

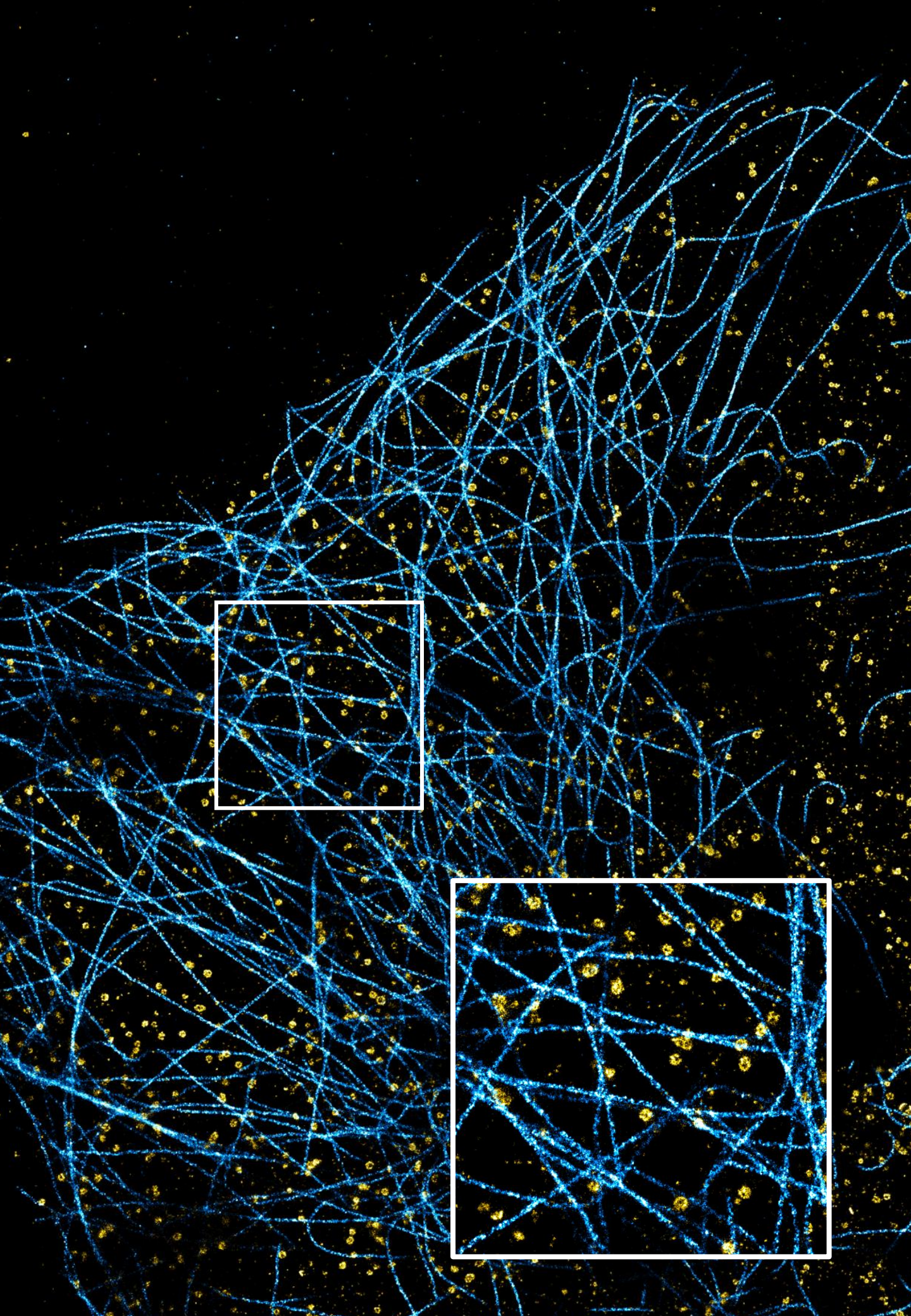
SAFe RedSTORM

THE SOLUTION FOR MULTI-COLOR 3D NANOSCOPY

L I G H T U P Y O U R R E S E A R C H



www.abbelight.com



MULTI-COLOR STORM

is a powerful way to



Reveal

macromolecular
structure



Measure

direct distance
between molecules



Quantify

molecular interactions
at the nanoscale

Multi-color STORM nanoscopy is a unique approach to simultaneously visualize and colocalize multiple structures at the nanoscale. Yet, it can be very challenging due to chromatic aberrations, drift, and variability in data quality between different colors.

