From Eye to Insight

Leica
MICROSYSTEMS

Step into the Microhub era. Meet Mica.

Distributed by

TRIOLAB

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Mica.

This changes everything.

The world's first Microhub has arrived. More than a highly automated microscope, Mica unites widefield and confocal imaging in a sample-protecting, incubating environment. With the simple push of a button, you have everything you need – all in one place – to supercharge fluorescence microscopy workflows, power-up your research and streamline your path to results.

What if every scientist could access spatial information?

Mica empowers every researcher to move from set up to beautifully visualized results and analysis efficiently, accurately, and confidently. Now you can focus on your science, not figuring out your microscope.

Powered by

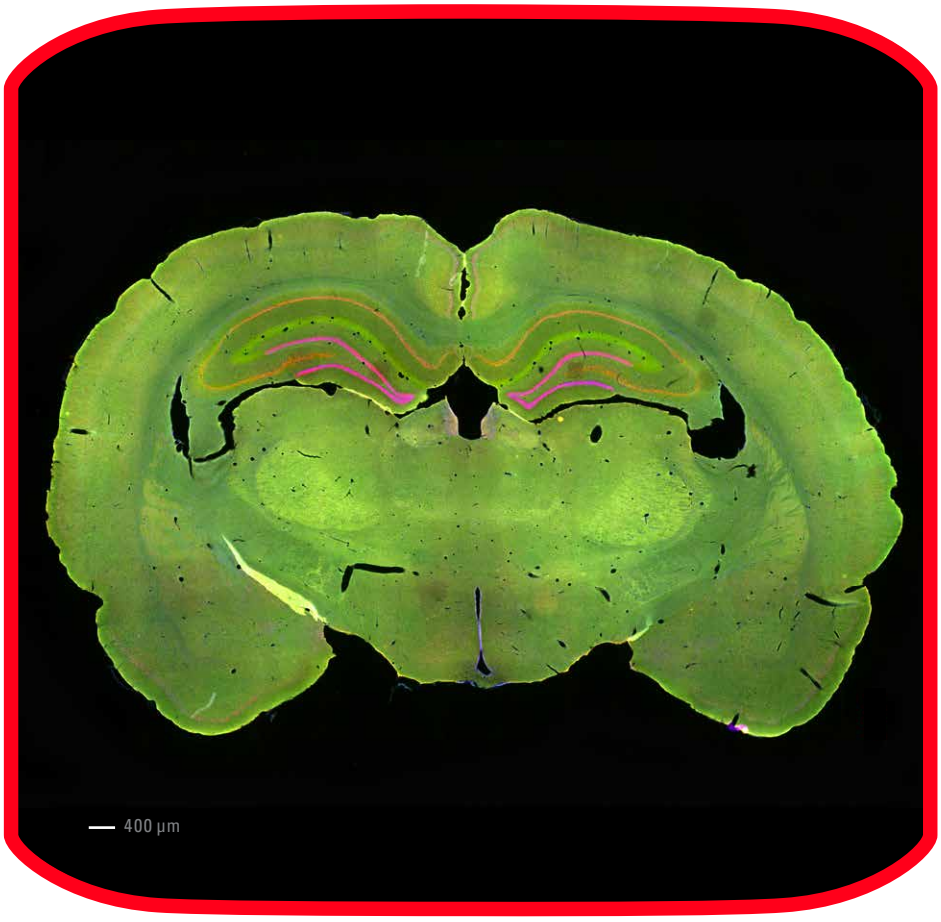
Point scanning confocal

Sample finder

OneTouch-Auto Illumination

AI-based Analysis

Eliminate over 85% of tedious setup steps that require special expertise



Tissue slice form the rat brain. Nuclei are stained with DAPI (blue), STL with FITC (green), astrocytes (GFAP) with Cy3 (yellow), and newborn neurons (NeuN) with Cy5 (red). 10x widefield tile scan, all 4 labels acquired simultaneously.

Step into the era of Access for all

Everyone can now leverage microscopy to make more discoveries. Mica provides a clear sample overview and allows to easily change observation conditions with just a few clicks.

