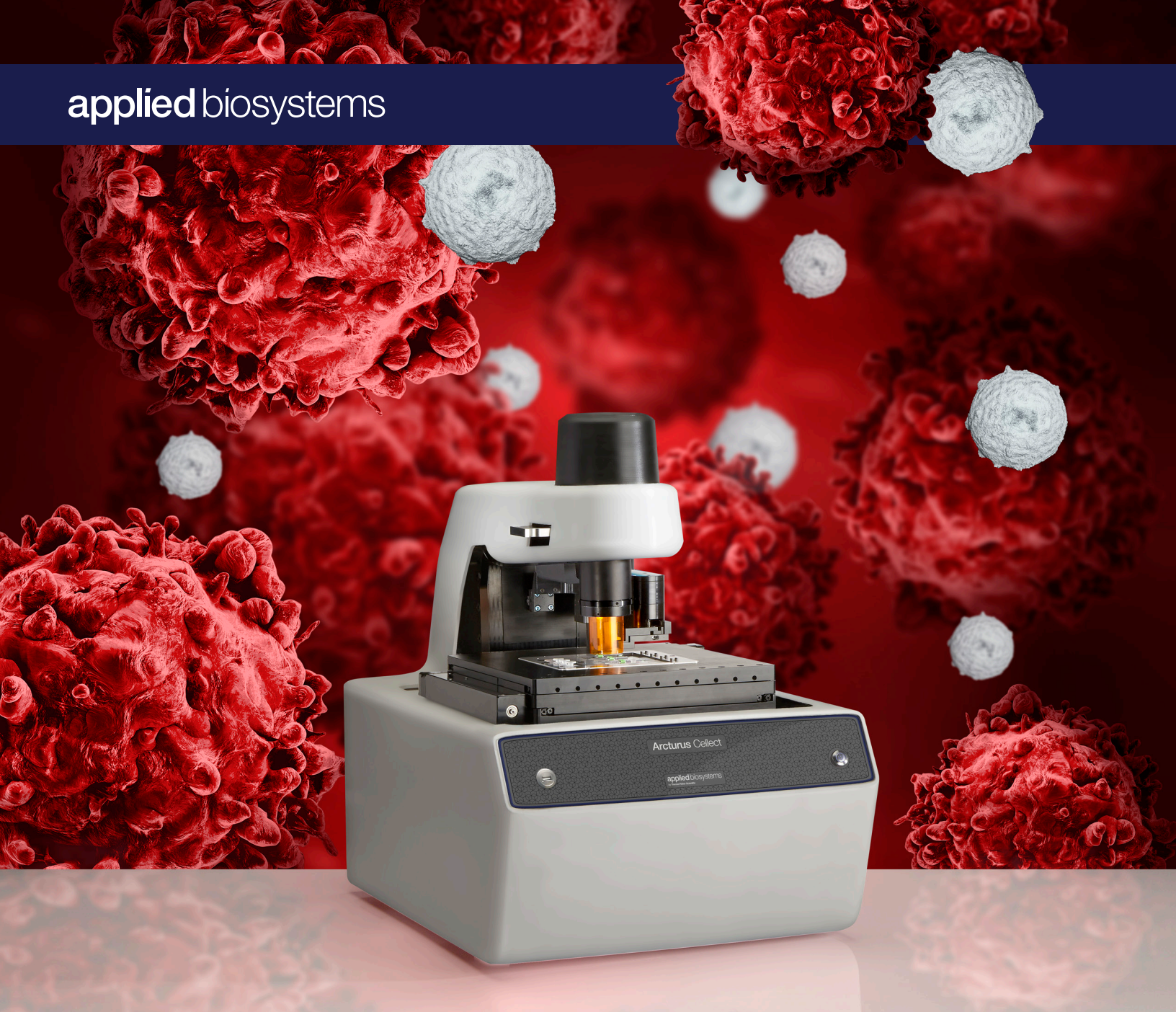


applied biosystems



Arcturus Collect LCM System

Discover more with laser capture microdissection

ThermoFisher
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Power and precision for microgenomics

The Applied Biosystems™ Arcturus™ Collect Laser Capture Microdissection (LCM) System combines the power of infrared (IR) laser capture and ultraviolet (UV) laser cutting in one unique, compact platform. The solid-state IR laser delivers a gentle capture technique that preserves the overall biomolecular integrity of cells, which is ideal for both individual cells and a small number of cells. The solid-state UV laser permits superior speed and precision, and is well suited for microdissecting dense tissue structures and rapidly capturing large numbers of cells.