What if multi-color STORM super-resolution imaging
was **easy, reliable** and **fast**?

Clathrin-CF 680
Tubulin-AF 647

10 μ m

SAFe RedSTORM



The SAFe RedSTORM instrument is **the first nanoscope module** dedicated to simplifying multi-color and colocalization experiments at the nanoscale.

Its unique technology combined to the **powerful NEO software** allows the simultaneous collection of up to 3 far-red fluorophores in a single acquisition and dramatically simplifies sample preparation and data analysis.

FAST

ASTER illumination

RELIABLE

Spectral demixing detection

ACCESSIBLE

Plug and play solution

Dedicated software

Unlimited buffer

Expert support

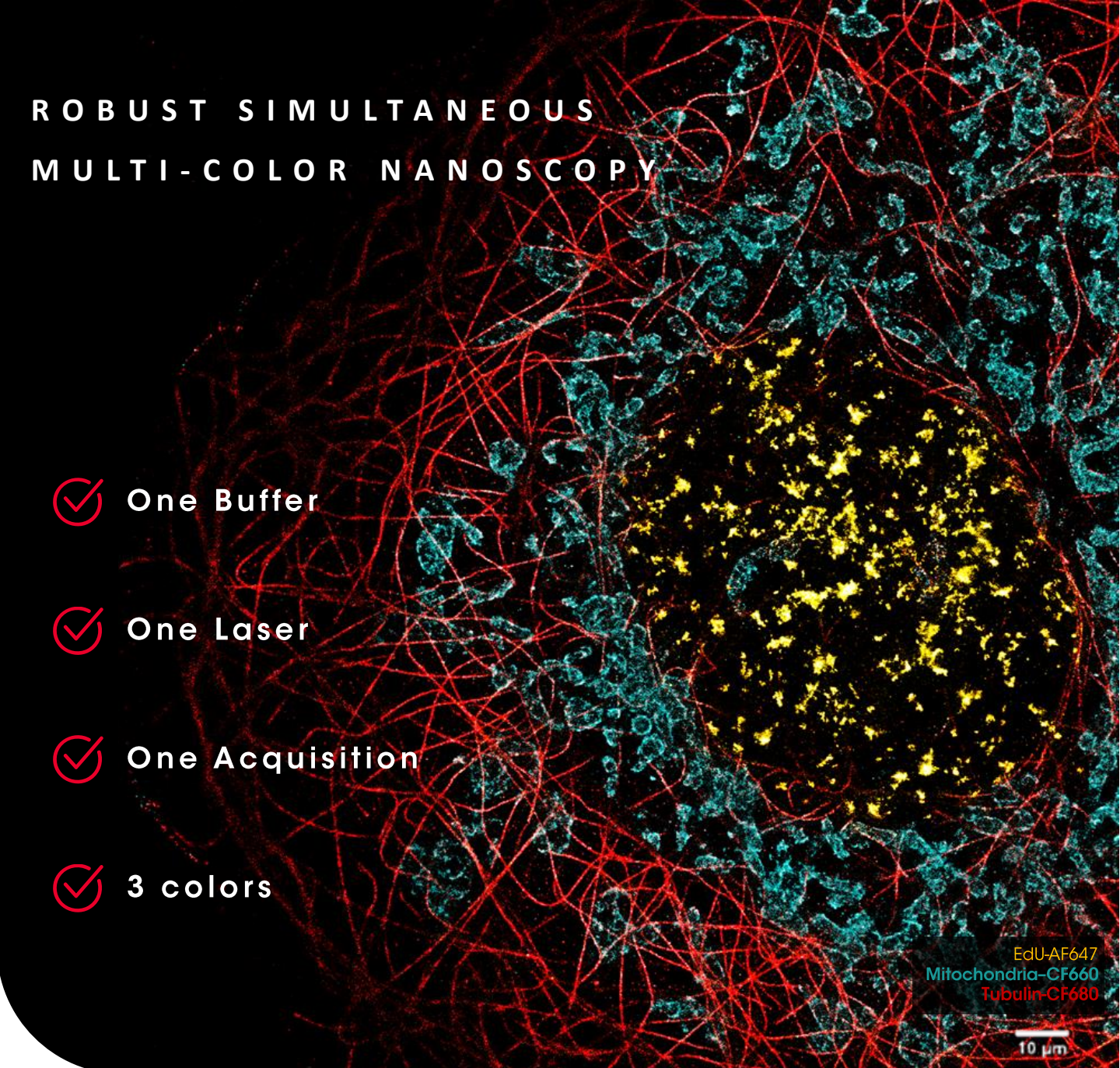
This **state-of-the-art instrument** is adaptable to any inverted microscope and will satisfy STORM and PAINT experts as well as Single-Molecule-Localization newcomers thanks to an open and robust conception.

