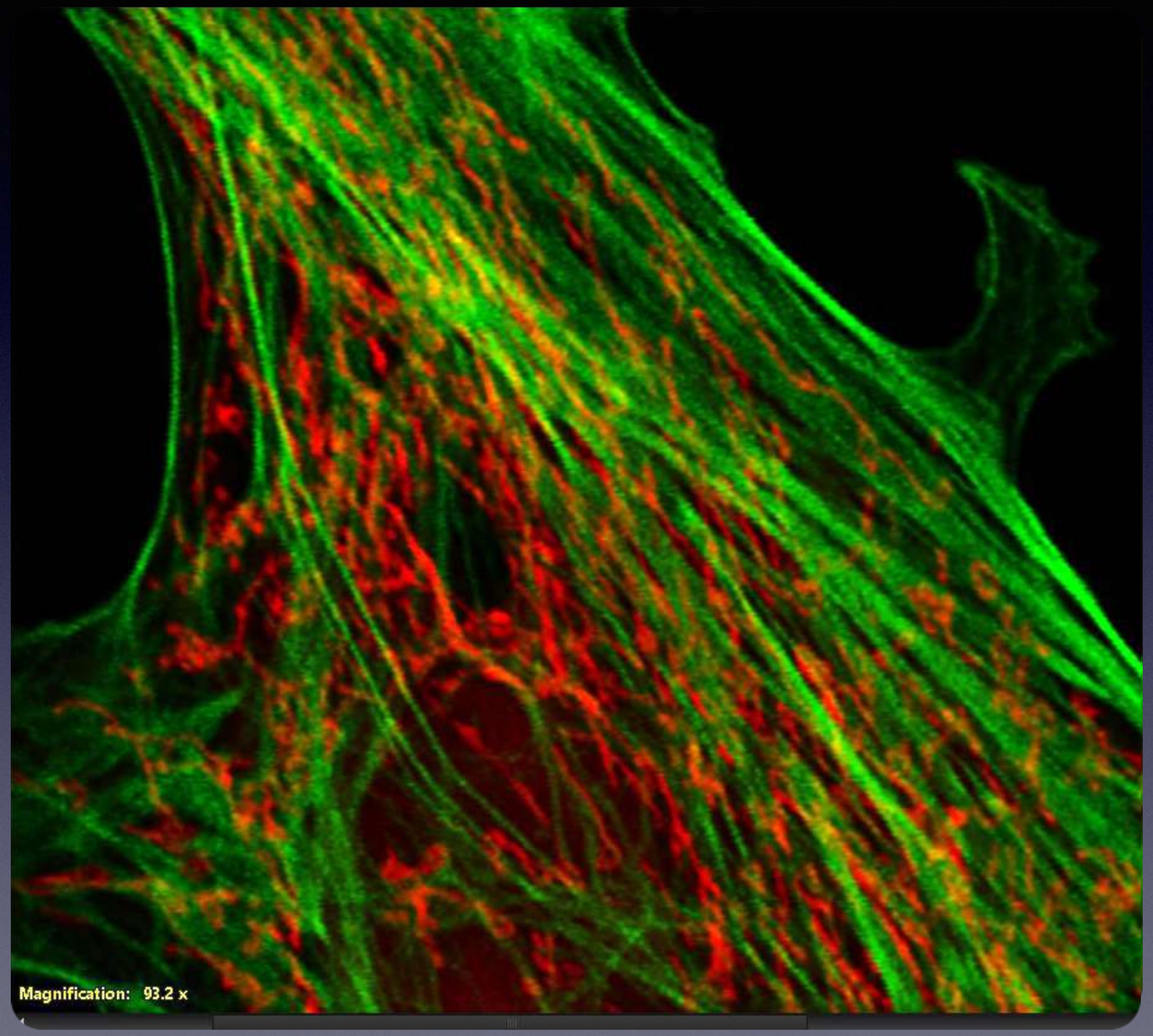

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II.影像分析—cellSens

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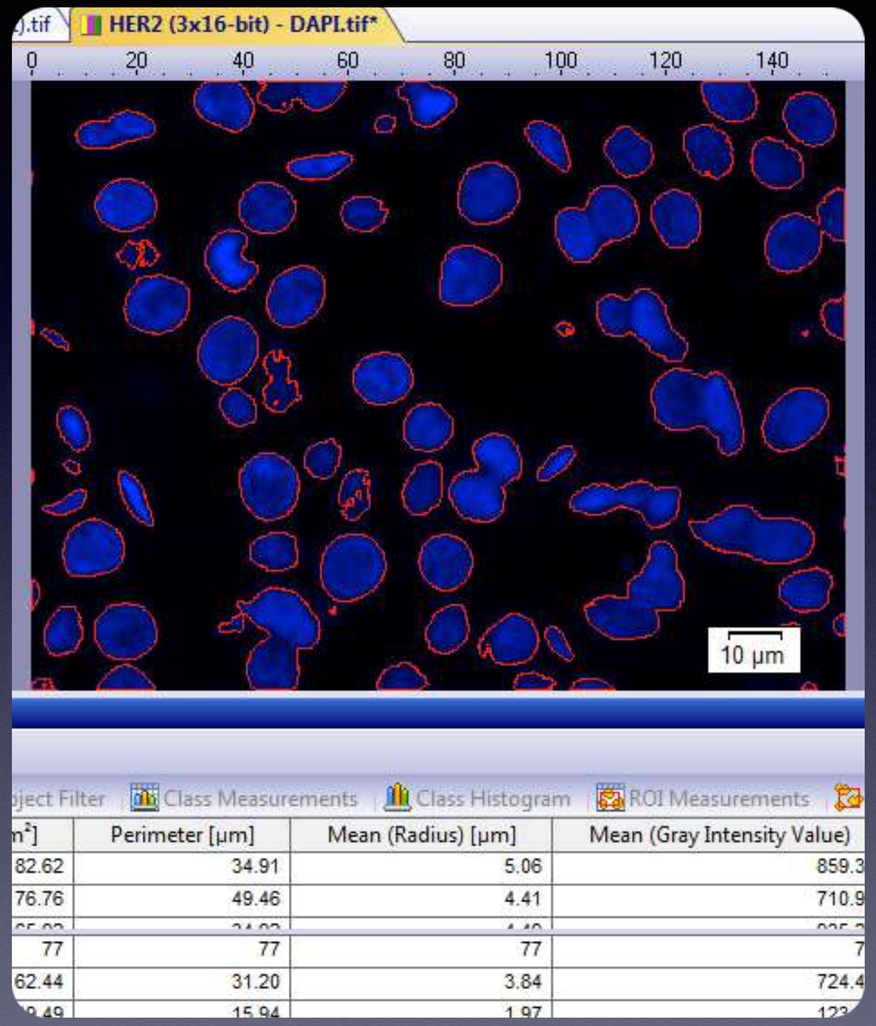

	Perimeter [µm]	Mean (Radius) [µm]	Mean (Gray Intensity Value)
82.62	34.91	5.06	859.3
76.76	49.46	4.41	710.9
77	77	77	7
62.44	31.20	3.84	724.4

面積,周長,螢光強度

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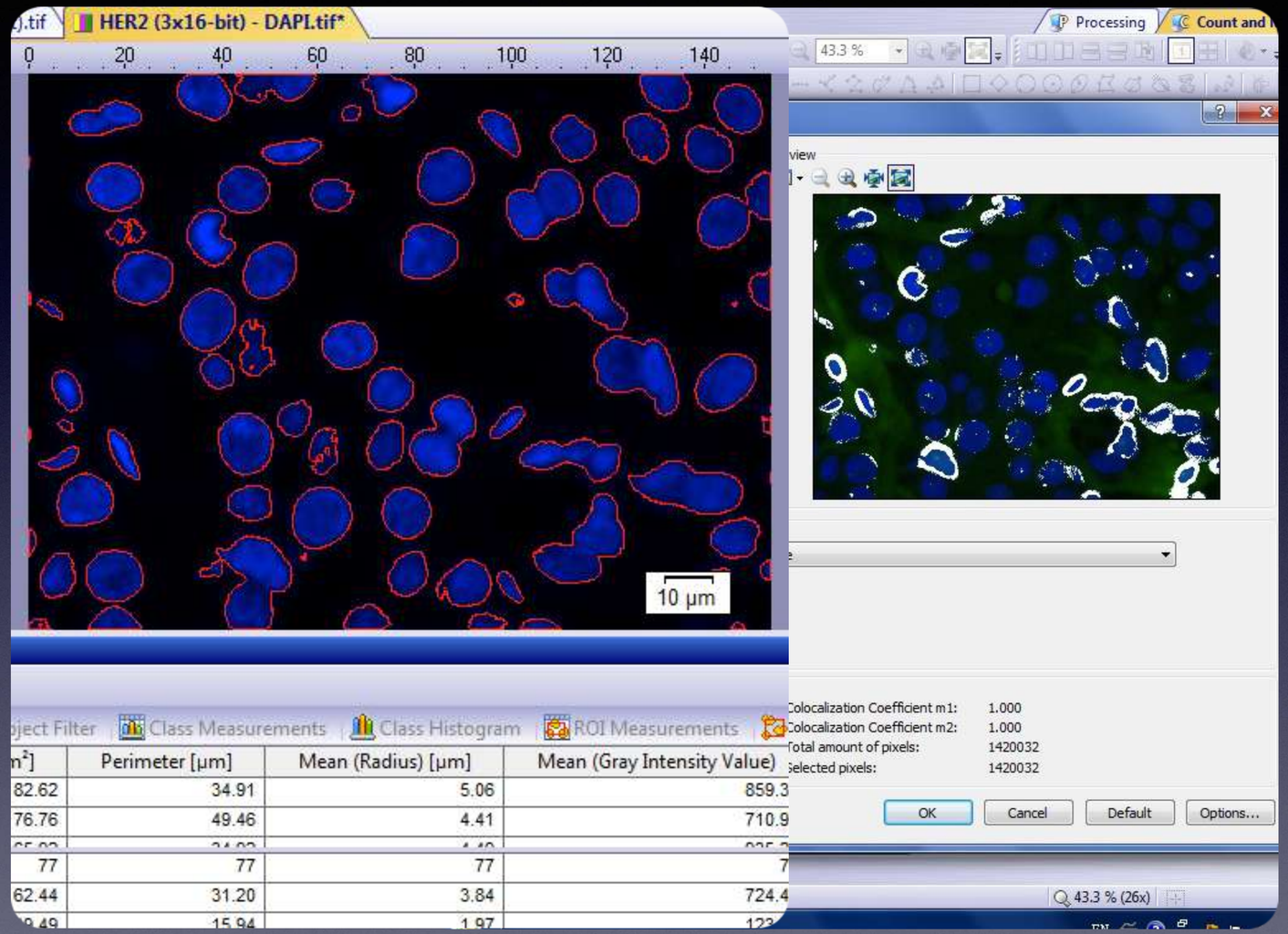

面積,周長,螢光強度　　螢光共位分析

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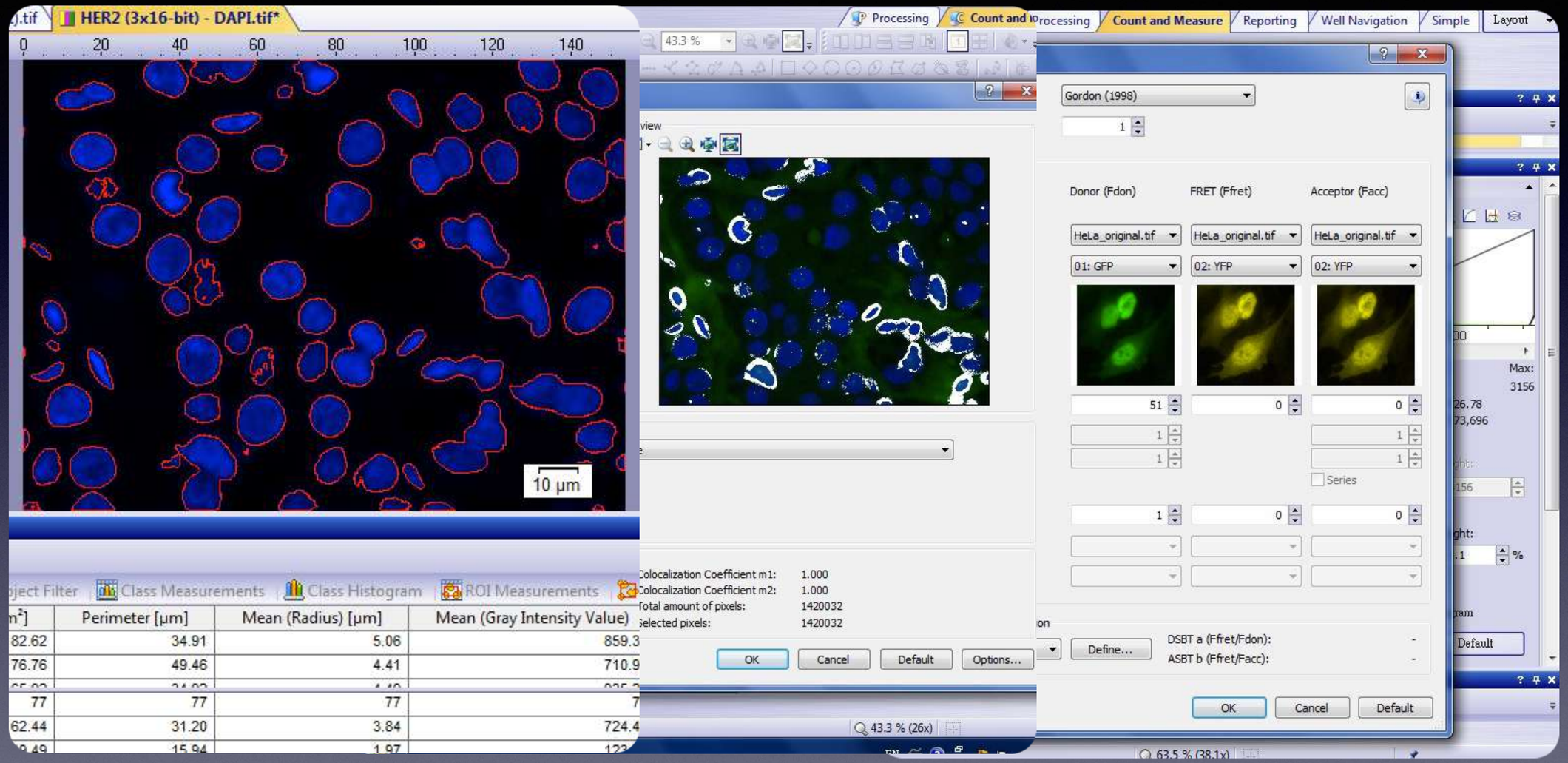

面積,周長,螢光強度　　螢光共位分析　　FRET

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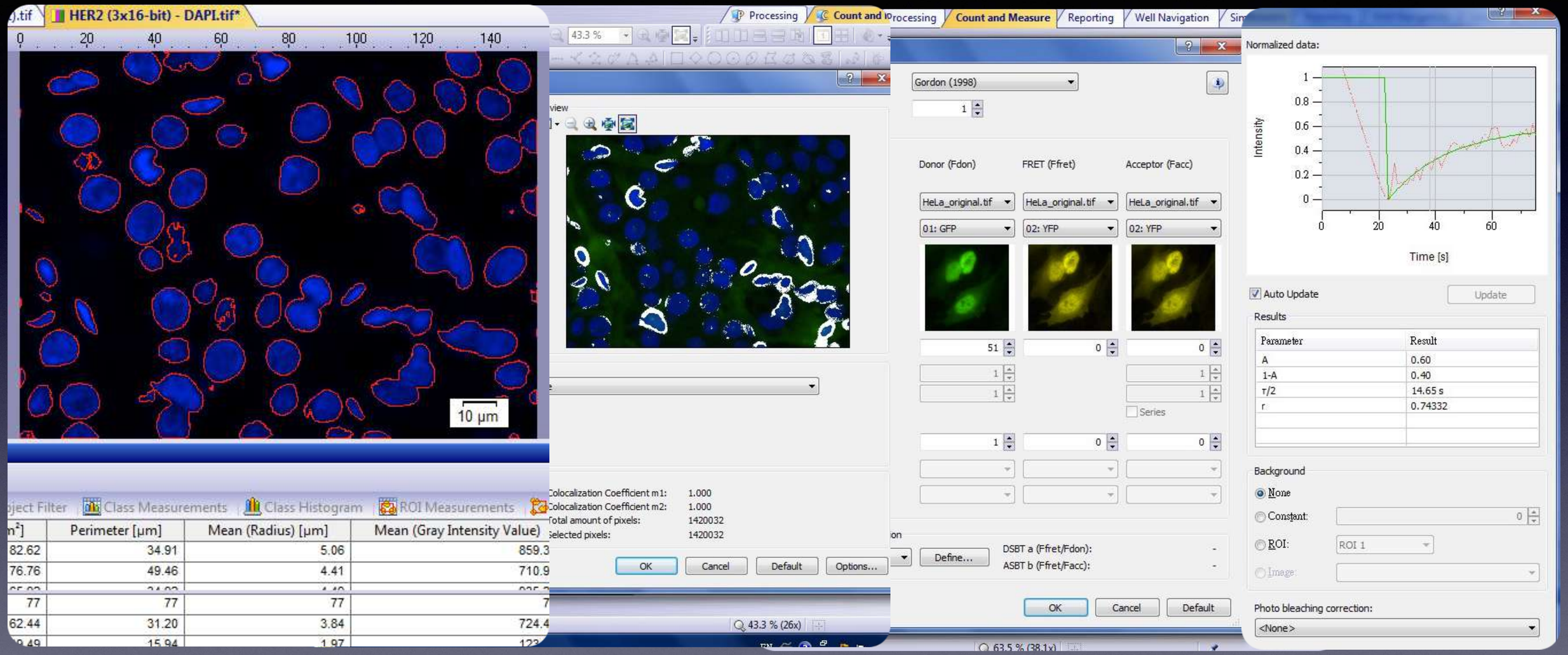

面積,周長,螢光強度　螢光共位分析　FRET　FRAP

II.影像分析—**cellSens FRET analysis**

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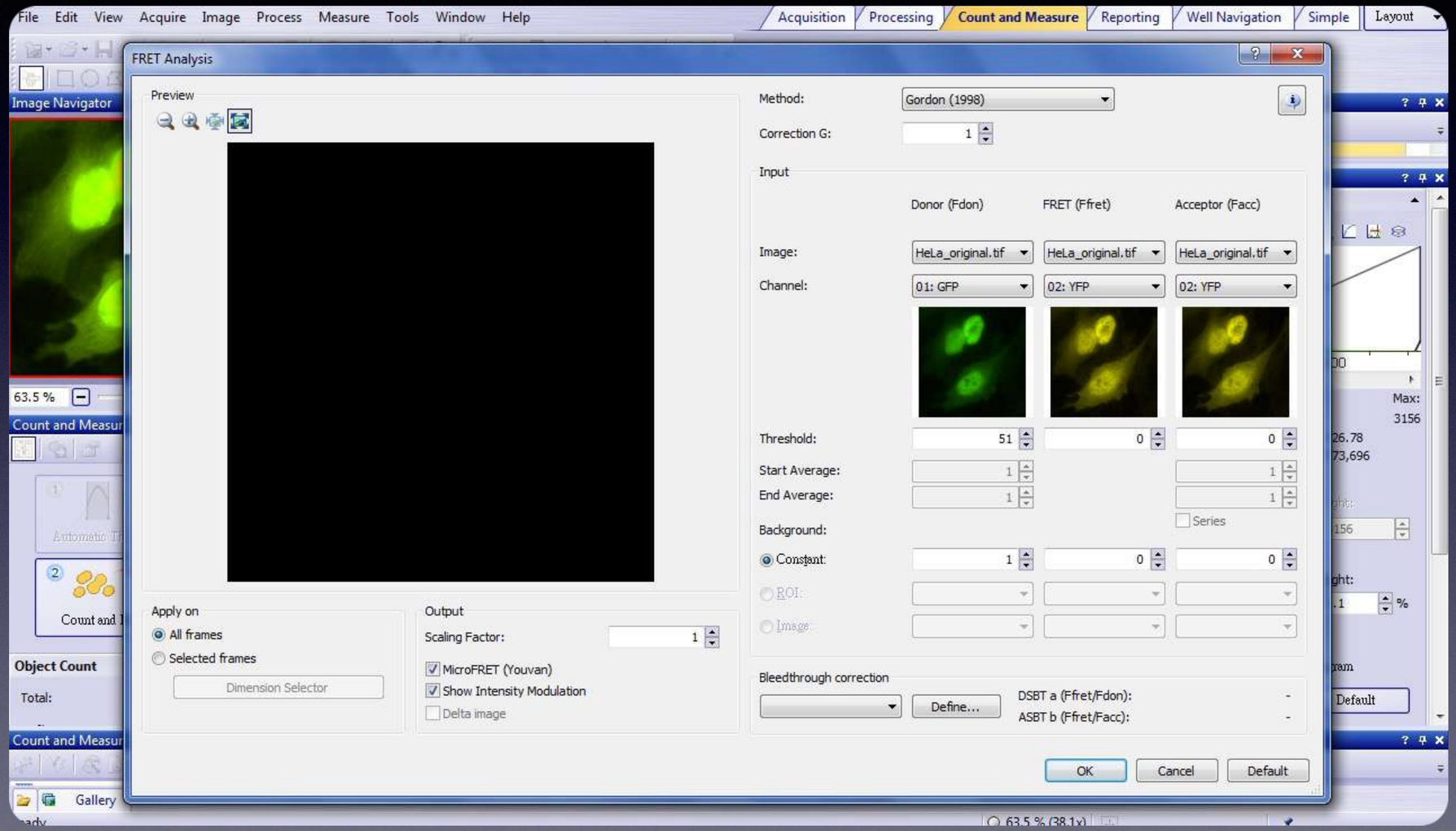

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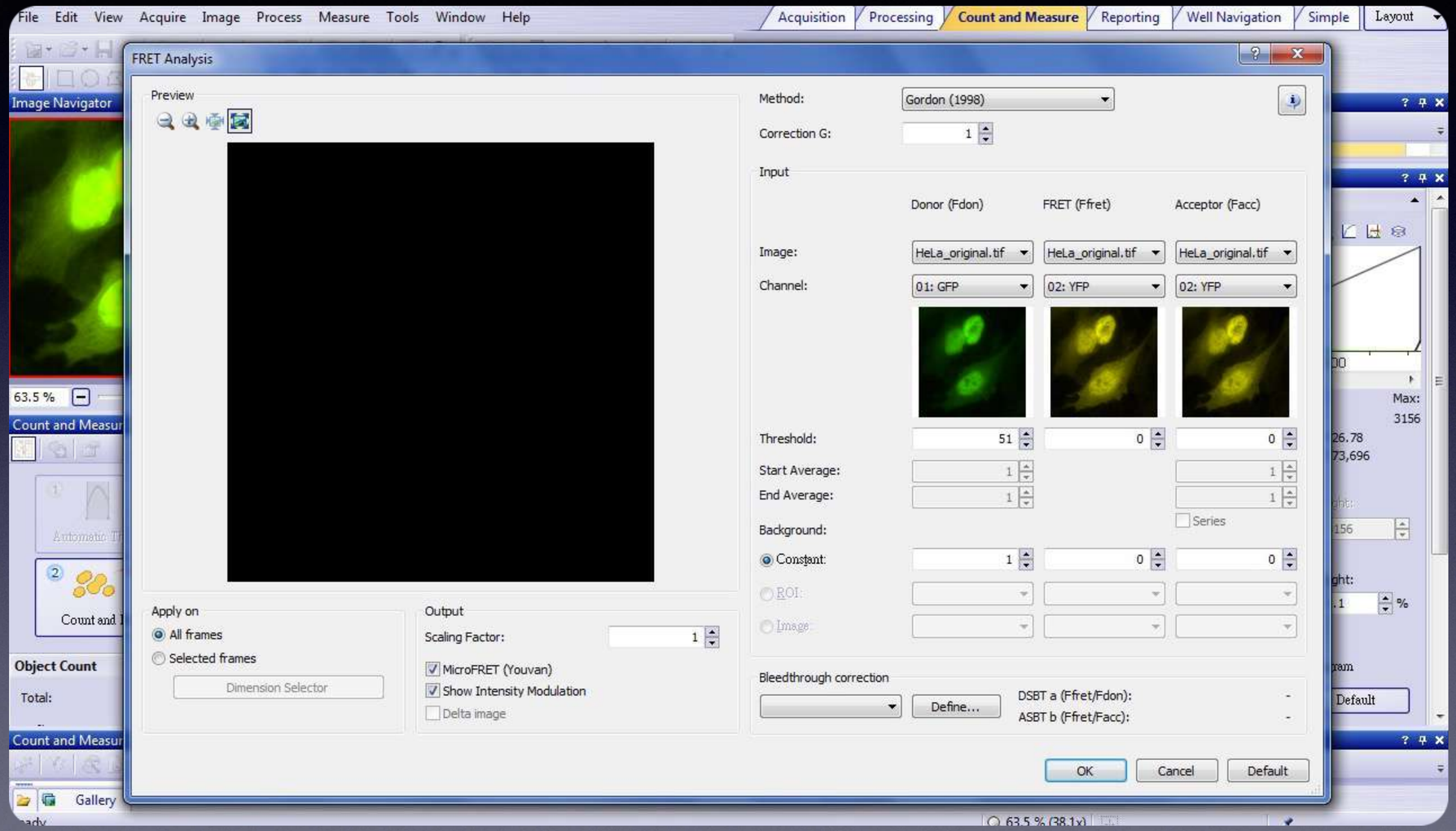