85% fewer steps to the first image

1/3 less time to the first image

1/2 of the training time

Mica is an incubator

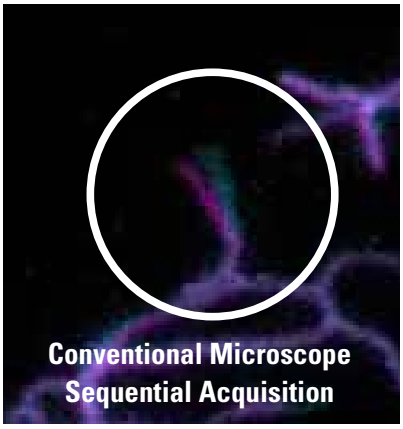
Unified imaging modalities

Intelligent Automation

Intelligent Imaging

Step into the era of
No constraints

The Microhub: everything you need to enable discoveries, unified in one easy-to-use system.
4x more data with 100% correlation. Access key contextual information with absolute spatiotemporal correlation.



U2OS cells stained with MitoTracker green (mitochondria structure, cyan) and TMRE (active mitochondria, magenta). Sequential acquisition (left side, conventional microscope) and simultaneous acquisition (right side, Mica) of the two channels over 2 minutes 100 frames using the 63x/1.20 CS2 Water MotCORR objective.

Absolute correlation thanks to FluoSync.
A fast and gentle method for multicolor fluorescence imaging.

FluoSync is the way we have adapted for Mica a published method by Cutrale et al., that simultaneously detects 4 colors without having to worry about cross-talk or having to apply complex mathematical methods to separate the fluorescent signals.

Download the Whitepaper on FluoSync

Powered by

4 labels simultaneously

4 labels 100% correlated

Patented FluoSync technology

Select the right modality in real-time. Seamlessly move from fast overview to high resolution.

Create Overview

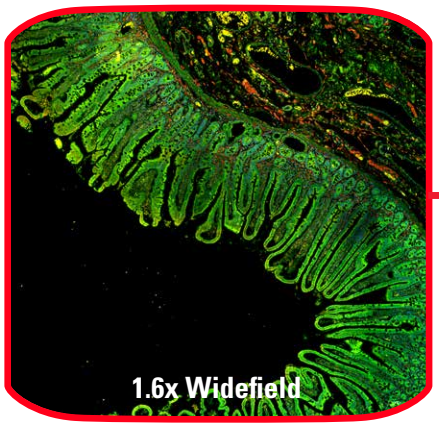
Find the sample structure on the carrier and observe the overall morphology of the colon slice. Identify a region of interest for more detailed inspection.

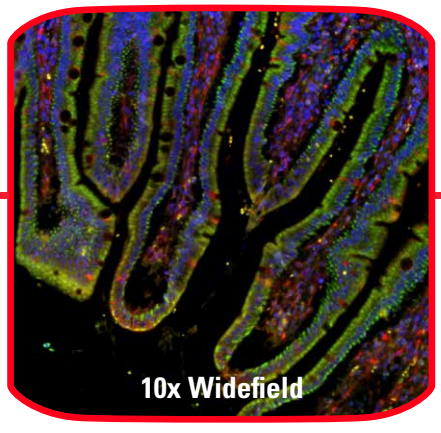
Get more details of a substructure

Switching to the next higher magnification allows to assess the integrity of the tissue and locate areas suitable for further analysis.

Select the cell of interest

Start to see the higher details and select the single cell to get subcellular information. However, some details remain hidden in the haze.





Intestine tissue section acquired with different objectives ranging from low to high magnification (1.6x, 10x, 20x, 63x), using widefield and confocal imaging.

Step into the era of
Radically simplified workflows

Bringing you faster from sample to discovery.
Reduce over 60% of process steps through system intelligence.

Reduce time and effort from sample to insight by simplifying your entire workflow.

Enable 100% reproducibility and repeatability throughout your experiment.