The SAFe RedSTORM nanoscope opens a new world of possibilities to understand the ultimate secrets of life, at the nanoscale.

ROBUST SIMULTANEOUS MULTI-COLOR NANOSCOPY

- ✓ One Buffer
- ✓ One Laser
- ✓ One Acquisition
- ✓ 3 colors

EdU-AF647
Mitochondria-CF660
Tubulin-CF680



<1%

VERY LOW CROSSTALK
with Alexa 647 and CF680 dyes

<3%

VERY LOW REJECTION
with Alexa 647 and CF680 dyes

400 frames/s

ULTRA-FAST ACQUISITION
At standard field of view 50x50µm²

150x150µm²

ULTRA LARGE FIELD OF VIEW
At high speed acquisition 100 frames/s

15 nm

ULTRA HIGH 3D RESOLUTION
Astigmatism and very precise
localization algorithm

ASTER ILLUMINATION EXCITATION

Adaptable Scanning for Tunable Excitation Regions (ASTER) is a proprietary (patent pending) **hybrid scanning** and **wide-field illumination technique**. The use of adaptive scanning strategies allows the concentration of laser power in specific areas to accelerate the blinking of dyes or the creation of an optimal patterned irradiance adapted to experimental needs.

Learn more about ASTER technology – [Mau et al., Biorxiv, 2020](#)

Large Field Of View

Scan the entire FOV of sCMOS cameras

Uniform EPI, HiLo, TIRF Irradiance

Automated switch between modes

Ultra-Fast Imaging

Focused excitation beam for better/faster blinking

Cost effective technology

Less laser power is required for STORM nanoscopy

3D STORM Imaging
Adducin – CF 680 and β II Spectrin – AF647
15M of points
Karoline Friedl, NeuroCyto Lab