This dual-laser system designed for laser capture microdissection, along with Applied Biosystems™ CapSure™ technology, helps ensure that sample custody is maintained at all times, thereby enabling researchers to uncover unique molecular signatures that would otherwise be obscured in a heterogeneous cell population.

Breadth of applications

The ability to identify and study pure cell populations can facilitate microgenomic analysis in key research areas including oncology, neuroscience, and proteomics, as well as emerging application areas such as plant biology and forensics (Figures 1 and 2). The Arcturus Collect LCM System can be used to isolate just a few cells in a group or a single cell from a wide variety of sample types, including tissue, blood, semen, and live-cell samples, depending on the application.

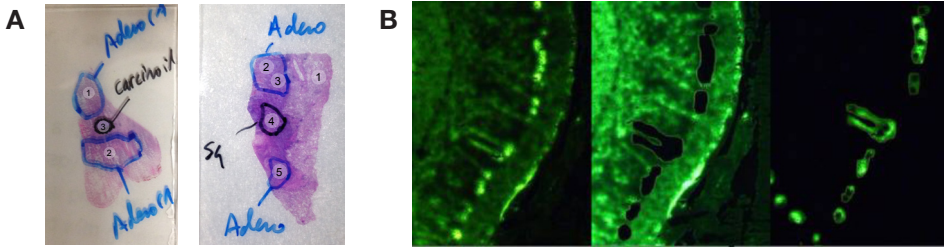


Figure 1. Applications of LCM in oncology and neuroscience. (A) Hematoxylin- and eosin-stained sections and LCM-collected regions of lung cancer tumors. These two slides were collected for a study showing that LCM reveals variant alleles that cannot be detected in whole-tissue scrapes. (B) Microdissected neurons expressing GFP. The images show, from left to right, the neurons before LCM, after LCM, and the captured cells.