AI based training of mitochondrial segmentation using your scientific expertise

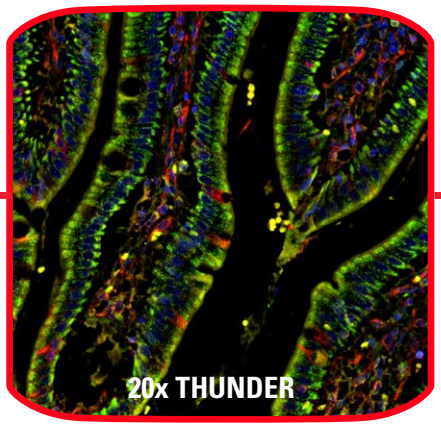
Pixel classifier

GUI operated annotations

Reusable AI models and projects parameters

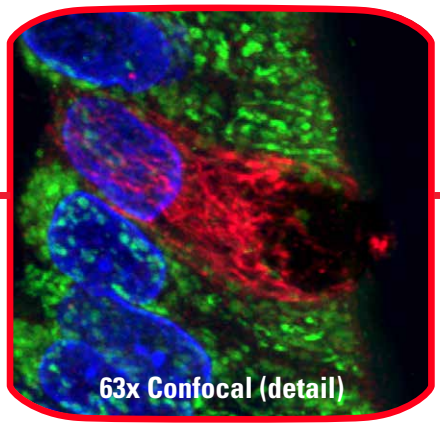
Select the cell of interest

THUNDER is the method of choice to get more contrast and see more details. This enables you to make the right selection and step further into the details of the sample.



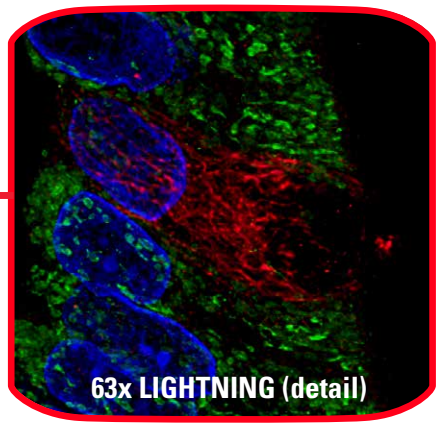
Get the subcellular information

Switch from Widefield to Confocal mode with just a simple click to get more subcellular information.



Get even more of the subcellular information

Adding LIGHTNING gives access to higher details of the subcellular structures seamlessly integrated into the whole workflow from fast overview to high resolution.

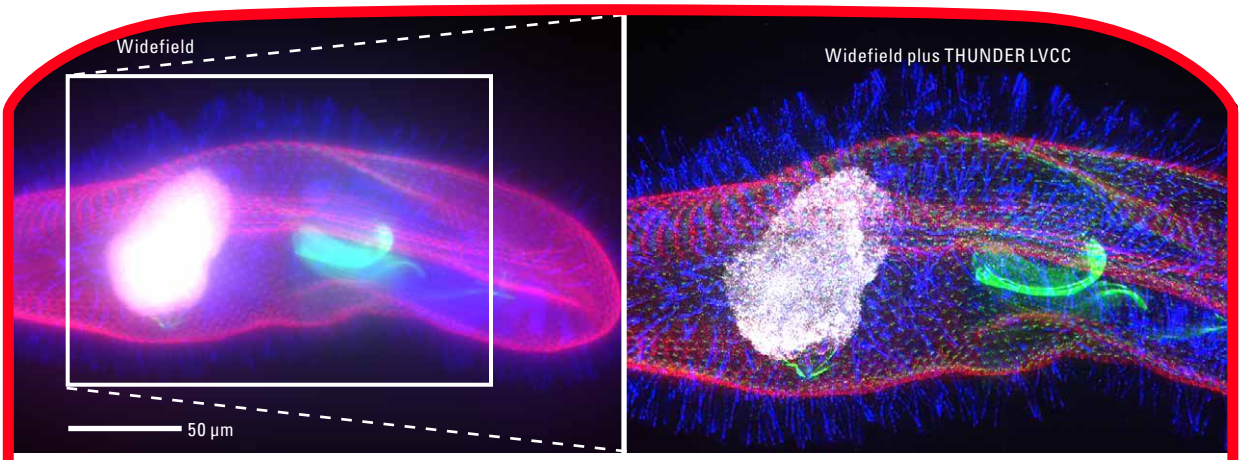


20x widefield images are processed with THUNDER and 63x confocal images with LIGHTNING. Nuclei are labeled in blue, mitochondria in green, and detyrosinated tubulin in red.