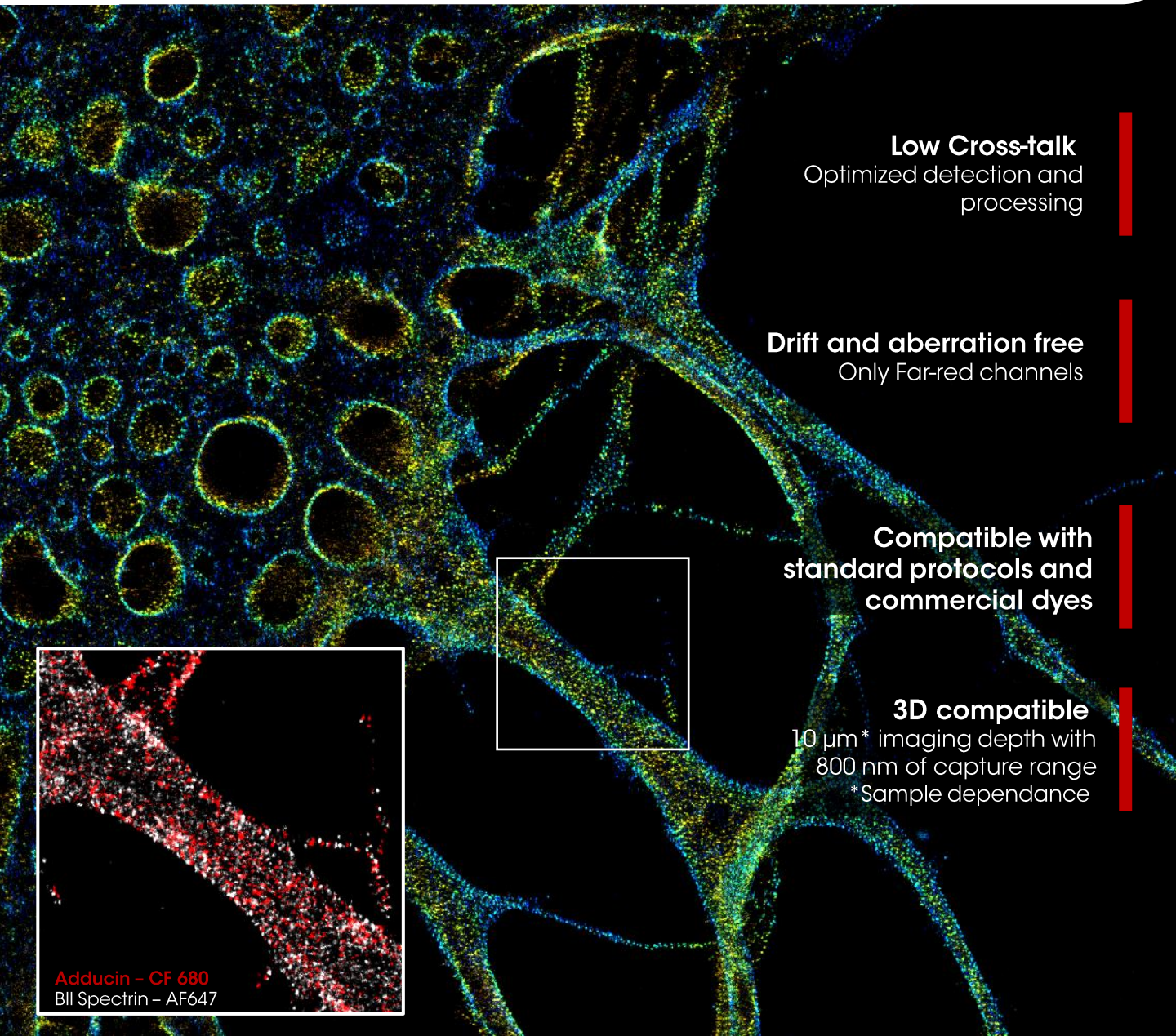
10 μ m

SPECTRAL FAR-RED DEMIXING DETECTION

Spectral Demixing relies on the ability to **distinguish emission from spectrally-close far-red dyes** by splitting the emission light with a dedicated dichroic cube and measuring the intensity ratio between the two split paths. Since this ratio is the identity card of each type of dye, it is used to determine the nature of each detected single molecule, on each single image, to reveal the global biological structure with high confidence, one molecule at a time.

Spectral Demixing Far-red is an **easy-to-use** and **powerful imaging approach** that overcomes the limits imposed by conventional multi-color imaging at nanoscale.

