

CCMI Advanced Light Microscopy Core

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Introduction

The **C**enter for **C**ellular and **M**olecular Imaging was first established in the early 90's.

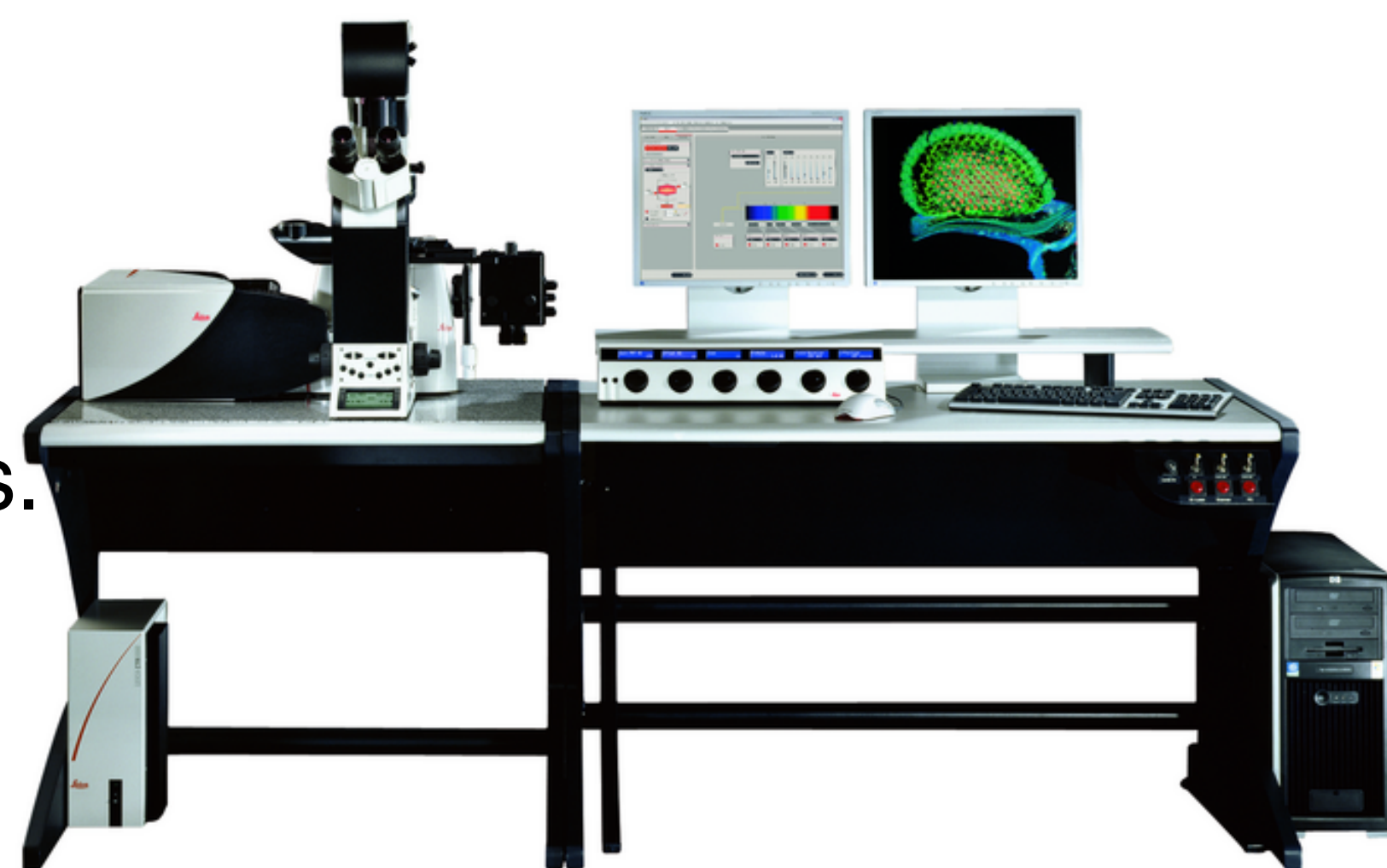
- The Core is available to everyone at Yale
- We are located in SHM IE25
- There are 7 microscopes and 4 workstation computers
- Currently the fee is \$50/hr for microscope usage
- Workstations are free to use, they include Imaris, LASX, ZEN Black, Blue, Huygens Deconvolution.
- For consult or training please contact Al Mennone al.mennone@yale.edu

Leica SP5

The SP5 is a basic confocal microscope with a number of advanced features which make it the most heavily used instrument in the core.

