CSU-W1 SoRa

Product specification (only items which differ from the CSU-W1 are shown)

	1 camera model (T1)	2 camera model (T2)	Split view model (T3)
Loadable model	A SoRa disk can be loaded as disk 2, and disk 1 can be selected (50µm or 25µm)		
Excitation wavelength	405nm - 640nm		
Observation wavelength	420nm - 680nm		
Effective field of view	Depends on the magnification changer for SoRa (see below)		
External light / NIR port	external light port cannot be equipped at the same time as the intermediate magnification switcher The NIR port cannot be used together with a SoRa disk		

Magnification changer for SoRa specification

Lens-switched light path	3 light paths switched electronically 1x, 2.8x, 4.0x magnification
External dimensions	425(W)×301.1(L)×122.5(H) mm (excl. protrusions and supporting column)
Weight	13kg
Microscope connection	Manufacturer-specific adapter

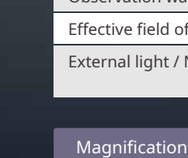
Field of view when using magnification changer for SoRa

Magnification Changer for SoRa	2.8 x	4.0 x
Recommended objective lens	100 x	60 x
Effective field of view	61x57µm	71x67µm

Resolution: PSF FWHM *1

XY/Z resolution (optical super-resolution)	150nm / 320nm
XY/Z resolution (after deconvolution)	120nm / 300nm

*1 Resolution value is for reference only



Safety Precautions

- Read the user's manual carefully in order to use the instrument correctly and safely.
- If used in combination with a laser light source, this product falls under the category of class 3B laser products. Do not look directly into the beam and avoid touching it or any other direct exposure to it.

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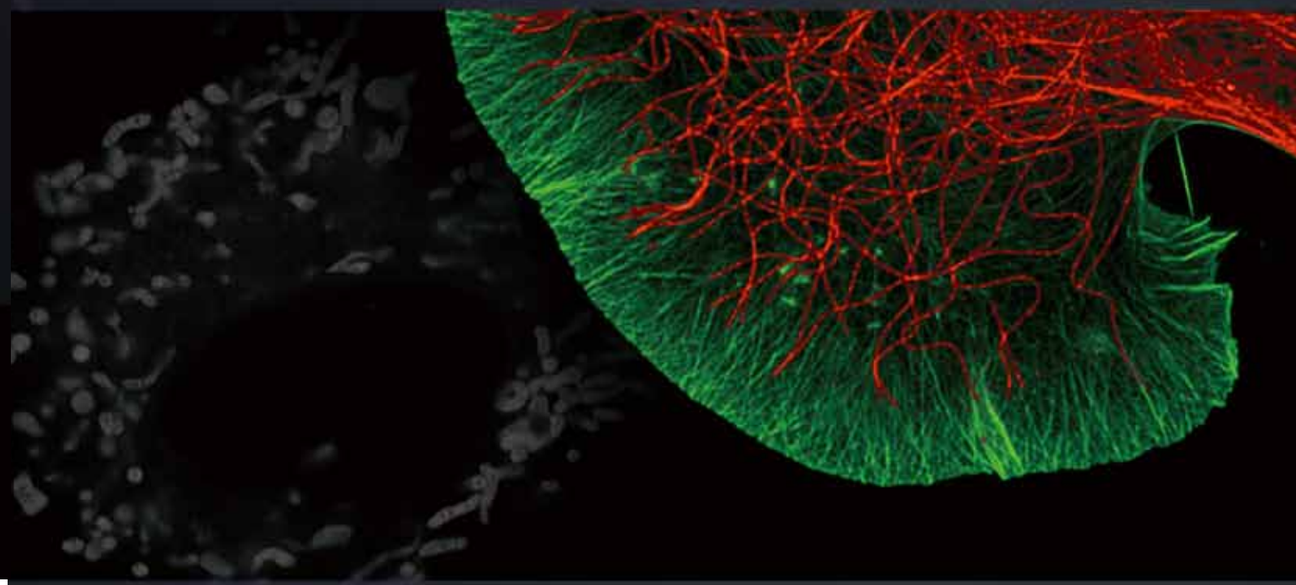
CSU-W1 SoRa

CONFOCAL SCANNER UNIT
SUPER RESOLUTION via OPTICAL Re-ASSIGNMENT



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CSU-W1 SoRa

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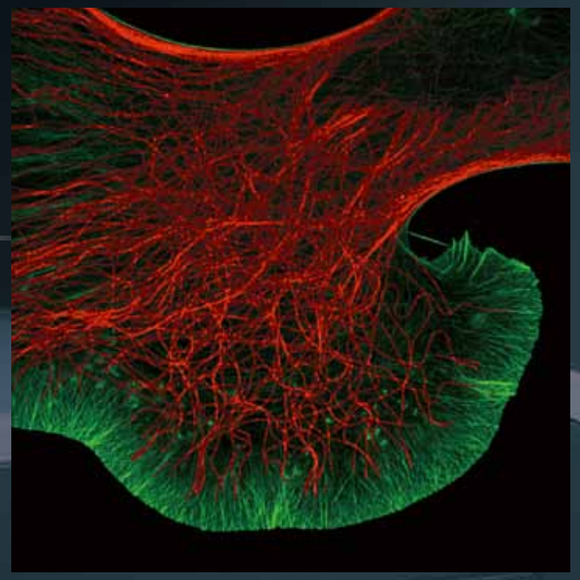
SUPER RESOLUTION via OPTICAL Re-ASSIGNMENT