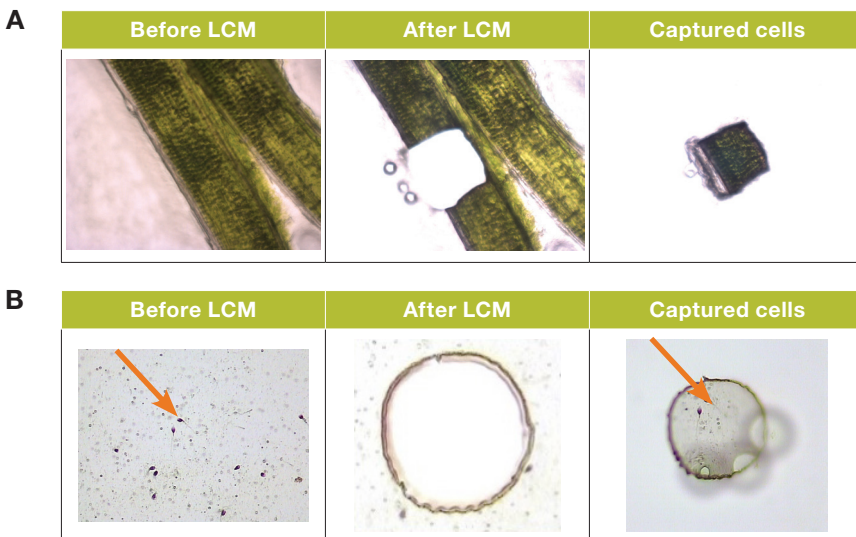
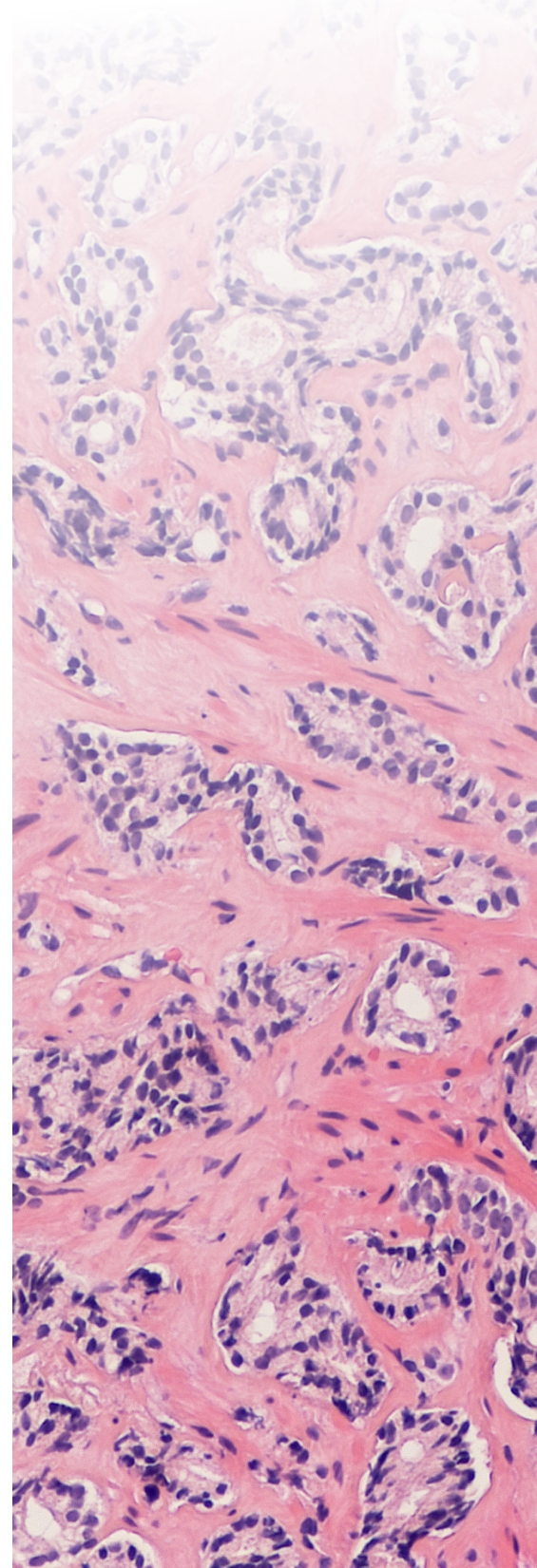


Figure 2. Emerging application areas of LCM: plant biology and forensics. (A) *Poa pratensis* (Kentucky bluegrass) live whole-mount preparation, microdissected using IR laser capture and UV laser cutting. (B) Sperm cells from mixed forensic smear, microdissected using IR laser capture and UV laser cutting.



Ultimate flexibility in sample source and preparation

The unique combination of IR laser capture and UV laser cutting permits the use of any slide type and any sample preparation method for contamination-free sample collection (Figure 3). Choose from glass membrane slides for contact microdissection or framed membrane slides for noncontact microdissection. Unlike other systems, the Arcturus Collect LCM System also permits the efficient use of low-cost plain glass slides.



Any of the following specimen preparations may be used:

- Thin or thick sections
- Fresh-frozen or formalin-fixed, paraffin-embedded (FFPE) tissues
- Fine-needle aspirates
- Chromogenic-stained, fluorescently stained, or unstained sections
- Hydrated or dehydrated specimens
- Forensic smears
- Live plant whole-mount preparations
- Live cell cultures

Complete system for microgenomics

From tissue staining and LCM instrumentation to kits for extraction, amplification, and labeling, we have what you need for your microgenomics project (Figure 3).

