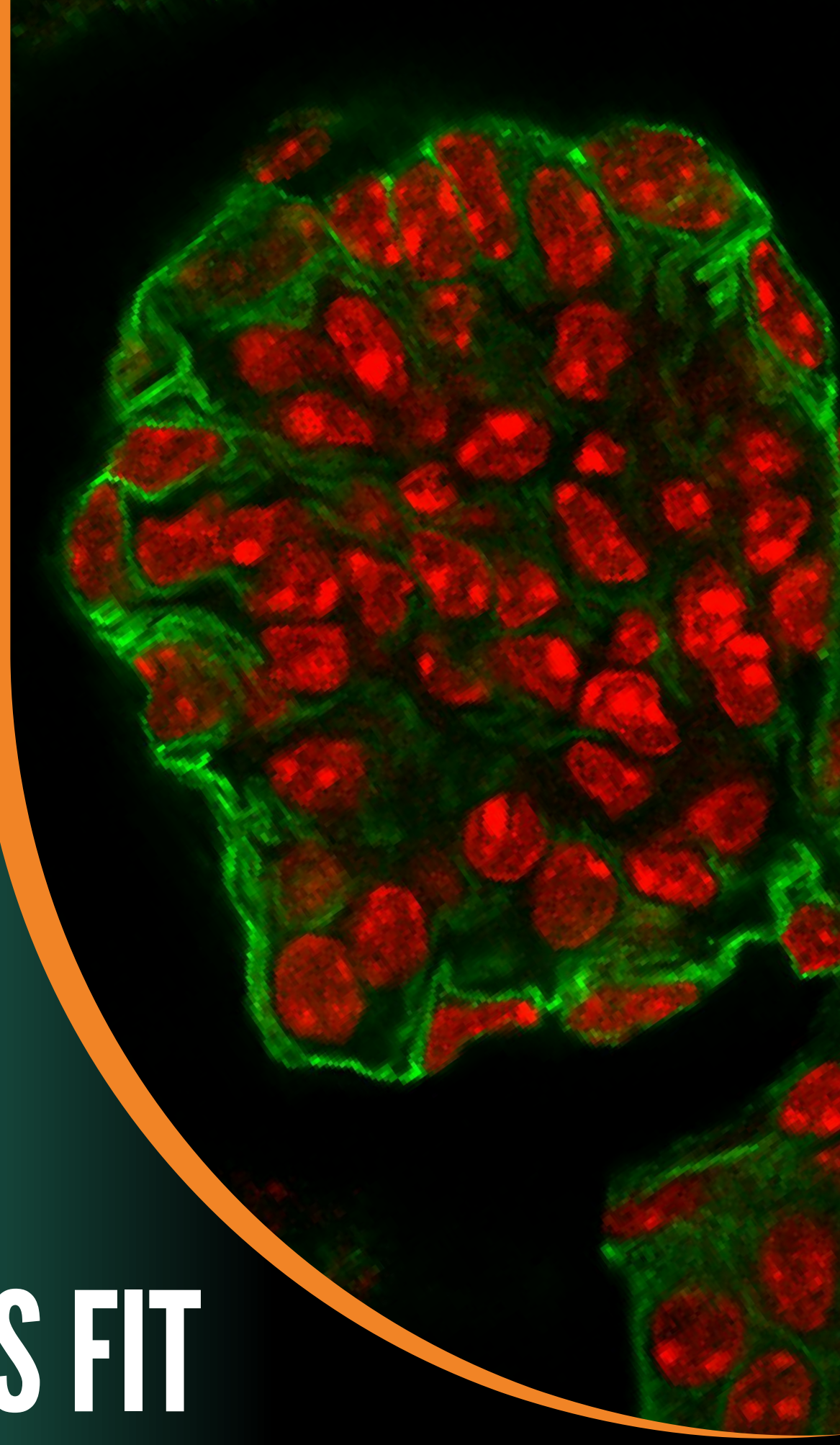
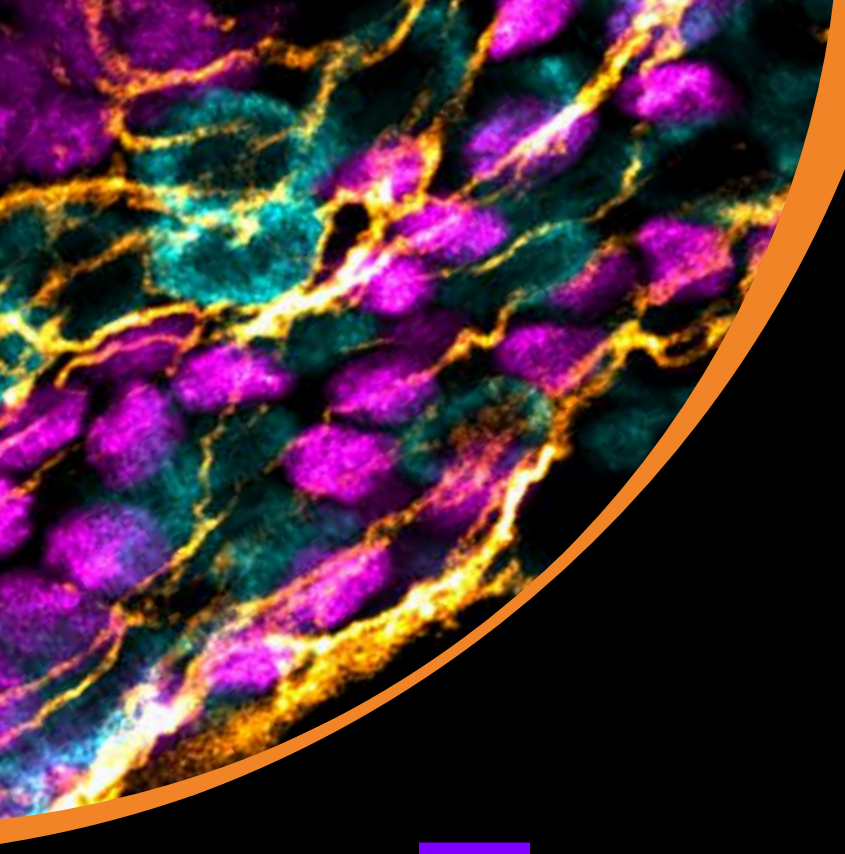
Confocal nl



Quick Knowledge PART 3

HOW DO RESCANS FIT WITHIN CONFOCAL MICROSCOPY LANDSCAPE?