Ratio

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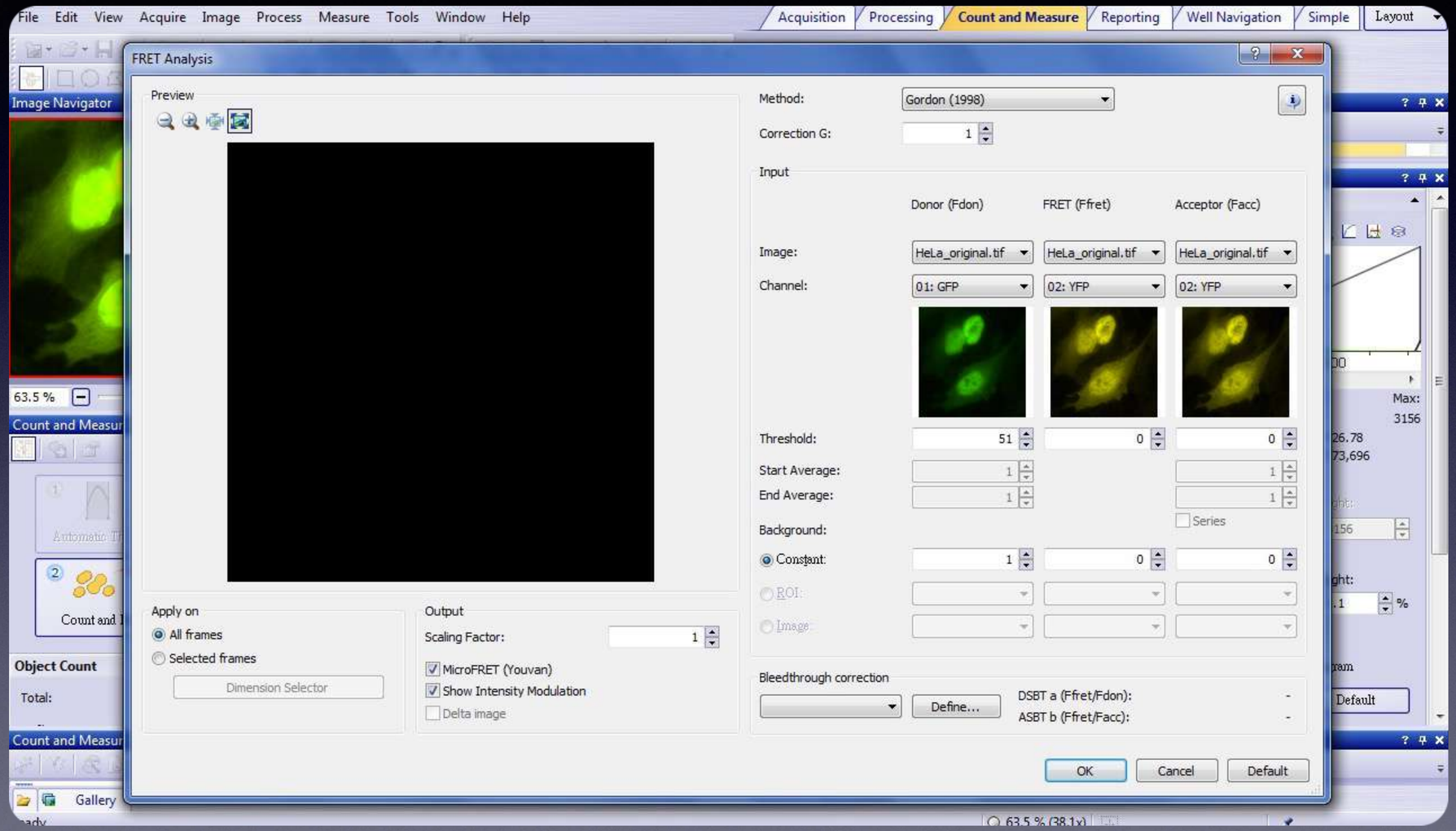

Ratio

Gordon/Micro FRET

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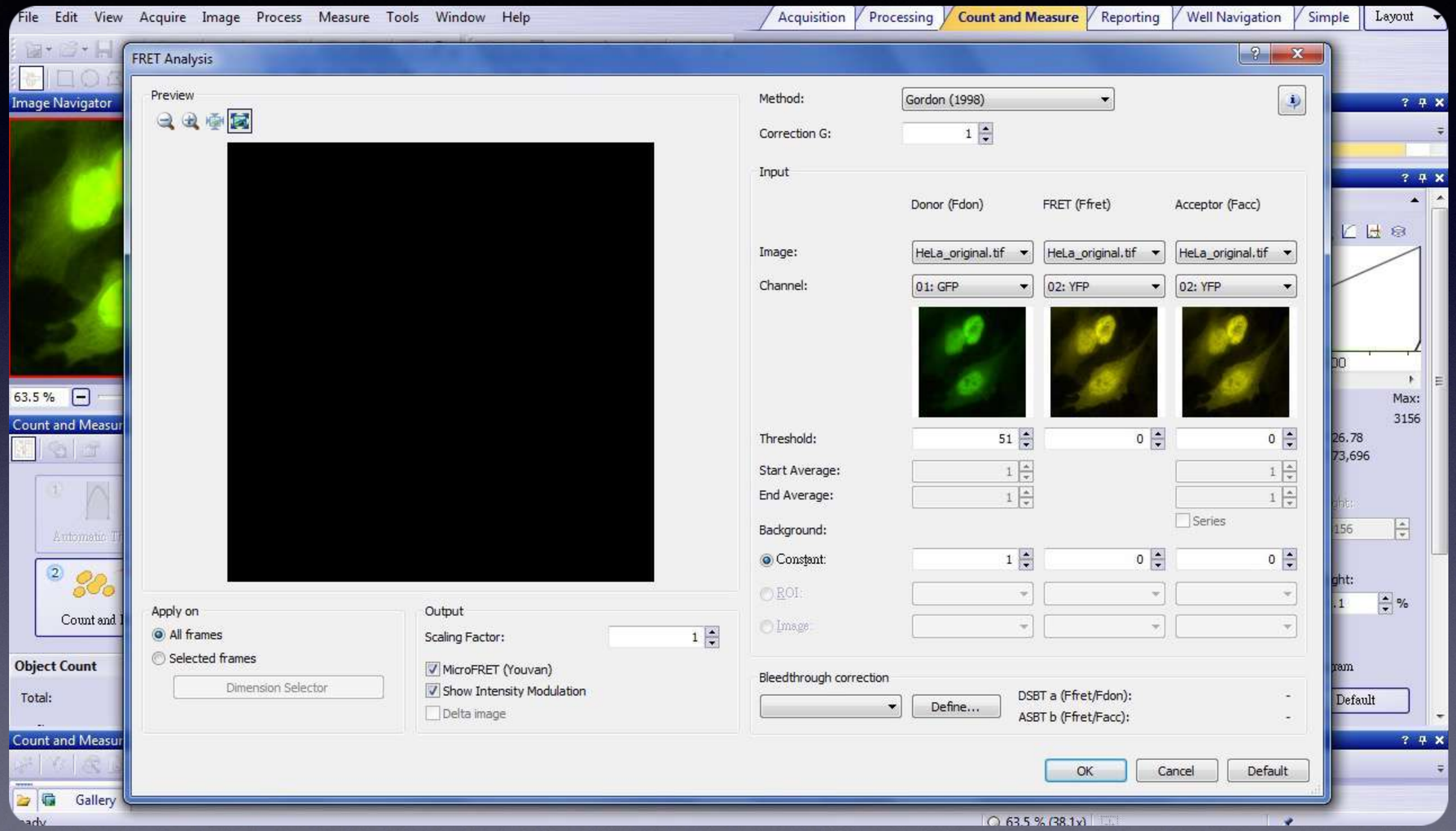

Ratio

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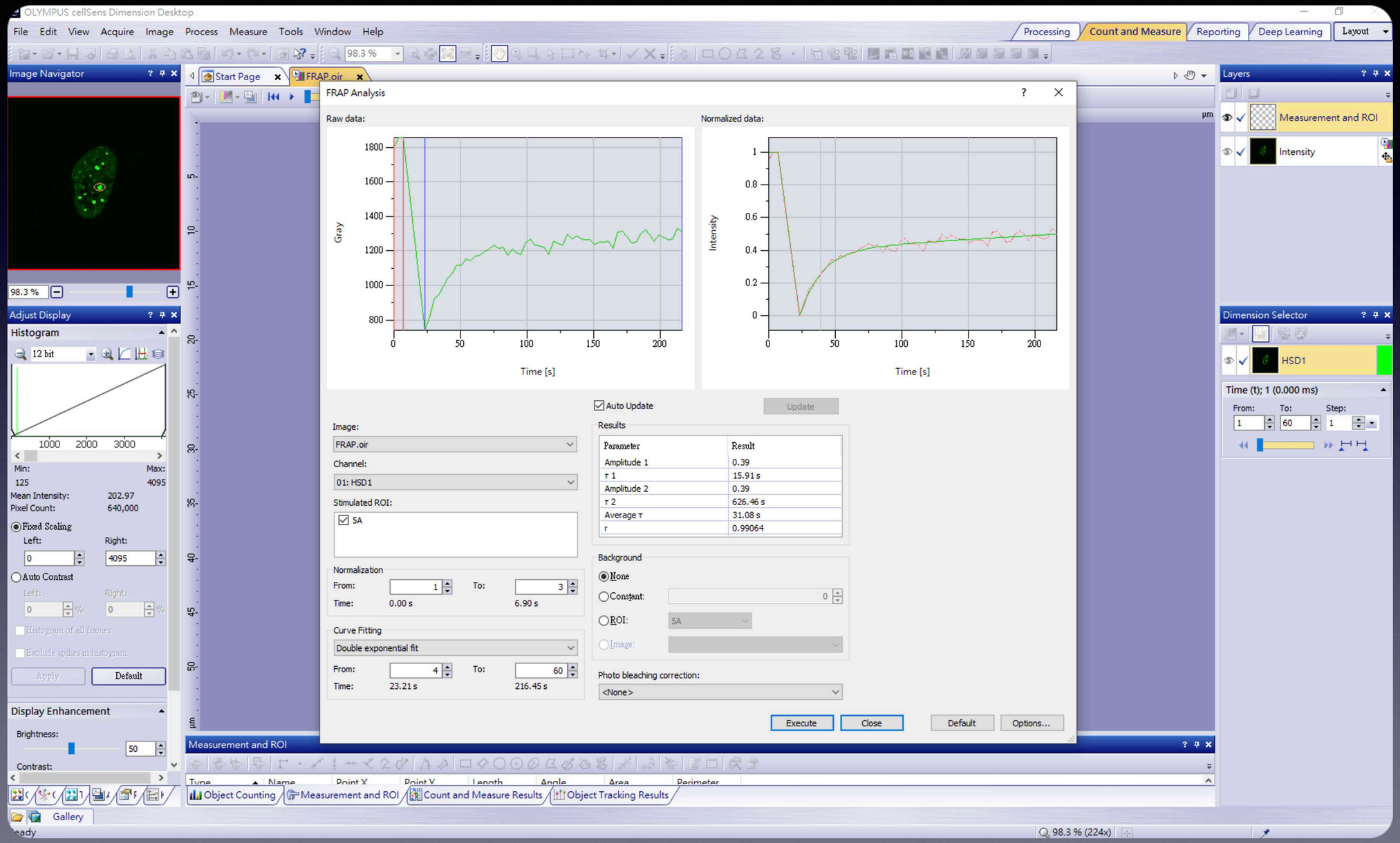
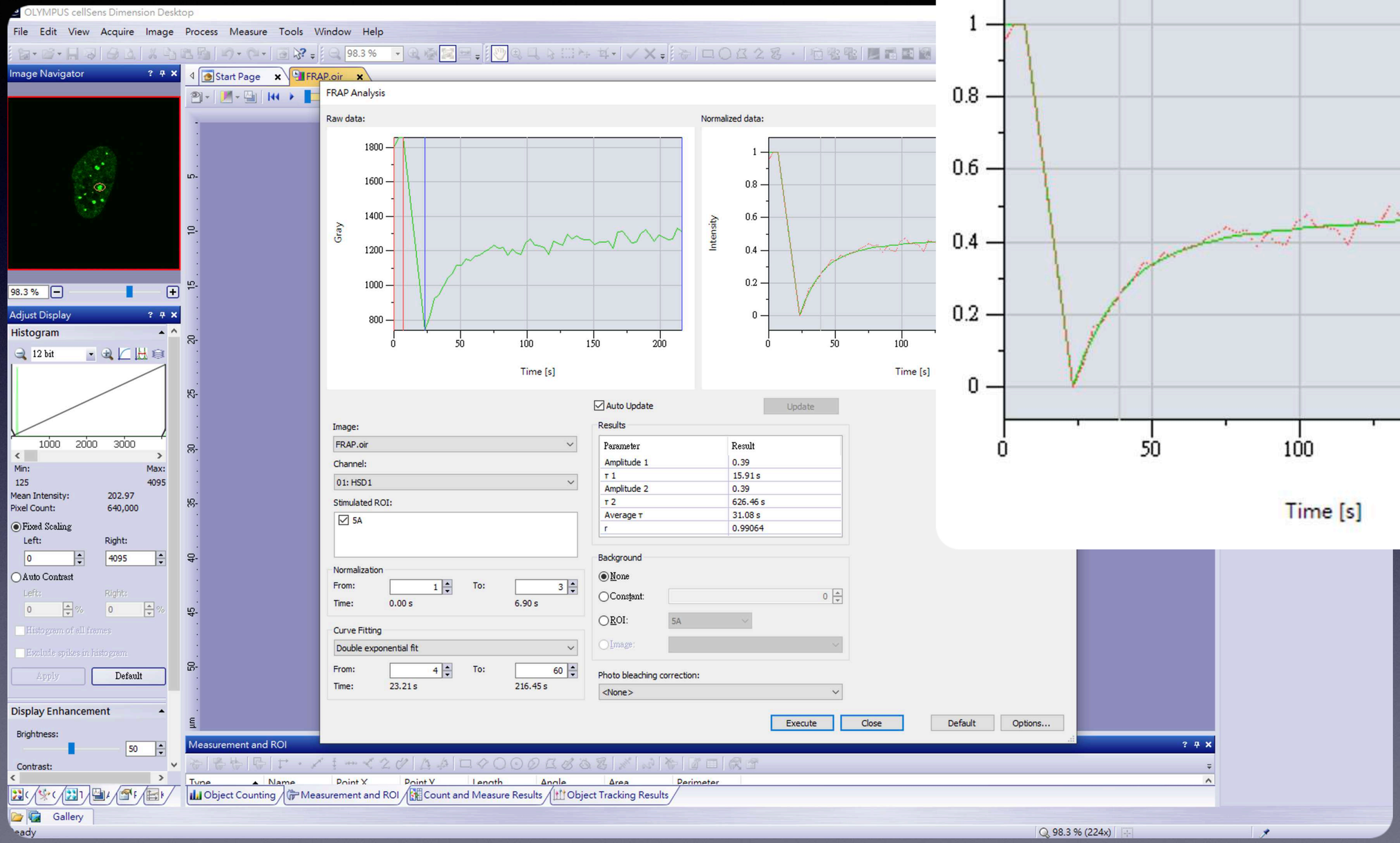
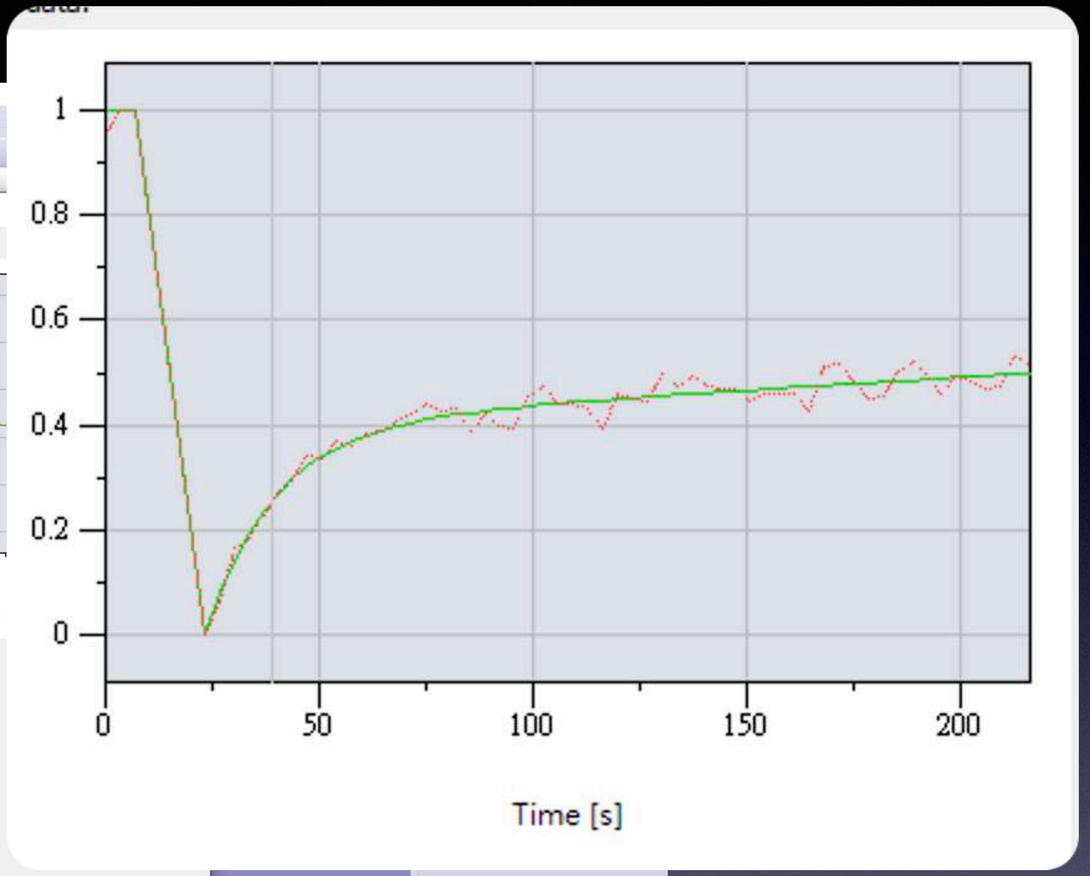
Acceptor photo bleach