Everything you need to enable discoveries unified in one easy-to-use system

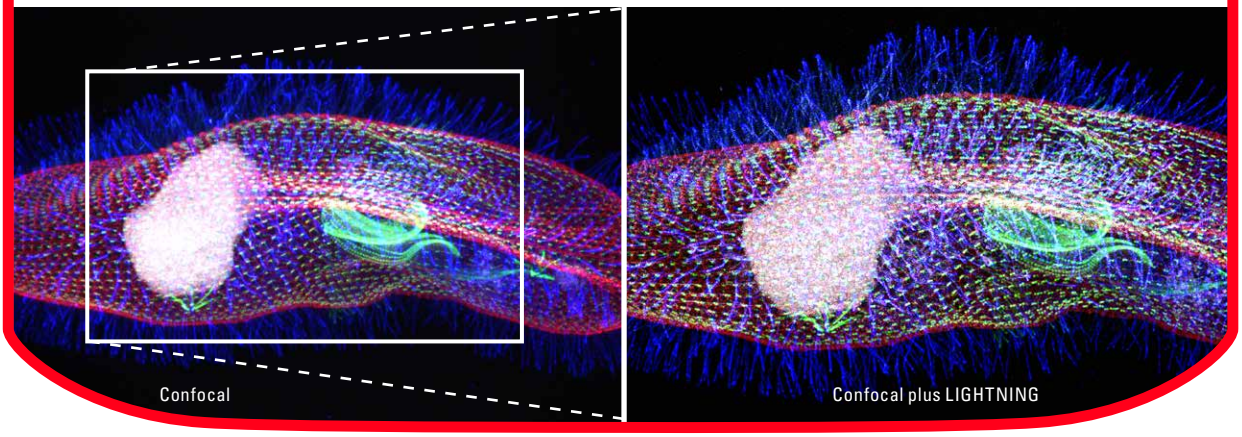
The Microhub brings widefield and confocal modalities at your fingertips: Mica's flexibility and multimodal capabilities make it the perfect choice for meeting the ever-changing needs of your experiments. You can select from multiple imaging modalities all within one system, including widefield, confocal, THUNDER imaging, LIGHTNING, Z-stacks, time-lapse and more. Mica further enhances the resolution of your confocal images by leveraging its LIGHTNING detection tool to achieve the highest possible subcellular resolution.

Mica offers ideal conditions for short and long-term live cell observation, too. The entire encapsulated inner sample space of Mica is an incubator and can be climate controlled (temperature, CO_2 and humidity regulation).



THUNDER is Leica's innovative opto-digital technique called Computational Clearing (CC). Computational Clearing detects and removes the unwanted signals from out-of-focus regions of the specimen in real time. It clearly reveals the desired signals from the in-focus region of interest within the specimen. CC distinguishes between the out-of-focus and in-focus signals via the difference in size of the features.
LIGHTNING is an adaptive process for extraction of information that reveals fine structures and details, otherwise simply not visible, fully automatically. Unlike traditional technologies, that use a global set of parameters for the full image, LIGHTNING calculates an appropriate set of parameters for each voxel to uncover details with the highest fidelity.

Image shows a protist Paramecium (Paramecium tetraurelia) stained to show the nucleus (Hoechst, white), the basal body, a protein ring found at the base of a cilium (AF488, green), the epiplasm, a thin dense layer at the base of a cilia where basal bodies are inserted (AF568, red) and the cilia (Star635P, blue). Images were acquired on Mica with HC PL APO CS2 63x/1.20 water objective using widefield (plus THUNDER ICC and LVCC) and confocal imaging (LIGHTNING grade and processing with +5 sample protection) without moving the sample. Sample courtesy: A. Aubusson-Fleury, CNRS, GIF sur Yvette, France.