There are 3 **types** of confocal technologies

1967

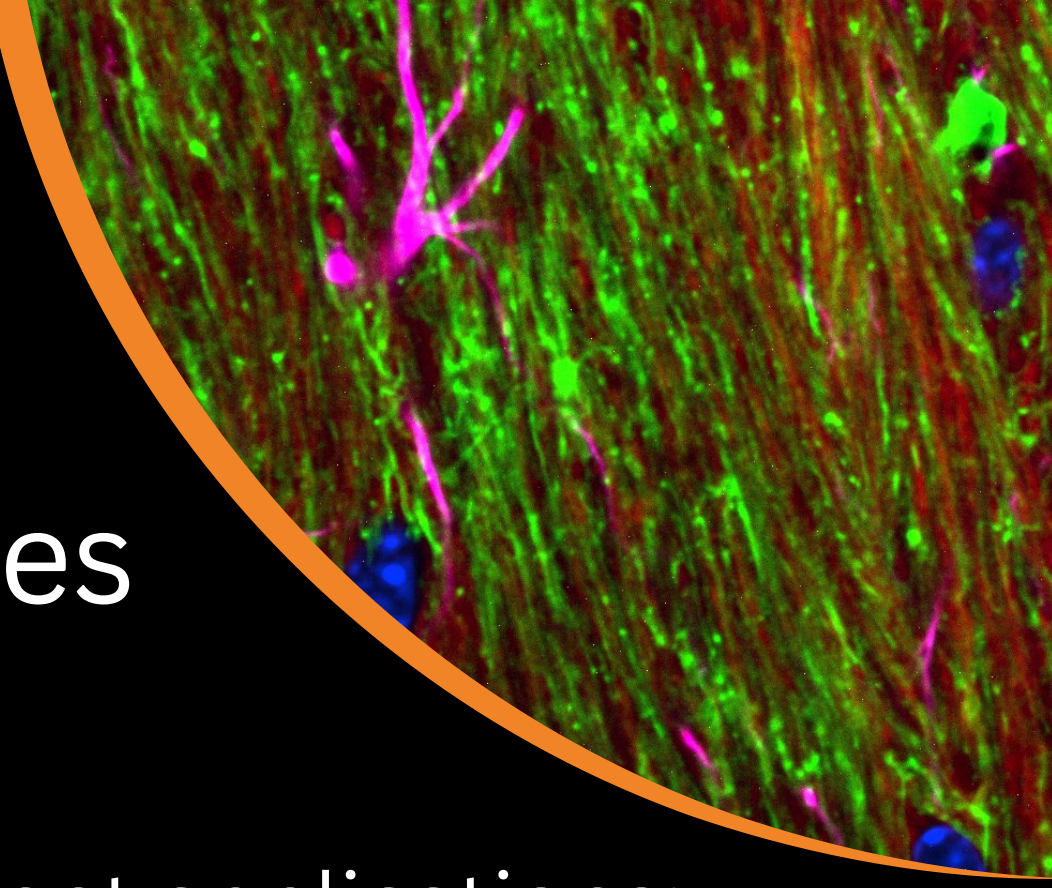
Spinning Disks (**SD**), where an image from many pinholes is projected on the camera as a detector

1969

Laser Scanning Confocal Microscopes (**LSCM**) with, usually, a PMT detector directly after one pinhole

2016

***RE*scan** confocals, with an additional scanning optical system between the pinhole and the camera detection (*see PART 1*)



Comparison of confocal technologies

Based on advantages in different applications:

	Low phototox.	Fast imaging	Deep imaging	Super Resolution (SR)
SD	✓	✓	✓	✗
SD+SR add-on	✓	✓	✗	✓
LSCM	✗	✗	✗	✗
LSCM+SR add-on	✗	✗	✗	✓
Point *RE*scan	✓	✗	✓	✓
Line *RE*scan	✓	✓	✓	✗

