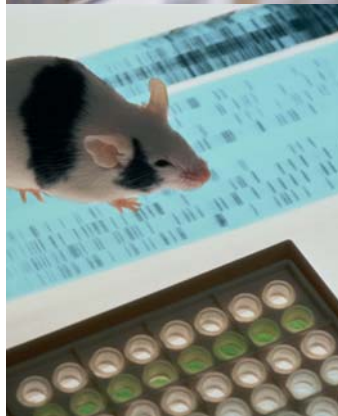




Leica LMD6000

Experience a New Level of Speed!
The Fastest Laser Microdissection Ever!

Intelligence
Speed
Precision
Integration



Experience a New Level of Speed!

Laser microdissection has become an indispensable technology for sample preparation. In all areas of research, it is the basic prerequisite to obtain well-defined starting material for downstream experiments. Therefore, meaningful analyses in the fields of genomics, microarrays, biochips, and proteomics can only be attained with the help of such high-precision technology. Sample preparation is done directly from the tissue section using a UV laser. The development of both the method and the instruments has made enormous progress during the past five years. Now as before, the driving force in this market is the Leica microdissection system.

High-speed microdissection –

The fastest way from tissue section to reaction buffer

Time is usually the most critical factor in specimen preparation. Extremely short handling times combined with maximum collection rates result in an unsurpassed speed of cell selection. The isolated material then falls directly into the lysis buffer and thus is protected from degradation.

Intelligent sample preparation – Just a mouse click away

Thanks to the automated cell recognition and laser cutting, sample isolation requires just a few mouse clicks. You can store all the experiment's parameters and reuse them again and again. This makes microdissection fun – even for thousands of cells.

High precision systems – When every μm counts

The new laser ensures outstanding cutting quality at all objective magnifications. The scanning stage enables the repositioning of the selected cells with micrometer accuracy. This, along with our patented optical laser control system, renders the collection of even the smallest specimens possible – with maximum precision and at high speeds.

Integrated solution for everybody's needs

Laser microdissection is a technology that can be used in many fields of life science research. Due to its modular concept, the system is very flexible: we offer you a variety of standard configurations. Thus you can profit from the versatility of the system and choose a solution that is perfectly tailored to your requirements.



The Optimum Leica LMD6000 Configuration For Your Application

In recent years, laser microdissection has become established as a new method for cell selection in life science research. To meet the requirements of many different application areas, we have put together four standard configurations. This way, you can quickly and easily find the best microdissection system for your application.

Typically Leica LMD6000

The heart of the new LMD system is the new fully automated upright research microscope Leica DM6000 B* with fully motorized transmitted light and fluorescence axes. It is equipped with motor focus and motorized revolving nosepiece and supports the customers' processes with automated functionalities like illumination manager, contrast manager, FIM, IFW and a lot more.

All automated components of the Leica DM6000 can be quickly and intuitively controlled via the new Leica SmartTouch which is integrated into the stand.

Our new generation diode laser provides a much higher beam quality and longer lifetime. The shorter pulse duration in combination with the optimal optical transmission at 355 nm enables fast and highly precise cutting. In addition it provides more energy especially for harder materials or thicker tissues.

The live images for the system are provided by the Hitachi analog 3 CCD camera or a Leica digital DFC camera. The new generation of the Hitachi camera offers an automated digital color shading correction, which minimizes virtual color gradients within the images. In addition, the customer benefits from the perfect color accuracy and its extremely fast live images.

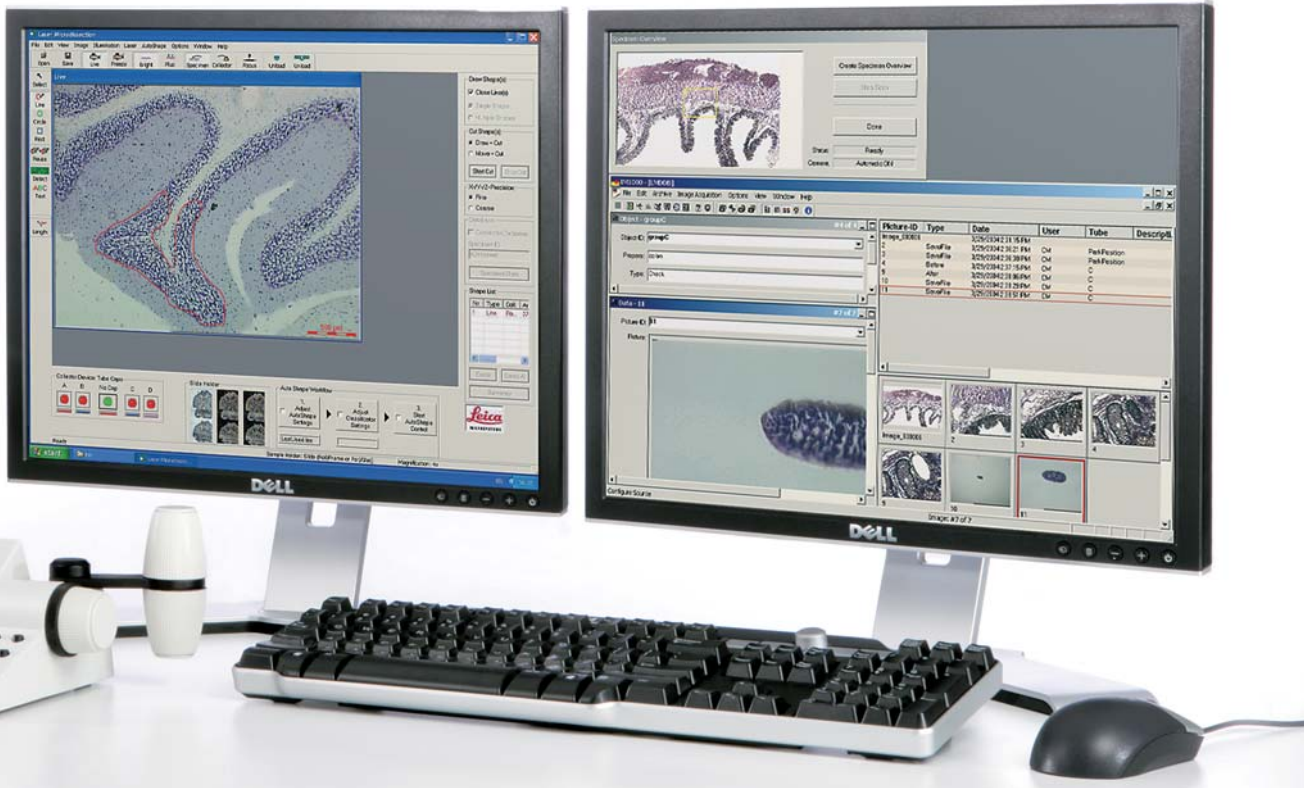


* Please refer to the Leica DM6000 B brochure for detailed information.

