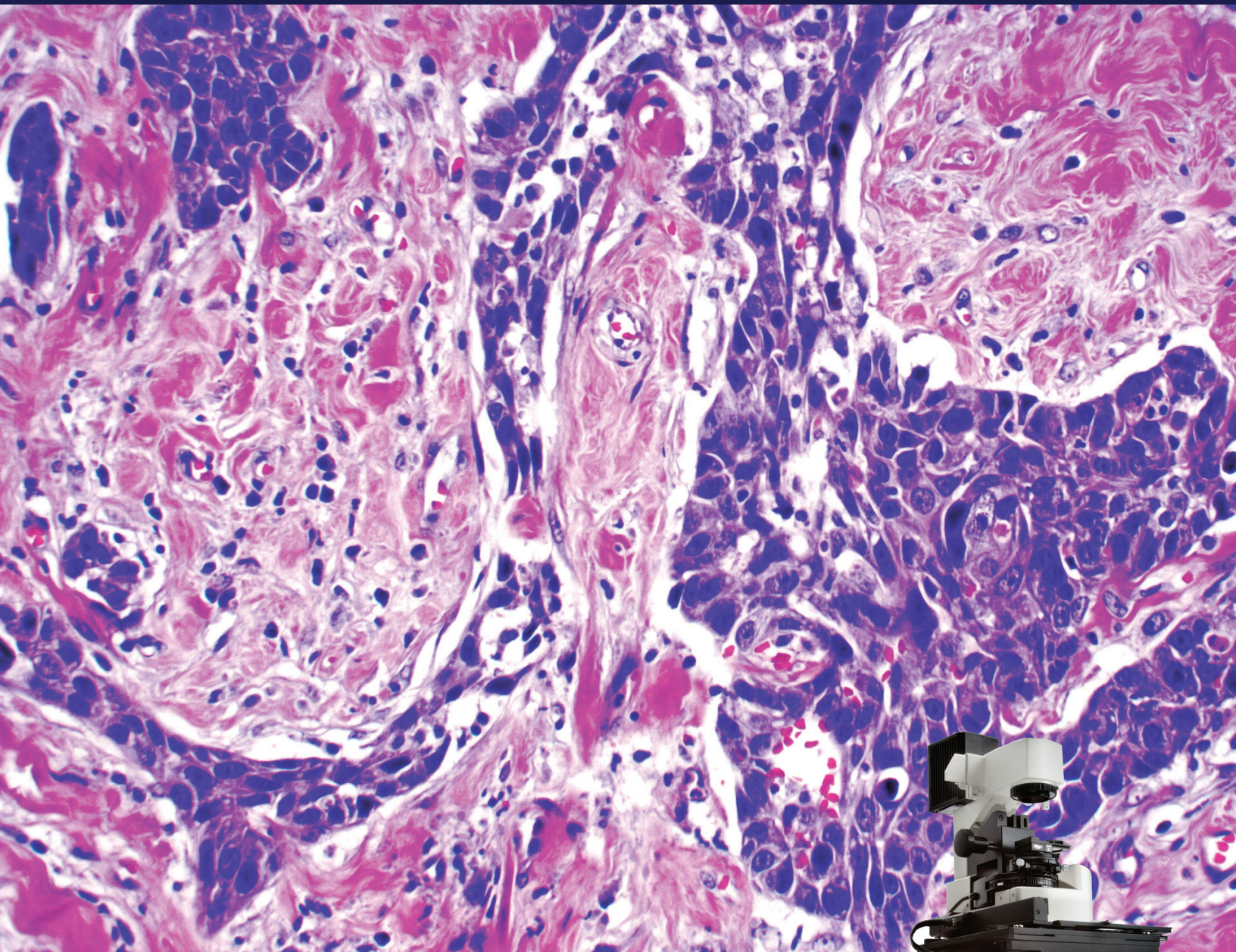


appliedbiosystems



ArcturusXT Laser Capture Microdissection System

Rapidly isolate pure cell populations
for microgenomics analysis



ThermoFisher
SCIENTIFIC

ArcturusXT Laser Capture Microdissection (LCM) System—a complete solution for microgenomics

The Applied Biosystems™ ArcturusXT™ LCM System is a unique microdissection system that combines the power of infrared (IR) laser capture and ultraviolet (UV) laser cutting in one modular platform. The solid-state IR laser delivers a gentle capture technique that preserves the overall biomolecular integrity of cells, and is ideal for both single cells and small numbers of cells. The solid-state UV laser permits superior speed and precision, and is well suited for microdissecting dense tissue structures, and capturing large numbers of cells. This unique combination of two lasers in one system helps ensure that sample custody is maintained at all times, thereby enabling researchers to uncover unique molecular signatures that would have otherwise been 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, and emerging application areas including plant biology and forensics (Figures 1 and 2). The ArcturusXT LCM System can be used to isolate just a few cells or a single cell from tissue samples, blood, or even semen samples, depending on the application.