Features:

- Lasers include a 405nm, Multi line Argon laser, 561nm and 633nm.
- Five detectors including two high sensitivity HyD detectors.
- Galvo stage insert for rapid focus.
- Spectral detectors.



Zeiss 710 Duo NLO

The 710 is configured for fixed and live specimens and is equipped with a Mai Tai 2-photon laser and 4 NDDs.

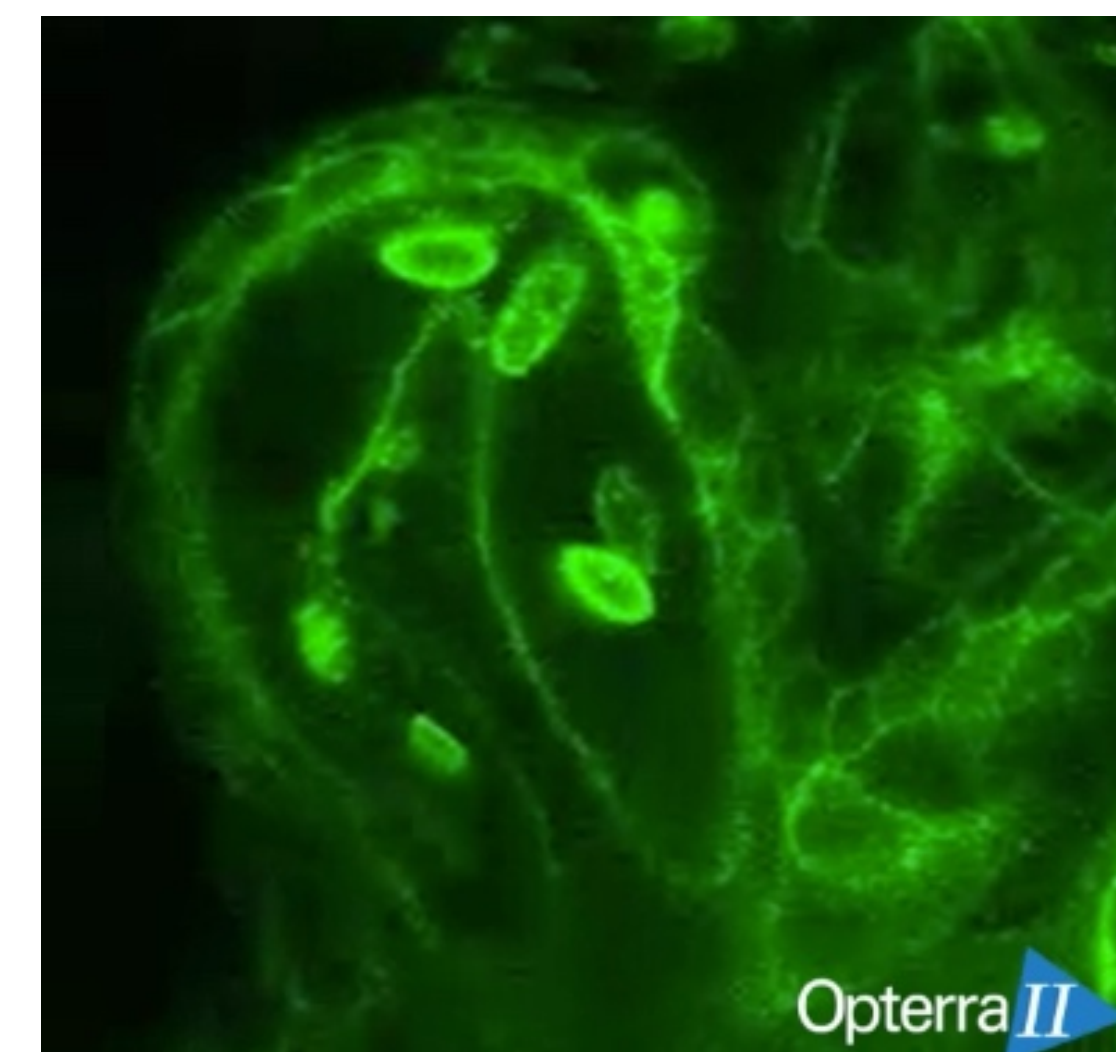
Features:

- Enclosed stage for temperature and CO₂ control for live specimens.
- 2-Photon laser for deep imaging with reduced phototoxicity.
- 4 external Non-Descanned Detectors
- Confocal lasers include 405, 458, 488, 514, 543, 561, 633nm



Bruker Opterra II Swept-Field Confocal

This microscope rapidly scans pinhole or slit arrays across the specimen for acquisition speeds of hundreds of frames per second.



Features:

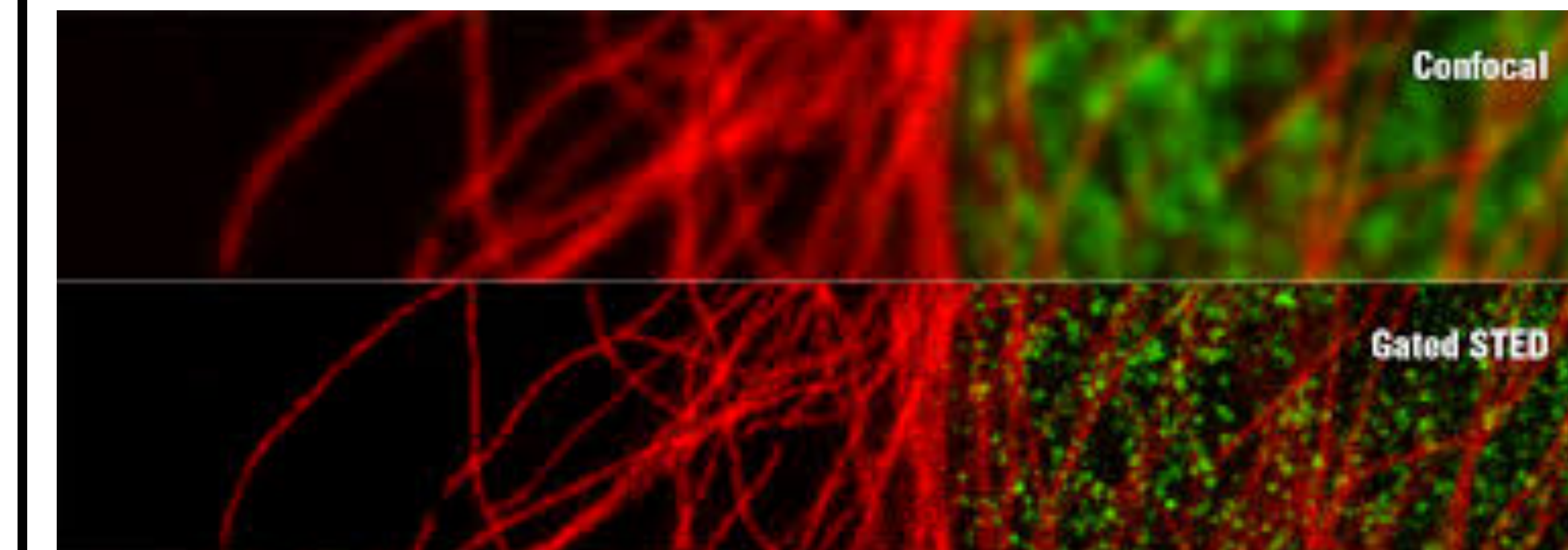
- Twin EMCCD Cameras.
- Very low exposure for long time course studies.
- Low phototoxicity.
- Incubator stage insert.
- Photo-activation module.
- Perfect Focus

Leica SP8 gated-STED Super Resolution

The SP8 uses donut shaped "depletion" lasers to increase resolution 5-fold over standard confocal microscopes.