Standard Configurations

		LMD6000 Patho	LMD6000 Live Cell	LMD6000 Proteome	LMD6000 Multi-User
Stand	Focus				
	Objective turret				
Transmitted light	Condenser				
	Transmitted-light methods	BF			
		PH			
DIC					
Fluorescence	Fluorescence axis				
Stage					
Software package includes:	Control software for the microscope				
	Full laser control				
	Autofocus				
	Automated collection devices and positioning of the PCR tubes				
	Fully automated inspection modus				
	Saving the user profiles				
	Overview BF images				
	Multi-cutting over the entire slide				
	Database interface (database Leica IM1000 is an option)				
	Dot Dissection Scan				
	Three-slide holder control				
	Serial section cutting				
	Overview fluorescent images				
Cutting over all slides at all magnifications					
Optional software	Database Leica IM1000				
	Live Cell Cutting module (LCC)				
	Automated Vision Control module (AVC) Standard				
	Automated Vision Control module (AVC) Professional				
Camera support	Analogue				
	Digital				

- motorized
- scanning stage
- manual
- available



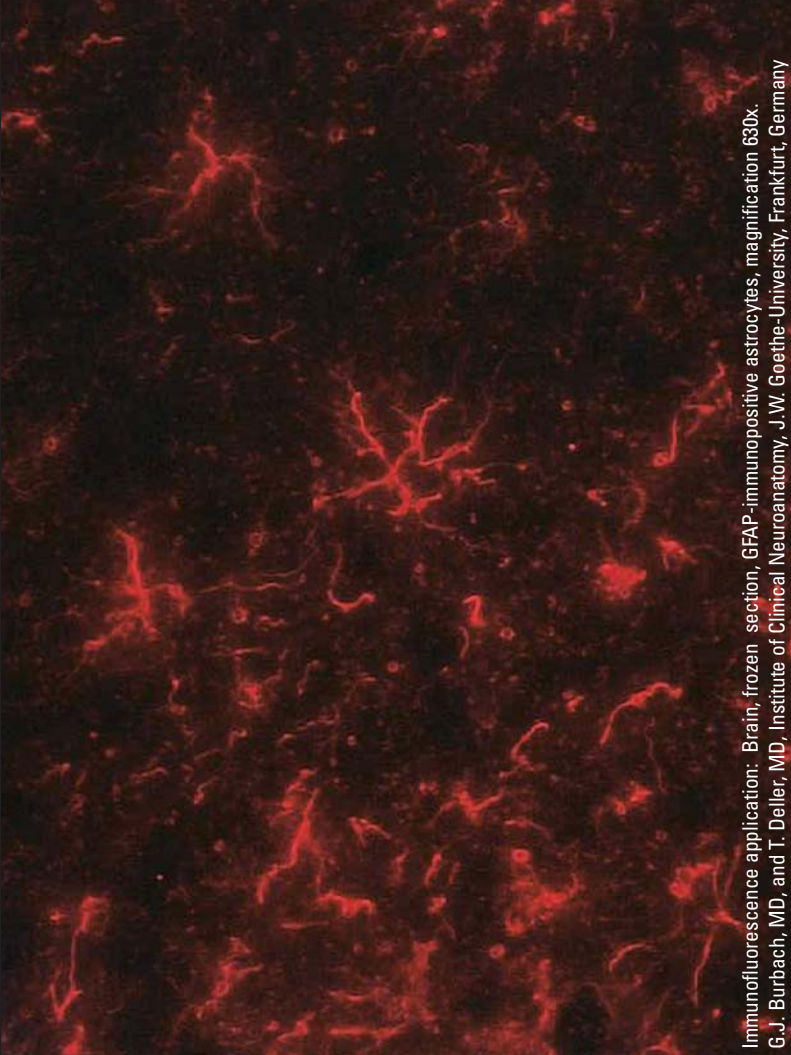
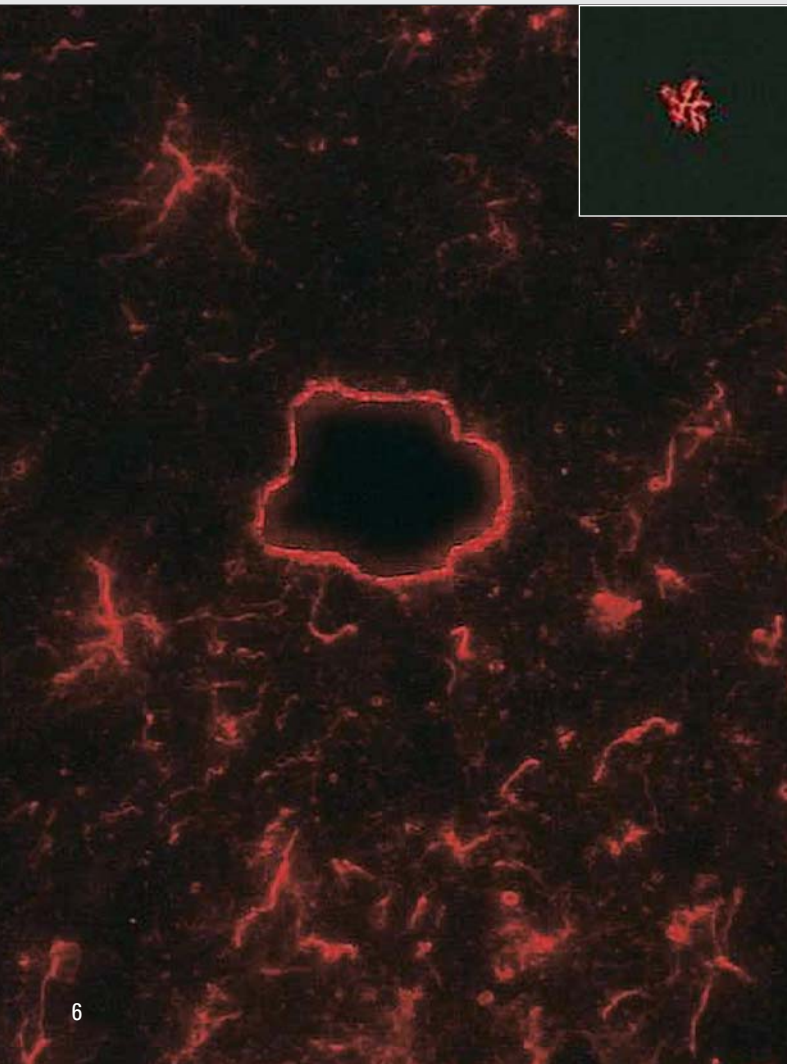
Leica Design by Christophe Apothéoz