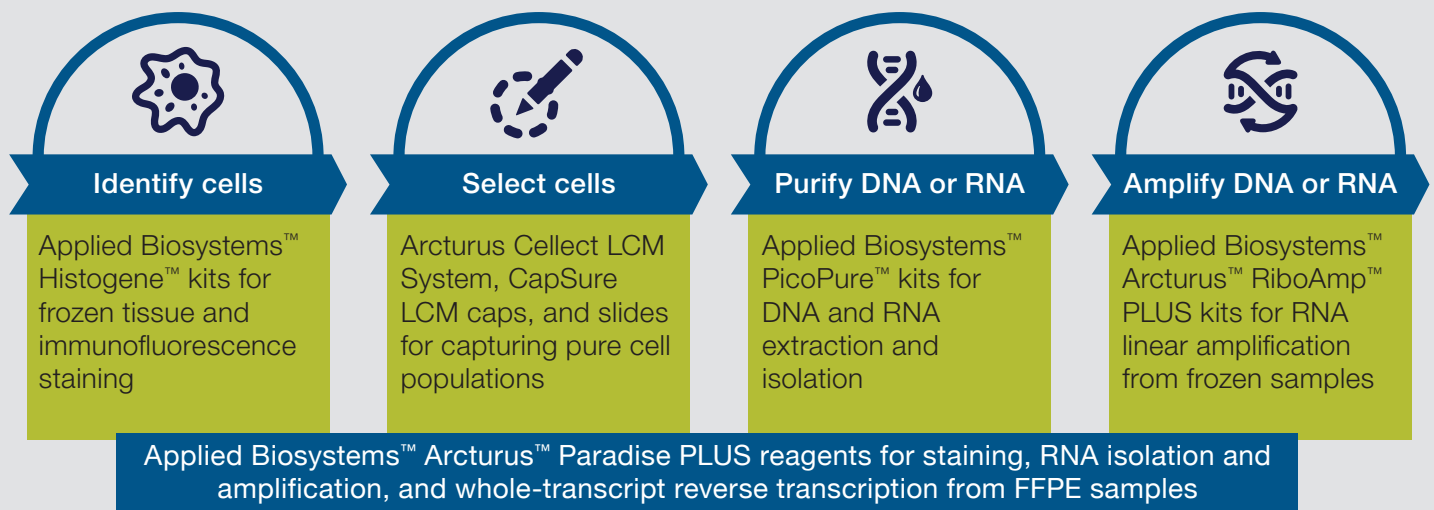
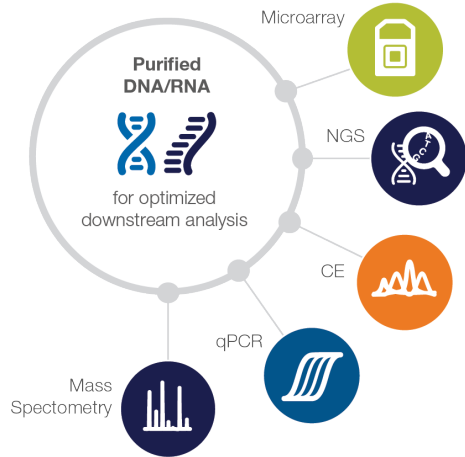


Figure 3. Experimental workflow for LCM. Depending upon the sample types and the applications needed in the microgenomics workflow, we offer a variety of kits—for steps from identifying and selecting cells to isolating and purifying RNA and DNA.

Our optimized solutions for gene expression analysis, next-generation sequencing (NGS), and Sanger sequencing will help streamline your downstream analysis as well. Our innovative technologies enable faster and more affordable sequencing results.



You can also count on our superior technical and applications support. Our dedicated team of highly qualified and professionally trained application scientists and technical support specialists can assist researchers in any molecular or cellular biology research area.

Protect the integrity of microdissected cells

Specially designed for research use with the Arcturus Collect LCM System, all CapSure LCM caps have a transfer film bonded to the lower cap surface. Using the Arcturus Collect LCM System, an infrared laser is pulsed through the top of the cap and interacts with the transfer film, which then distends and adheres to individual cells or

regions of interest. The film—instead of the tissue or cell sample—absorbs the laser energy, resulting in gentle, nondamaging microdissection that preserves the integrity of the captured material.

The Arcturus Collect LCM System enables the easy exchange of stage inserts to accommodate alternate sample formats such as larger slides and Petri dishes, which are ideal for neurobiology studies and live-cell experiments (Table 1). Each instrument has an interactive touchscreen display, a trackball-actuated stage, and a mouse for easy and ergonomic navigation choices. Additionally, long-lasting LED illumination for both brightfield and fluorescence provides precision lighting for high-quality imaging.