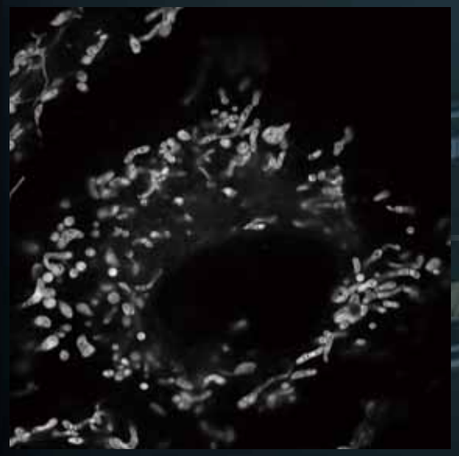
For more information

XY resolution of approx. 120nm*

XY resolution has been improved by approximately 1.4x the optical limit based on spinning-disk confocal technology.
Furthermore, a final resolution approximately twice the optical limit is realized through deconvolution.
*For reference



Growth cone of NG108 cells
Image provided by Dr. Kaoru Kato, Biomedical Research Institute,
National Institute of Advanced Industrial Science and Technology (AIST)



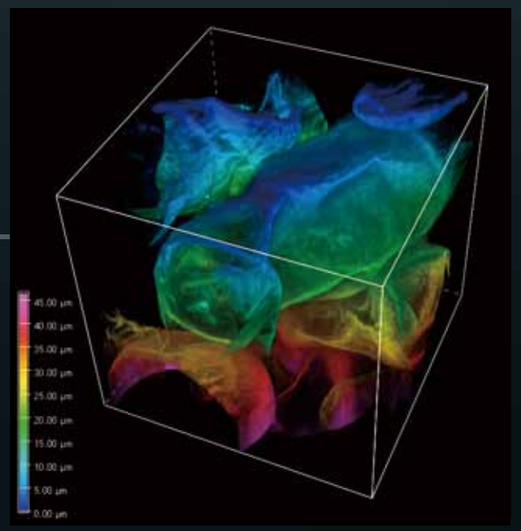
Real time live cell imaging of mitochondria (10FPS)
Image provided by Dr. Kaoru Kato, Biomedical Research Institute,
National Institute of Advanced Industrial Science and Technology (AIST)

Ideal for super-resolution live cell imaging

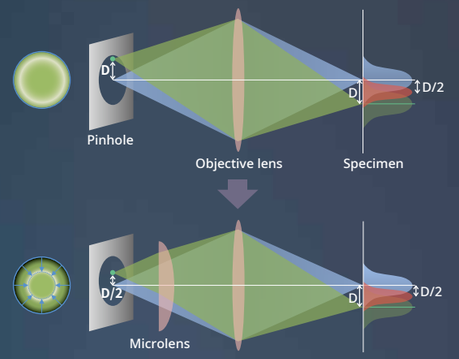
Just like the CSU,high-speed real time imaging can be performed with super-resolution.
In addition, live cell imaging is possible, reducing bleaching and phototoxicity.

Easy to use

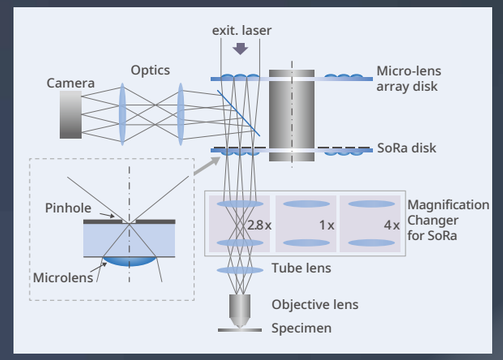
Super-resolution images can be observed in real time without any specific preparation of sample.
Deep position observation is made possible through optical sectioning based on confocal technology.



Principle of super resolution



[Principle explanation]



[CSU-W1 SoRa configuration]

The image formation in regular confocal microscopes is shown as the product of the illumination PSF (point spread function) and detection PSF. If we consider the image formation on the pinhole at a position D from the optical axis, it is the product of the illumination PSF and detection PSF (as shown), and we can see that information at the position D/2 from the optical axis at the light source is transmitted. That is to say, information at the D/2 position at the light source is magnified to D on the pinhole. In order to correct this, a microlens is fitted and the individual focal points projected onto the pinhole are optically reduced by half, creating an ideal image formation.
By doing so, the resolution is made approximately equal to an ideal confocal microscope, in which the pinhole has been reduced to an infinitesimal size, producing an estimated 1.4x improvement upon regular confocal microscopes.

Reference
T. Azuma and T. Kei, "Super-resolution spinning-disk confocal microscopy using optical photon reassignment," Opt. Express 23, 15003-15011 (2015)

Configuration when upgrading from the CSU-W1

CSU-W1 (dual-disk)
Magnification Changer for SoRa

A SoRa disk can be added to your CSU-W1.
By using a magnification changer for SoRa, it's possible to perform imaging tailored to your experimental requirements through switching between regular confocal observation and super-resolution observation.

1X: Confocal observation (Regular CSU-W1)
2.8X: Super-resolution 100x objective lens
4X: Super-resolution 60x objective lens

SUPER RESOLUTION via OPTICAL Re-ASSIGNMENT