Leica LMD6000 Live Cell

Your ideal system for live-cell cutting, laser ablation and fluorescence imaging

- Live cell research
- Neurobiology

Living organisms can be perfectly inspected with the Leica LMD6000 Live Cell. The intelligent illumination and contrast managers guarantee brilliant images in record time. In general, the possibility of inspecting specimens using fluorescence is becoming increasingly important in laser microdissection. Simultaneously viewing and sectioning specimens, whether these are immunolabel tissue sections or live cells, is a standard feature here. In addition, the fully automated fluorescence axis minimizes bleaching effects, accelerates your processes and offers the opportunity of exactly reproducible experiment conditions.



Immunofluorescence application: Brain, frozen section, GFAP-immunopositive astrocytes, magnification 630x. C.J. Burbach, MD, and T. Deller, MD, Institute of Clinical Neuroanatomy, J.W. Goethe-University, Frankfurt, Germany

- Laser ablation

The adjustment of the laser focus in the Z-plane plays an important role in experiments such as laser ablation. The distance of the laser beam to the specimen can be adjusted in order to guarantee the damage of defined segments of the cell. Laser can be also used for local introduction of DNA-strandbreaks.

Sample Preparation – Just a Mouse Click Away

Let's start with the basis

The foundation of the new laser microdissection system is the high-end Leica DM6000 B digital research microscope. The new microscope system automates complex workflows in the simplest possible way: one touch of a button is enough to switch to an entirely different contrast method – truly a state-of-the-art research system with high potential. Operating the entire system is intuitive and relieves the user of the need to make routine adjustments. The automated, visual control of the collected dissections is just as simple as the automated selection of cells using the fully automated and fully integrated cell recognition system. The system works quickly and reliably. This results also in drastically increased productivity.

Control the microscope from any position

The new Leica STP6000 SmartTouch Panel can be used to completely and conveniently control the microscope from any position at the laboratory workstation. All automated functions can be set intuitively from the external control panel. The SmartTouch Panel also offers a focus wheel for fine and coarse adjustment, controls for x,y stage adjustments, and eleven programmable function buttons. This provides easy, convenient control of all functions with just one module.

Brilliant fluorescence and sophisticated DIC contrasting

When developing our new laser microdissection system, we placed great emphasis on image quality. Microdissection requires uncompromising image quality. The new Leica LMD6000 is convincing proof of this. See for yourself the spectacular resolution of the automated fluorescence, the differential interference contrast (DIC) and the phase contrast. The quality of the fluorescence is dramatically enhanced by the new light source Leica EL6000. The newly developed BGR filter cube for blue-green-red light emission enables simultaneous cutting under fluorescence inspection mode. In addition, Leica's fast autofocus is just one of the many advantages that make working with the Leica microdissection system easy and efficient. Details in live cells or tissues are impressively rendered by the Leica LMD6000.



“Modern laboratories require efficient time management. A forward-thinking system is thus indispensable for innovative research.”

Dr. Christian May

Leica Microsystems CMS GmbH, Wetzlar, Germany

Dr. Christian May set a high value on the following benefits:

- Fast and reliable inspection of all types of cells through fully automated contrasting methods
- Improved quality of images by the automated fluorescence axis
- Sectioning of thicker or harder samples as well as reliable ablation with the new laser module

Leica LMD6000 Multi-User

The system for high speed, precision and flexibility

- Multi-User facilities

The Leica LMD6000 Multi-User is the most extended configuration. Nothing will be impossible in respect to multiple applications. In addition, all system parameters can be stored for later retrieval. Reprogramming of experiment conditions is therefore obsolete after changing to a different application or specimen. This is an important advantage when many users with different demands work on the same system.

“Three slide holder” allows simultaneous work on up to three slides, enabling work in serial section cutting mode. In this way, specimen selection can be done on the stained tissue and the pattern copied to another unstained slide.



- Gene expression profiling
- Neurobiology

The powerful diode laser is guided along the sectioning line in the specimen with maximum accuracy by newly developed optics. This allows large cell areas or hundreds of individual cells to be gained from the tissue section in a minimum of time and directly into the reaction buffer. You can work with up to three slides in parallel and collect the specimen into four microcentrifuge tubes or an 8-well strip. This increases the sample throughput and shortens your working time at the system.

The handling of the collection devices is convenient due to the automatically movable tray.

The photo shows the device for four microcentrifuge tubes. However, the tray easily takes customized devices as well as the regular collection devices.