Line *RE*scan is comparable to SD

Point *RE*scan is comparable to LSCM+SR add-on

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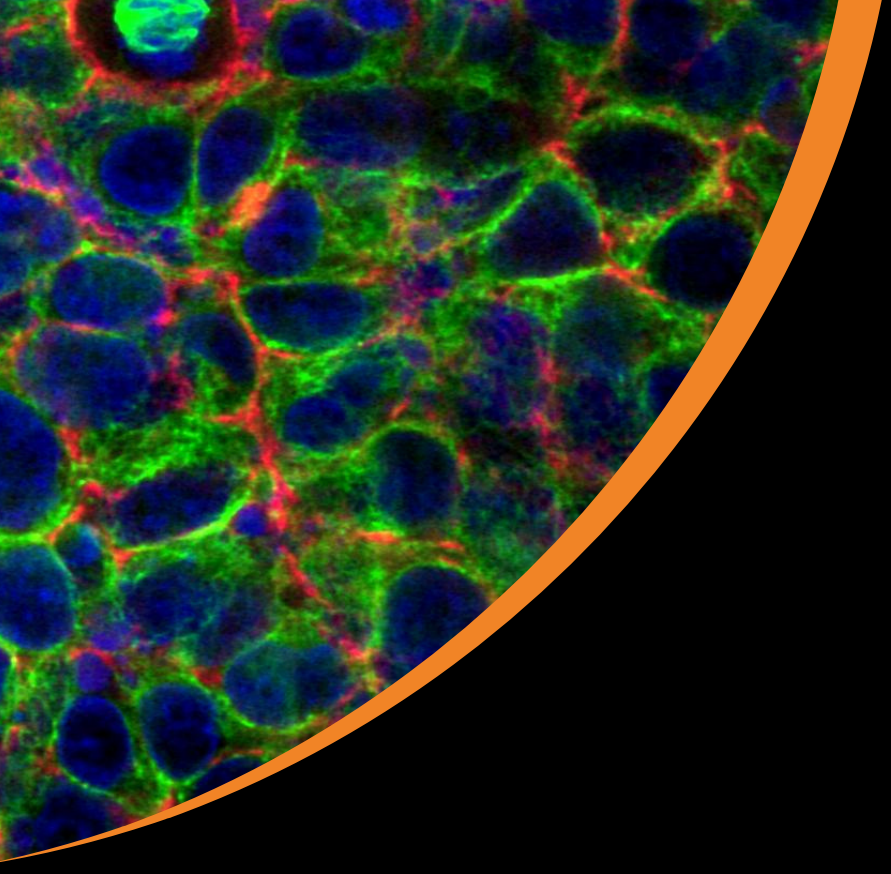
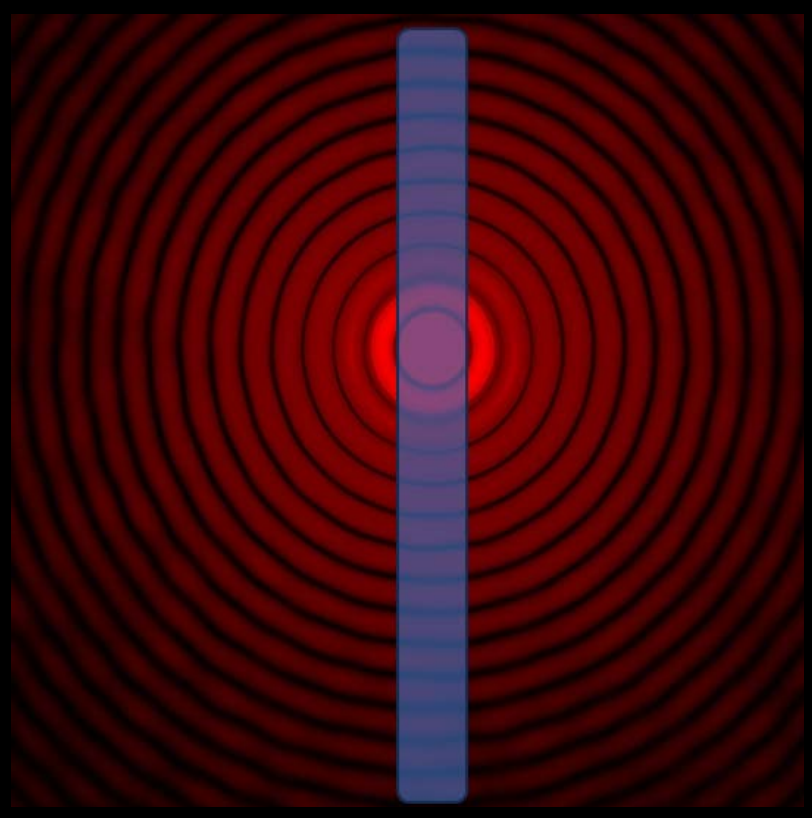
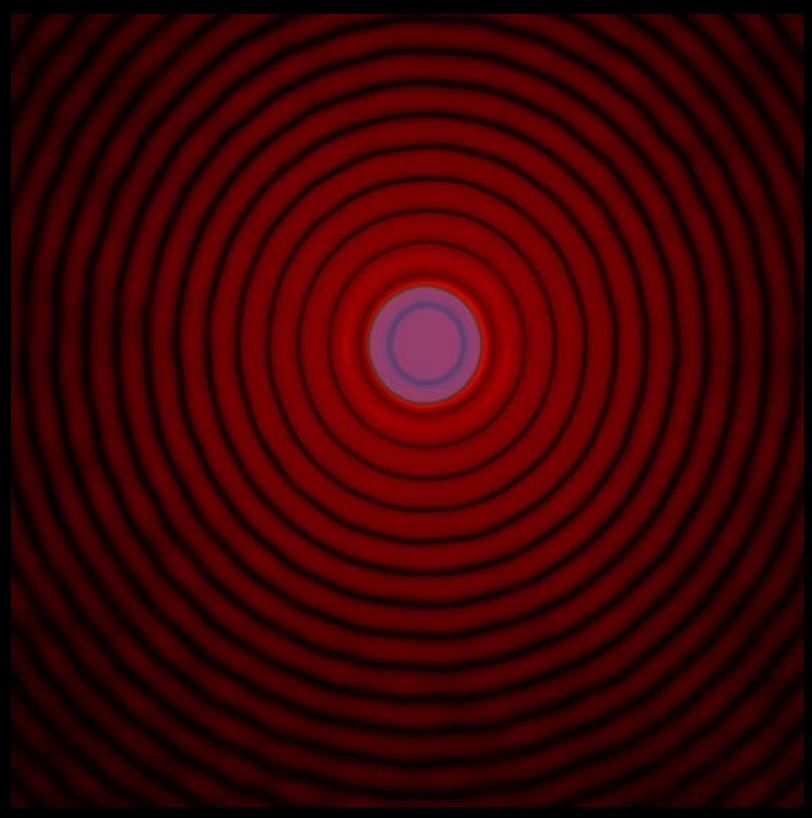


Line *RE*scan vs **Point *RE*scan**: Confocality

Line *RE*scan



Point *RE*scan



In **Line *RE*scan**, compared to **Point *RE*scan**, we have consciously sacrificed a fraction of confocality to gain a tremendous improvement in speed (*similar to confocality/speed in SD vs LSCM, respectively*).