Features:

- Tunable white light laser for user defined excitation wavelength.
- Three depletion lasers 592nm, 660nm and 775nm.
- Capable of 50nm resolution in the focal plane and 120nm resolution in the axial plane.
- Live cell incubation stage insert.
- Hyvolution for rapid deconvolution.



Bruker Vutara 352 Super Resolution

The Vutara is based on single molecule localization techniques such as PALM/STORM. Resolution as low as 20nm.

Features:

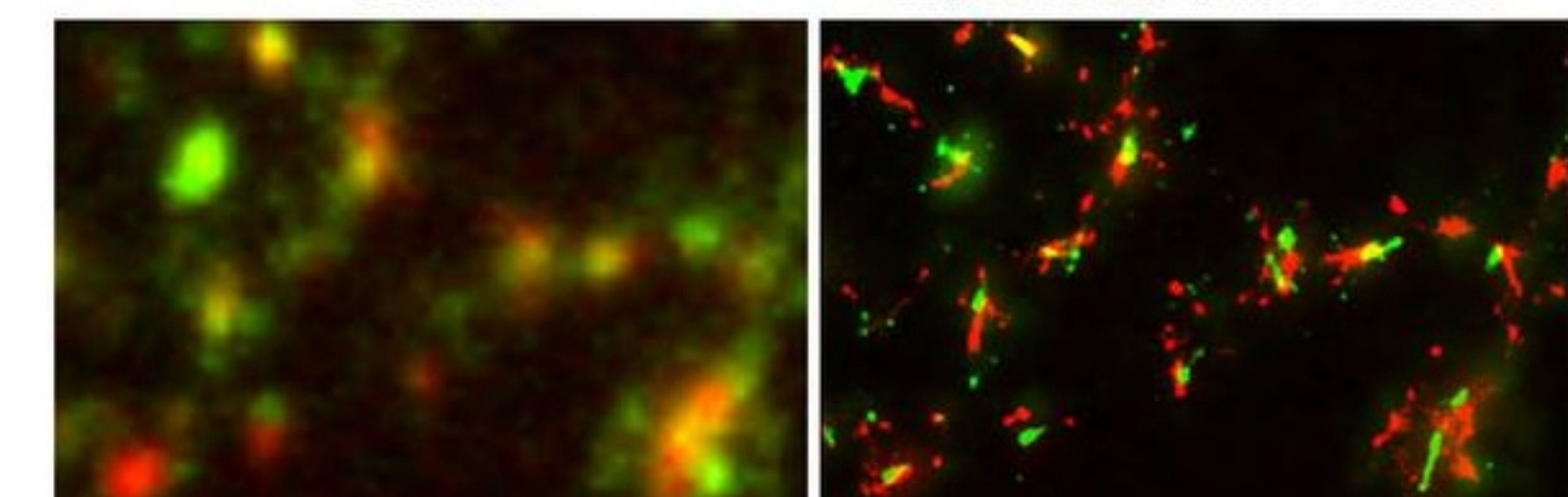
- Microscope enclosure with Temperature, humidity and CO₂ control.
- 405nm Activation laser, 488, 560 and 640 imaging lasers.



- Additional Opterra Swept-Field scanner with EMCCD camera included.