The Fastest Way From Tissue Section to Reaction

Experience a new level of speed

Sample preparation is a critical step of every experiment. That's why it's so important to quickly and reliably gain the starting material for downstream analysis. To obtain nucleic acids or proteins as intact as possible, the time between tissue preparation and the cell lysis should be kept to a minimum. In this respect, the Leica microdissection system sets new standards. Extremely short handling times, combined with maximum collection rates thanks to a powerful diode laser, result in unsurpassed speed and precision in the isolation of the cells of interest.

Fast detection with intuitive software

The partner of the efficient laser, in respect of speed, is the intuitive software. Once the specimen to be microdissected is identified on the tissue section, you can define the size, shape and number of cells or areas you need for the downstream analysis. The software module AVC* (auto vision control) will automatically recognize the specimens, followed by the automatic laser cutting to the previously defined caps of microcentrifuge tubes. This will relieve the user of the tedious task of marking the cells by hand and, in conjunction with quick sectioning techniques, results in unsurpassed collection rates.

* Available as an option (refer to page 5).



“Single-cell gene expression analysis techniques including the Leica Laser Microdissection system are crucial for our research.”

Prof. Dr. Birgit Liss

Department of Molecular Neurobiology
Institute of Normal and Pathological Physiology
Philipps University Marburg, Germany

Prof. Dr. Liss profits in her work from the new Leica LMD6000 system:

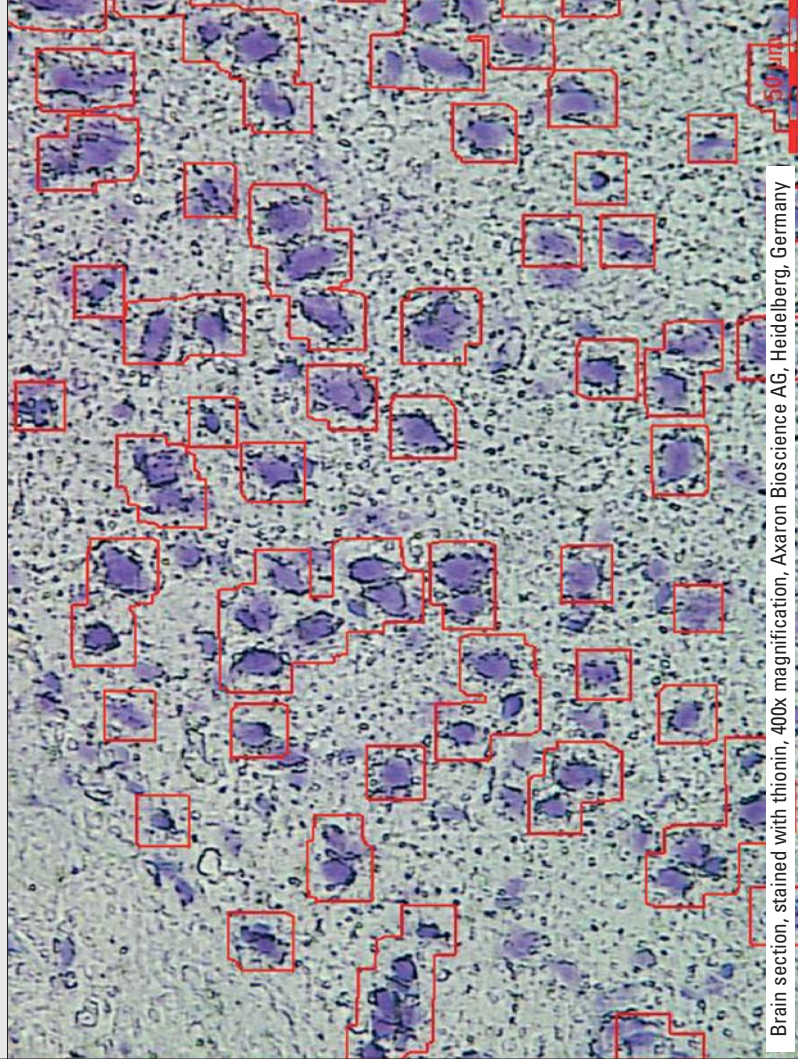
- Fast, efficient and contamination-free cutting of cells saves time of entire experiments
- “Three slide holder” increases sample throughput
- “Serial section cutting” feature will ensure high quality RNA from untreated tissue sections

Leica LMD6000 Proteome

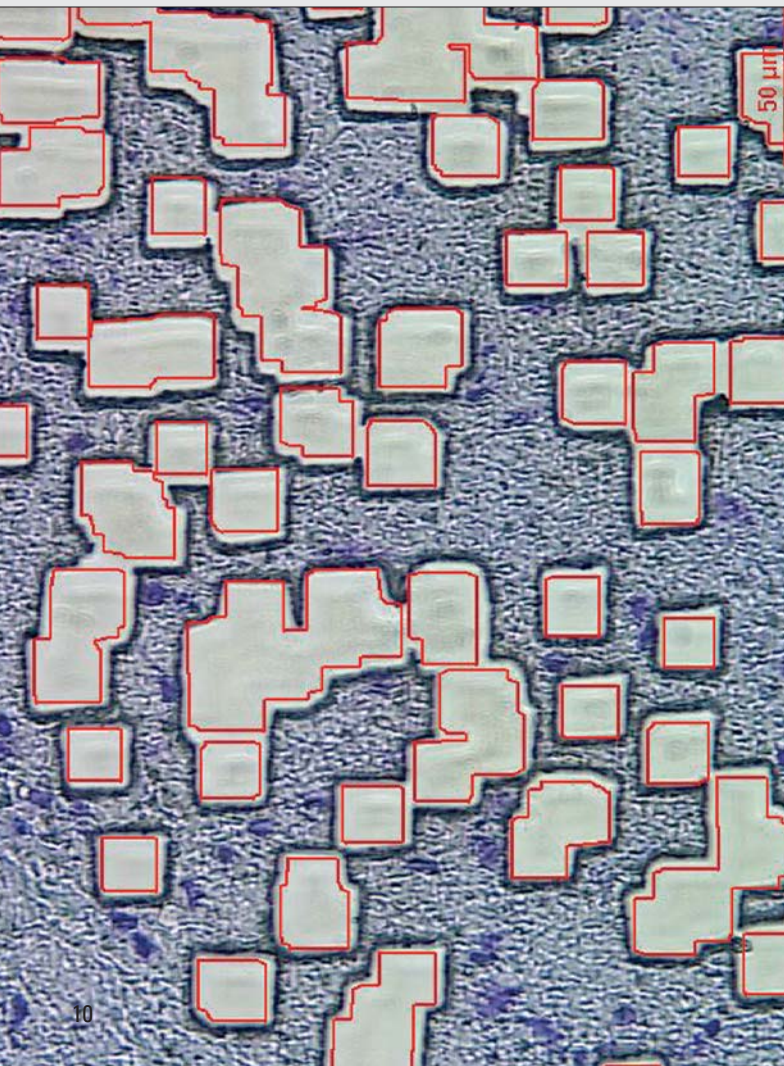
Your system for high precision cutting and high collection rates