Contact us for any further information



Low Cross-talk

Optimized detection and processing

Drift and aberration free

Only Far-red channels

Compatible with
standard protocols and
commercial dyes

3D compatible

10 μm * imaging depth with
800 nm of capture range

*Sample dependance

Adducin - CF 680
BII Spectrin - AF647

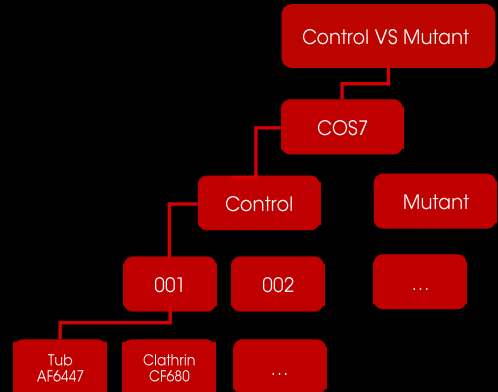
NEO SOFTWARE

A complete **straightforward** & **user-friendly workflow** from acquisition to quantification and analysis

ACQUISITION

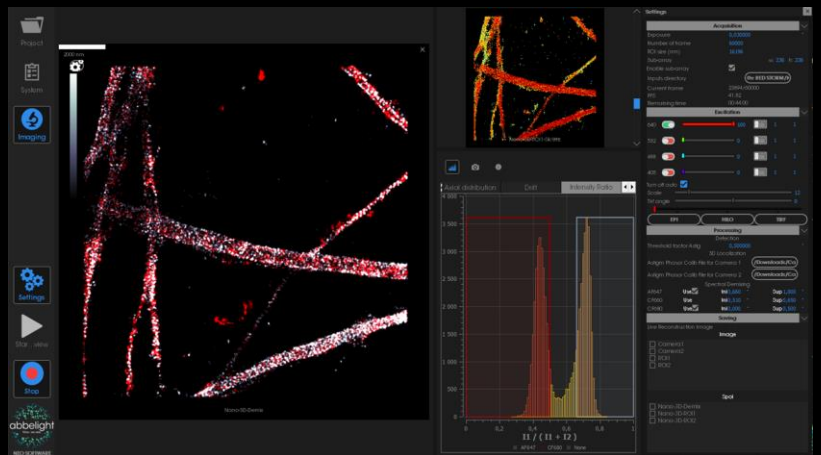
1 Project Management | Smart Digital Notebook

- Manage data acquisition in an **intuitive user interface**
- Organize your **biological conditions**
- **Collect all relevant metadata** to avoid wasting time transferring your notes in laboratory notebook.



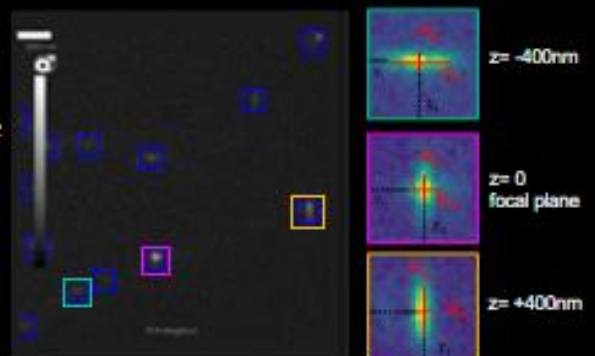
2 Acquisition | Live feedback

- **Multi-color images** in just a few clicks
- **Live feedback** during the imaging: Detection / Localization / 3D Reconstruction / Drift correction
- Display of **quality control parameters**



3 Batch Processing | Save time

- Process all your datasets **in parallel** to gain time
- **Ready-to-use** algorithms with optimized parameters for beginners
- Access to detailed processing parameters for experts
- **Robust** localization algorithms and drift correction