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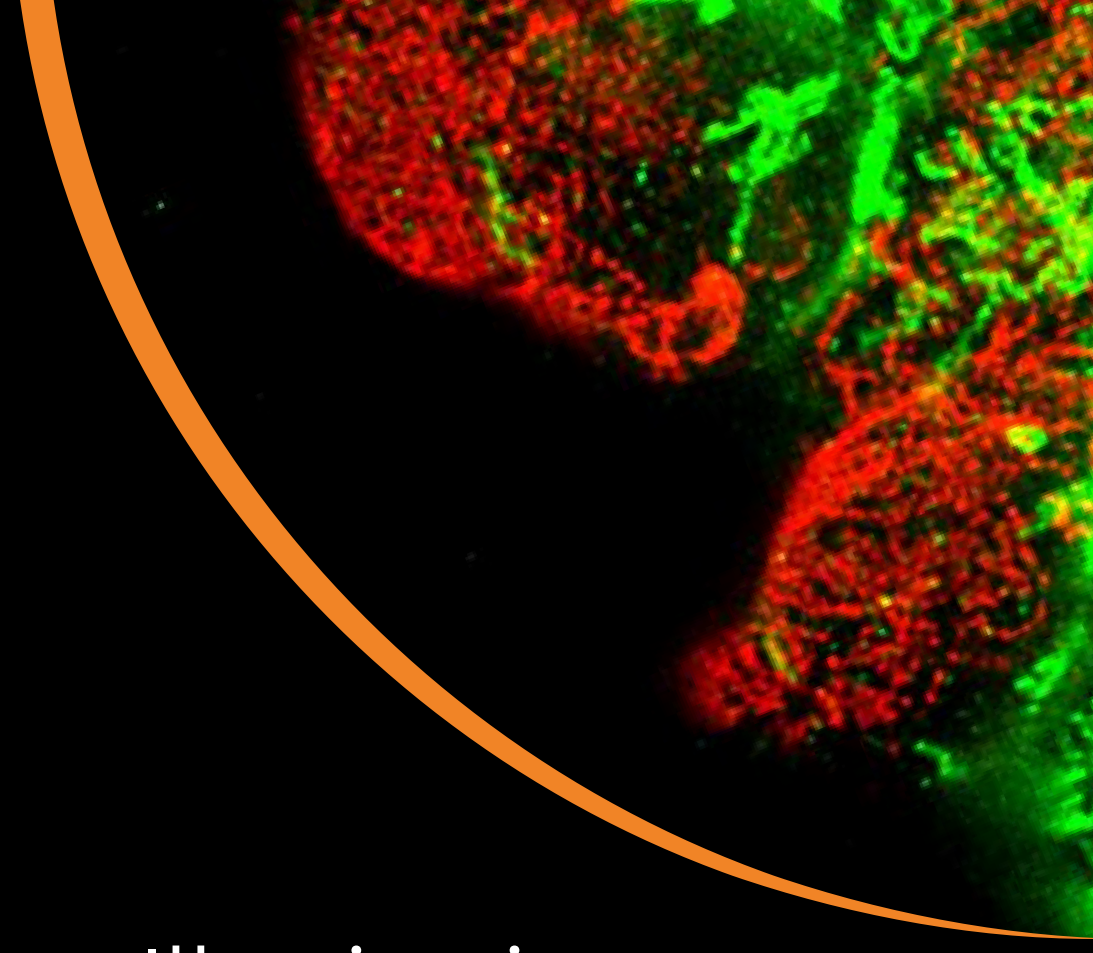
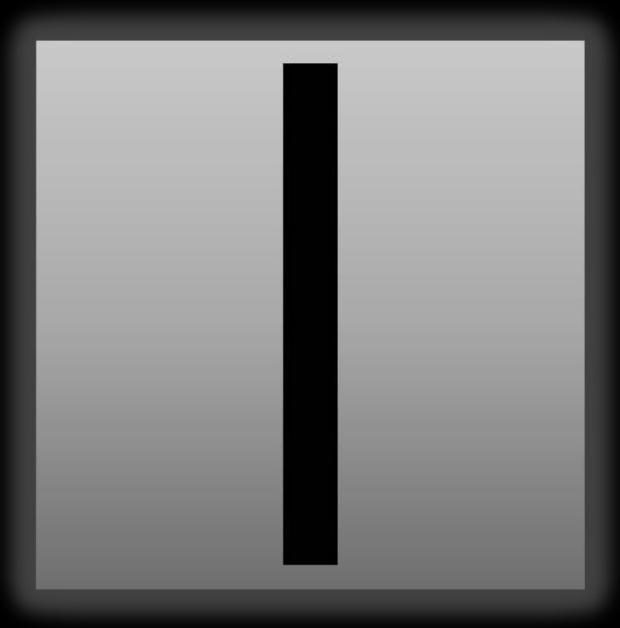
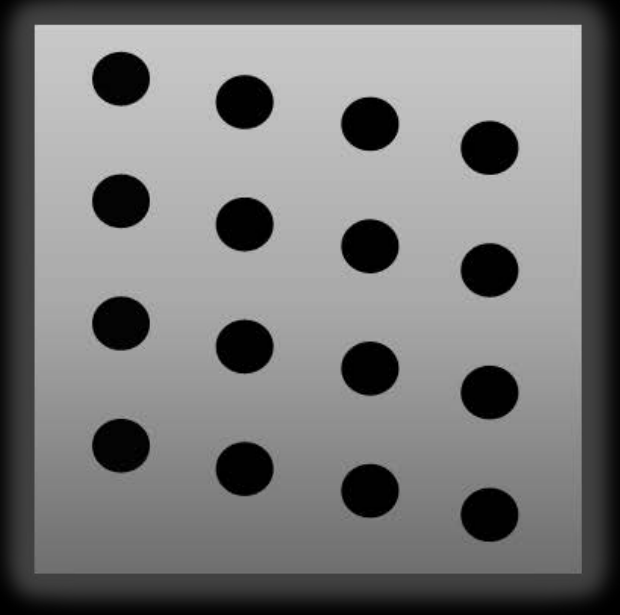
Line *RE*scan vs Spinning Disk: Pinhole