- Proteomics
- Gene expression profiling

Automated systems with a straightforward design are an especially invaluable aid in the field of high-end research. Time-consuming routine tasks are entirely taken over by the system. The high-precision stage and laser control allows accurate automatic cell recognition. Subsequent collection of hundreds of individual cells in an extremely short time are just a few mouse clicks away. Specimens directly drop by gravity into a microcentrifuge cap for direct downstream application.



Brain section, stained with thionin, 400x magnification, Axaron Bioscience AG, Heidelberg, Germany



- Cancer Research

Disease research highly depends on the amount and quality of material to be investigated. If large areas of tissue need to be collected, e.g. for investigation of gene expression pattern, microdissection with the 6.3x SmartCut objective is the perfect solution.

Additionally, the image of the whole tissue section can be archived by generating an overview image with the 1.25x objective – a potentially important point when working with pathological tissue to get an image backup on investigated tissue.

When Every μm Counts

SmartCut objectives – Experience a new level of precision

With the new optics and precision laser control, you can dissect even the tiniest of specimens with maximum precision and high speed. This is possible because the laser guidance system works optically and is independent of the stage movement. The Leica SmartCut objectives significantly increase efficiency of laser microdissection. The high UV transmission together with the outstanding imaging performance of the UV laser yield the best possible results. The SmartCut series includes objectives in a range from 6.3x to 150x for all conceivable applications, even including the selection of individual metaphase chromosomes.

100% repositioning – wherever you want

Accurate and reliable repositioning of the cells to be collected is the key to higher throughput in such application areas as proteomics or biochip analysis. With a new scanning stage design, we attain an accuracy of at least two μm without the loss of speed associated with common precision stages. Even more, the repositioning is applicable together with the AVC professional software module*. The pattern of the automatically selected cells can be transferred to another slide in the holder. In this way, you can cut out the specimens from the adjacent slide without running additional cell recognition software.

* Available as an option for Leica LMD6000 Multi-User and LMD6000 Proteome (refer to page 5).



“Precise specimen preparation is the basis for reliable research findings. Leica Microdissection is the key to your success.”

Dr. Christoph Horlemann

Product Manager “Laser Microdissection”
Leica Microsystems CMS GmbH, Wetzlar, Germany

Dr. Christoph Horlemann knows the limitations researchers meet when working on proteomics and attaches with the Leica LMD6000 importance to:

- Leica AVC software module automates the procedure of specimen definition and recognition
- Leica SmartCut objectives 40x and 63x are optimal for microdissection of individual cells
- “Serial section cutting” feature enables isolation from the intact, unstained tissue