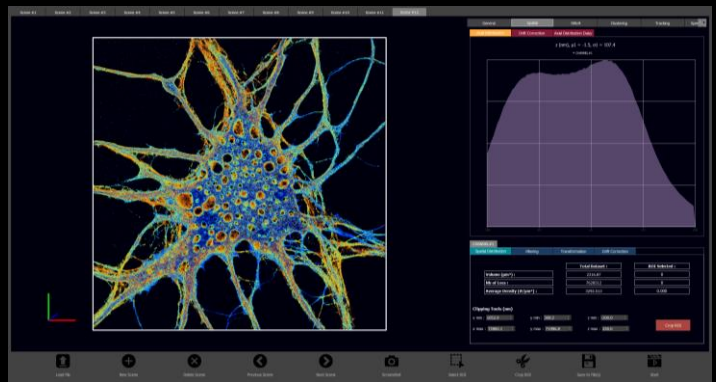
Single-molecule datasets go through a complete analysis workflow:
from visualization to quantification

ANALYSIS

4

Data Visualisation | Single-molecule statistics and data filtering

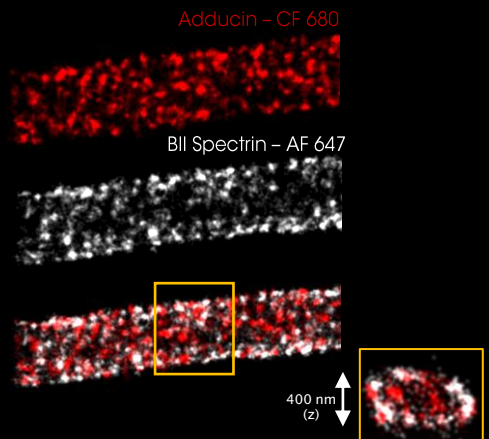
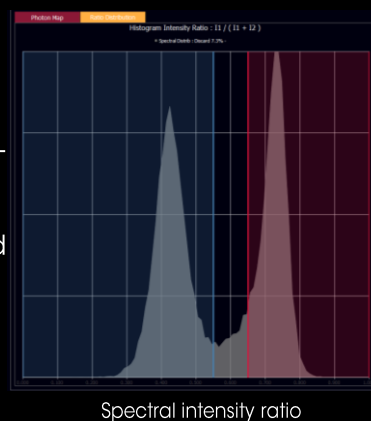
- Open .csv format in the viewer
- Observe **spatial distribution**
- **Select filter**: frame number, uncertainty of localizations, blinking analysis



5

Multi-color identification | Spectral demixing

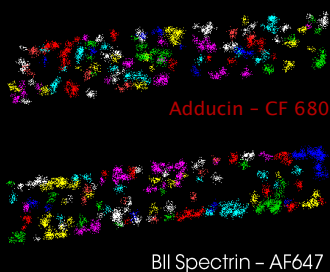
- **Configure spectral demixing** parameters: thresholding based on mono-color calibration
- **Visualize** photon map and intensity ratio
- Demix colors and export both coordinate tables