	Pinhole	Illumination
Line *RE*scan	 Slit	Line
SD	 Multiple circular	Array of beams

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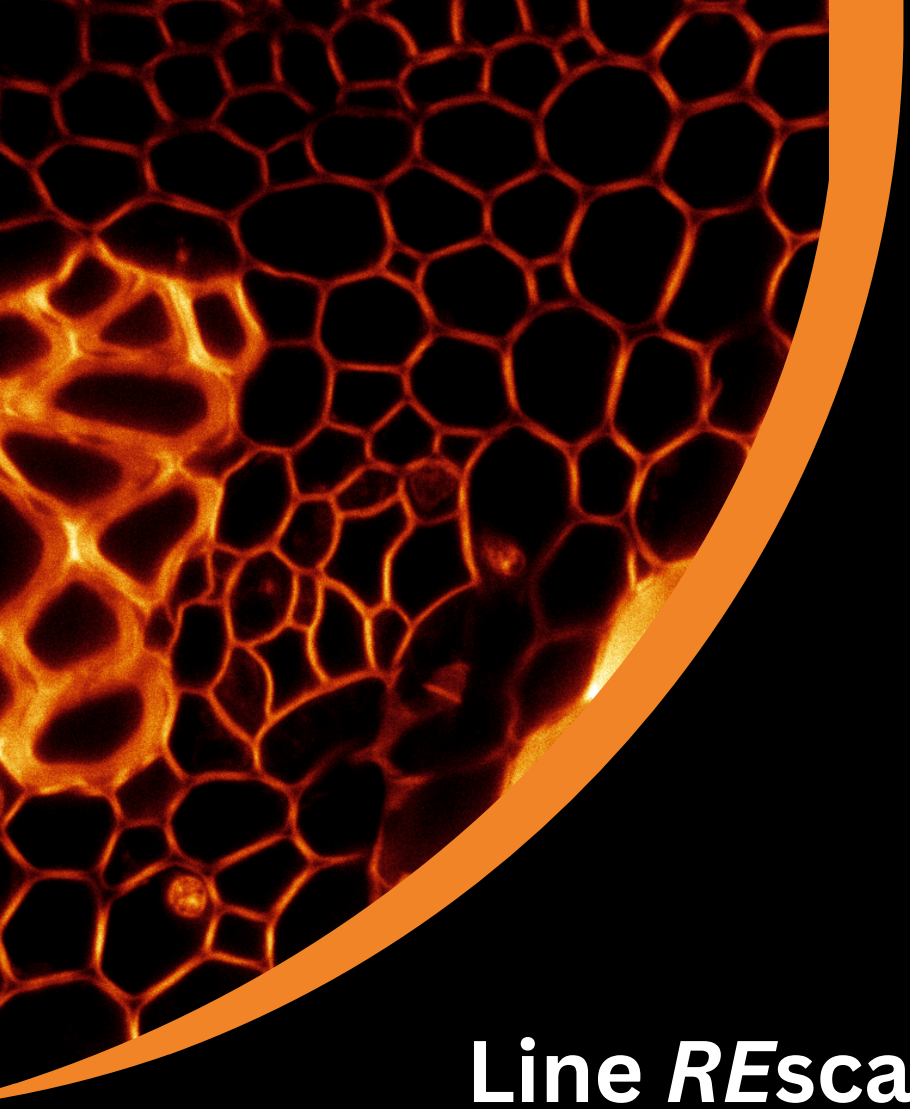
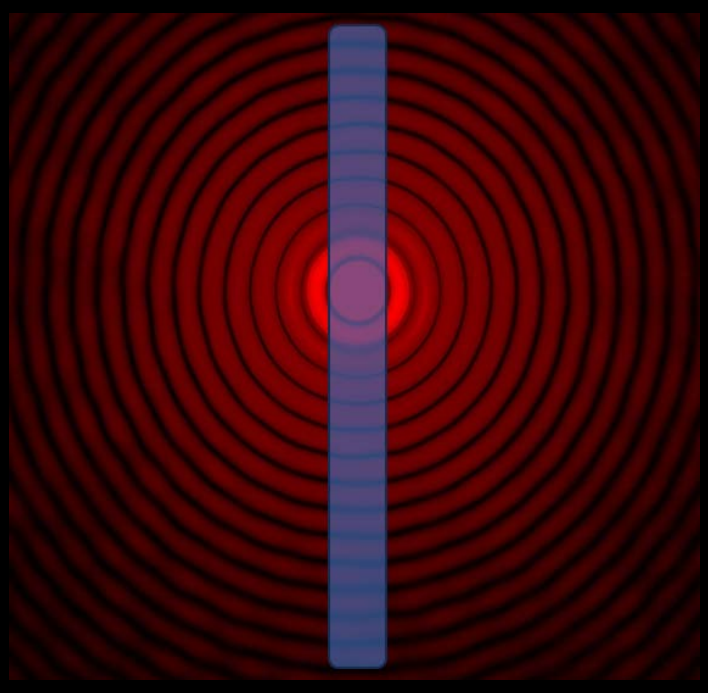
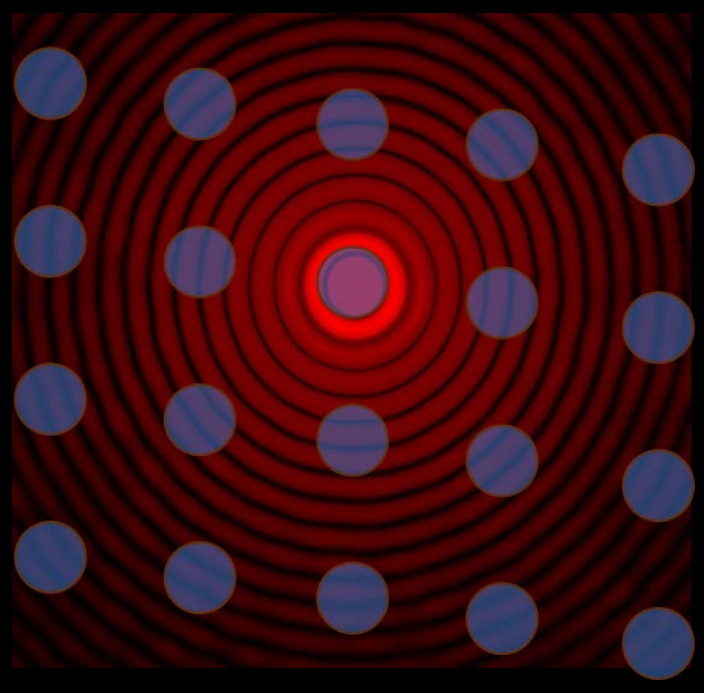