Access key contextual information with absolute spatiotemporal correlation

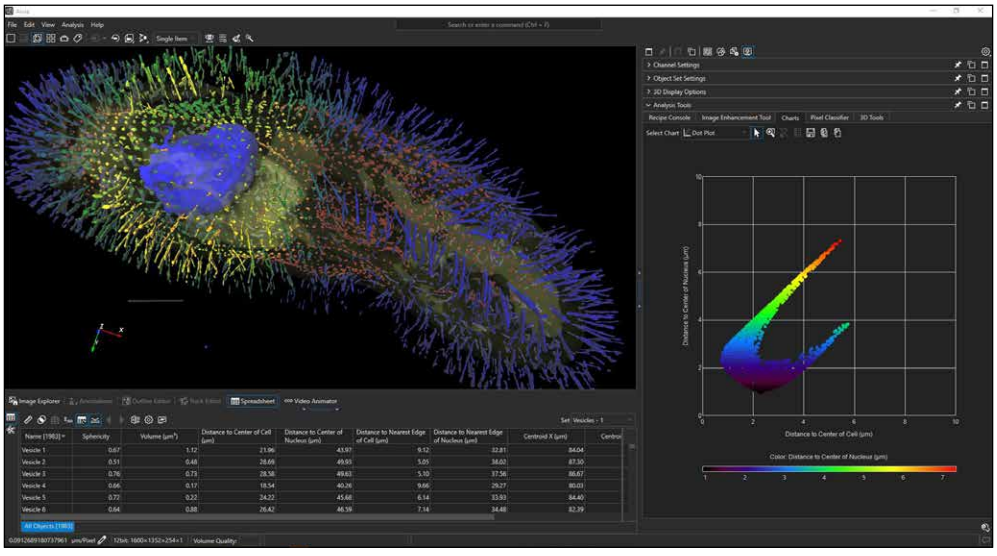
Now researchers can simultaneously visualize four colors in widefield and then freely switch to confocal to more easily correlate data and explore unexpected paths of investigation. Mica offers simultaneous four color imaging and patented FluoSync spectral unmixing technology, that means you can generate 4 x more data with 100% correlation in only one exposure, whether using widefield or confocal imaging.

A look inside: Using an array of 4 detectors combined with hybrid unmixing, Mica allows to detect up to four different labels with true dye separation and no spatiotemporal mismatch. With just one exposure and without the need to setup filters.

Consistent and unbiased analysis across projects and user with AI powered analysis

Mica comes with analysis tools like the AI based Pixel Classifier. Easily train Mica to recognize objects in images without image processing skills. Simply by drawing examples on the image the pixel classifier learns to reproduce the input and segments all objects in the images.

Looking for extended analysis option? Mica is open to be combined with the AI Image Analysis Software Aivia from Leica Microsystems. Aivia is a uniquely innovative and complete 2-to-5D image visualization, analysis and interpretation platform designed for the reliable processing and reconstruction of highly complex images in just minutes.



Analysis of cell parameters using the Aivia AI powered analysis software in the grade Elevate

SPECIFICATIONS

			Mica Widefield	Mica Widefield Live Cell	Mica WideFocal	Mica WideFocal Live Cell
TRANSMITTED LIGHT CONTRAST	Integrated modulation contrast (IMC), automatically adjusted and brightfield contrast in RGB or gray scale mode		x	x	x	x
INCIDENT FLUORESCENCE ILLUMINATION	LED	365 nm, 470 nm, 555 nm, 625 nm	x	x	x	x
FluoSync WIDEFIELD DETECTION	Simultaneous detection channels	4 with FluoSync fluorophore separation	x	x	x	x
	Detector type	5 MP CMOS	x	x	x	x
CONFOCAL ILLUMINATION	Laser diode	405 nm, 488 nm, 561 nm, 638 nm			x	x
FluoSync CONFOCAL DETECTION	Detector type	HyD FS			x	x
	Simultaneous detection channels	4 with FluoSync fluorophore separation			x	x
Environmental Control	Live Cell Package	Temp. (to 45 °C), CO_2 (0 - 10 %), humidity		x		x
IMMERSION DISPENSION	Closed loop water dispenser. Water immersion for one objective is feedback controlled and does not require any interaction			x		x
THUNDER	Methods	ICC, SVCC, LVCC	x	x	x	x
LIGHTNING	Methods	Basic, upgradeable to LIGHTNING Expert	x	x	x	x

MEET
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