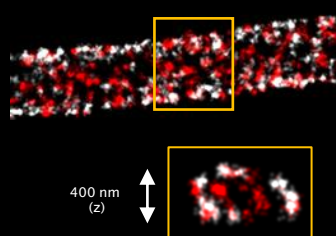
6

Analysis | Clustering, filtering and quantification of structure

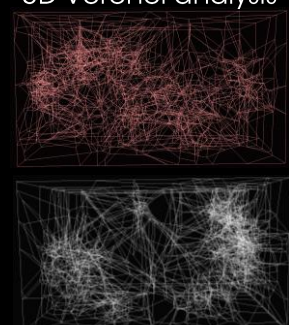
DBSCAN analysis



Filtering clusters

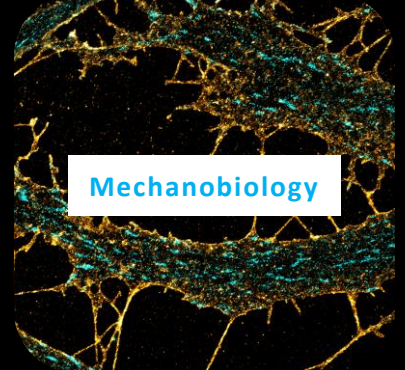
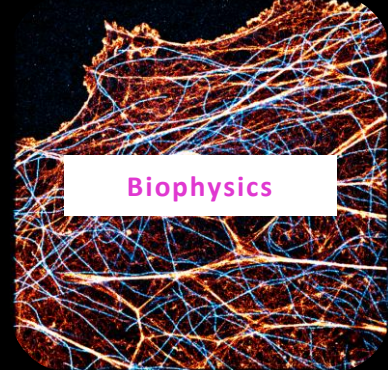
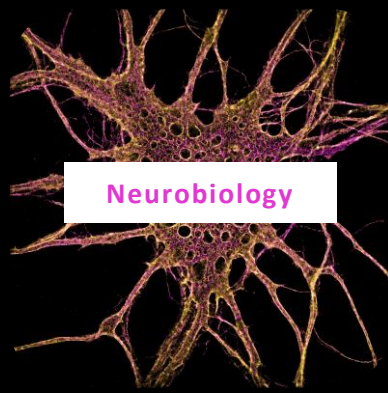
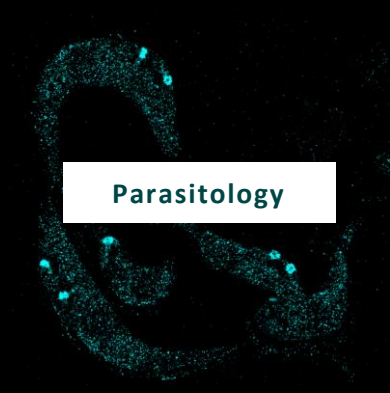
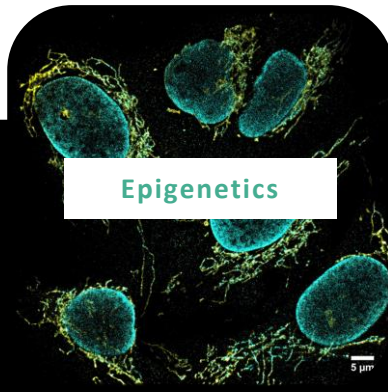
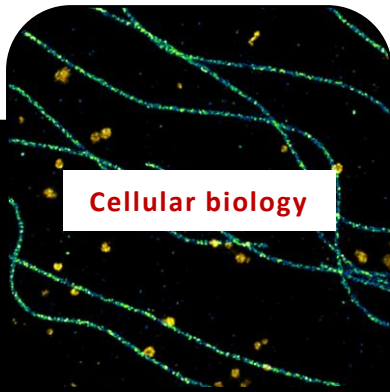