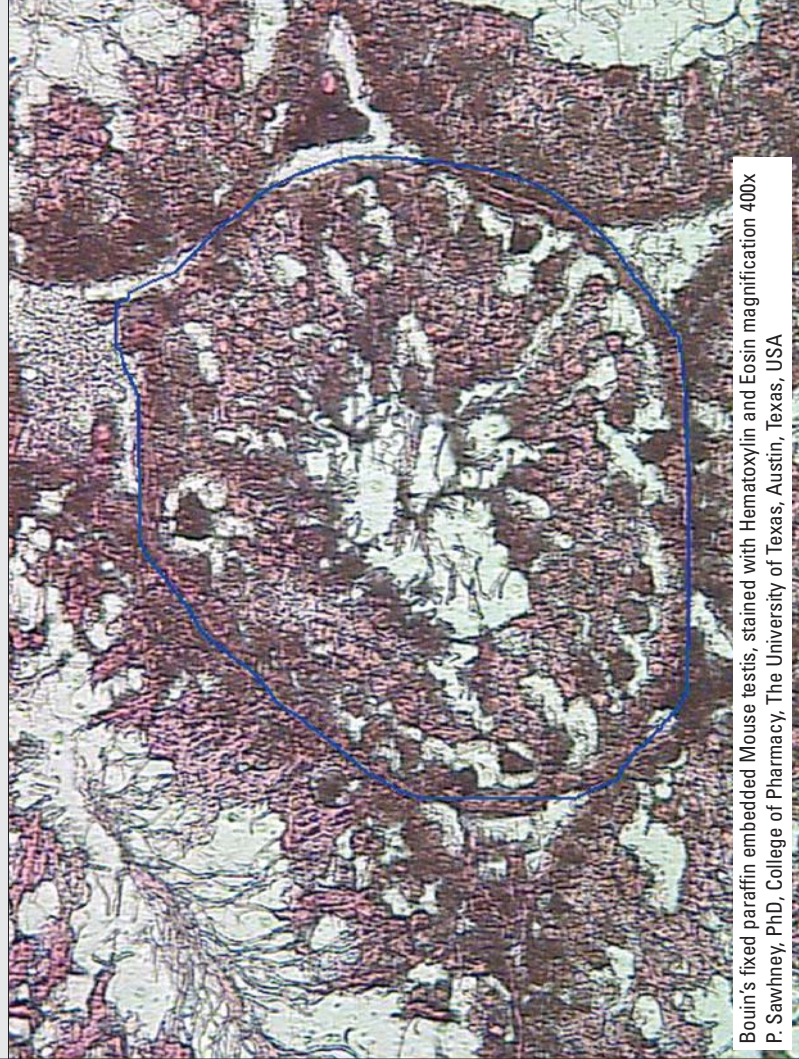


Leica LMD6000 Patho

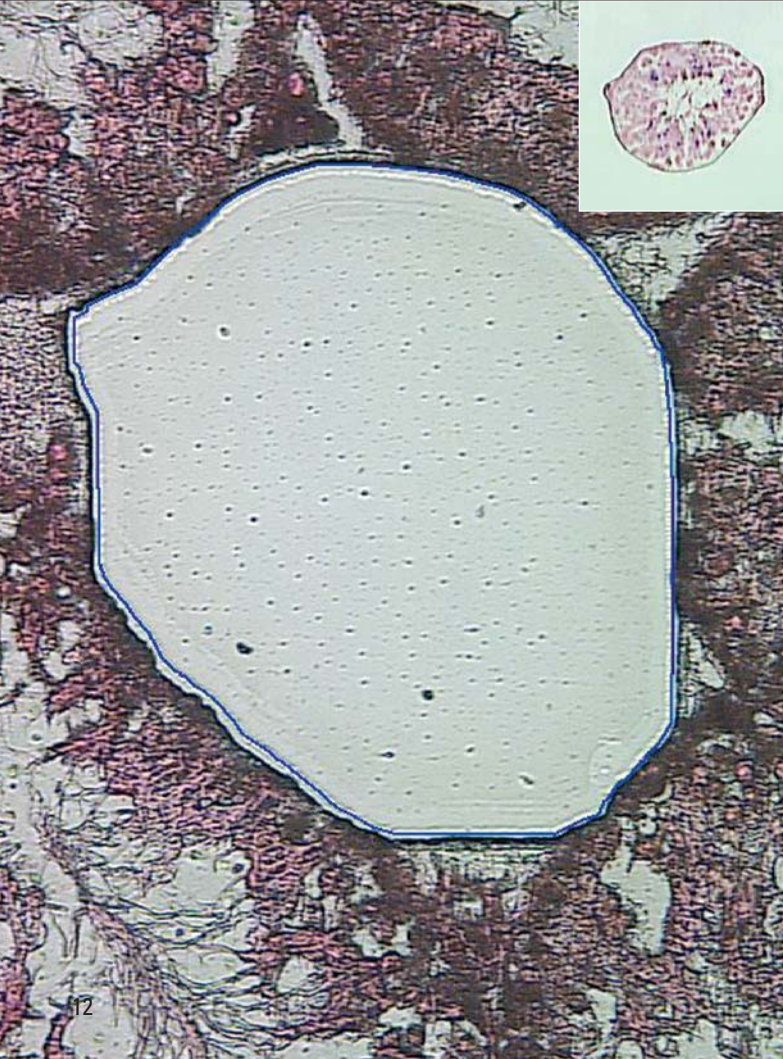
Your entry-level system for laser microdissection in routine laboratory work

- Pathology
- Forensic
- Plant Research

This configuration represents the standard system for microdissection including all functions of the Leica LMD6000. The standard brightfield contrasting method offers the optimal solution for investigation on specimens stained with the classical stains or by immunohistochemistry. Especially researchers who do not require high throughput or large amounts of specimens will be satisfied with the system, which makes the classical – non-automated – microdissection much easier. The integration of the powerful laser into a laser microdissection system with state-of-the-art optics means that even thicker or harder tissues can be sectioned easily and with precision.



Bouin's fixed paraffin embedded Mouse testis, stained with Hematoxylin and Eosin magnification 400x
P. Sawhney, PhD, College of Pharmacy, The University of Texas, Austin, Texas, USA



The versatility of this configuration is unbeatable. The variety of objectives, holders and collection devices always gives you the optimal system solution for your application. Additionally, a powerful database* is integrated, allowing you to easily follow your experiment by archiving the images of the tissue sections before and after microdissection. If necessary, the sample throughput can be increased by multi-cutting over the entire slide.

*Available as an option (refer to page 5).

Integrated Solution For Everybody's Needs

A system solution can only be as good as the sum of its components

All components of our laser microdissection system interact efficiently with each other. This requires a logical integration of the complete system functionality. Due to the modular concept of the Leica microscopes, our Leica LMD6000 offers high versatility. Next to the essential basis of our digital high-end research microscope coupled with the laser, all other options are available and can be used in any combination. In this way, the configuration you choose suits your needs.

Flexible technology for the highest levels of research

Choose between various components to compile a system ideally tailored to your applications: we offer either a motorized or high-precision scanning stage. SmartCut objectives with the required magnifications and an additional 1.25x objective to generate overview images are standard accessories. In addition to the manual condenser for brightfield, we offer a fully automated variant – enabling contrasting inspection modes. The new external light source Leica EL6000 is optimal for brilliant fluorescence. To complete the fully-integrated solution, you can select between a basic and an advanced software package. In addition, optional software modules like the live cell cutting LCC-module, the auto vision control AVC-module or the database Leica IM1000 are available.



Compactness meets Elegance: The fully-integrated solution is tailored to multiple applications. The intelligent Leica Microdissection system expands your opportunities: full potential for various research areas, concentrated in our all-in-one system solution.