Line *RE*scan vs Spinning Disk: Confocality

Line *RE*scan



SD



Line *RE*scan and SD have reduced confocality compared to **Point *RE*scan** or LSCM.

With more depth, the crosstalk of many pinholes is evident in SD but not in **Line *RE*scan**, making the latter **superior for deep imaging**.

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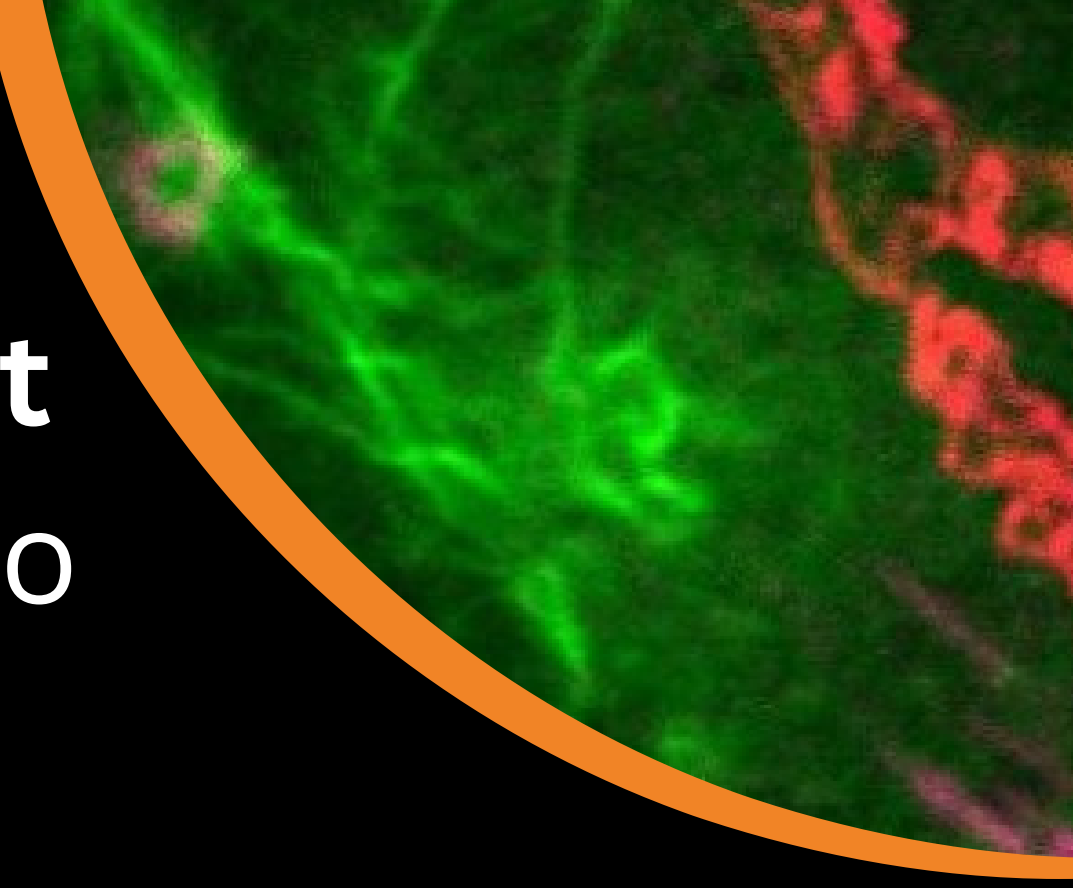


Advantages of **Point *RE*scan** compared to LSCM+SR add-on?

1. Lower phototoxicity,

2. Brighter signal,

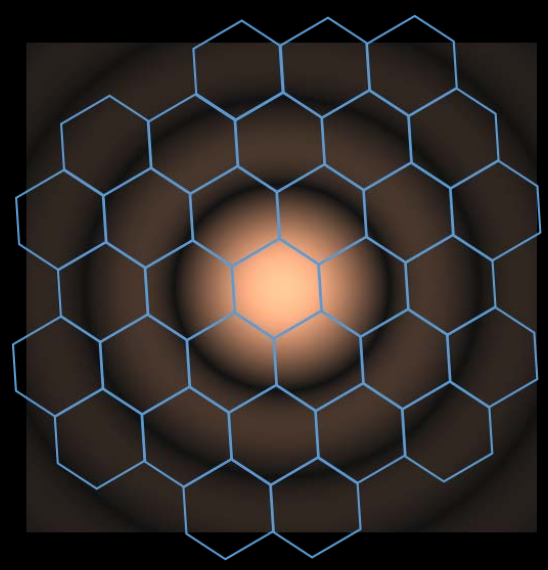
3. Deeper imaging, all three due to:

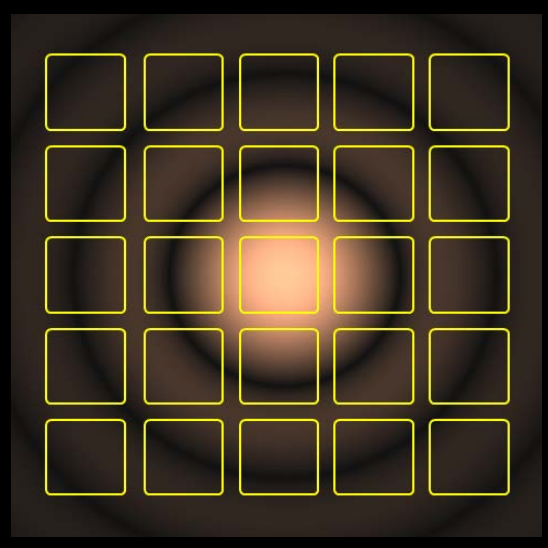
a) higher sensitivity of the detector

b) larger pinhole (*see PART 1*)

4. Optically fixed super resolution

(*no processing necessary*)





Different detectors in LSCM+SR add-on

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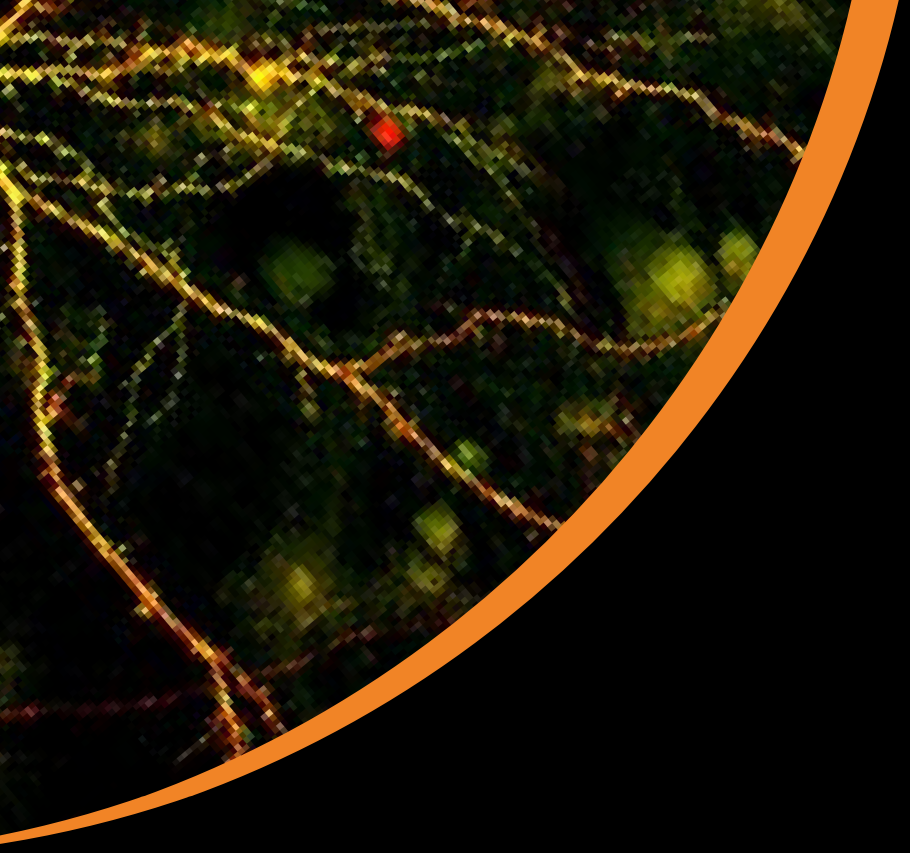
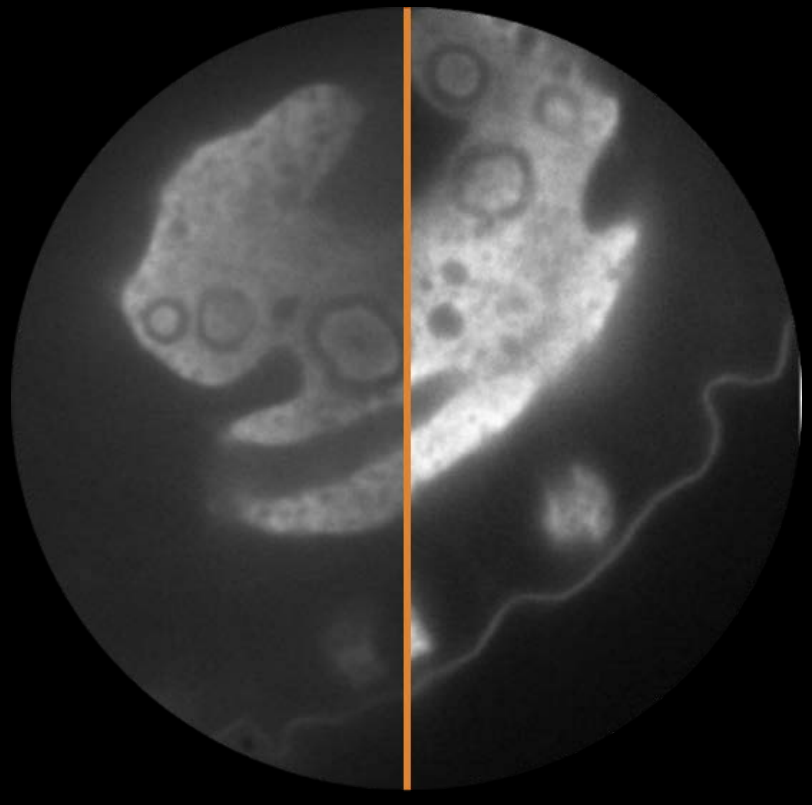