II.影像分析—cellSens FRAP analysis

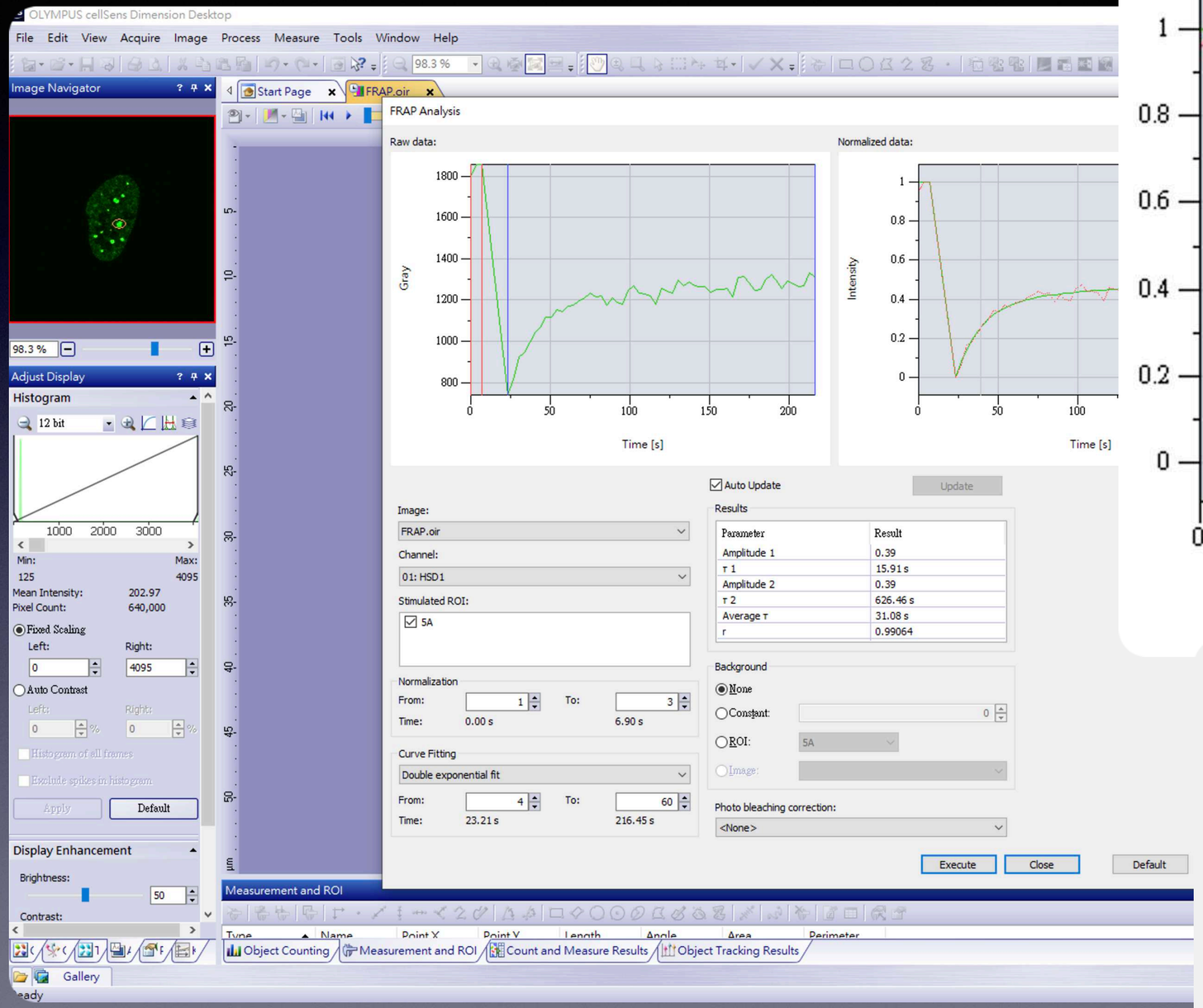


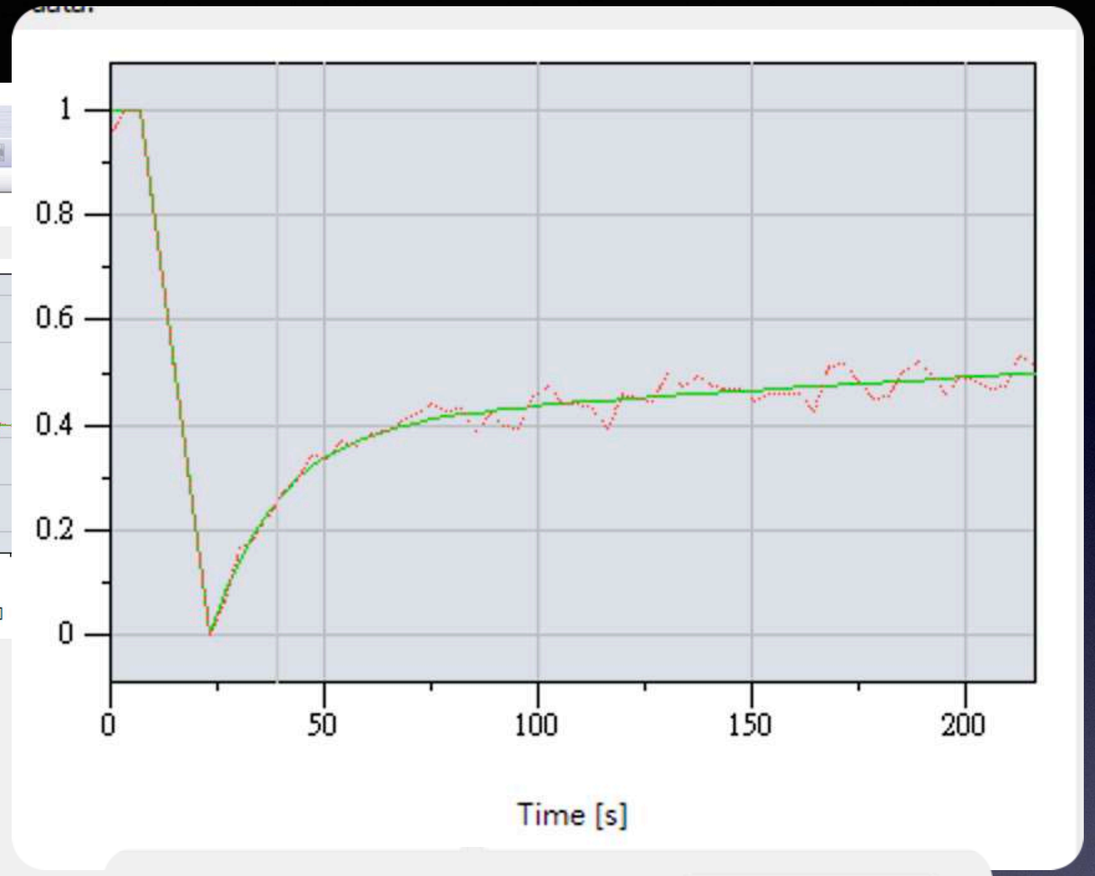
II.影像分析—cellSens FRAP analysis





II.影像分析—cellSens FRAP analysis





Auto Update

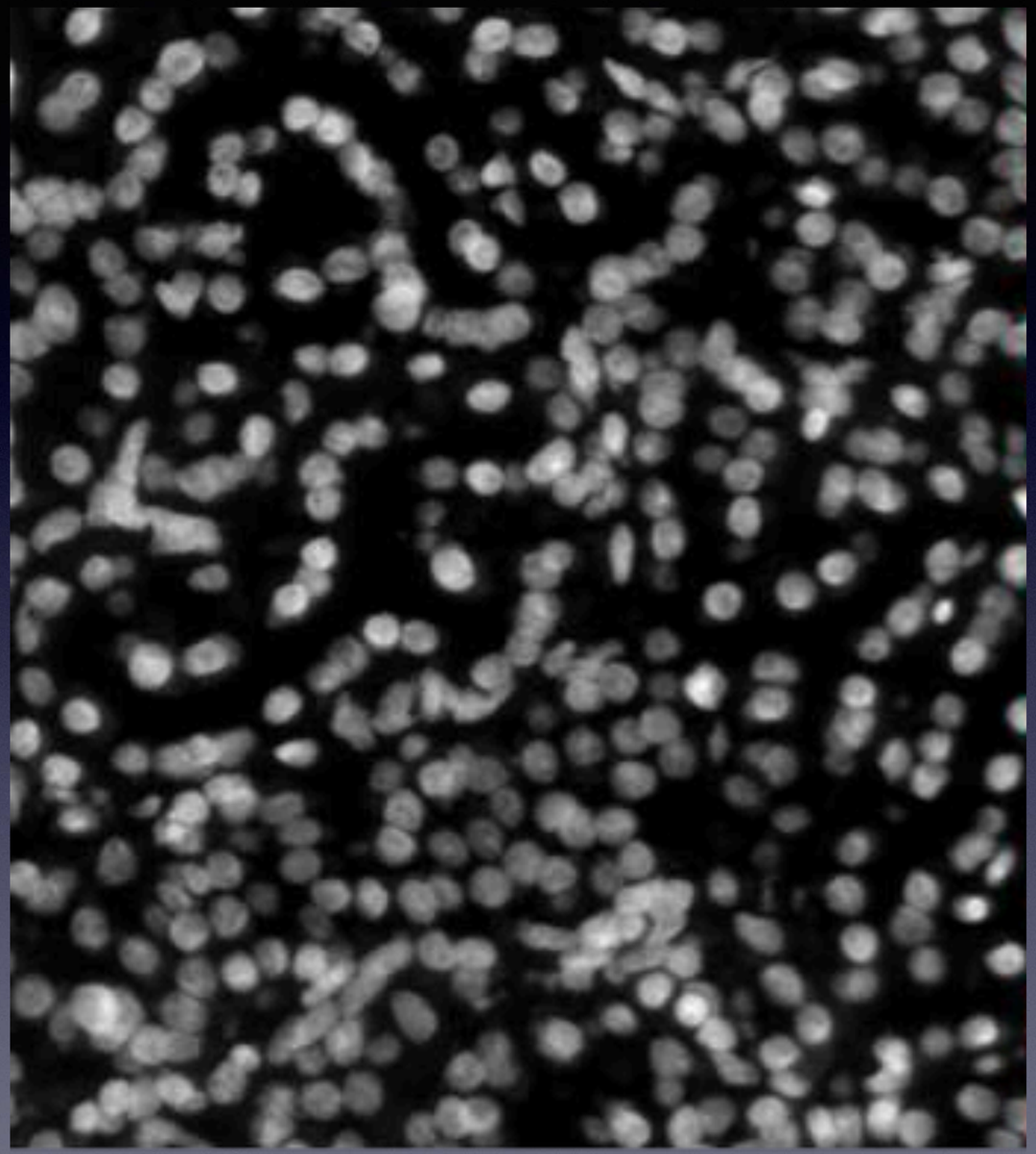
Update

Results

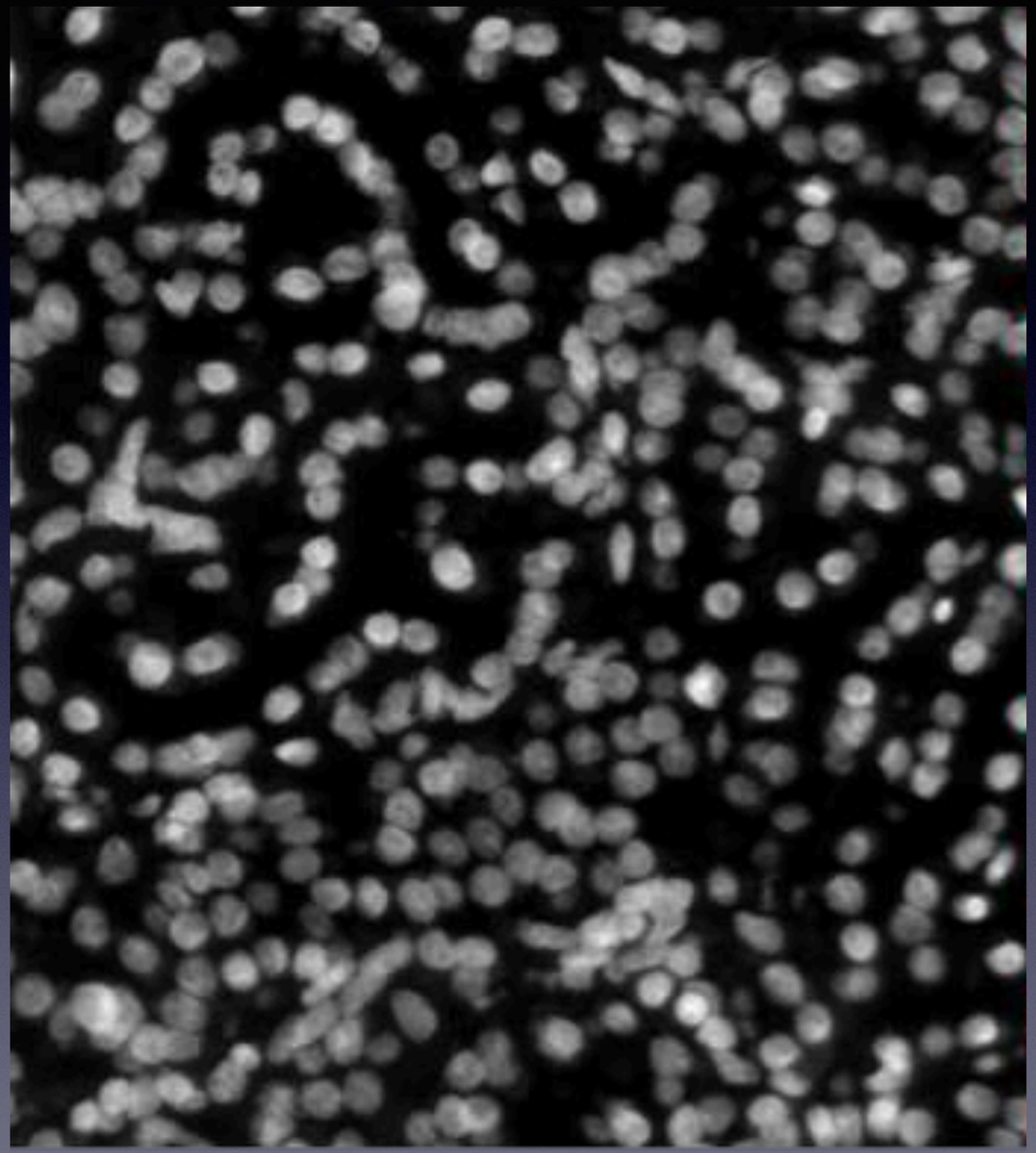
Parameter	Result
Amplitude 1	0.39
τ 1	15.91 s
Amplitude 2	0.39
τ 2	626.46 s
Average τ	31.08 s
r	0.99064