Table 1. Arcturus Collect LCM System specifications.

Attribute	Detail
Lasers	UV cutting laser: solid-state, diode-pumped (355 nm) IR capture laser: solid-state, near-IR (808 nm)
Illumination	High-intensity LED illumination system
Objectives	2x, 4x, 10x, 20x, 40x, 60x objectives
Stage	Motorized, trackball-actuated in X and Y axis with 1 μm precision Stage inserts for 3 traditional slides (75 x 26 mm), 2 large-format slides (75 x 50 mm), or 1 Petri dish (50 x 7 mm)
Contrast methods	Brightfield, phase contrast Optional: Fluorescence (LED)
Computer	Onboard PC (Intel™ NUC) with Microsoft™ Windows™ 10 software
Display	Ultra HD touchscreen display Optional: Large touchscreen, ultra HD display

Easy-to-use software

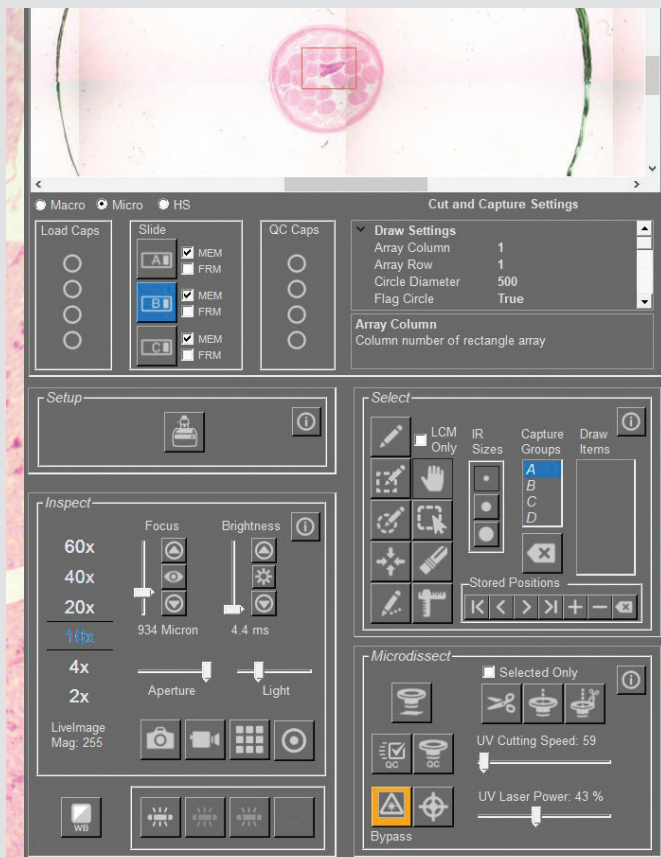
The Applied Biosystems™ Arcturus™ Software included with your instrument simplifies the LCM workflow. With the click of a mouse, you can control all of the system operations, including stage translation, slide and objective selection, focus and light intensity, laser parameters, cap transfers (including QC confirmation), and camera settings (Figure 4).

Tracking your sample

Electronic documentation makes it simple to record each step of the process before and after microdissection. Static images and live video can be taken at any point during the process, providing a record of the entire experiment. View the CapSure LCM caps at the QC station for positive identification of captured material, and utilize capture groups to display and track all individual and group area measurements.

Automated image analysis

The Applied Biosystems™ AutoScanXT™ Software Module for image analysis automatically identifies cells and regions based on user-defined criteria, which greatly helps reduce the overall time required to perform microdissection. This optional module can be used to analyze an individual image, tiled images, the area under a CapSure LCM cap, or the entire slide area. AutoScanXT Software performs optimally on high-contrast samples and may be used with colorimetric, fluorescent, and IHC-stained specimens. Once the regions have been automatically identified, the user proceeds directly to standard microdissection using the Arcturus Collect LCM instrument.



Step 1: Set up

Load materials onto stage and input important study information.

Step 2: Inspect

Identify cells of interest using the fully automated microscope tools, including autofocus and digital zoom.