3D Voronoï analysis



A MULTICOLOR SUPER-RESOLUTION IMAGING SYSTEM

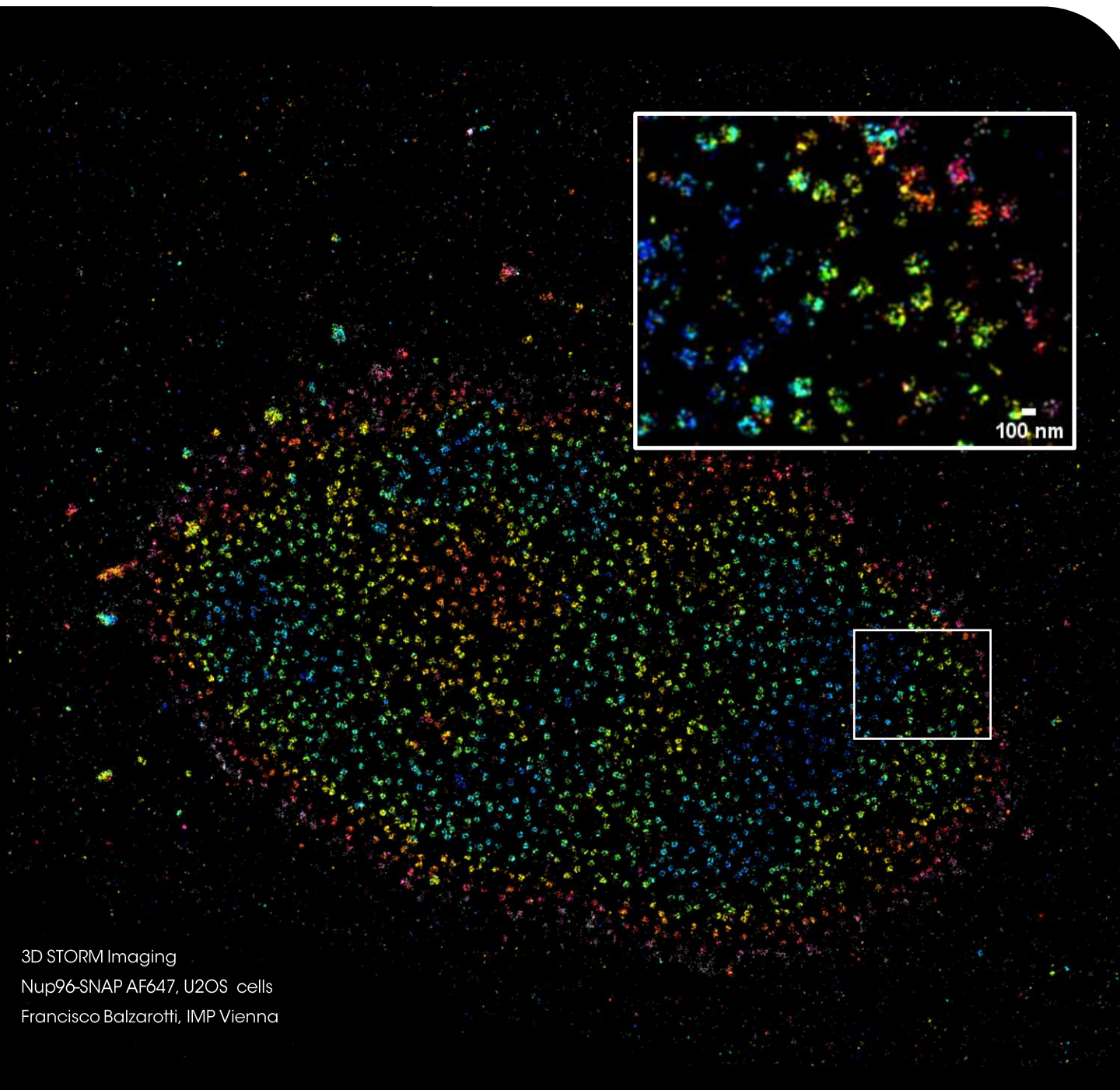
for numerous fields of application



"I think spectral demixing has the potential to unlock the long-standing obstacle to multicolor STORM. It allows for fast, easy, and robust imaging of 2 - 3 targets with consistent quality across channels, free of chromatic aberration. The specific implementation by Abbelight brings flexibility in the spectral detection for best sensitivity and minimal crosstalk."

Testimonials from Dr Christophe LETERRIER

(NEUROCYTO LAB Neuropathophysiology Institute, Marseille, France)



3D STORM Imaging

Nup96-SNAP AF647, U2OS cells

Francisco Balzarotti, IMP Vienna

NOW IT IS YOUR TURN TO SEE!



ABBELIGHT
191 avenue Aristide Briand
94230 Cachan – France
Email: contact@abbelight.com

Additional content and information:
www.abbelight.com
www.abbelightacademy.com

**DANGER-VISIBLE AND INVISIBLE LASER
RADIATION AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION CLASS 4
LASER PRODUCT**

Total Power 1500 mW MAX
CW 400-700 nm
IEC/EN60825-1: 2014

Complies with FDA performance standards for laser products except for deviations pursuant to Laser Notice n°50, dated June 24, 2007