Even the basic Leica LMD6000 system fulfills all the requirements for efficient laser microdissection:

- The system is equipped with all necessary features for routine LMD enabling tissue inspection and manual selection of regions of interest for cutting such as tumor cells or spermatozoa
- Powerful diode laser allows cutting of all standard tissue sections as well as cutting of harder tissues (e.g. plants) or thicker tissues
- Non-contact LMD is a prerequisite for contamination-free collection of material for subsequent molecular analyses

Technical Data

		Leica LMD6000 Patho	Leica LMD6000 Live Cell	Leica LMD6000 Proteome
Dissection	Technique	Transport by gravity, without contact	Transport by gravity, without contact	Transport by gravity, without contact
	Laser	Solid state, wavelength 355 nm	Solid state, wavelength 355 nm	Solid state, wavelength 355 nm
	Cutting	Moving laser by optics	Moving laser by optics	Moving laser by optics
Stand	Power supply	In CTR6000 electronics box	In CTR6000 electronics box	In CTR6500 electronics box
Operation	Focus	motorized	motorized	motorized
	Objective turret	motorized including dry and immersion mode 7x M25 thread	motorized including dry and immersion mode 7x M25 thread	motorized including dry and immersion mode 7x M25 thread
Stage	Typ	Motorized stage	Motorized stage	Scanning stage
	Holder	1 normal slide (25 x 76 mm), optional big slide (50 x 76 mm), optional petri dish (50 mm)	1 normal slides (25 x 76 mm), optional big slide (50 x 76 mm), optional petri dish (50 mm)	3 normal slide (25 x 76 mm), optional big slide (50 x 76 mm), optional petri dish (50 mm)
	Collector	0.2 standard PCR-tube, 0.5 standard PCR-tube, petri dish (50 mm), 1x 8-well stripes (building up a 96 well plate)	0.2 standard PCR-tube, 0.5 standard PCR-tube, petri dish (50 mm), 1x 8-well stripes (building up a 96 well plate)	0.2 standard PCR-tube, 0.5 standard PCR-tube, petri dish (50 mm), 2x 8-well stripes (building up a 96 well plate)
	Control elements	6 freely programmable function buttons SmartMove – Control elements for x, y, z movement – 4 freely programmable function buttons Leica STP6000 – Control elements for x, y, z movement – Touch panel with information and control panels – 11 freely programmable function buttons	6 freely programmable function buttons SmartMove – Control elements for x, y, z movement – 4 freely programmable function buttons Leica STP6000 – Control elements for x, y, z movement – Touch panel with information and control panels – 11 freely programmable function buttons	6 freely programmable function buttons SmartMove – Control elements for x, y, z movement – 4 freely programmable function buttons Leica STP6000 – Control elements for x, y, z movement – Touch panel with information and control panels – 11 freely programmable function buttons
Transmitted-light axis	Illumination	12 V 100 W halogen lamp	12 V 100 W halogen lamp	12 V 100 W halogen lamp
	Automation	– Automatic illumination manager (brightness adjustment) – Automatic contrast manager (field diaphragm adjustment) – Constant Color Intensity Control (CCIC)	– Automatic illumination manager (brightness adjustment) – Automatic contrast manager (field and aperture diaphragm adjustment) – Constant Color Intensity Control (CCIC)	– Automatic illumination manager (brightness adjustment) – Automatic contrast manager (field diaphragm adjustment) – Constant Color Intensity Control (CCIC)
	Contrast techniques	BF	BF, PH, DIC, POL, DF	BF
Condensers	Automation	BF condenser	Motorized condenser turret 7-position Motorized polarizer	BF condenser
Fluorescence axis	Mot. filter turret	–	5-position	–
	Illumination	–	Leica EL6000	–
	Automation	–	– Automatic illumination manager (FIM) (brightness adjustment) – Circular and rectangular field diaphragms for eyepiece or camera viewing	–
	Filter system	–	LMD BGR filter cube for simultaneous viewing and cutting	–
Camera	Digital color	DFC290, DFC300 FX, DFC420 (C), DFC490	DFC290, DFC300 FX, DFC420 (C), DFC490	DFC290, DFC300 FX, DFC420 (C), DFC490
	Digital monochrome	DFC340 FX, DFC360 FX	DFC340 FX, DFC360 FX	DFC340 FX, DFC360 FX
	Analogue color	Hitachi HV-D20P	Hitachi HV-D20P	Hitachi HV-D20P
Objectives		specially for laser microdissection constructed objectives with highest UV- transmission (from 5x to 150x), 150x DRY objective for finest cuttings	specially for laser microdissection constructed objectives with highest UV- transmission (from 5x to 150x), 150x DRY objective for finest cuttings	specially for laser microdissection constructed objectives with highest UV- transmission (from 5x to 150x), 150x DRY objective for finest cuttings

Leica LMD6000 Multi-User

Transport by gravity, without contact

Solid state, wavelength 355 nm

Moving laser by optics

In CTR6500 electronics box

motorized

motorized
including dry and immersion mode
7x M25 thread

Scanning stage

3 normal slides (25 x 76 mm),
optional big slide (50 x 76 mm),
optional petri dish (50 mm)

0.2 standard PCR-tube,
0.5 standard PCR-tube,
petri dish (50 mm),
2x 8-well stripes
(building up a 96 well plate)

6 freely programmable function buttons

SmartMove

– Control elements for x, y, z movement

– 4 freely programmable function buttons

Leica STP6000

– Control elements for x, y, z movement

– Touch panel with information and

control panels

– 11 freely programmable function buttons

12 V 100 W halogen lamp

– Automatic illumination manager
(brightness adjustment)

– Automatic contrast manager
(field and aperture diaphragm adjustment)

– Constant Color Intensity Control (CCIC)

BF, PH, DIC, POL, DF

Motorized condenser 7-position

Motorized polarizer

5-position

Leica EL6000

– Automatic illumination manager (FIM)
(brightness adjustment)