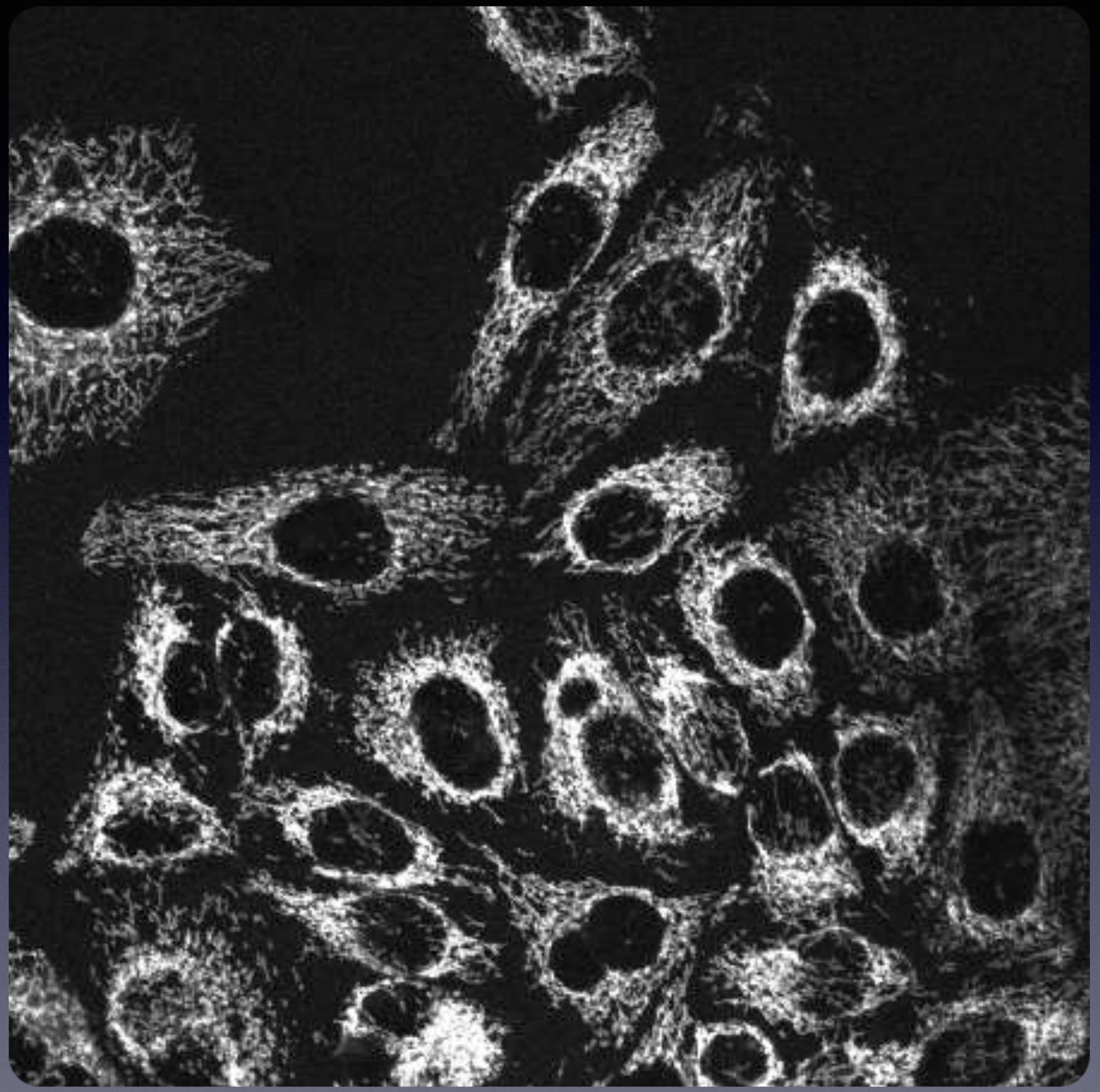
II.影像分析—cellSens TruAI

II.影像分析—cellSens TruAI

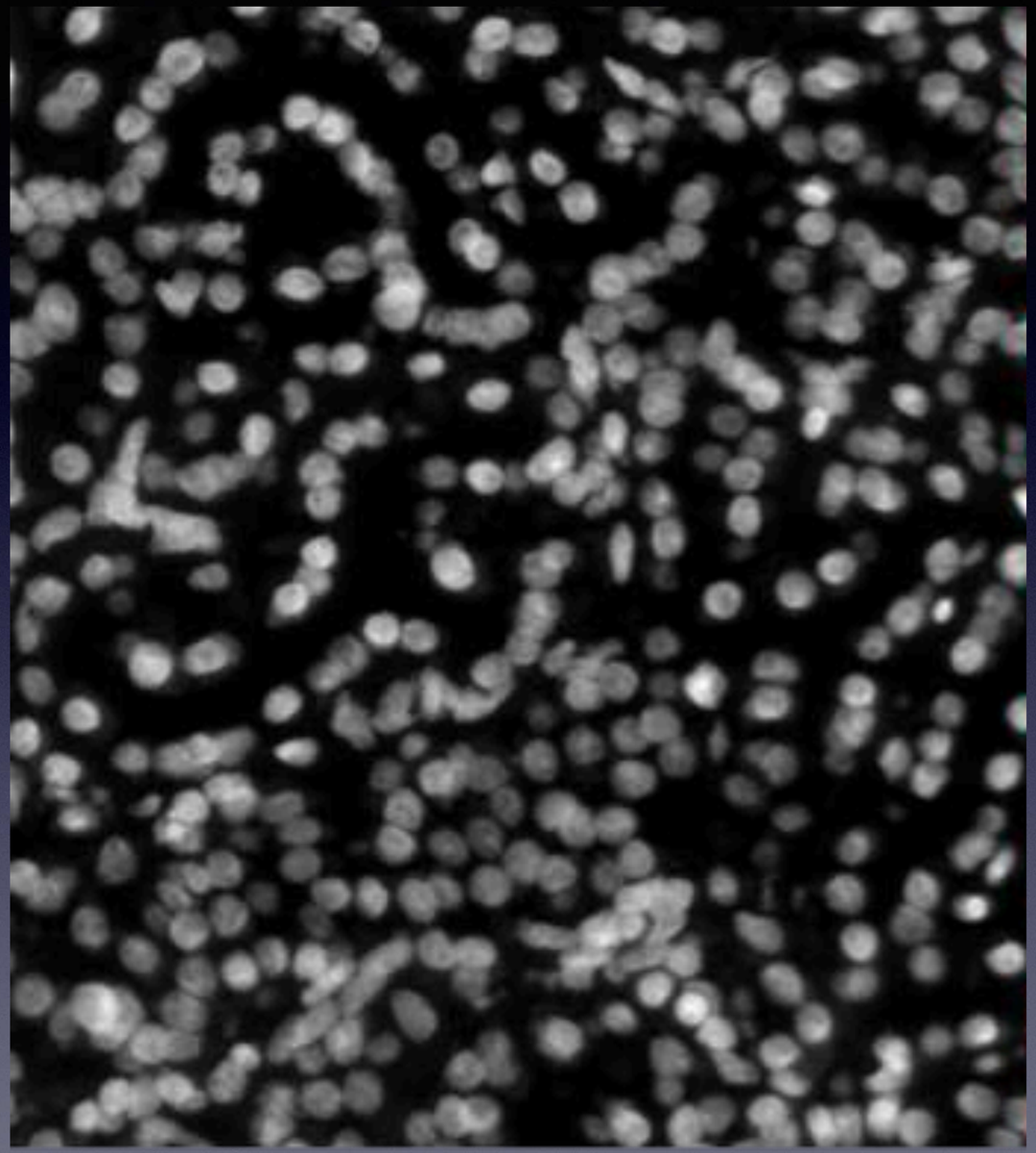


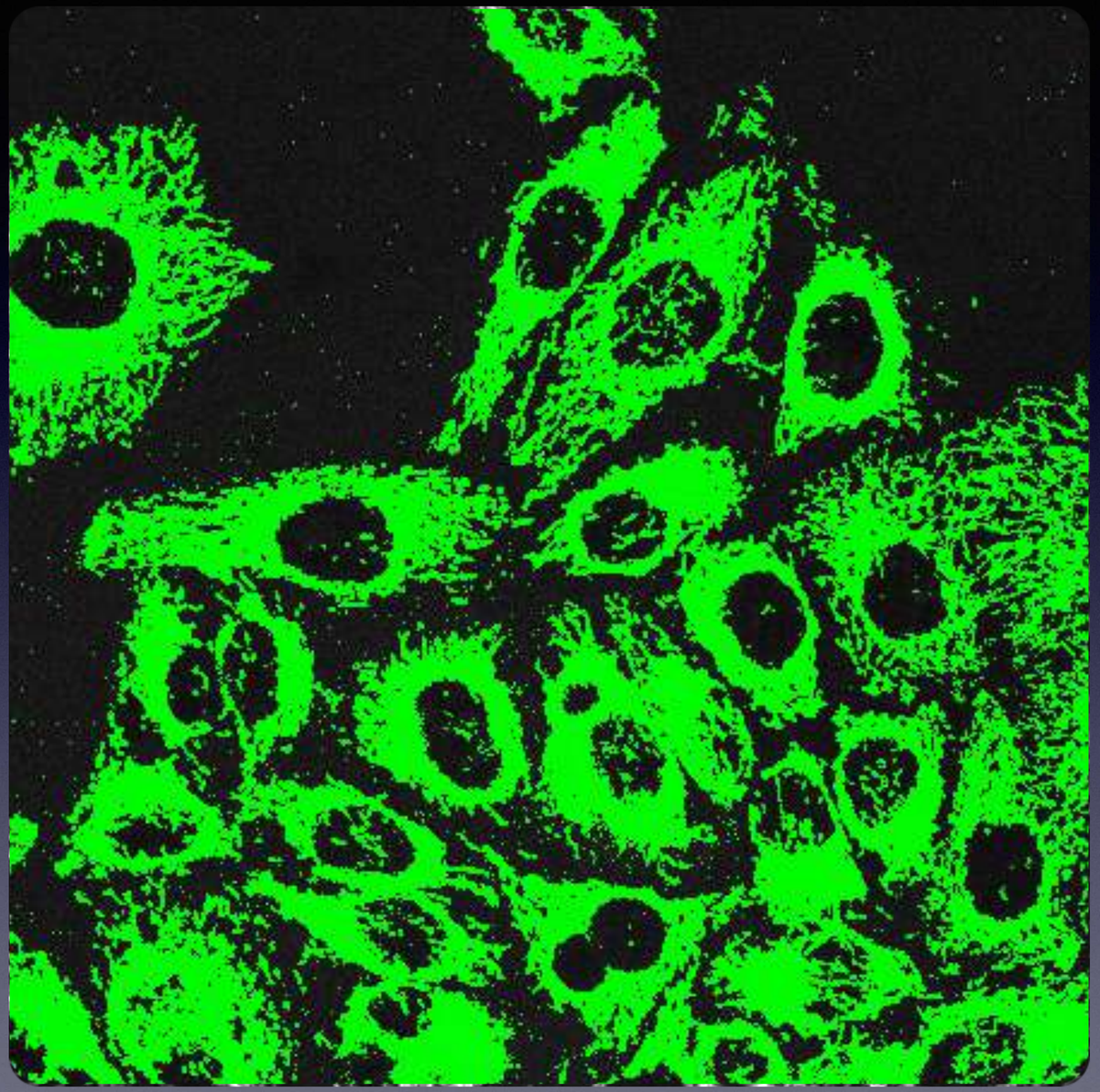
II.影像分析—**cellSens TruAI**



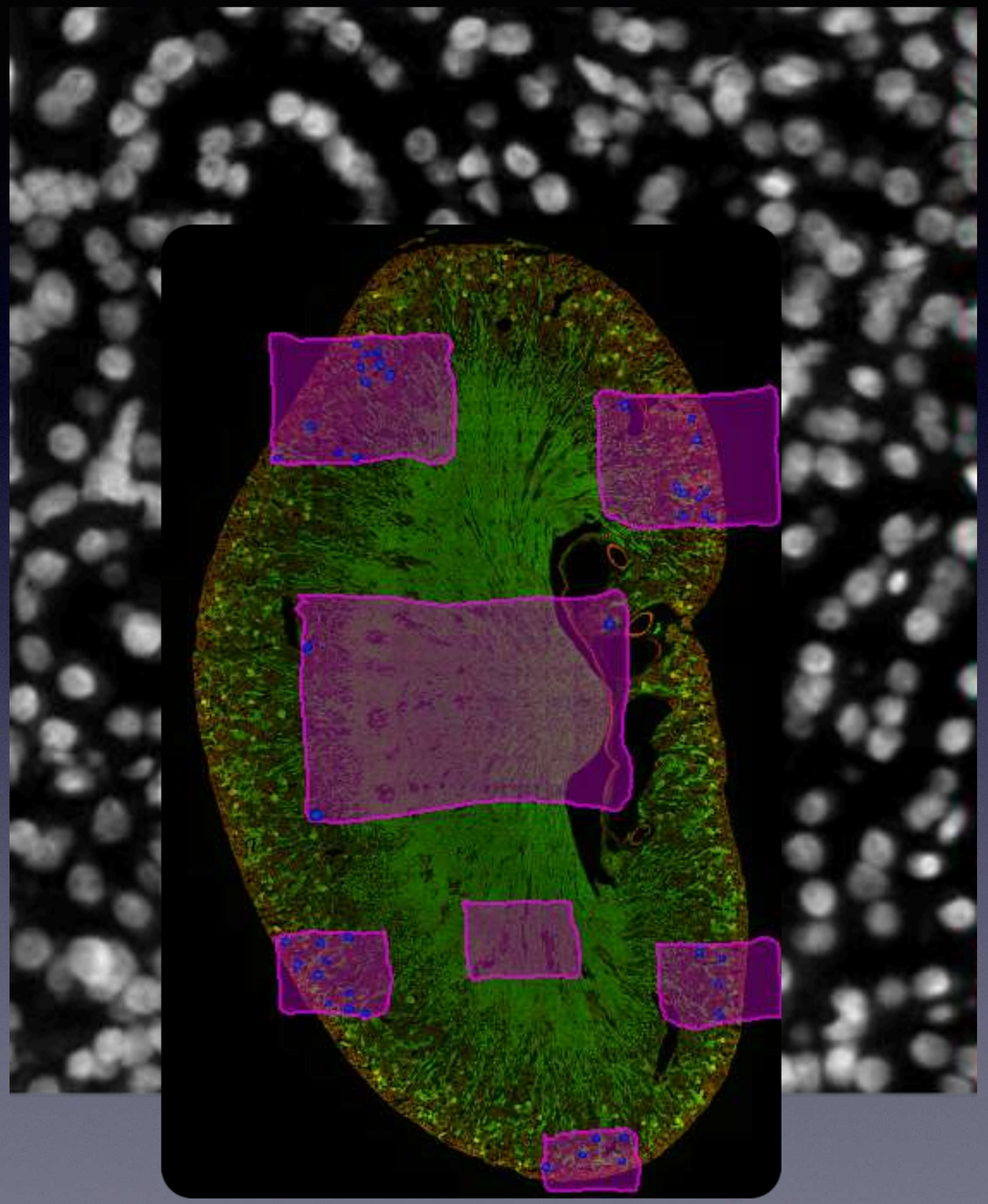


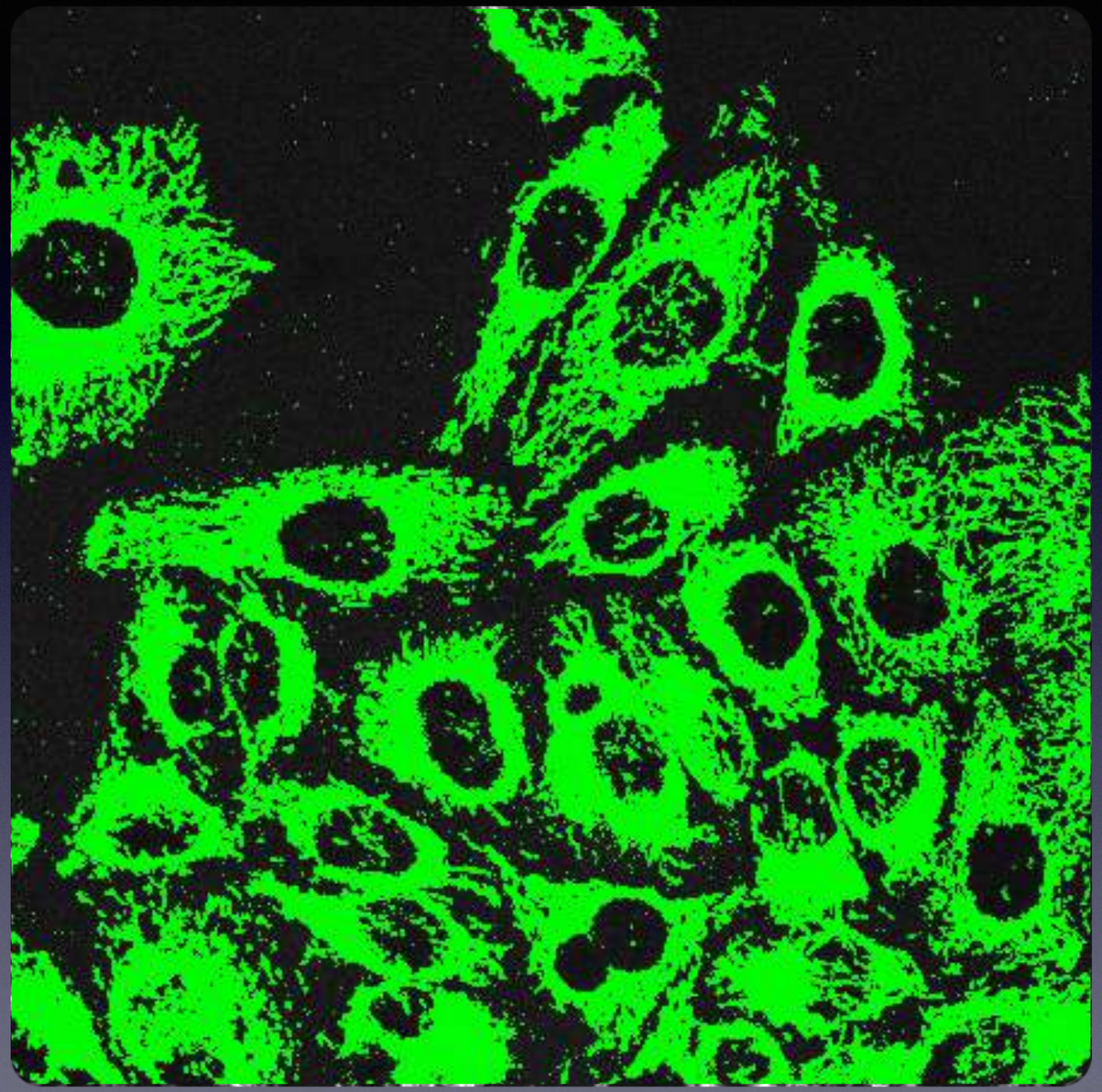
II.影像分析—cellSens TruAI



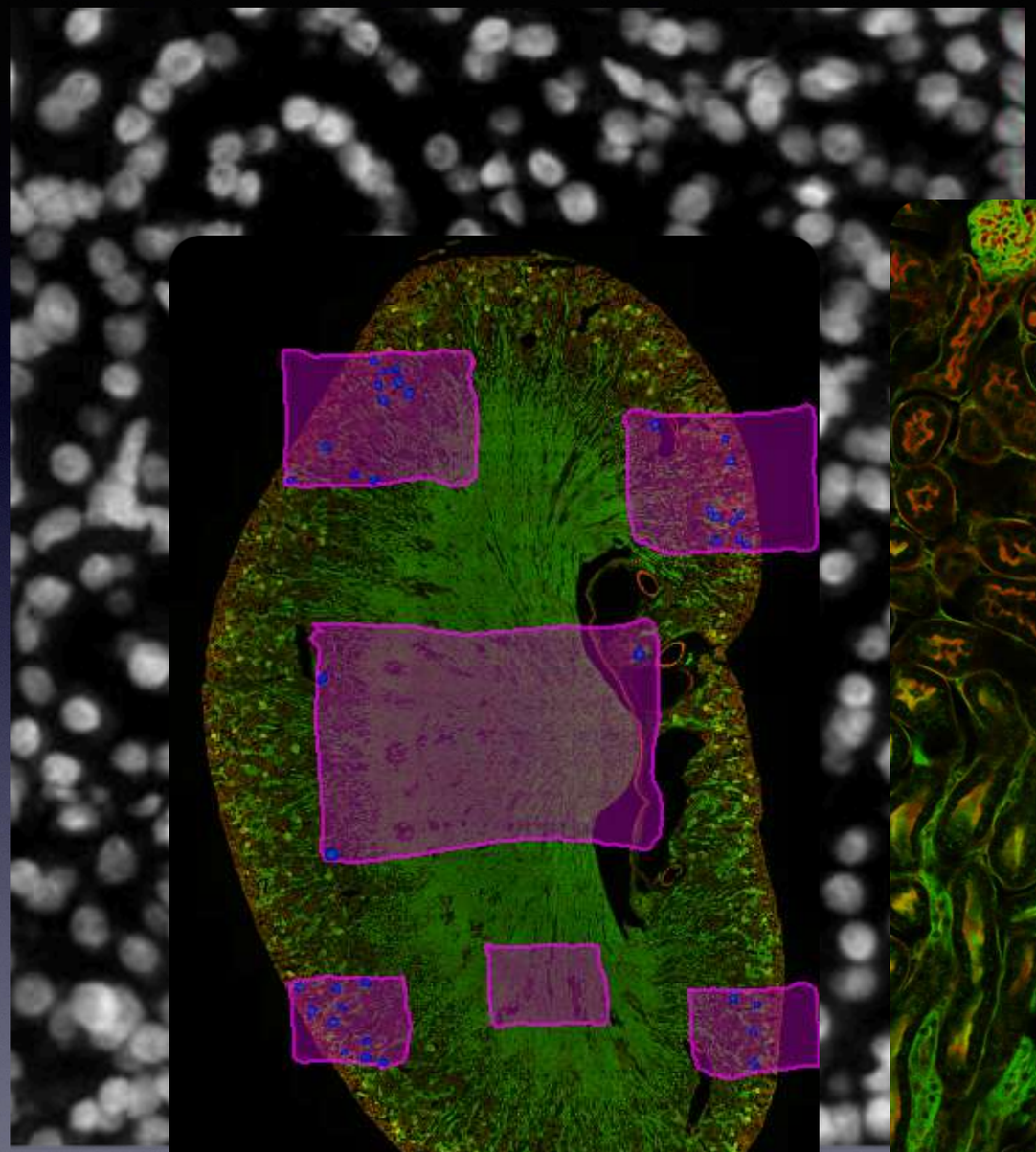


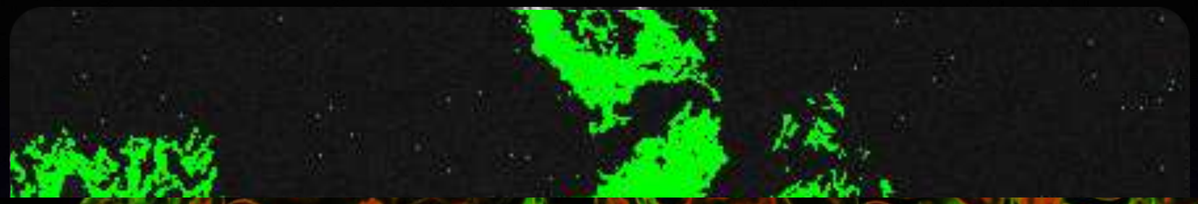
II.影像分析—**cellSens TruAI**

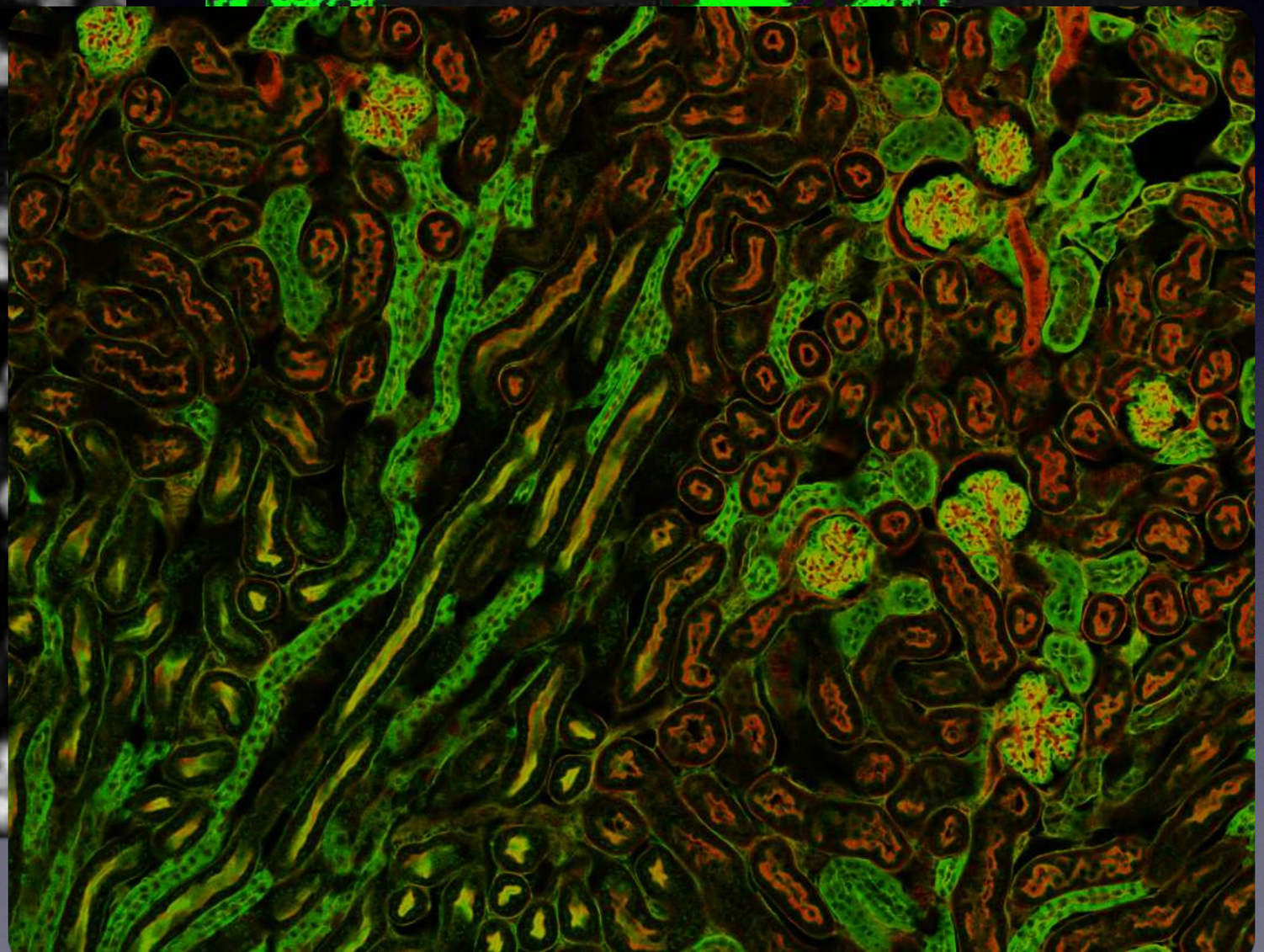




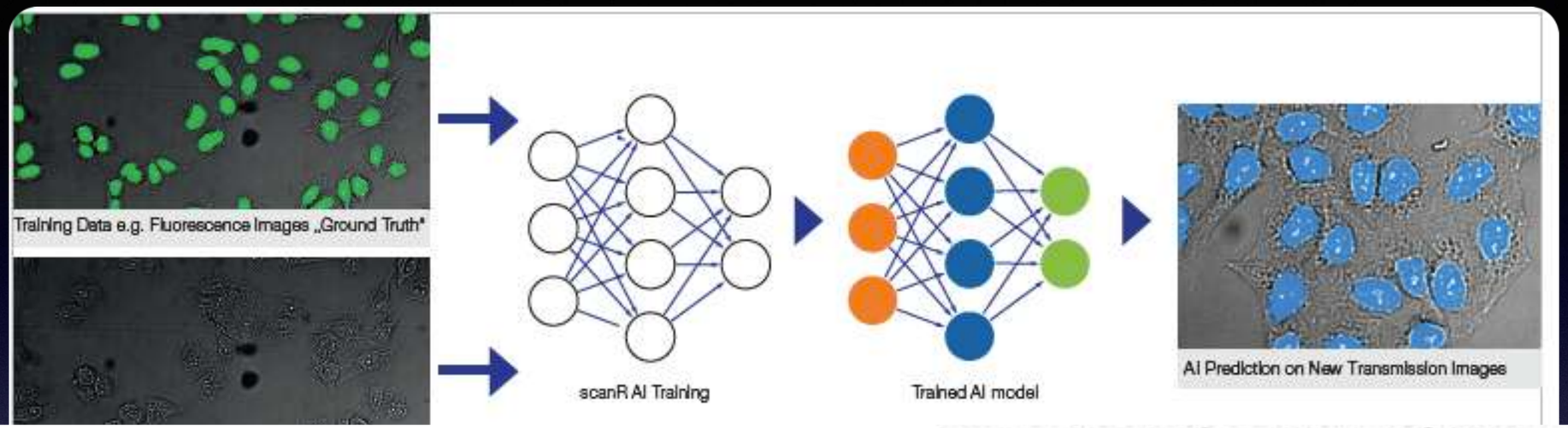
II.影像分析—cellSens TruAI

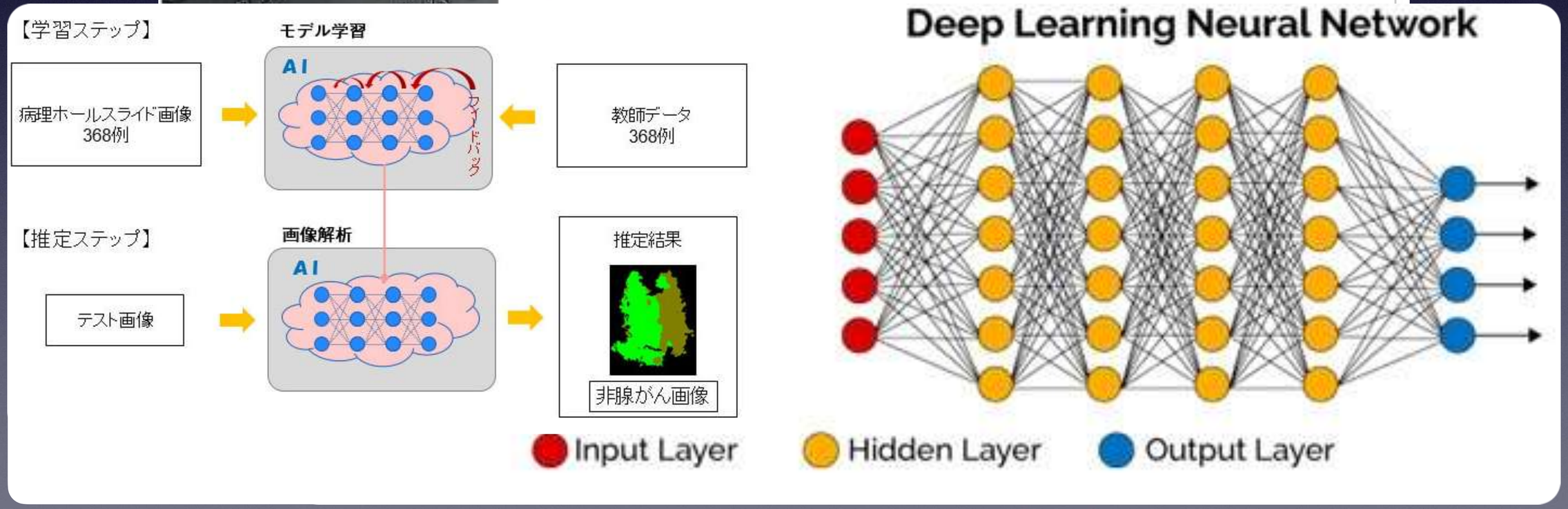






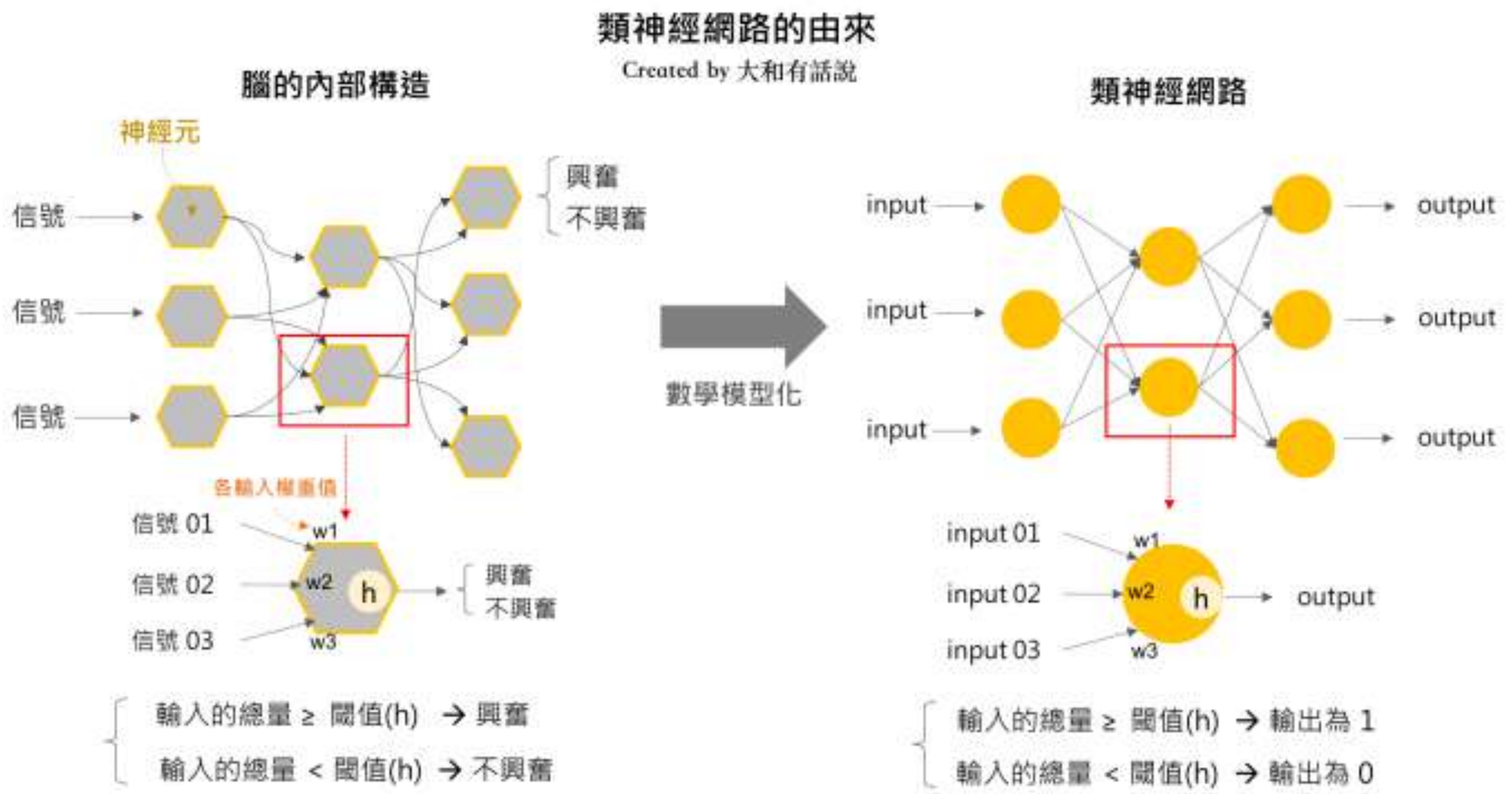
III.影像分析—cellSens TruAI 卷積神經網路CNN(Convolution Neuron Network)



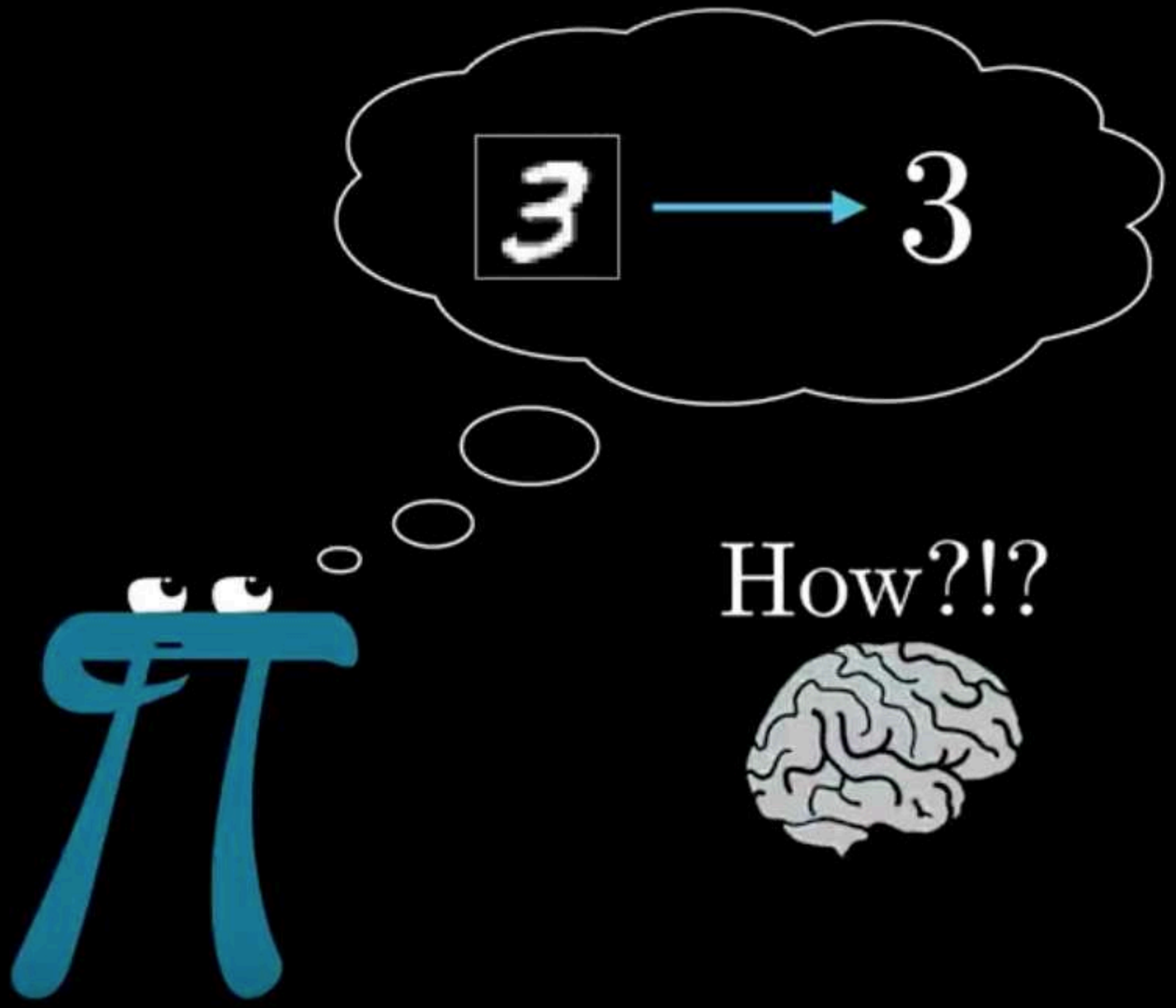


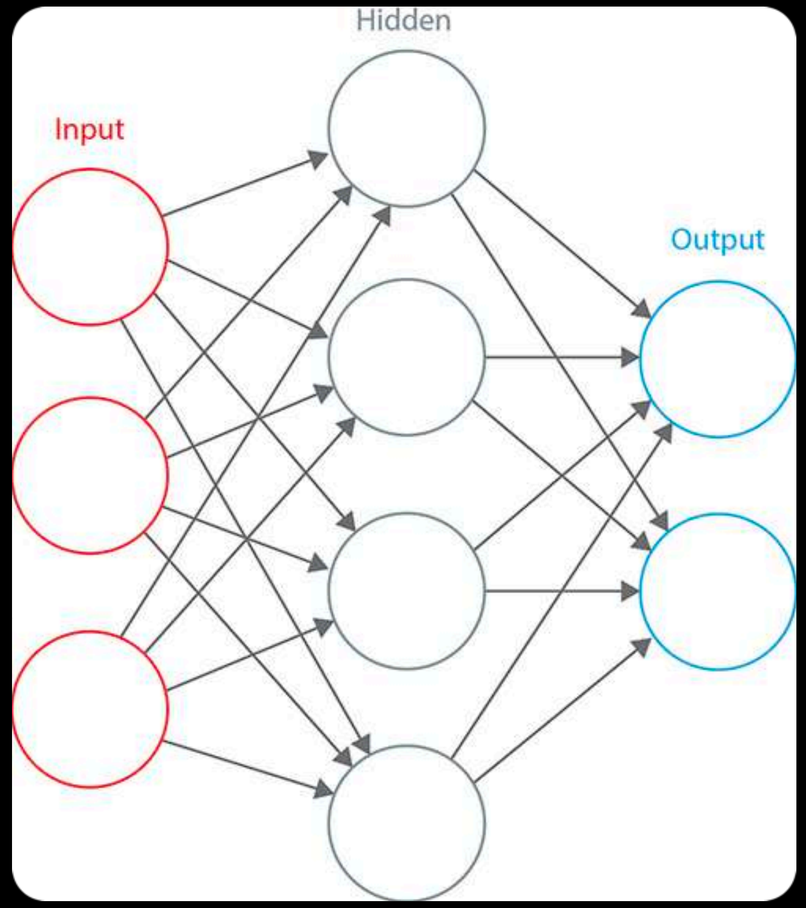
II.2D 影像分析—**cellSens TruAI 深度學習AI模組**

II.2D 影像分析—cellSens TruAI 深度學習AI模組



AI-CNN原理說明(數字辨識)





AI-CNN原理說明(數字辨識)

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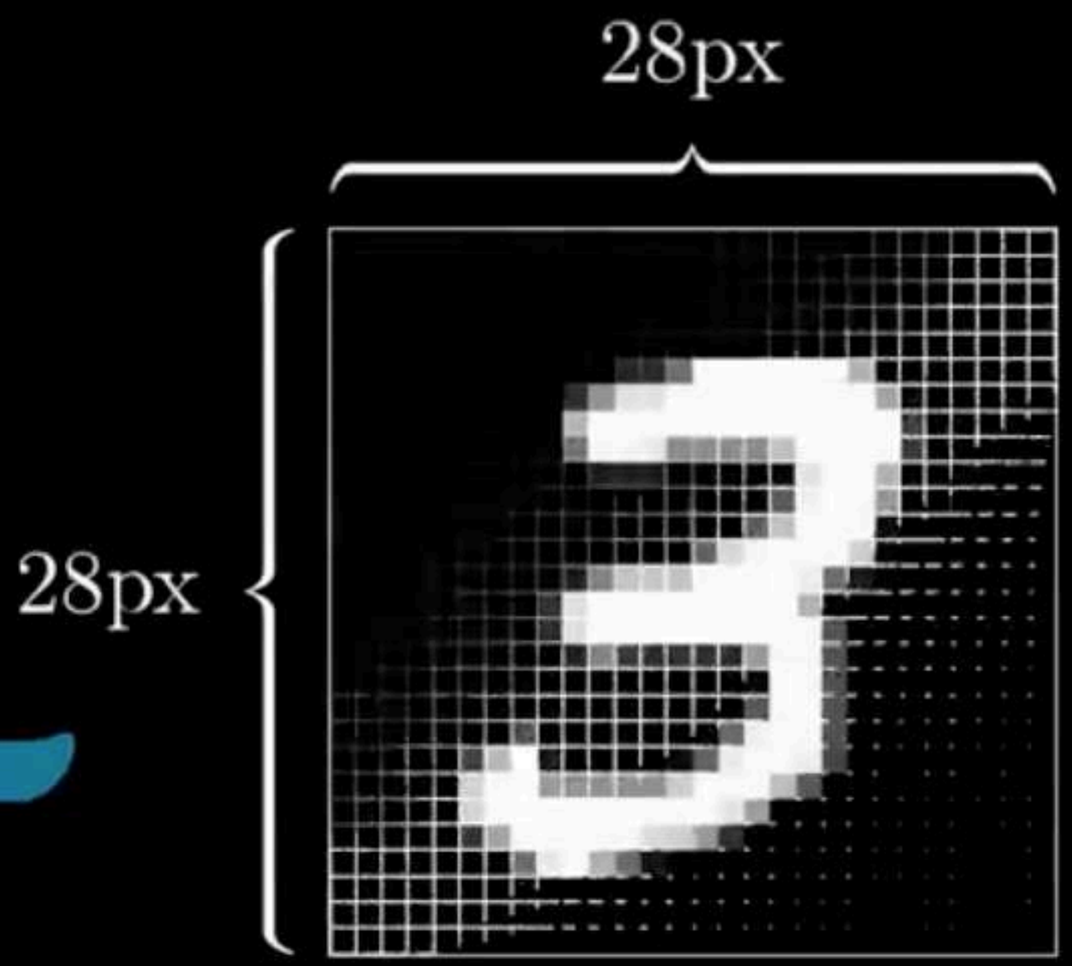
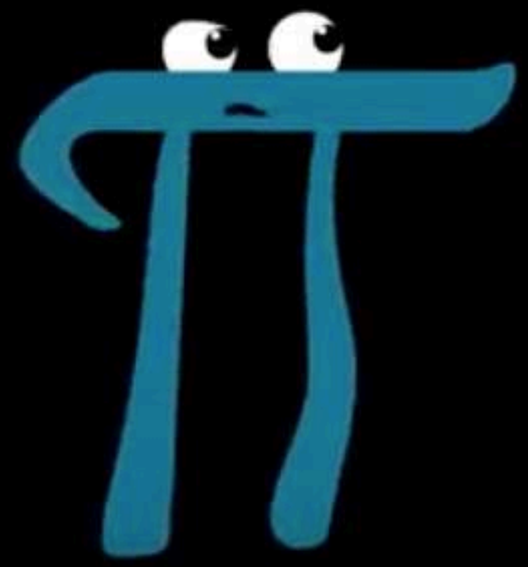
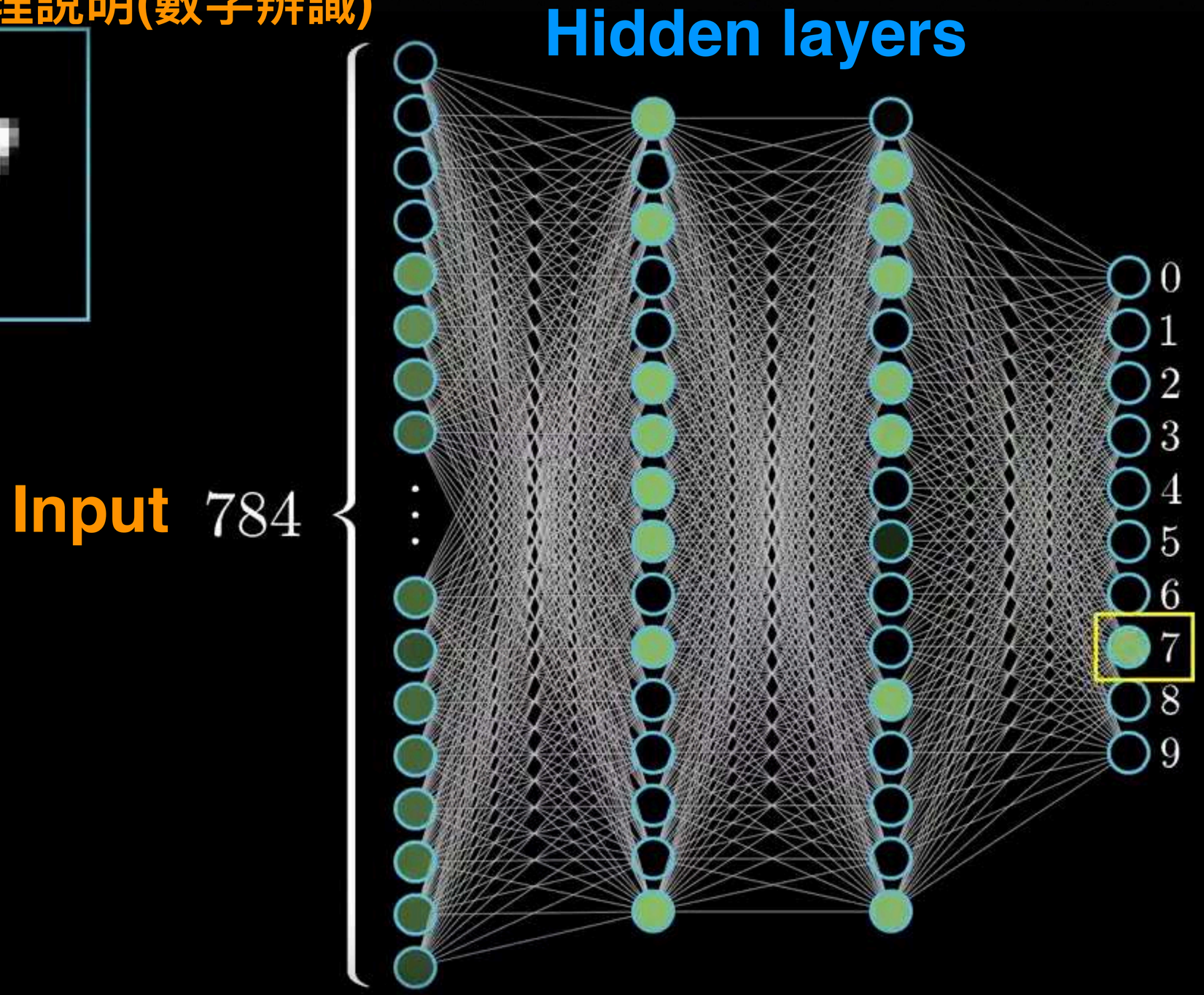