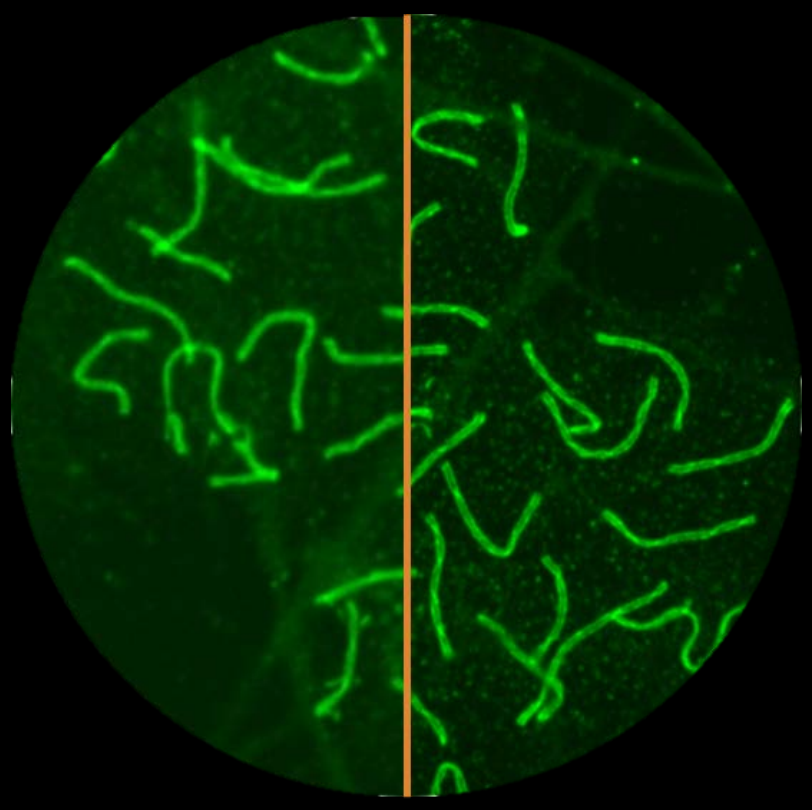
Comparing ***RE*scans** to corresponding confocals

SD



Line *RE*scan

LSCM



Point *RE*scan

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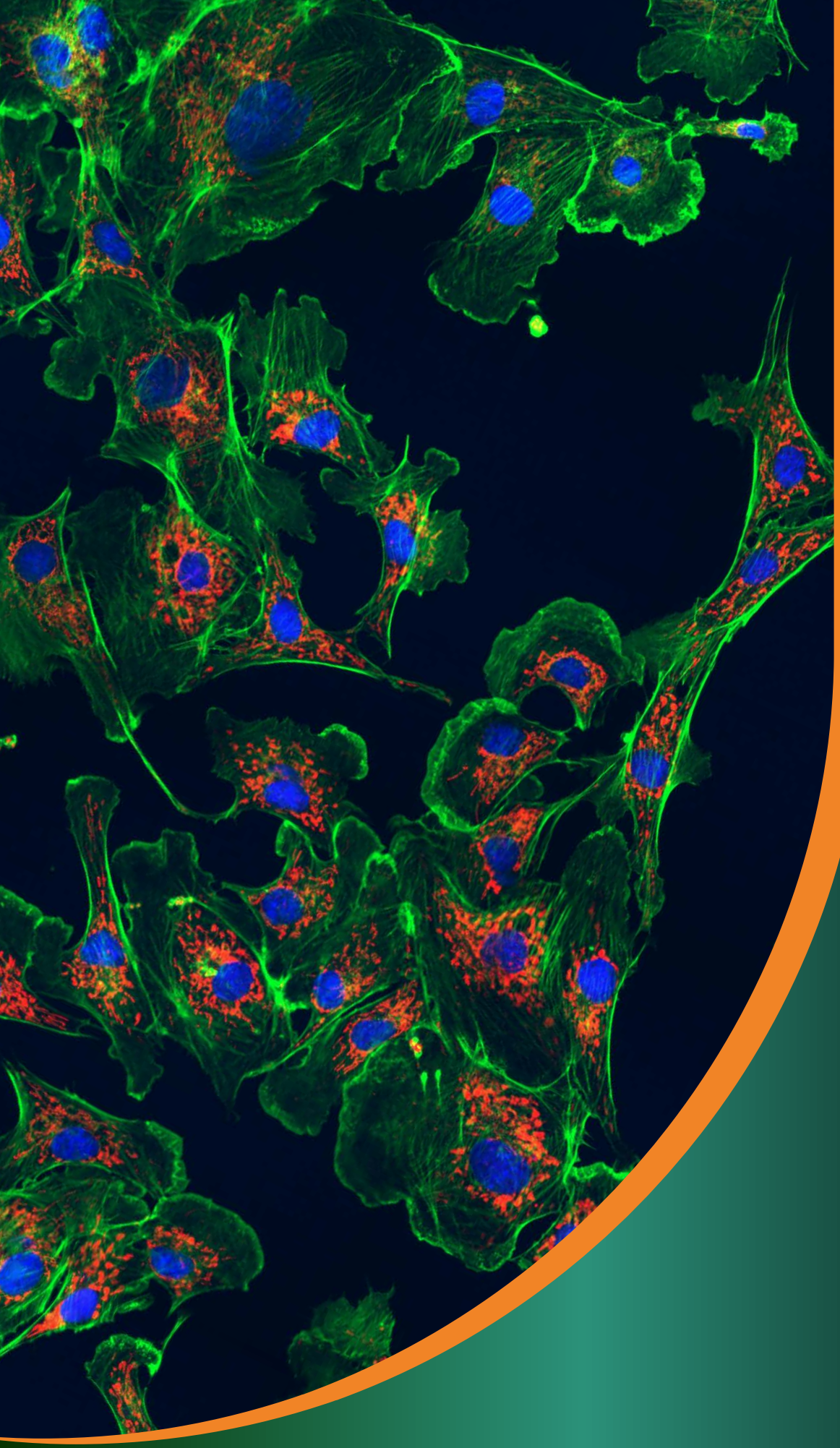

Find out more at

www.confocal.nl

*With **REscan**, we develop more.*
*See **GAIA**, our REvolutionary **Point REscan** Super resolution confocal!*

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