– Circular and rectangular field diaphragms
for eyepiece or camera viewing

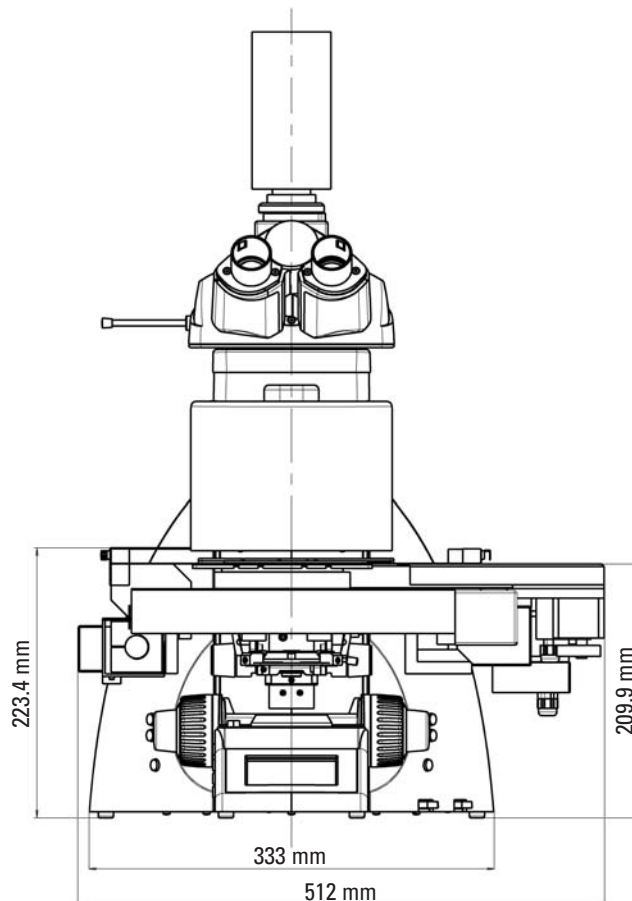
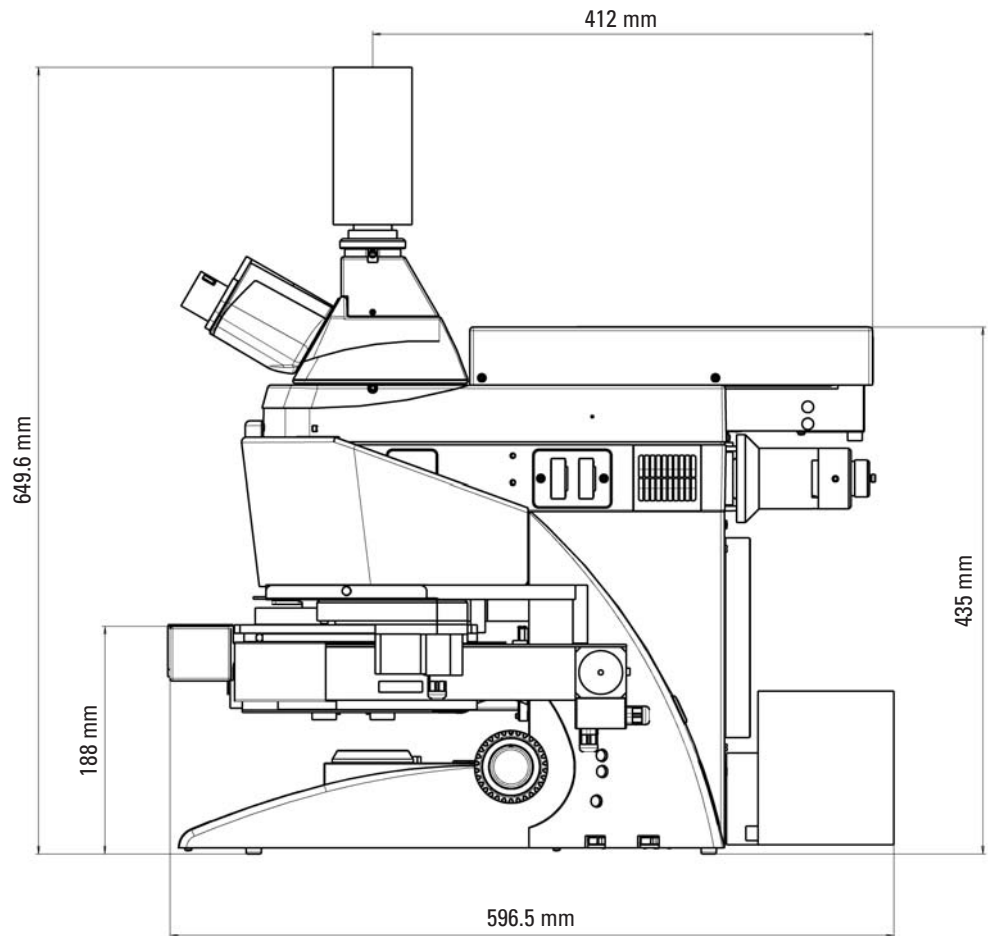
LMD BGR filter cube for
simultaneous viewing and cutting

DFC290, DFC300 FX, DFC420 (C), DFC490

DFC340 FX, DFC360 FX

Hitachi HV-D20P

specifically for laser microdissection
constructed objectives with highest UV-
transmission (from 5x to 150x),
150x DRY objective for finest cuttings



Leica Microsystems – the brand for outstanding products

Leica Microsystems operates internationally in four divisions, where we rank with the market leaders.

● Life Science Research Division

Leica Microsystems' Life Science Research Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems' customers at the leading edge of science.

● Industry Division

The Leica Microsystems Industry Division's focus is to support customers' pursuit of the highest quality end result by providing the best and most innovative imaging systems for their needs to see, measure and analyze the microstructures in routine and research industrial applications, in materials science and quality control, in forensic science investigations, and educational applications.

● Biosystems Division

The Biosystems Division of Leica Microsystems brings histopathology labs and researchers the highest-quality, most comprehensive product range. From patient to pathologist, the range includes the ideal product for each histology step and high-productivity workflow solutions for the entire lab. With complete histology systems featuring innovative automation and Novocastra™ reagents, the Biosystems Division creates better patient care through rapid turnaround, diagnostic confidence and close customer collaboration.

● Surgical Division

The Leica Microsystems Surgical Division's focus is to partner with and support micro-surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

Leica Microsystems' mission is to be the world's first-choice provider of innovative solutions to our customers' needs for vision, measurement and analysis of micro-structures.

Leica, the leading brand for microscopes and scientific instruments, developed from five brand names, all with a long tradition: Wild, Leitz, Reichert, Jung and Cambridge Instruments. Yet Leica symbolizes innovation as well as tradition.

Leica Microsystems – an international company with a strong network of customer services

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and representatives of Leica Microsystems
in more than 100 countries.