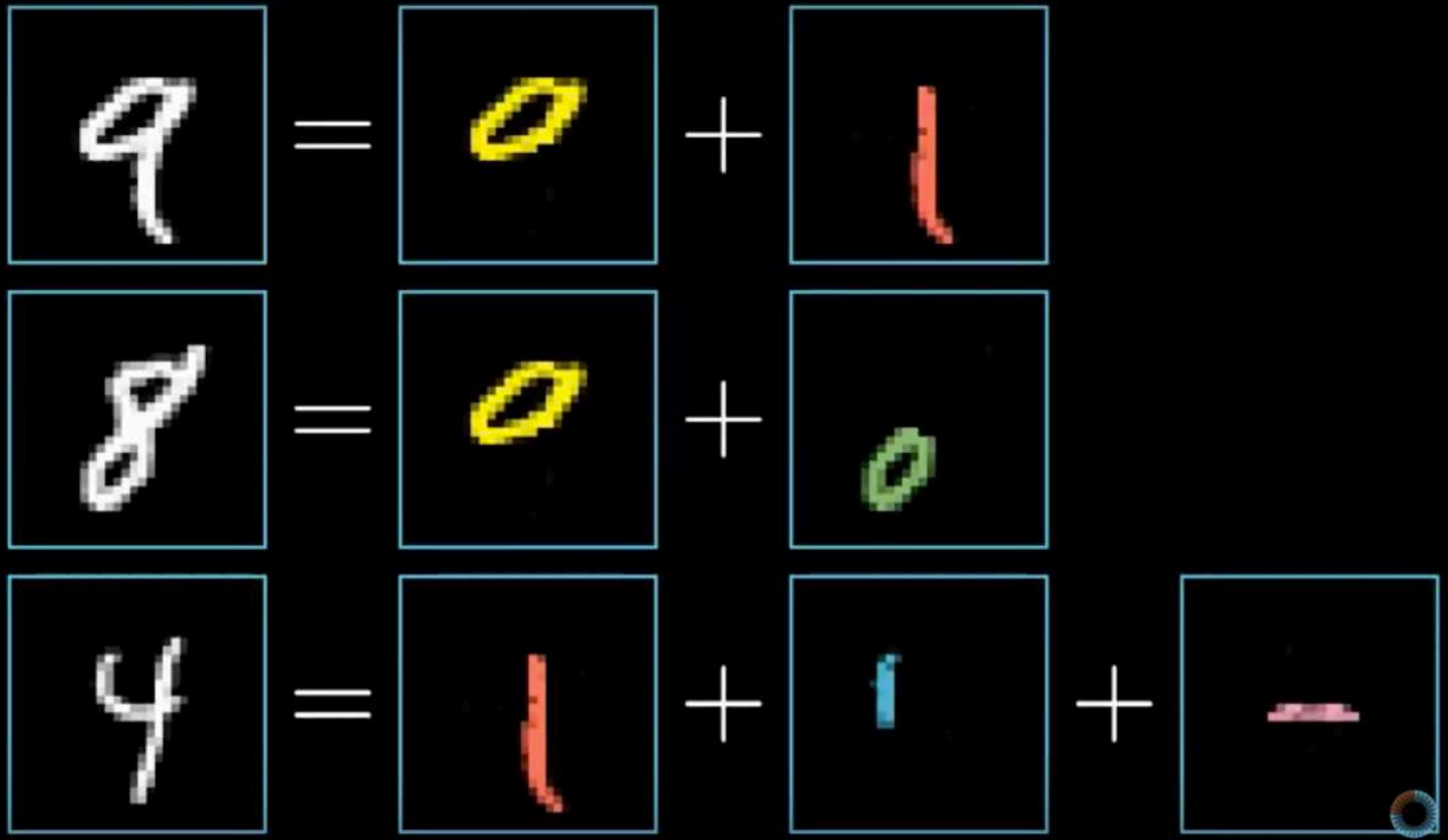
28 X 28 = 784
(input layer)



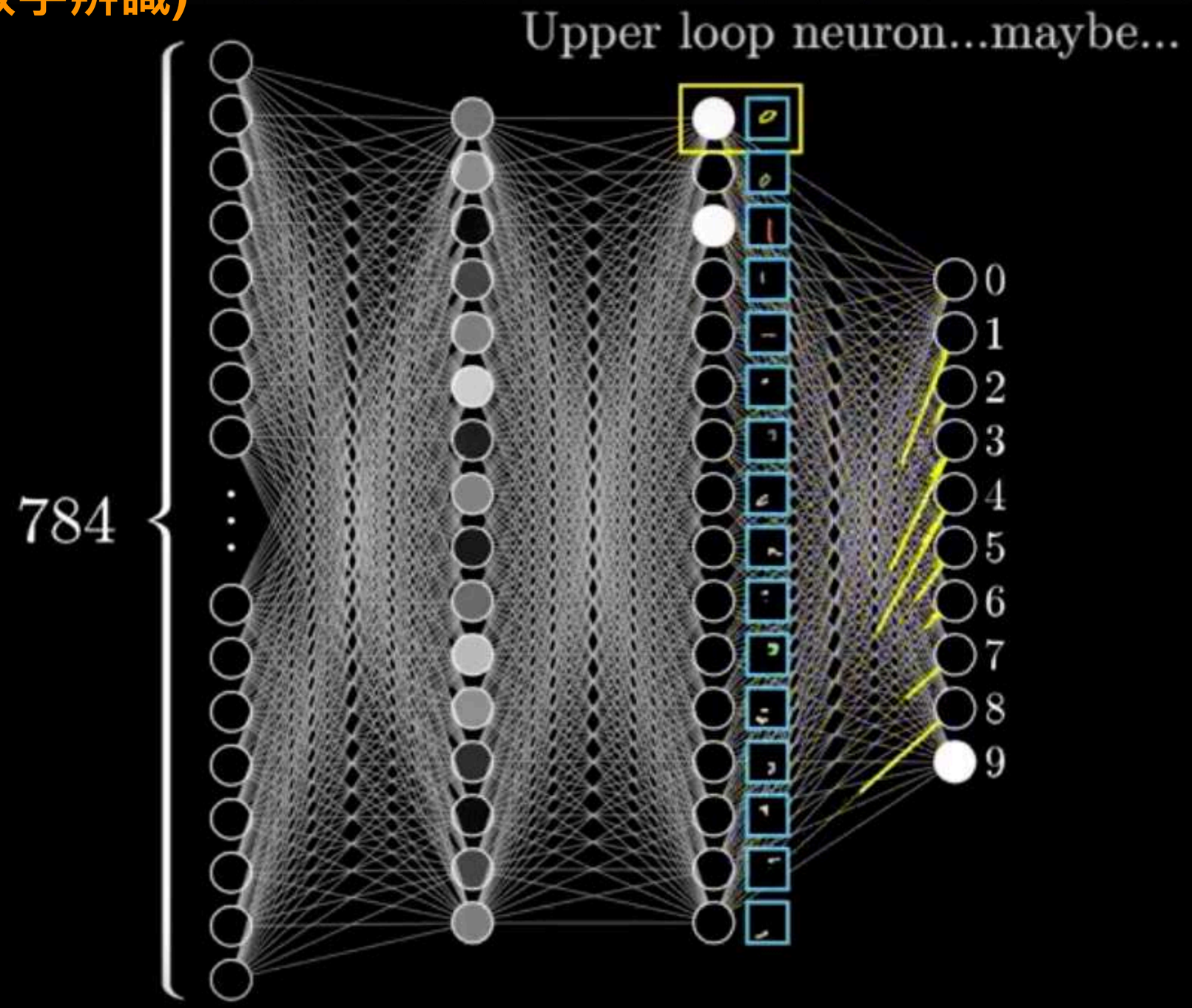
AI-CNN原理說明(數字辨識)



AI-CNN原理說明(數字辨識)



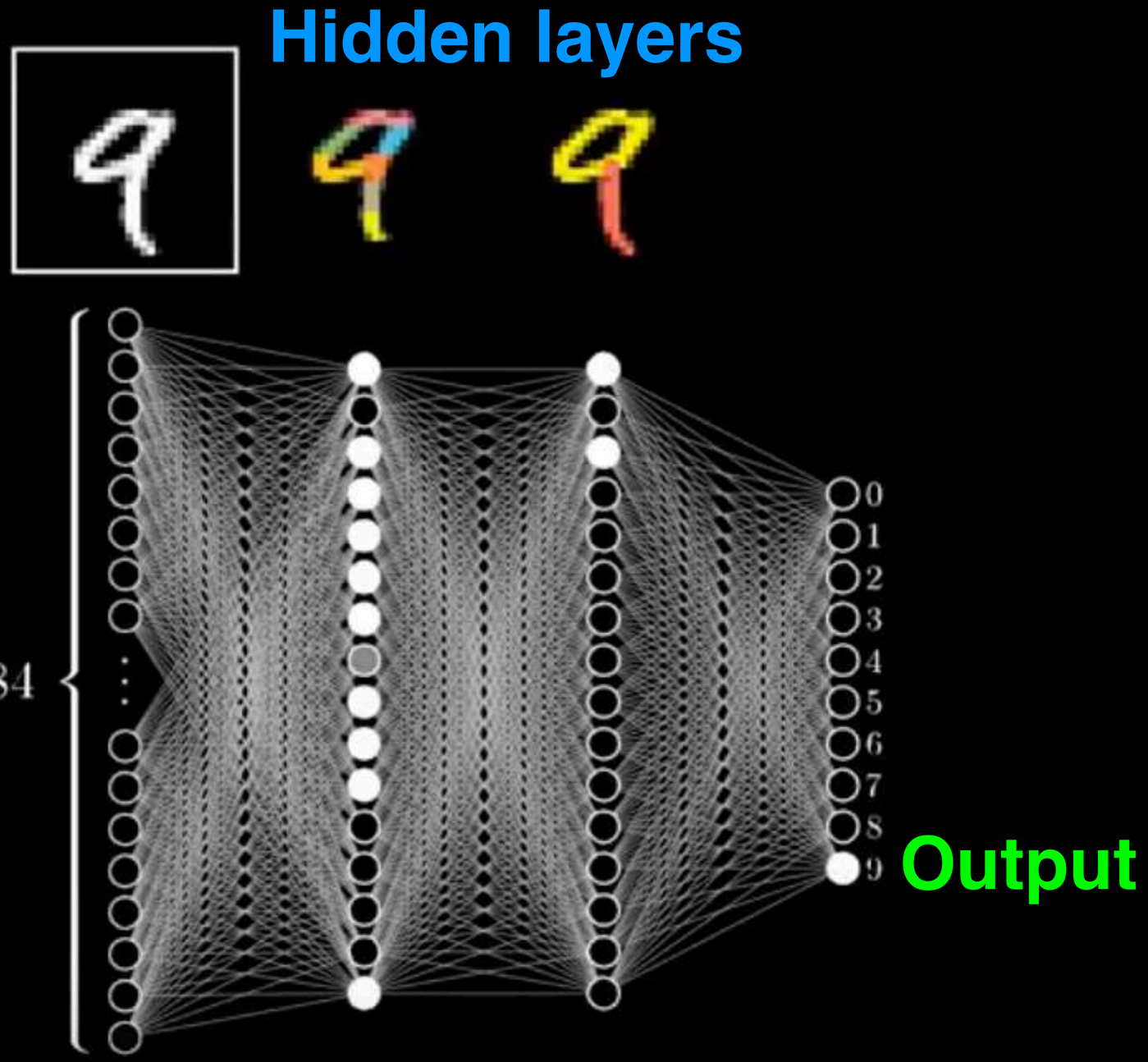
AI-CNN原理說明(數字辨識)



AI-CNN原理說明(數字辨識)

We'll get back to this

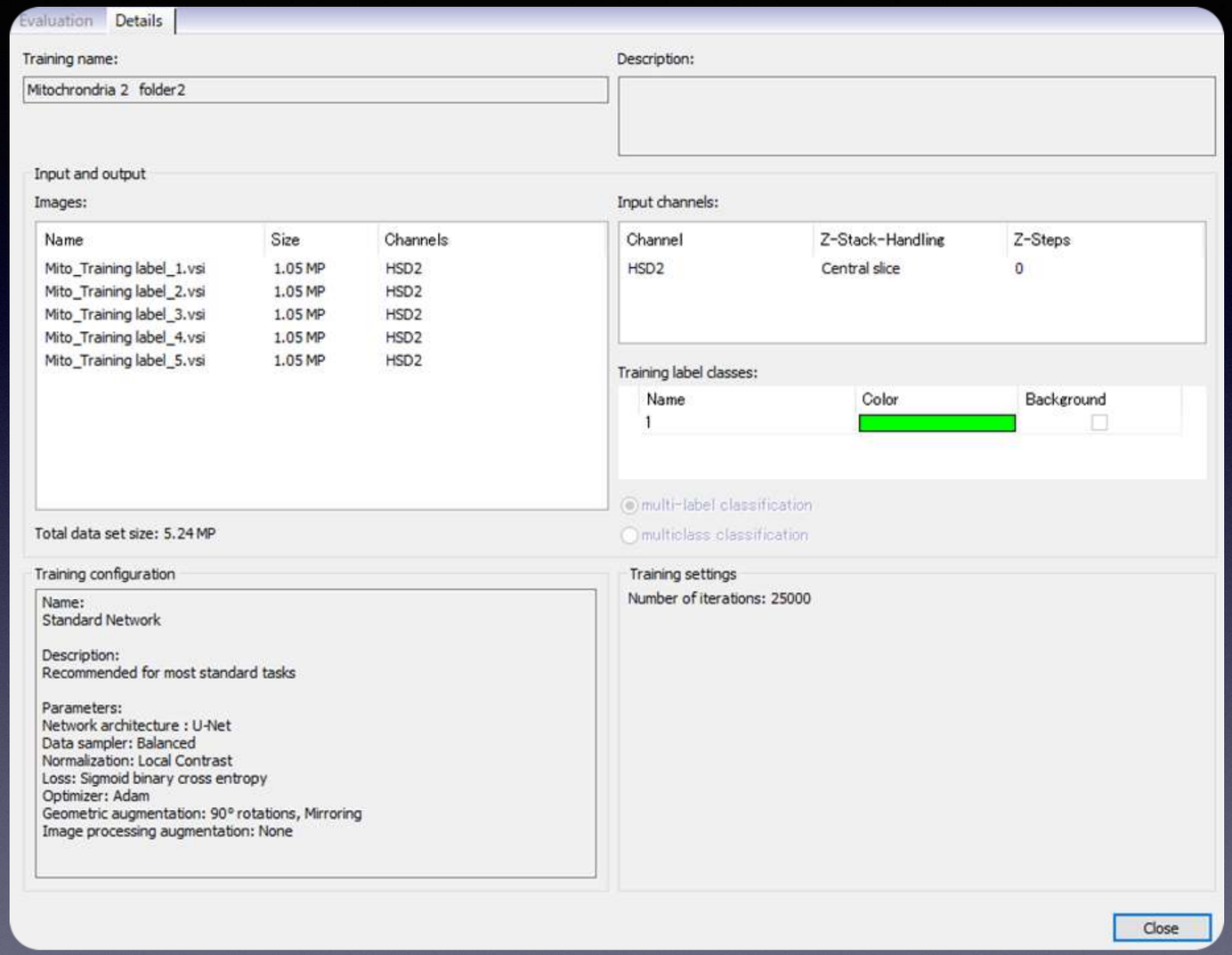
Does the network actually do this?



