Product Fact Sheet

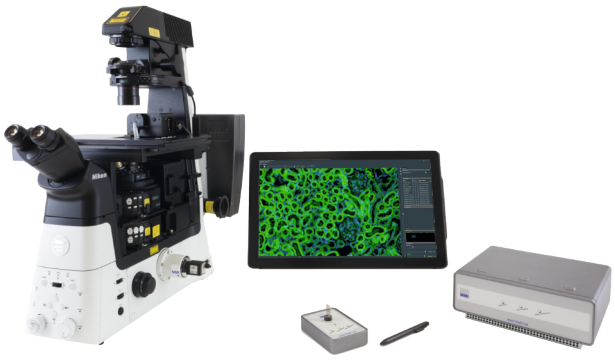
MMI CellCut

Laser Microdissection for highest sample integrity

Product name

MMI CellCut

Product picture



The MMI CellCut on the Nikon Ti2-Eclipse inverted microscope. The system is compatible with many microscope brands and models.

Manufacturer information

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Summary

Laser Microdissection serves as an essential foundation across various research domains, providing accurately defined initial material crucial for numerous subsequent experiments. For the attainment of valuable data from individual cells, precisely cut cell clusters, single cells, or even subcellular components, the MMI CellCut combines the most precise cutting performance and ensures outstanding sample integrity with the highest flexibility and ease of use.

Applications

With over 20 years of experience in laser microdissection, the team at Molecular Machines & Industries stands out from the crowd. Our dedicated group of researchers have developed the most precise laser microdissection system on the market. The gentle cutting guarantees a homogeneous cell population for meaningful downstream analysis.

Cancer research:

- Pathology
- Oncology
- Diagnostics
- Tumor heterogeneity

Forensics:

- DNA profiling
- Anthropology
- Entomology

Fundamental research:

- Neuroscience
- Cell biology
- Stem cell research
- Microbiology
- Immunology
- Virology
- Mycology
- And many more

Specifications

Features	Description
Compatible Microscopes	Inverted or upright research microscopes • Olympus IX-73/83 • Nikon Ti2 (U,E) • External z-Drive motorisations for different manual inverted microscopes
Laser system	Standard Laser: • For cutting normal biological material • Waveleanght: 355 nm • Pulse width: < 1 ns • Repitition rate: 2 kHz • Pulse energy (typical): > 1 µJ • Average power (nominal): < 5 mW Universal Laser: • For cutting all common biological materials • Waveleanght: 355 nm • Pulse width: < 1 ns • Repitition rate: 4 kHz • Pulse energy (typical): > 2 µJ • Average power (nominal): < 10 mW High Power Laser: • For cutting very hard material such as teeth, bones or forensic tapes • Waveleanght: 349 nm • Pulse width: < 1 ns • Repitition rate: 500 Hz • Pulse energy (typical): > 100 µJ • Average power (nominal): < 35 mW
Minimum Workspace	The table top for the microscope, laser, optical equipment, computer monitor and keyboard requires a minimum workspace of 1.20 m × 0.90 m

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Specifications

Features	Description
Samples	For all application-relevant samples • Cryo or paraffin-preserved tissues • Single cells • Cell compartiments • Cytospins • Chromosomes • Plant tissue • Smears • Living cells
Automated sample transfer	CapLift technology • Computer-controlled • Contamination-free sandwich technology • High repositioning accuracy • Adjustable contact pressure between cap and slide
MultiCap (optional)	Allows automatic collection of targets in up to 8 different Isolation Caps
Isolation Caps	Diffusor caps • (0.2 ml, 0.5 ml and 1,5 ml) designed to highlight cell cores and reduce the contrast of the cell wall – ideally suited for stained samples Transparent caps • (0.2 ml, 0.5 ml and 1,5 ml) make cell walls and tissue structures perfectly visible – ideally for fluorescent samples
Z-Drill function	Cutting of wet and thick tissue without the need for increased laser power. The laser is refocused through the sample and so facilitates cutting in a spiral

Features	Description
Software	• MMI CellTools software for Windows 10 / 11 • Computer-controlled laser power, focus position and cutting speed • Free-hand drawing or predefined figures: circles, squares, ellipses • Multi-segment drawing for objects larger than the field of view • Automatic cutting of marked areas and collecting of dissected samples, • Group cutting functions including group statistics • Automatic documentation with immediate access to report • Serial section function: allows the marking of target regions onto one or more unstained sections by using a stained top section as a template • Differences in shape, angle and position are automatically compensated by the software giving highly accurate results
Motion control (Motorised stages)	Standard stage • Scanning area: 120 × 100 mm^2 • Repositioning accuracy: < 1 µm • Step resolution: 0.156 µm • Speed: 50 mm/sec Long travel scanning stage • Scanning area: 280 × 82 mm^2 • Repositioning accuracy: < 1 µm • Step resolution: 0.075 µm • Speed: 25 mm/sec
Predefined Target Positioning	Isolation of multiple samples on a single IsolationCap without sample overlay

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Specifications

Features	Description
Fluorescence light sources (optional)	Lumencor Spectra III • Sources: 8 solid-state sources including LEDs, lasers and proprietary luminescent light pipes • Wavelengths: 380 - 750 nm • Bandpass Filters: Integrally installed bandpass filters for spectral output refinement Additional fluorescence sources available from respective microscope manufacturer
Microscope incubator / Stage top incubator (optional)	• Temperature control • Hepa filter • CO_2 / humidity control • Oxygen control
CellCut system upgrades	• Single cell isolation in suspensions (MMI CellEctor) • Digital slide scanner module (MMI CellScan) • Automated detection of biological samples (MMI CellDetector) • Optical tweezers (MMI CellManipulator)
"Live cell" handling	Gentle isolation of living cells
Camera	Various MMI cameras • Specifications can be found in the CellCut Manual Hamamatsu • High performance scientific cameras with high resolution and low readout noise
PC and monitor	Specifications will be continuously updated according to market development
PenScreen system operation (optional)	Sensitive 24" touch screen monitor for user-friendly system operation

Ordering information

Article No.	Item
[10200]	MMI CellCut Standard
[102001]	MMI CellCut Universal
[102002]	MMI CellCut High Power

Key features

- Highest sample integrity by airtight and sterile cutting and collection
- Most precise cutting performance on the market. This ensures the thinnest and cleanest cut.
- Visual inspection and documentation of cut samples
- Living cell dissection without removing culture media to ensure the highest cell integrity for re-cultivation, cloning and single cell analysis
- CellCut is the most flexible laser capture microdissection system

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