Step 3: Select

Use simple drawing tools to designate cells for microdissection by drawing freehand or using defined-area circles.

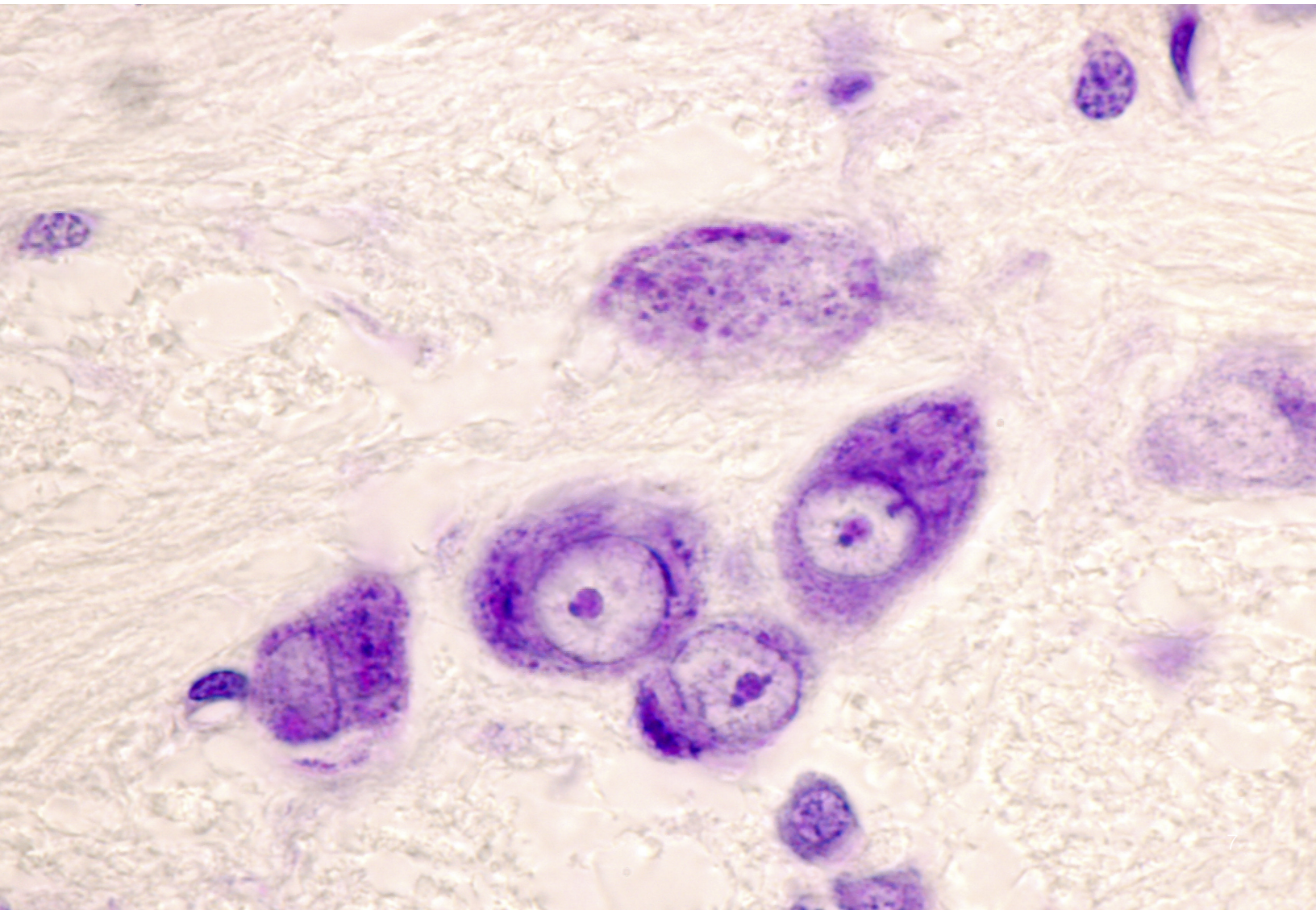
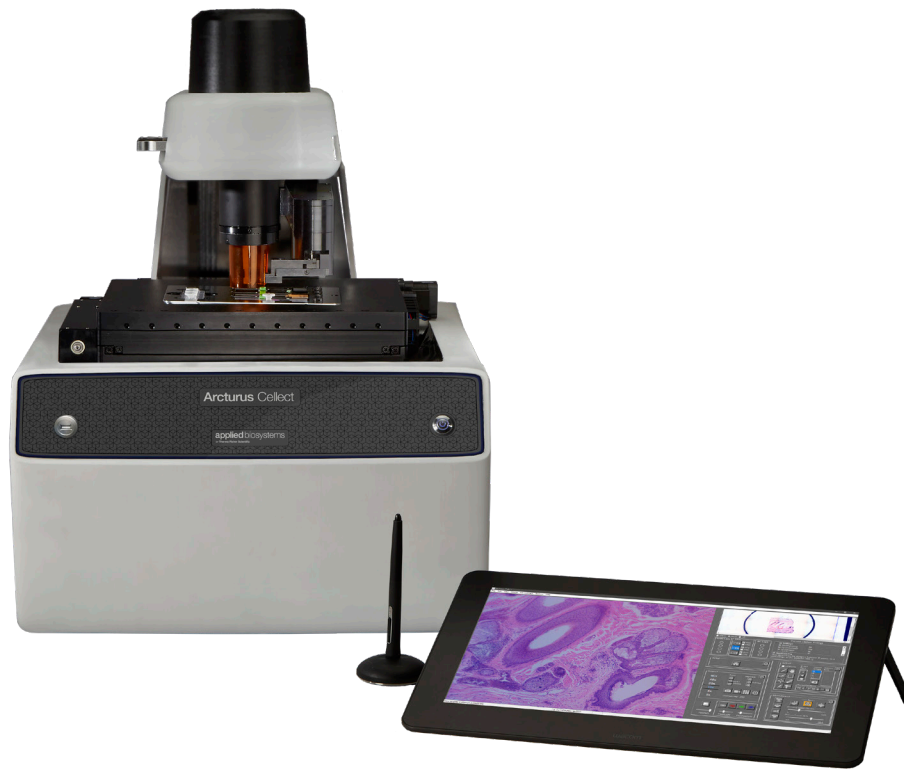
Step 4: Microdissect