III.影像分析—**cellSens TruAI**

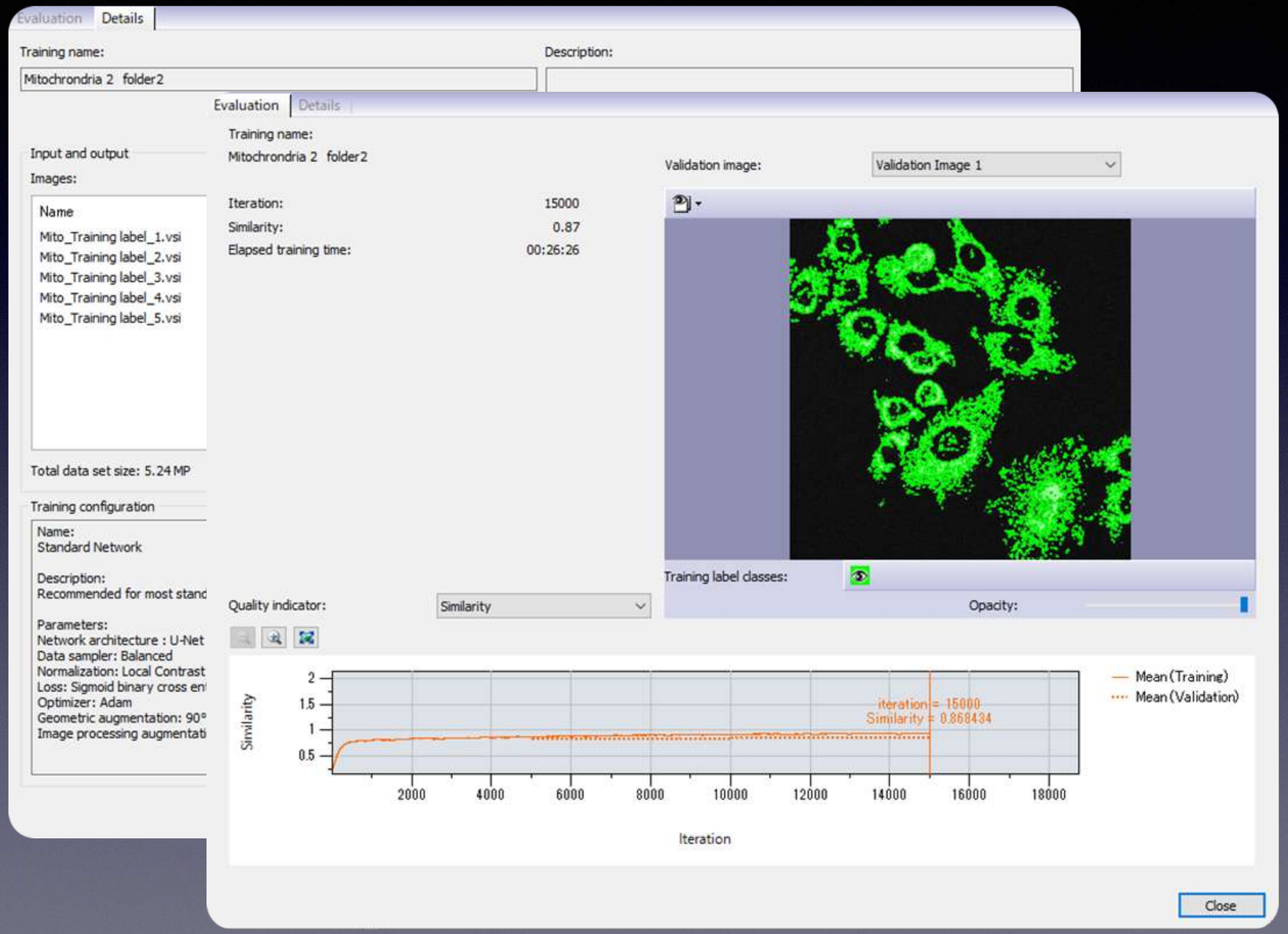
TruAI特色：

III.影像分析—cellSens TruAI



TruAI特色：

III.影像分析—**cellSens TruAI**



TruAI特色：

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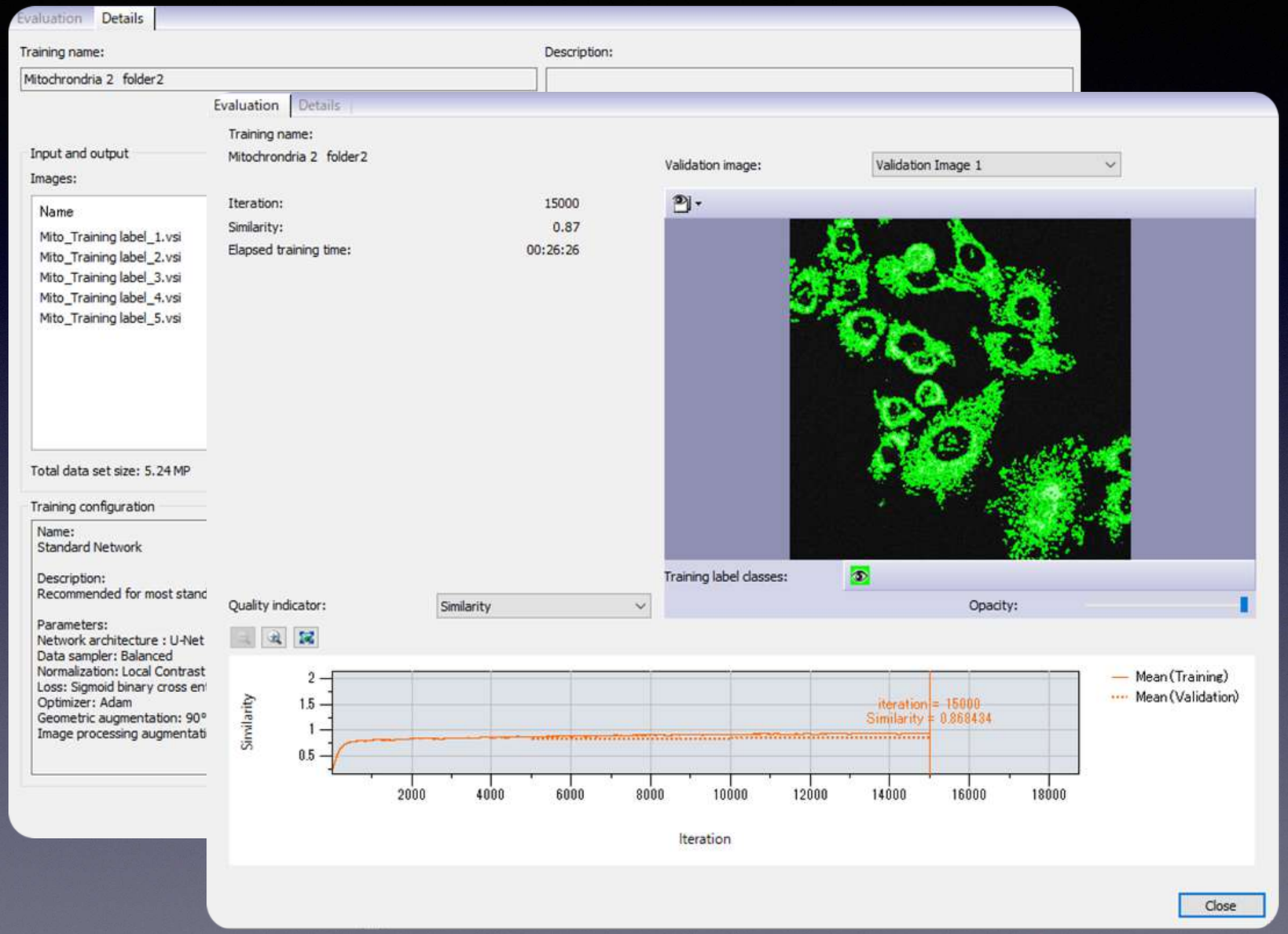
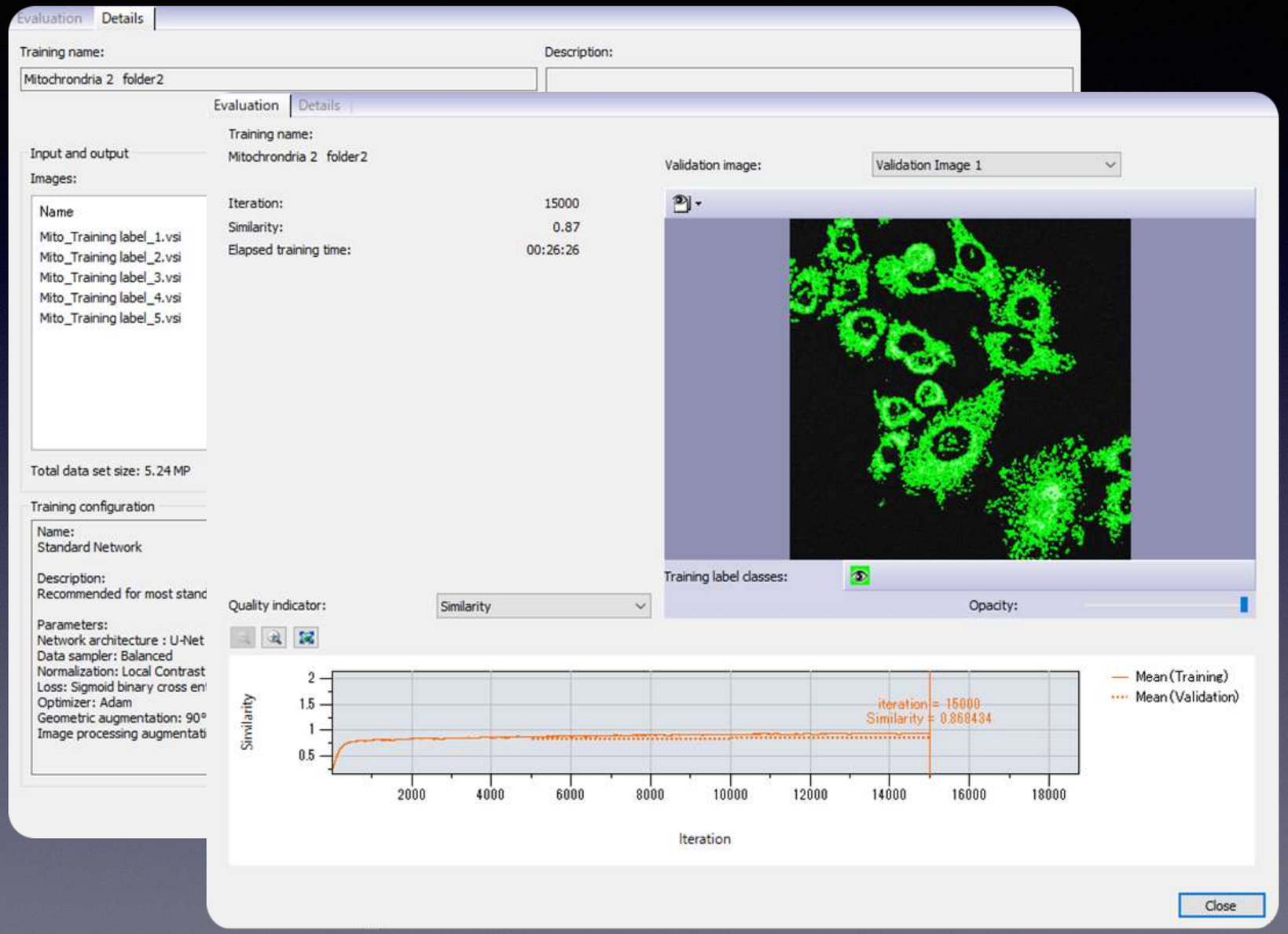


TruAI特色：

1.無需任何程式語言

III.影像分析—cellSens TruAI



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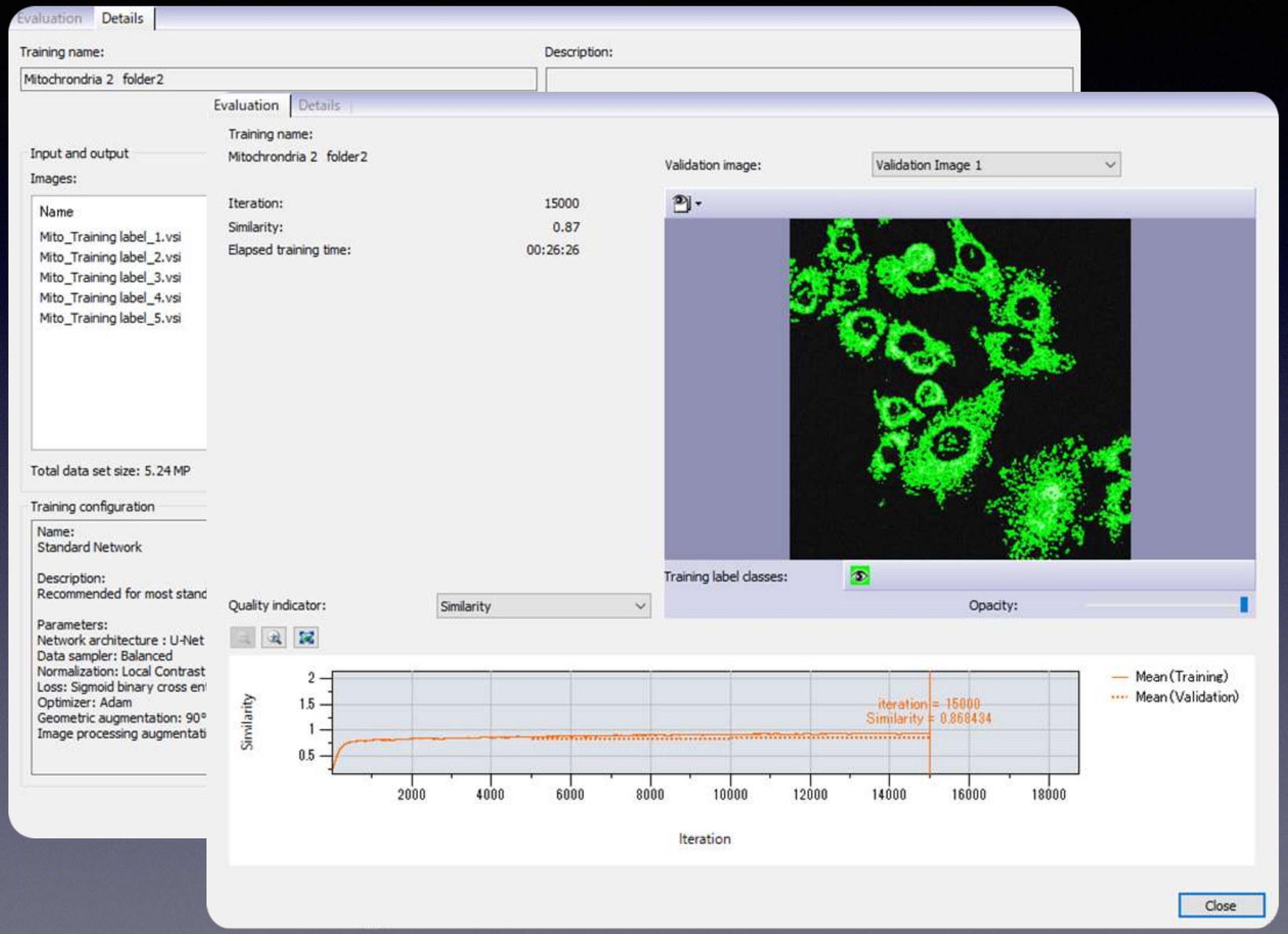


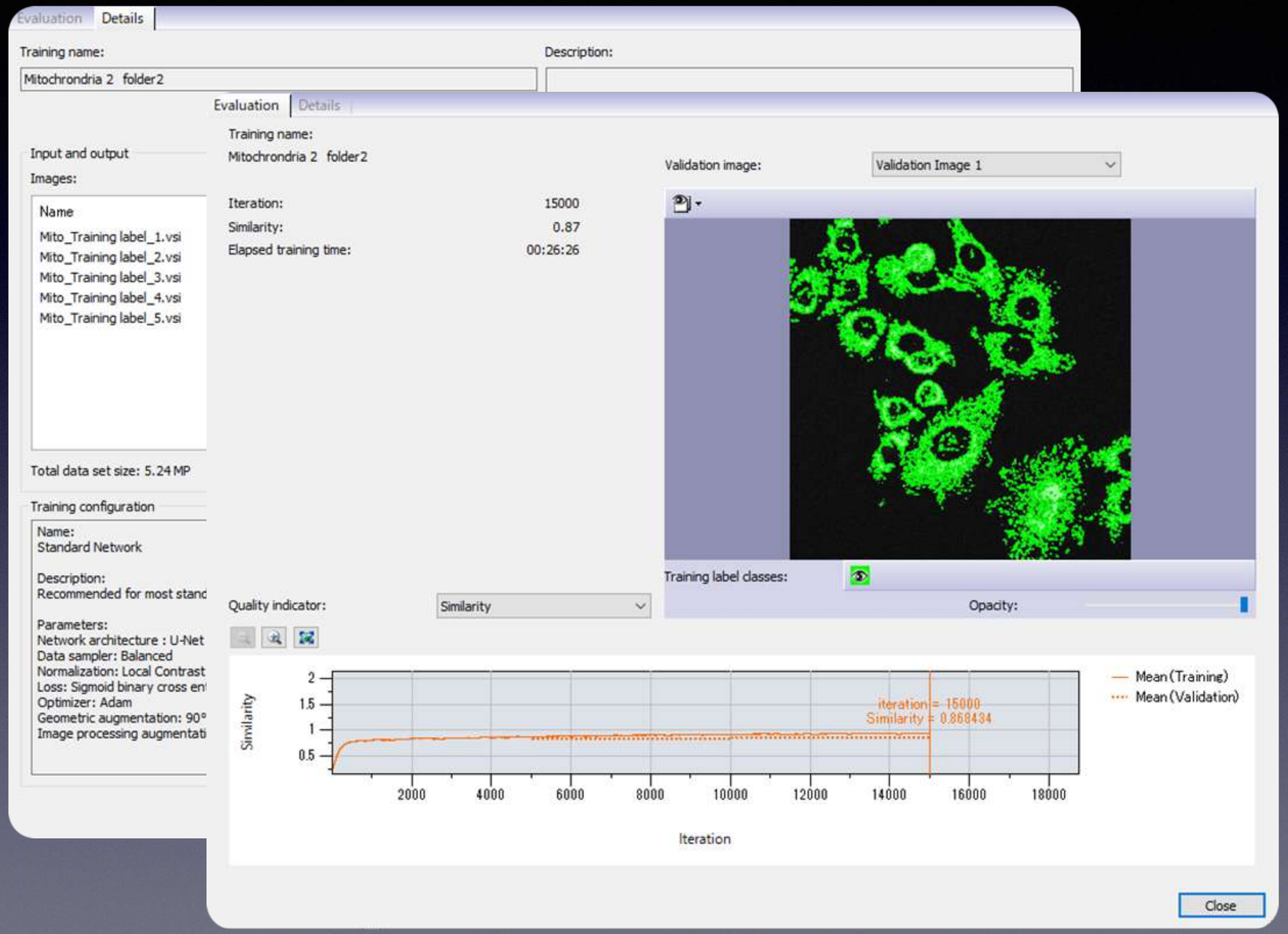
TruAI特色：

1.無需任何程式語言

2.無需繁雜設定程序

3.訓練時間極短(GPU)

III.影像分析—cellSens TruAI



TruAI特色：

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2.無需繁雜設定程序

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4.AI判讀結果精確

II.2D 影像分析—cellSens TruAI 深度學習AI模組

II.2D 影像分析—cellSens TruAI 深度學習AI模組

深度學習技術
實現更為快速精確的分析

II.2D 影像分析—cellSens TruAI 深度學習AI模組

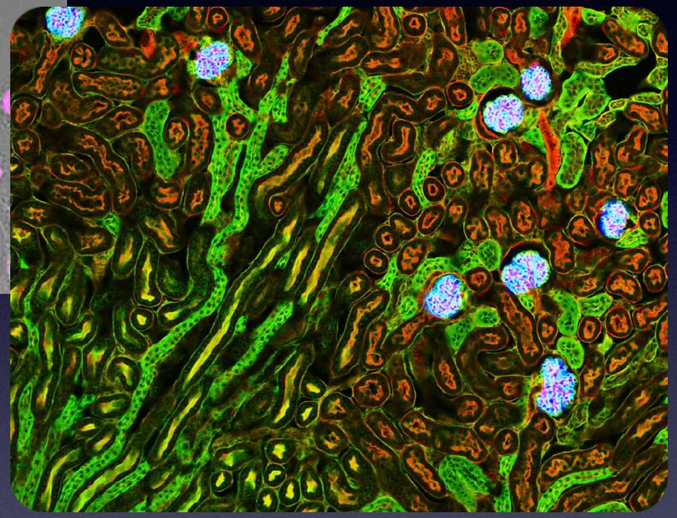
免標定核辨識

TruAI

深度學習技術
實現更為快速精確的分析

II.2D 影像分析—cellSens TruAI 深度學習AI模組

免標定核辨識



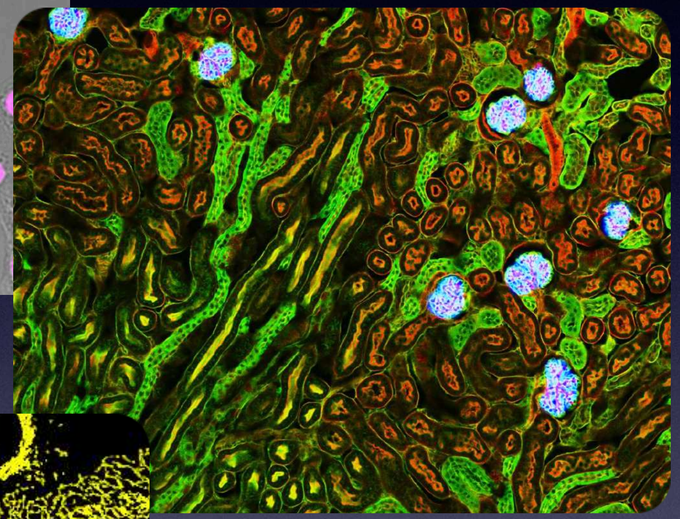
腎絲球判定

深度學習技術
實現更為快速精確的分析

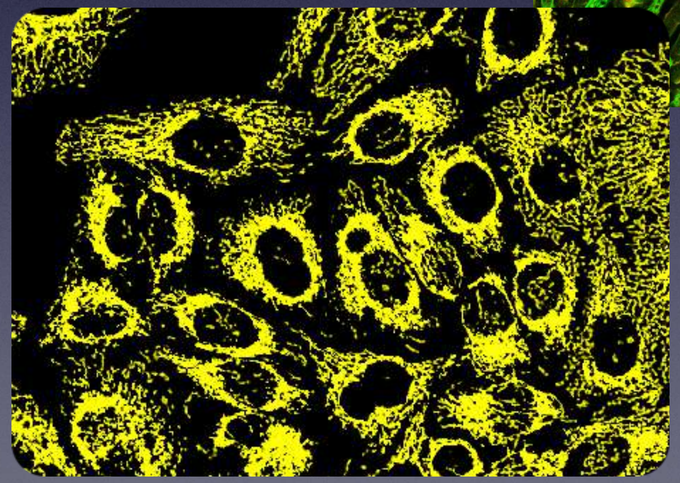
II.2D 影像分析—cellSens TruAI 深度學習AI模組

深度學習技術
實現更為快速精確的分析

免標定核辨識

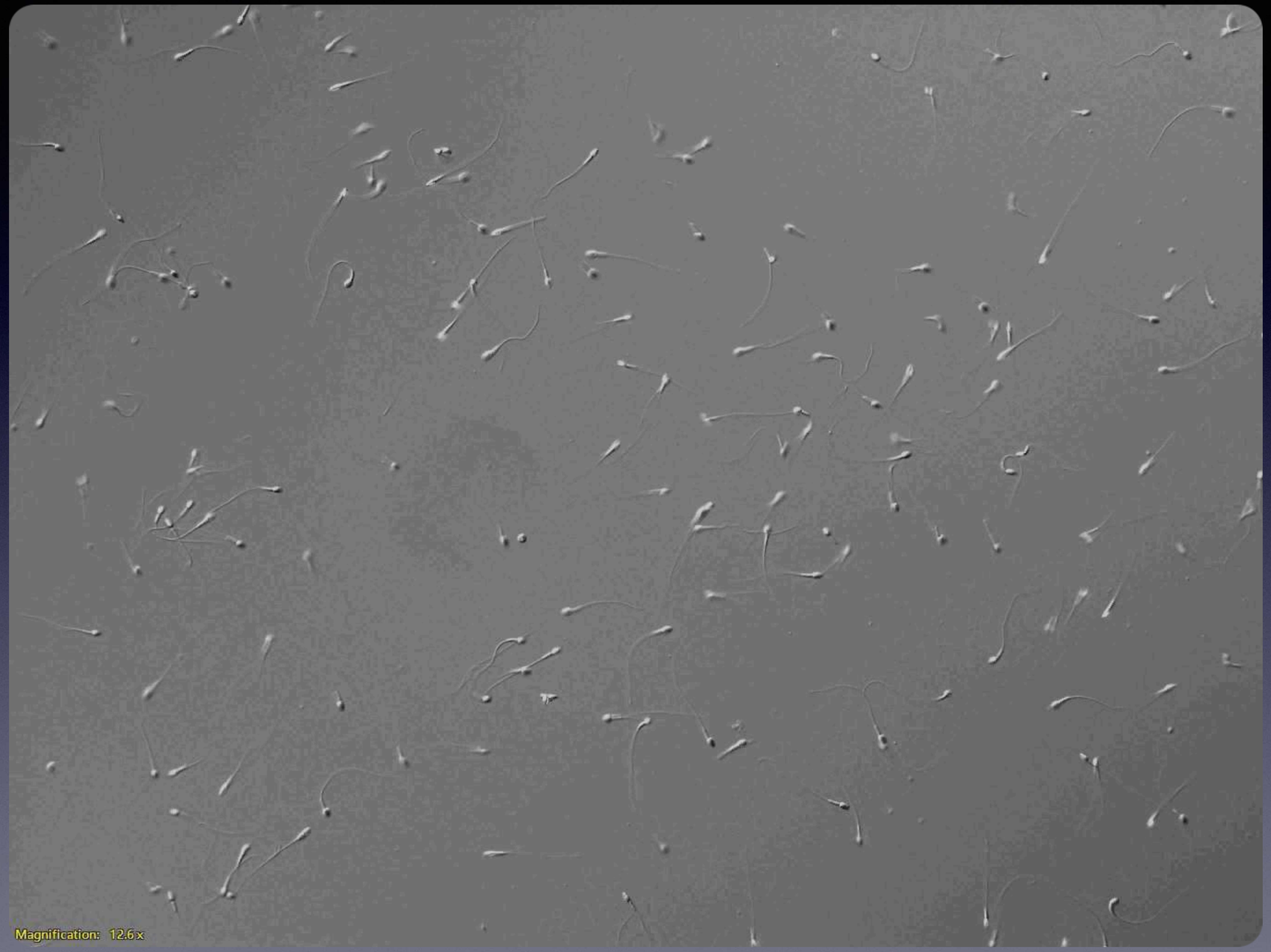


腎絲球判定



粒線體分析

II.2D 影像分析—實際範例 臺大獸醫系 精子辨識



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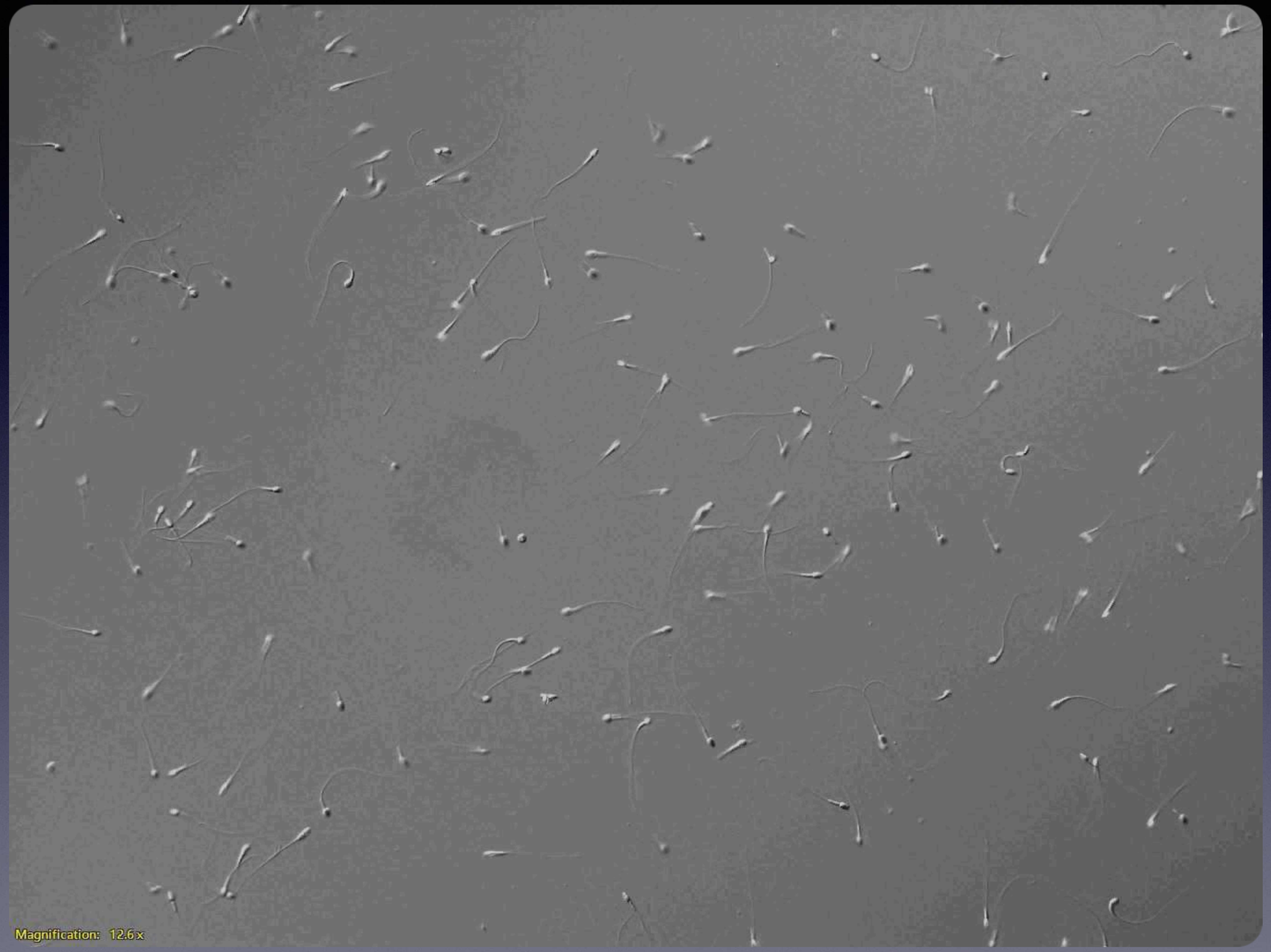