Confocal

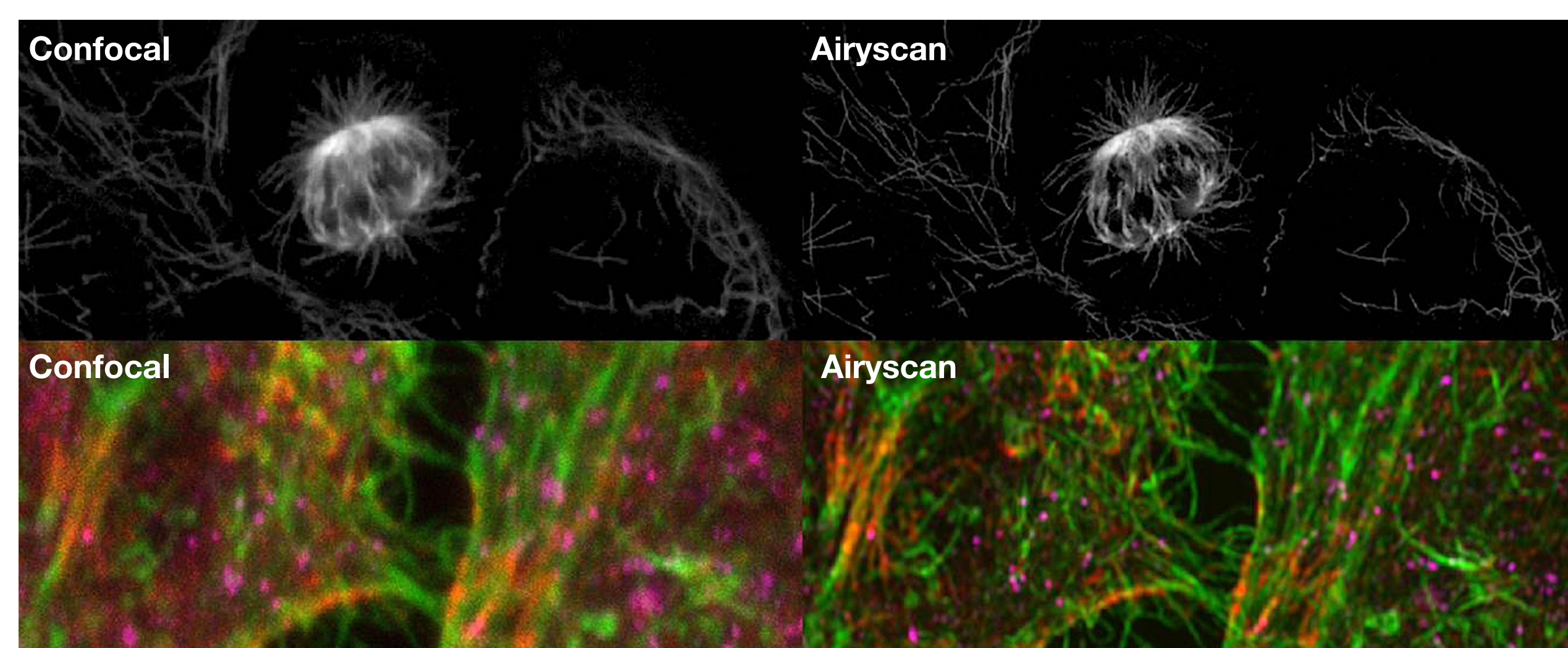
Super Resolution over Confocal



Zeiss 880 Airyscan Fast

The 880 airyscan uses a concentrically arranged hexagonal detector array which results in a 1.7-fold increase in spacial resolution over typical confocal microscopes. The fast module elongates the beam which allows a 4x increase in scan speed.

- Features:
- Incubation chamber for live specimens.
 - 32 channel GaAsP spectral detector
 - Multi-line Argon, 405, 561, 594, 633nm lasers.
 - Definite focus.



Bruker Luxendo Light Sheet

The Luxendo SPIM (**S**elective **P**lane **I**llumination **M**icroscope) uses a thin sheet of laser light to provide very fast scan speeds and gentle handling of live specimens.

Features:

- 488, 561, 642nm lasers.
- Specimen chamber with temperature control.
- Two high speed sCMOS cameras.
- Ideal for long term developmental studies.
- Very low phototoxicity.