Save time and increase productivity with easy-to-use tools for laser cutting and laser capture.

Step 5: QC

Inspect the microdissected material on the LCM cap for positive identification, documentation of captured material, and assurance of proceeding downstream with the exact cells of interest.

Figure 4. Operation workflow. Go from sample loading to extraction of biomolecules in just five steps.



Ordering information

Description	Quantity	Cat. No.
Arcturus instruments		
Arcturus Collect LCM System		A40330
With fluorescence option	1 instrument	A40331
With large display option		A40328
With fluorescence and large display option		A40329
CapSure LCM caps and Arcturus accessories		
CapSure Macro LCM Caps	48 caps	LCM0211
CapSure LCM MicroCaps		A30153
CapSure HS LCM Caps	32 caps	LCM0214
PEN Membrane Frame Slides	50 slides	LCM0521
PEN Membrane Glass Slides		LCM0522
Live Cell Growth Chambers, Sterile	6 each	5000300
Microdissection Petri Dishes, Sterile		5000301
Arcturus microgenomics reagents		
Histogene LCM Frozen Section Staining Kit	72 applications	KIT0401
Histogene LCM Immunofluorescence Staining Kit	32 applications	KIT0420
PicoPure DNA Extraction Kit	30 extractions (Macro Cap) 150 extractions (HS Cap)	KIT0103
PicoPure RNA Isolation Kit	40 samples	KIT0204
RiboAmp PLUS RNA Amplification Kit	12 one-round or 6 two-round amplifications	KIT0521
RiboAmp HS PLUS RNA Amplification Kit	6 two-round amplifications	KIT0525
Paradise PLUS RNA Extraction and Isolation Kit (FFPE)		KIT0312I
Paradise PLUS RNA Amplification Kit (FFPE)	12 samples	KIT0312
Paradise PLUS Whole Transcript Reverse Transcription (WT-RT) Kit (FFPE)		KIT0315

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