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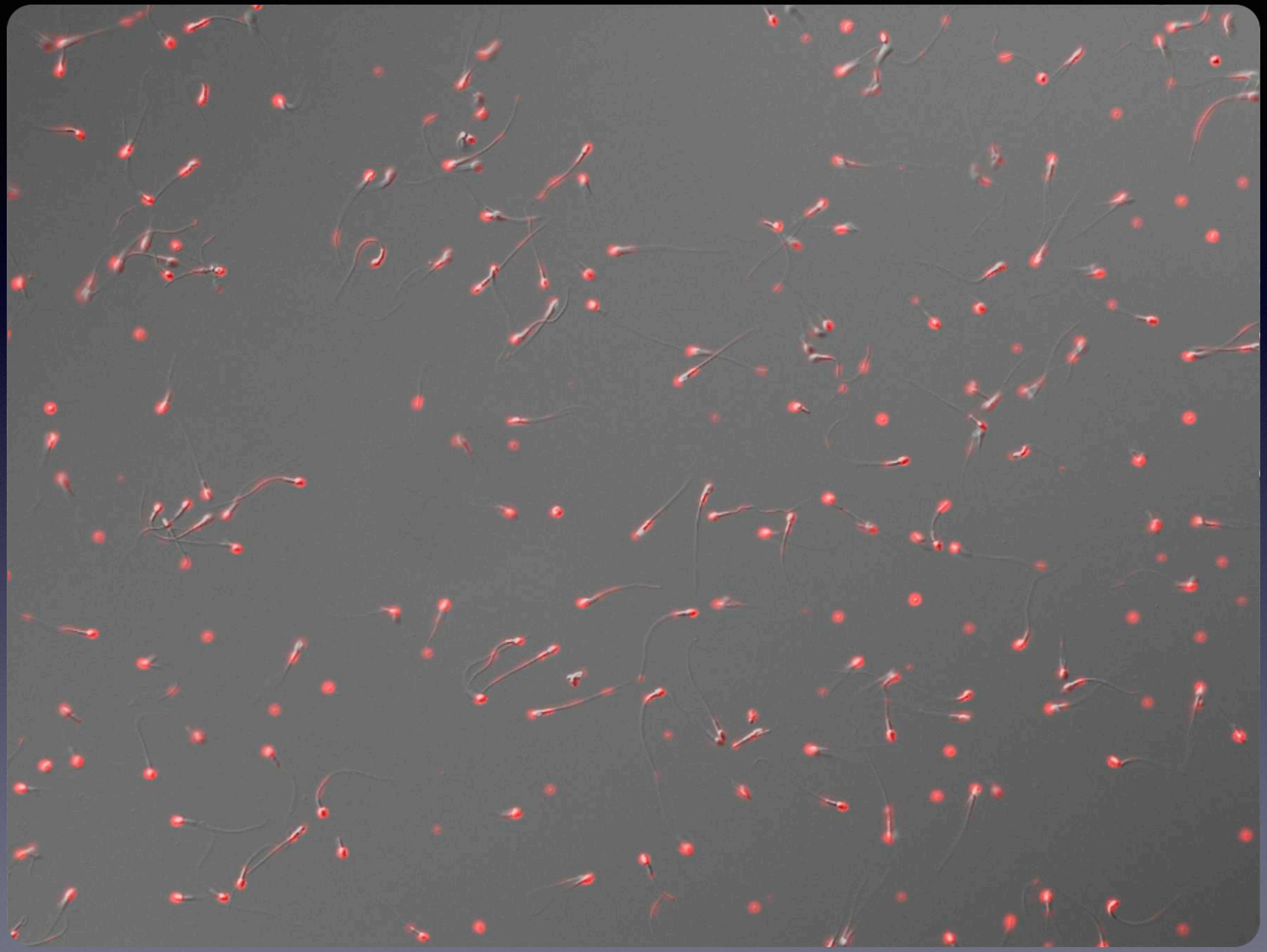
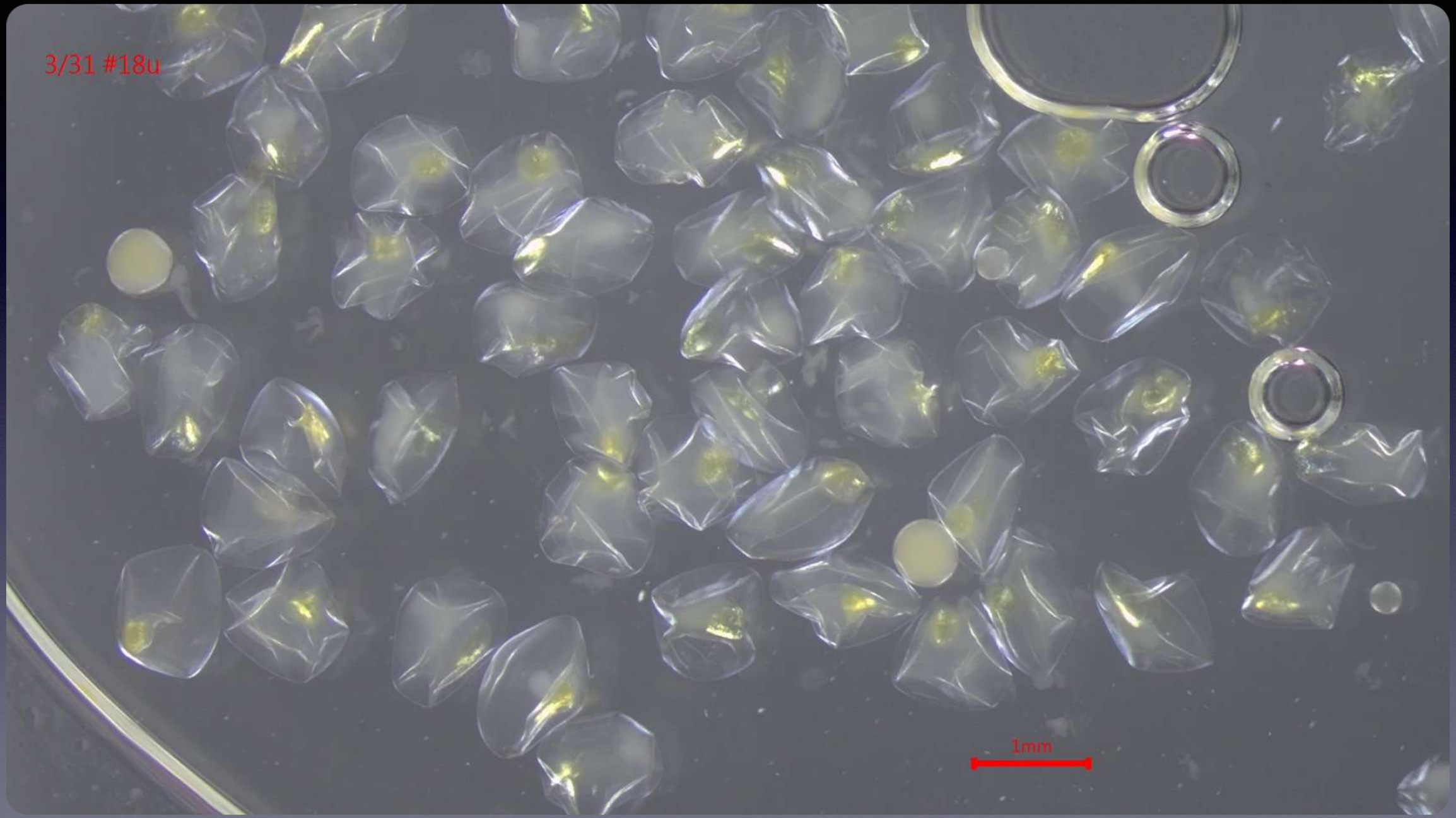
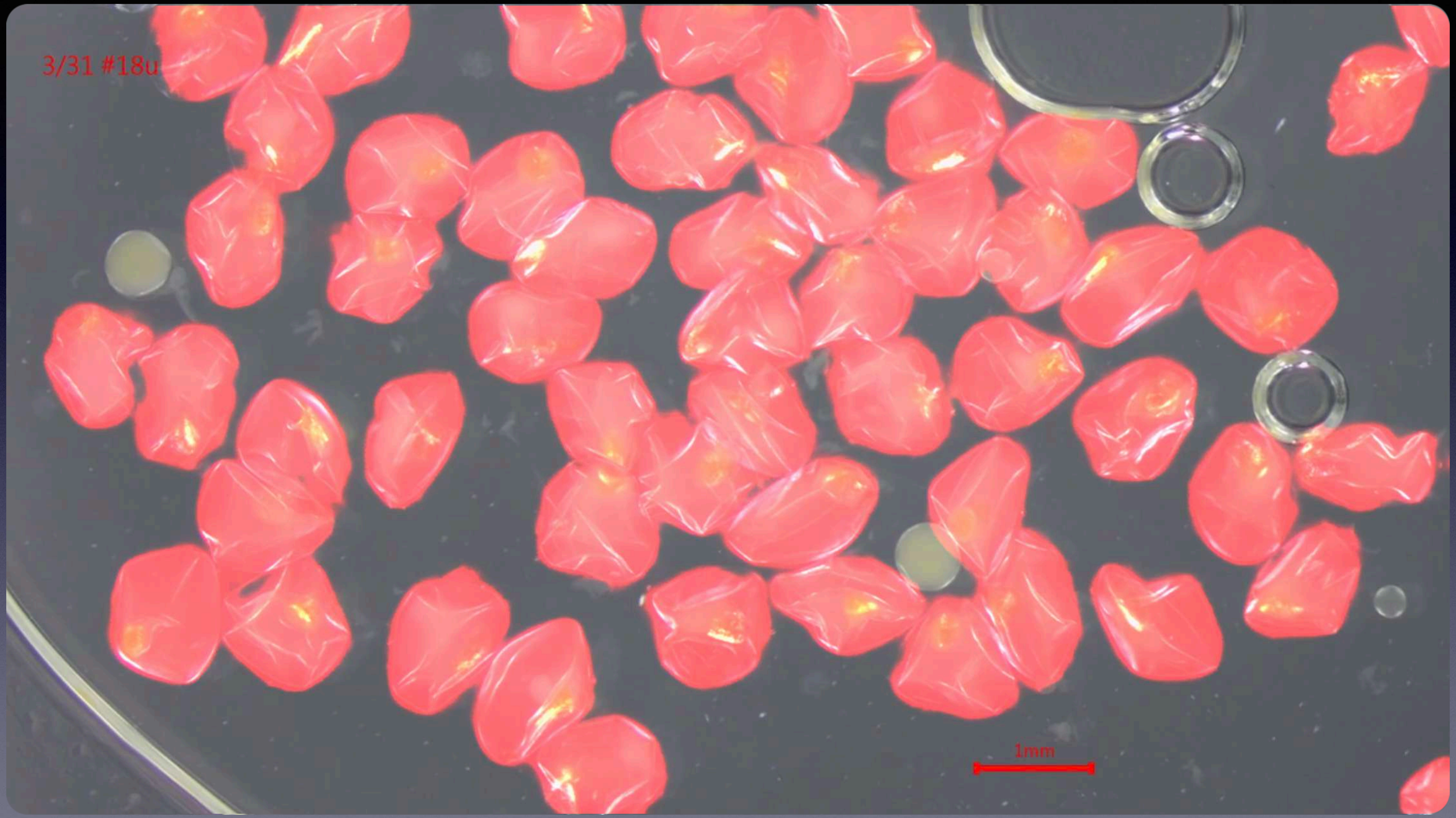


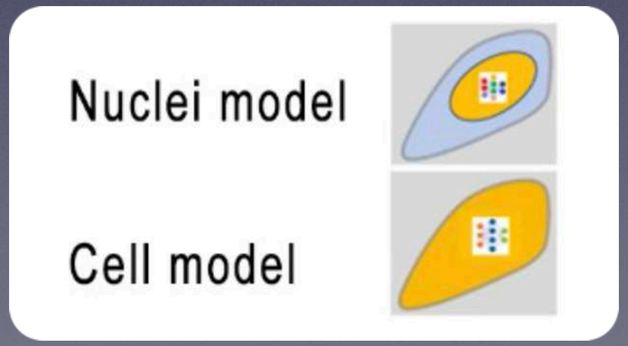
II.2D 影像分析—實際範例 基隆水試所 魚卵辨識



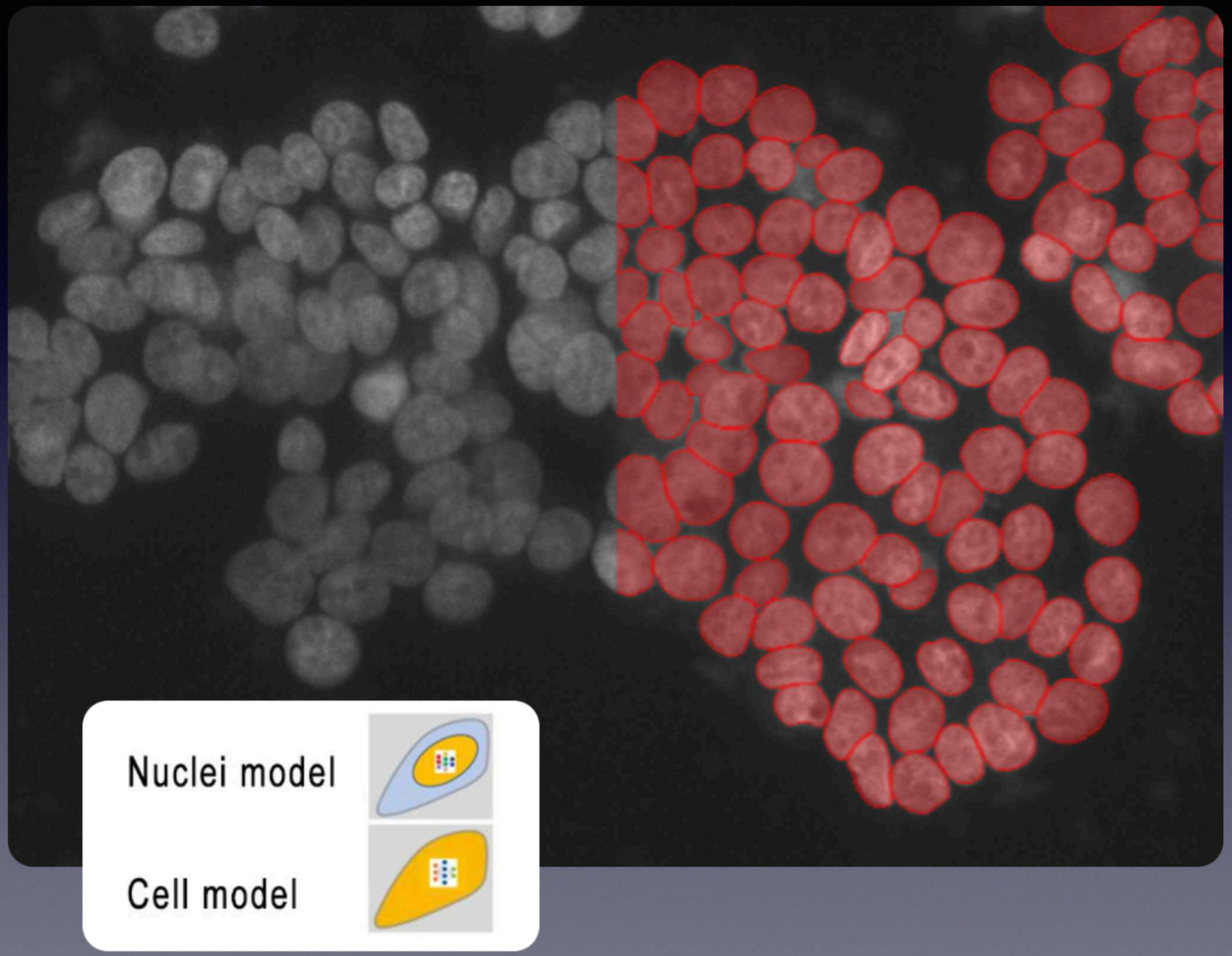
II.2D 影像分析—實際範例 基隆水試所 魚卵辨識



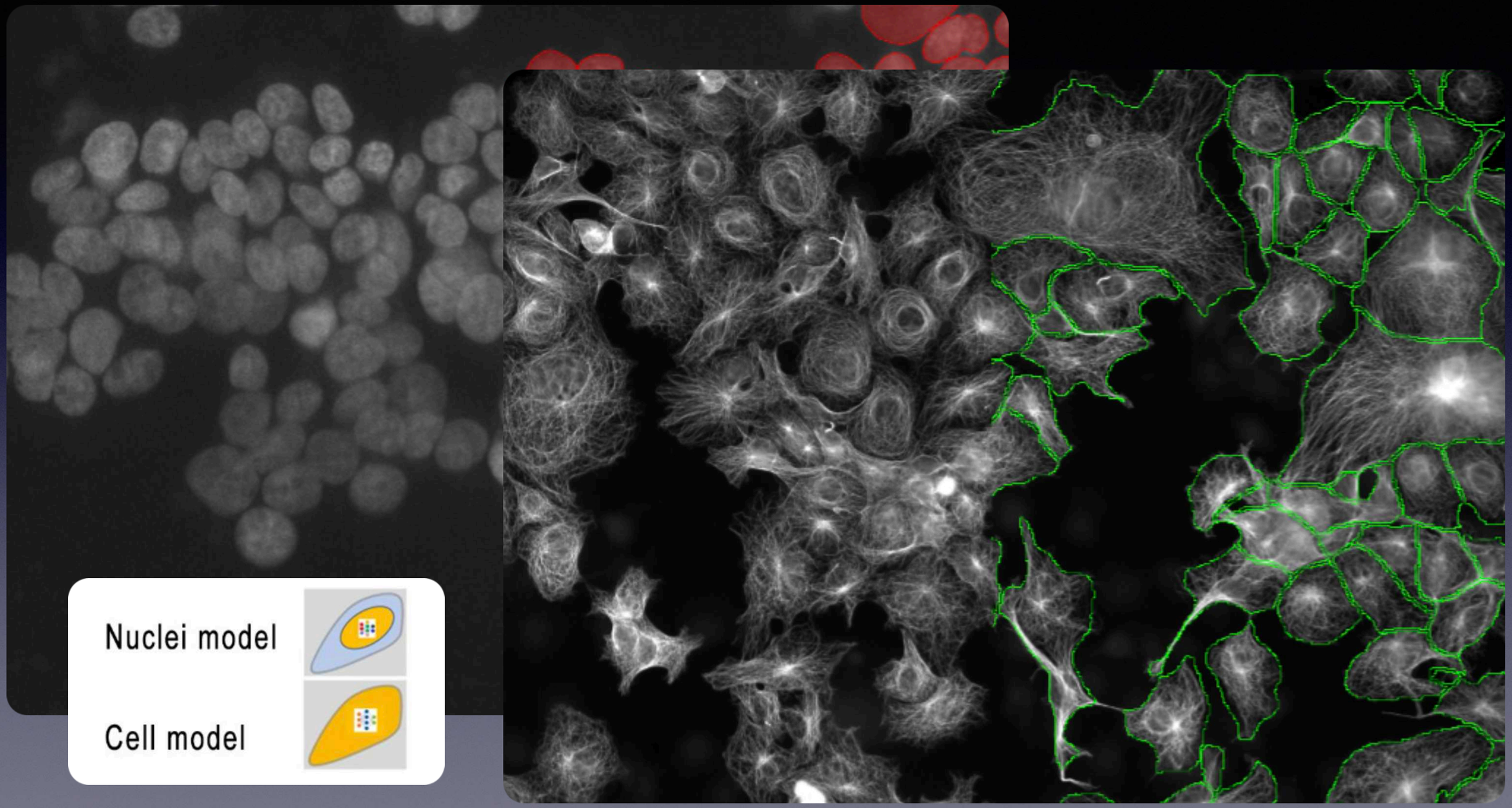
II.2D 影像分析—cellSens TruAI 深度學習AI模組. Pre-Trained Network



II.2D 影像分析—cellSens TruAI 深度學習AI模組. Pre-Trained Network



II.2D 影像分析—cellSens TruAI 深度學習AI模組. Pre-Trained Network



IV.總結—硬體與應用

IV.總結—硬體與應用

4 Fluorescence detector+ 1 transmitted (DIC)

IV.總結—硬體與應用

4 Fluorescence detector+ 1 transmitted (DIC)

1.25X to 100X, air, water, oil, and silicone oil

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405nm to 640nm, from DAPI to Cy5

IV.總結—硬體與應用

4 Fluorescence detector+ 1 transmitted (DIC)

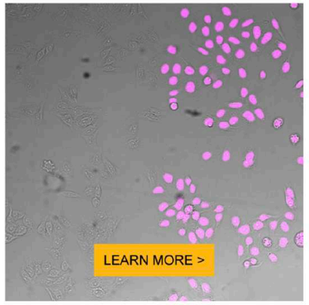
1.25X to 100X, air, water, oil, and silicone oil

405nm to 640nm, from DAPI to Cy5

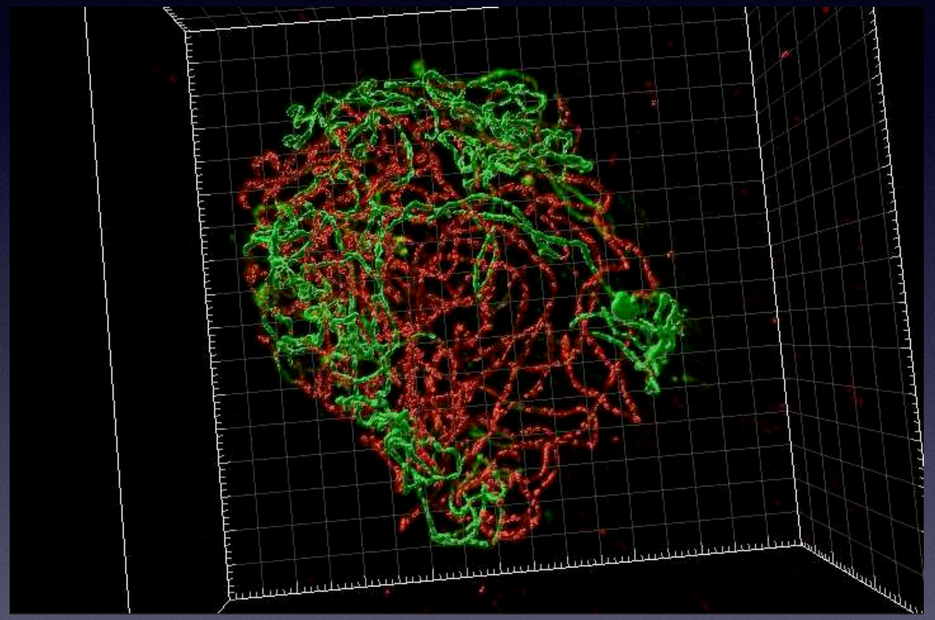
- Marco Tile
- XYZ
- XYT
- Photo-activation
- FRAP FRET
- Super-Resolution

IV.總結—影像分析/提升解析度

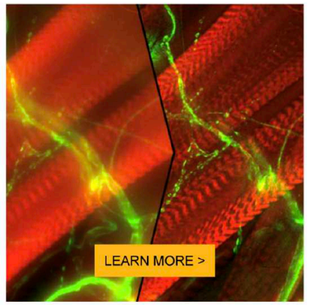
TRU AI



Accurate and Efficient Image Analysis based on Deep-Learning Technology



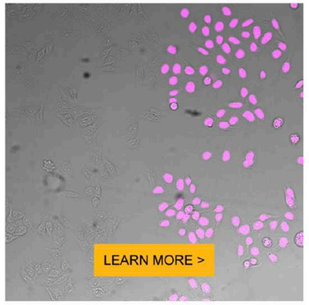
TRU SIGHT



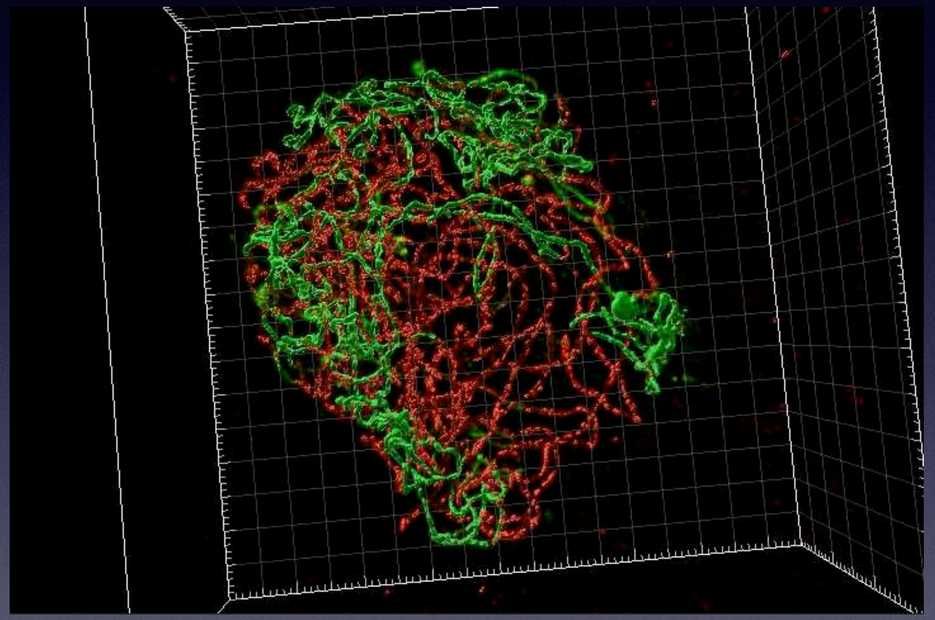
Seamless Deconvolution for Clearer, Sharper Images

IV.總結—影像分析/提升解析度

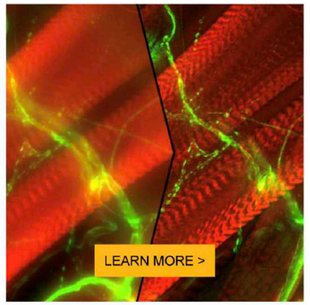
TRU AI



Accurate and Efficient Image Analysis based on Deep-Learning Technology



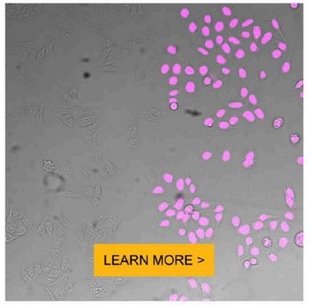
TRU SIGHT



Seamless Deconvolution for Clearer, Sharper Images

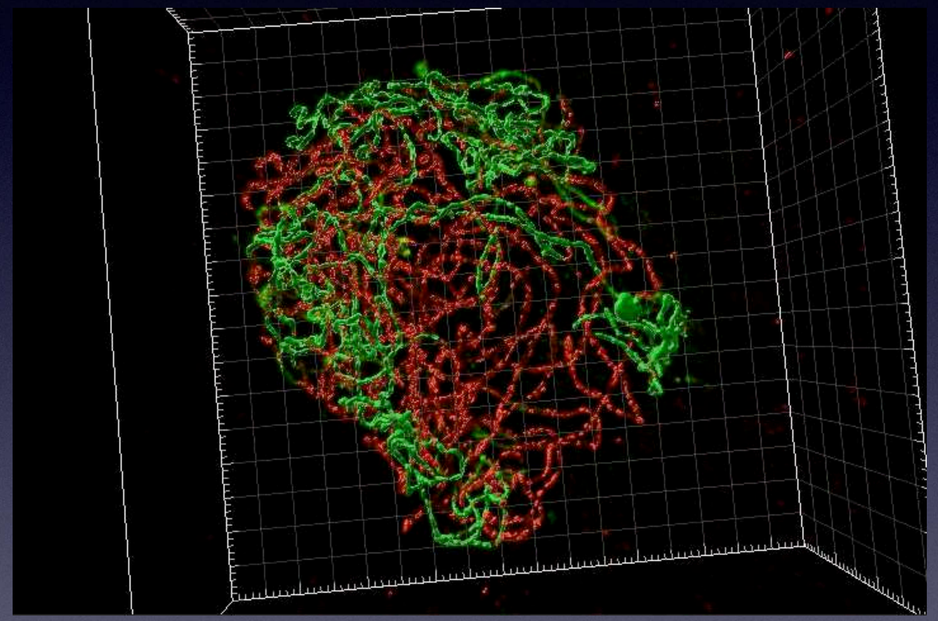
IV.總結—影像分析/提升解析度

TRU AI

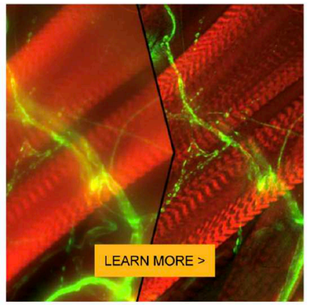


Accurate and Efficient Image Analysis based on Deep-Learning Technology

Segmentation

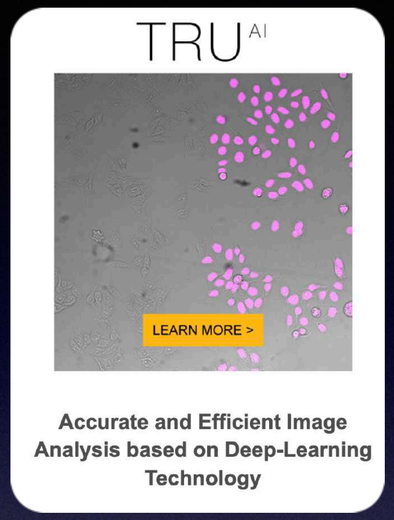


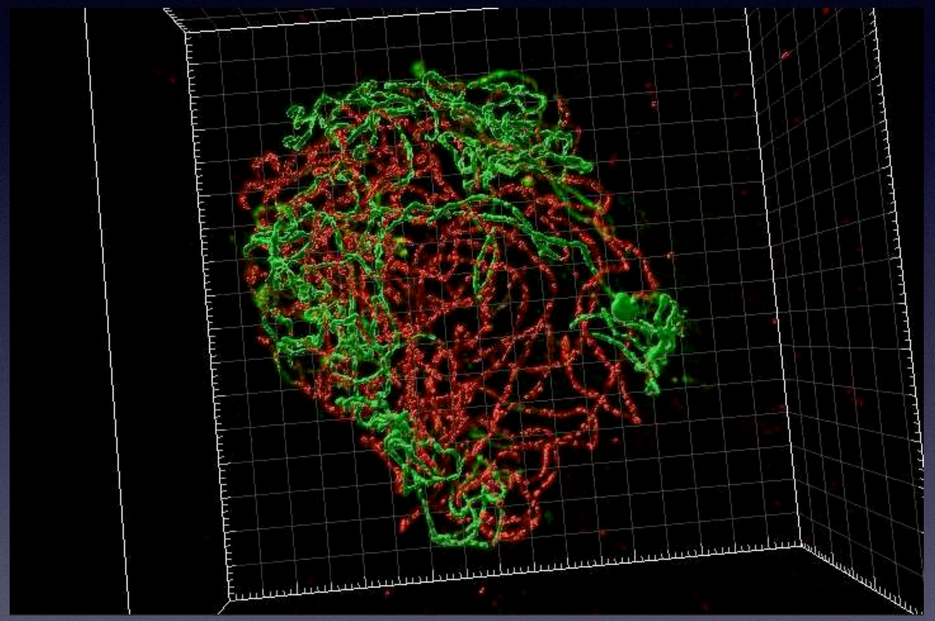
TRU SIGHT

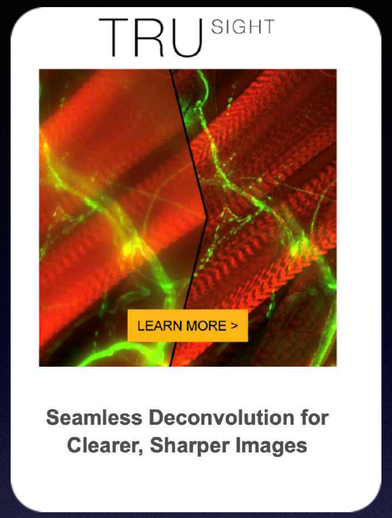


Seamless Deconvolution for Clearer, Sharper Images

IV.總結—影像分析/提升解析度



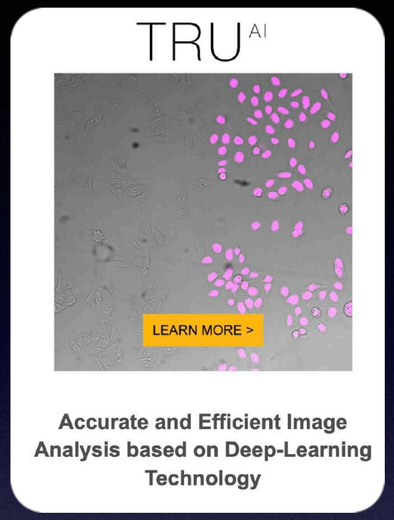


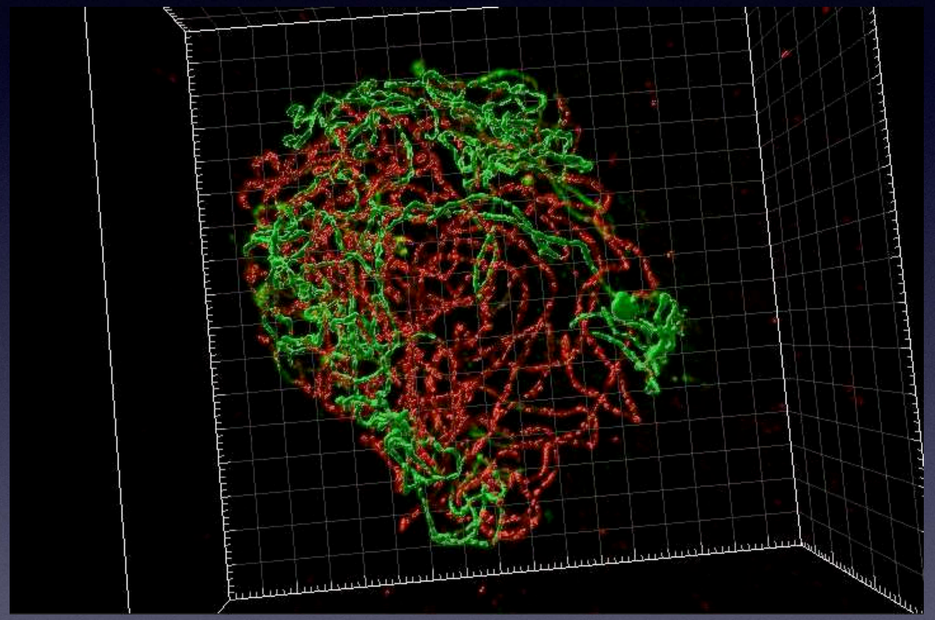


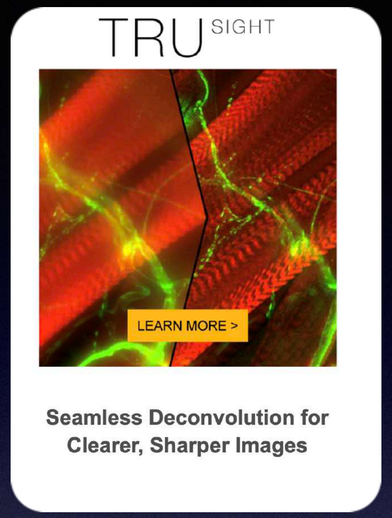
Segmentation

2D parameter

IV.總結—影像分析/提升解析度





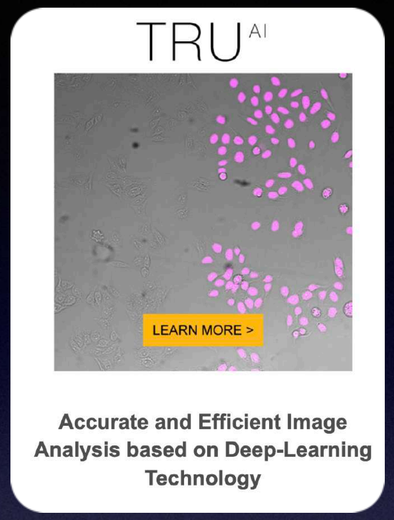


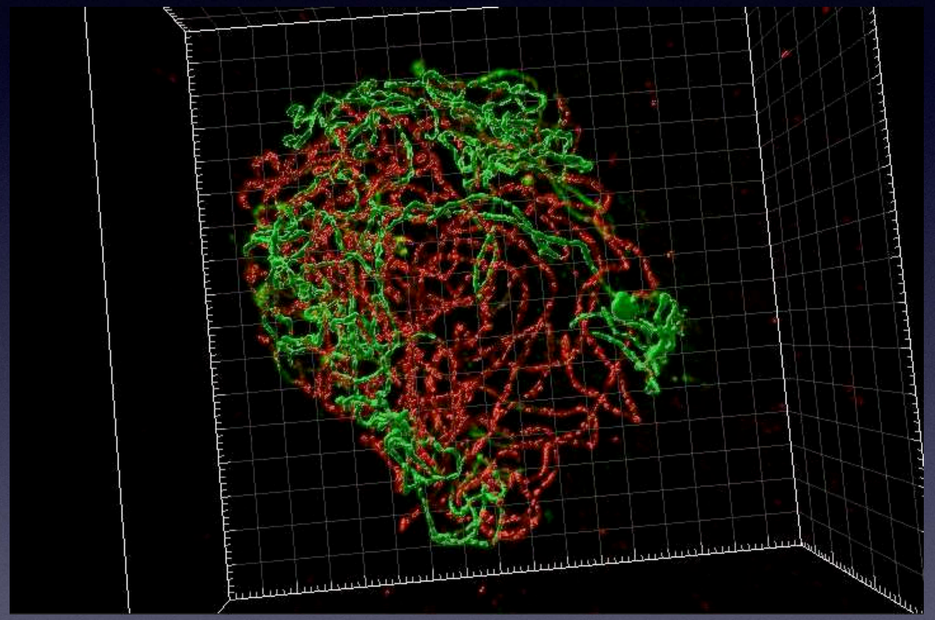
Segmentation

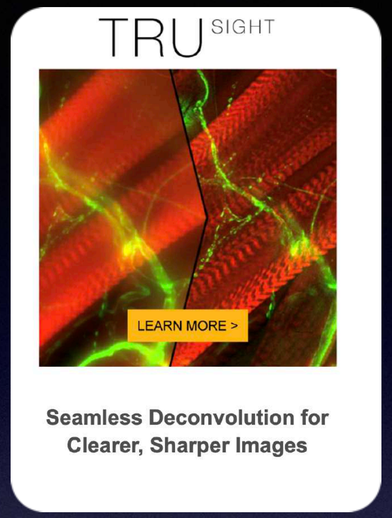
2D parameter

Co-localization

IV.總結—影像分析/提升解析度







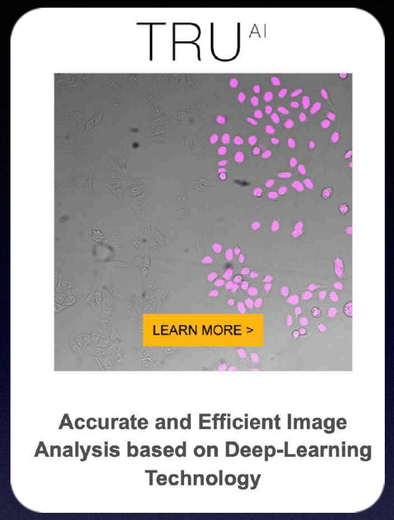
Segmentation

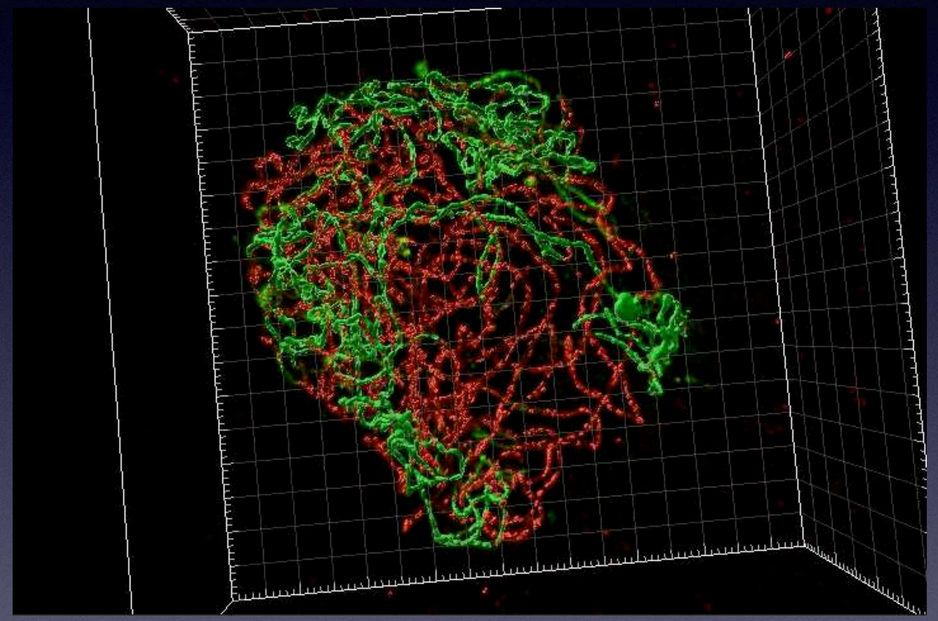
2D parameter

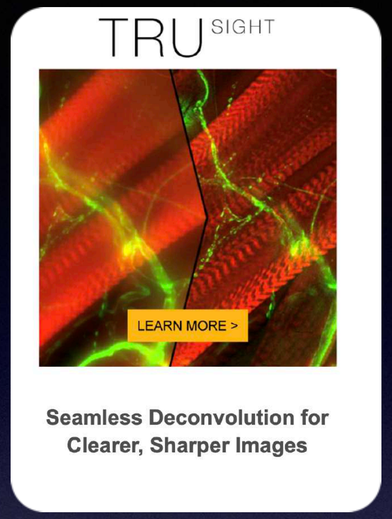
Co-localization

FRAP. / FRET.

IV.總結—影像分析/提升解析度







Segmentation

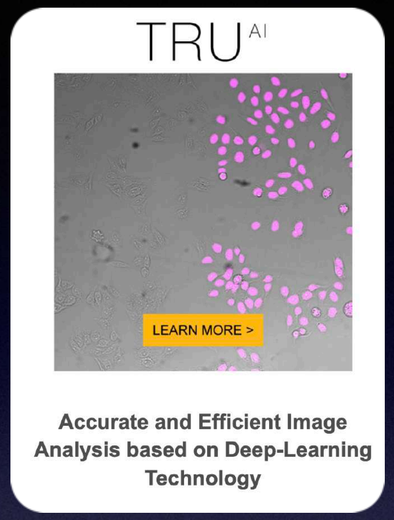
2D parameter

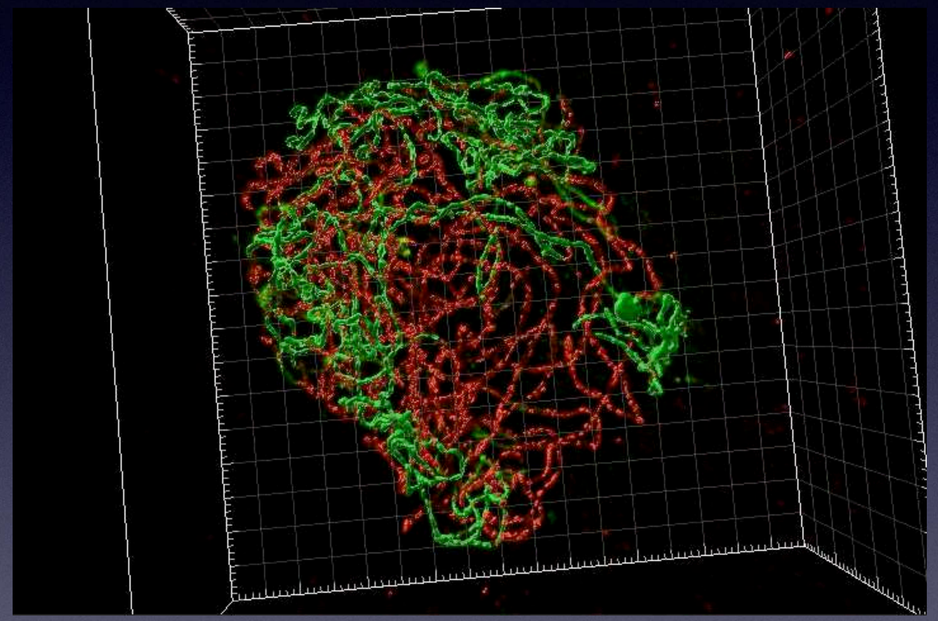
Co-localization

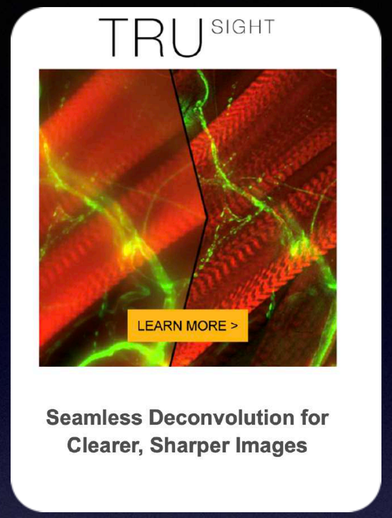
FRAP. / FRET.

Higher S/N ratio

IV.總結—影像分析/提升解析度







Segmentation

2D parameter

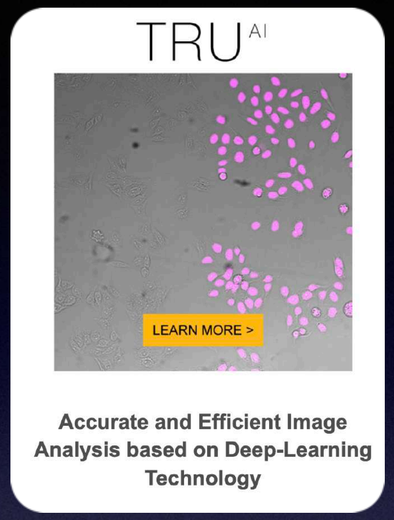
Co-localization

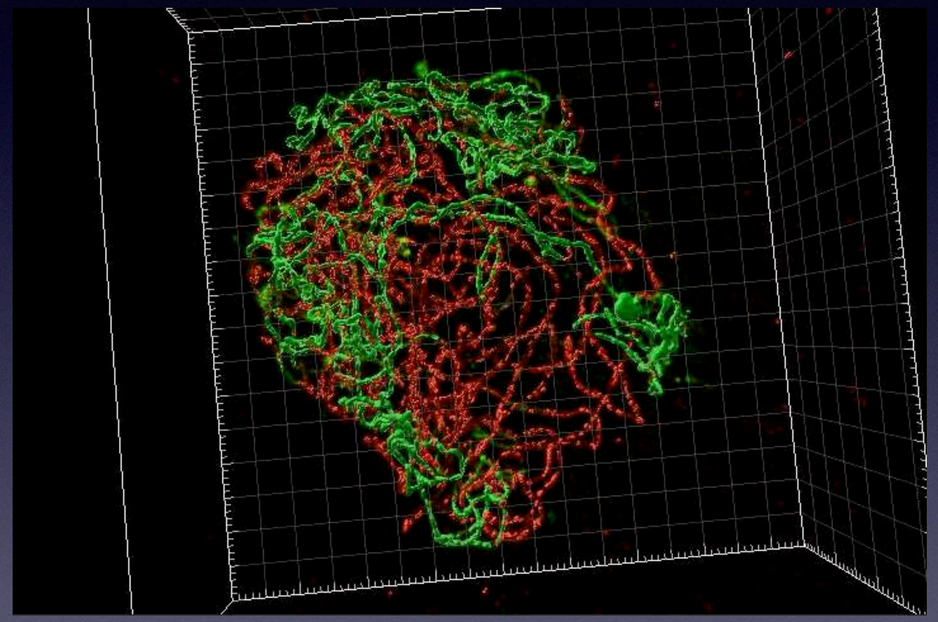
FRAP. / FRET.

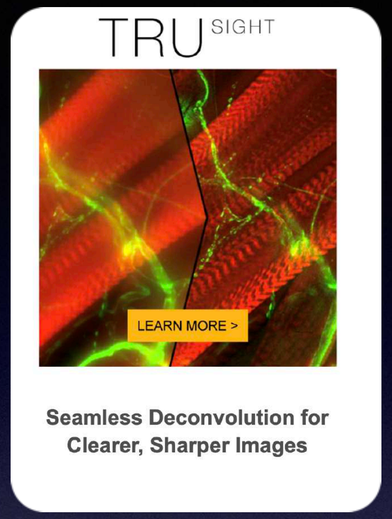
Higher S/N ratio

Resolution

IV.總結—影像分析/提升解析度







Segmentation

2D parameter

Co-localization

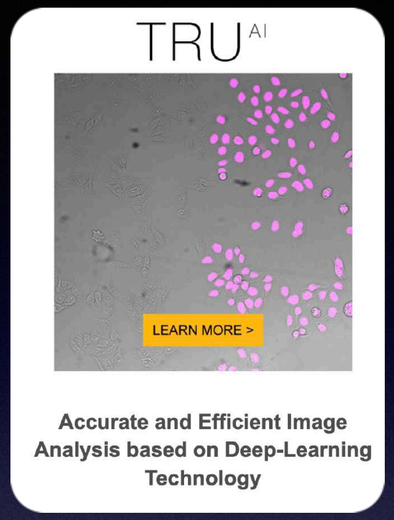
FRAP. / FRET.

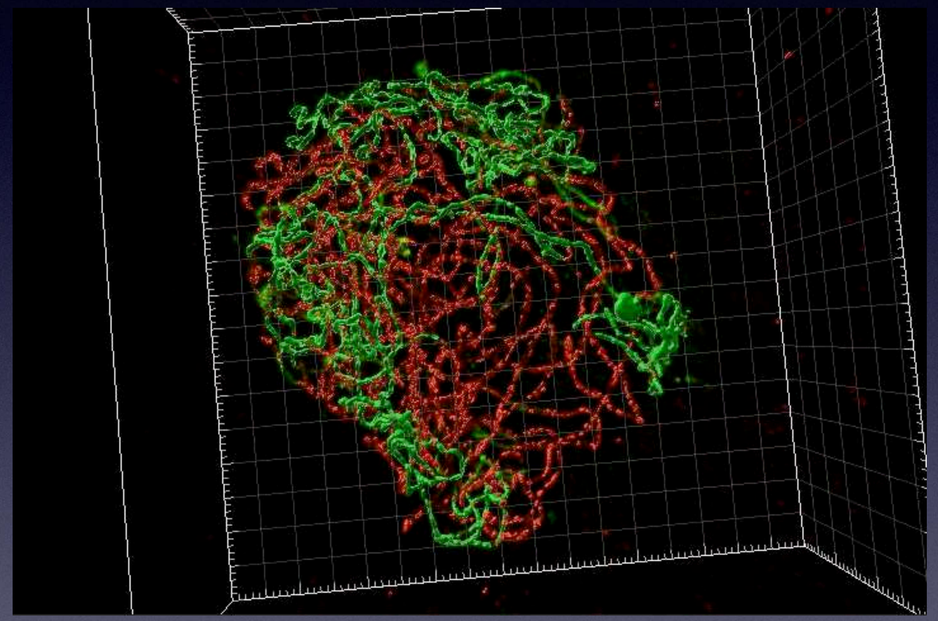
Higher S/N ratio

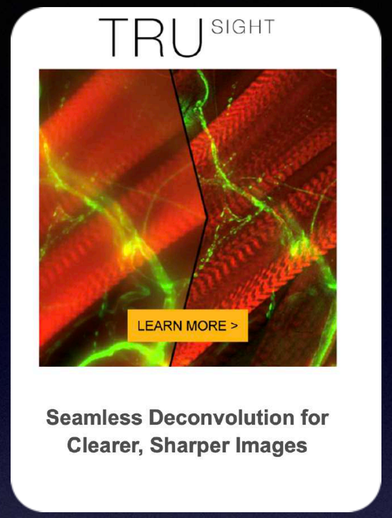
Resolution

Super-resolution

IV.總結—影像分析/提升解析度







Segmentation

2D parameter

Co-localization

FRAP. / FRET.

Higher S/N ratio

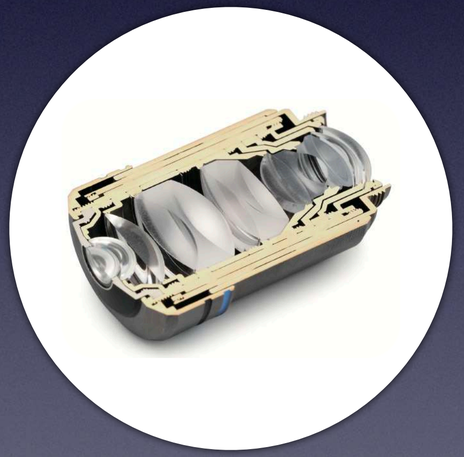
Resolution

Super-resolution

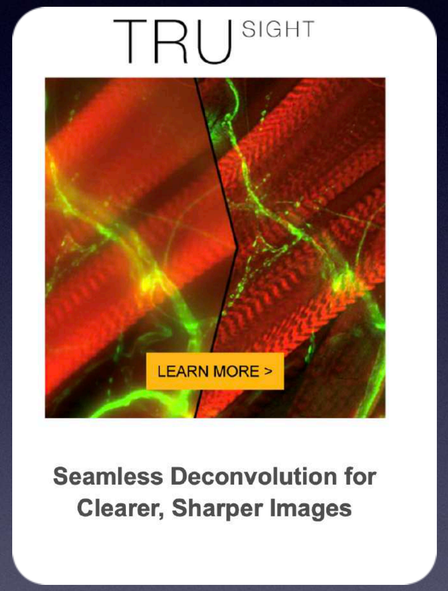
Support all FL microscopy

Any questions??

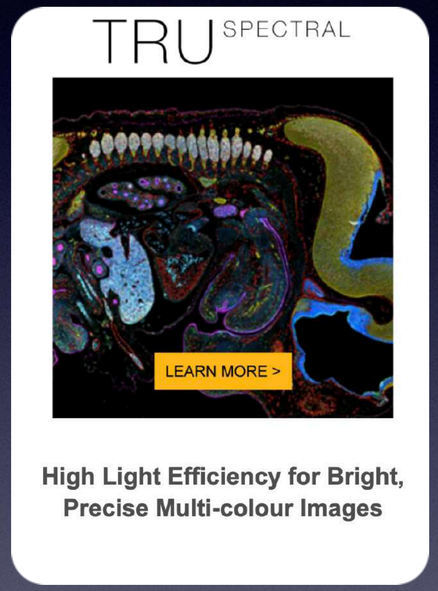
Thank you for your attention!



OLYMPUS FV3000



Seamless Deconvolution for Clearer, Sharper Images



High Light Efficiency for Bright, Precise Multi-colour Images

TruAI

歡迎體驗新系統and影像分析軟體