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 (Figure 3). Choose from glass membrane or framed membrane slides for contact or non-contact microdissection. Unlike other systems, the ArcturusXT LCM System permits 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
- Chromogenic-stained, fluorescently stained, or unstained sections
- Hydrated or dehydrated specimens
- Fine-needle aspirates
- Forensic smears
- Live plant whole-mount preparations
- Live cell cultures

Applications of LCM in oncology and neuroscience

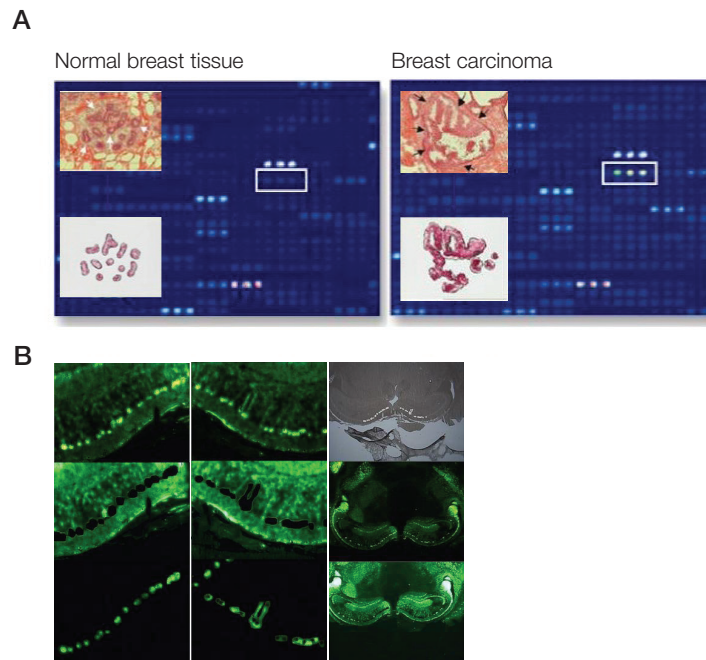


Figure 1. Oncology and neuroscience applications. (A) LCM reveals breast cancer-specific molecular signatures. (B) Microdissected neurons expressing GFP.

Applications of LCM in plant biology, forensics, and live cell isolation

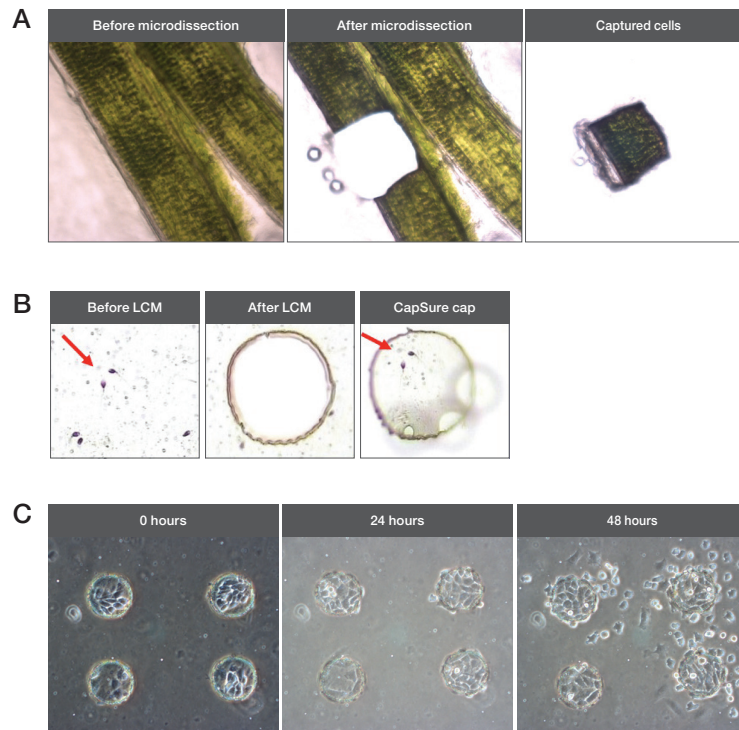


Figure 2. Emerging application areas. (A) *Poa pratensis* (Kentucky bluegrass) live whole-mount preparation, microdissected using IR-LCM and UV laser cutting. (B) Sperm from mixed forensic smear, microdissected using IR and UV laser cutting. (C) Chinese hamster ovary (CHO) cells grown in the ArcturusXT™ Live Cell Growth Chamber, then isolated under sterile conditions using the ArcturusXT™ Microdissection Petri Dish. The isolated cells were allowed to outgrow and were visualized under differential interference contrast (DIC) at 0 hours (left), 24 hours (center), and 48 hours (right) post-microdissection.

Sample extraction for downstream analysis

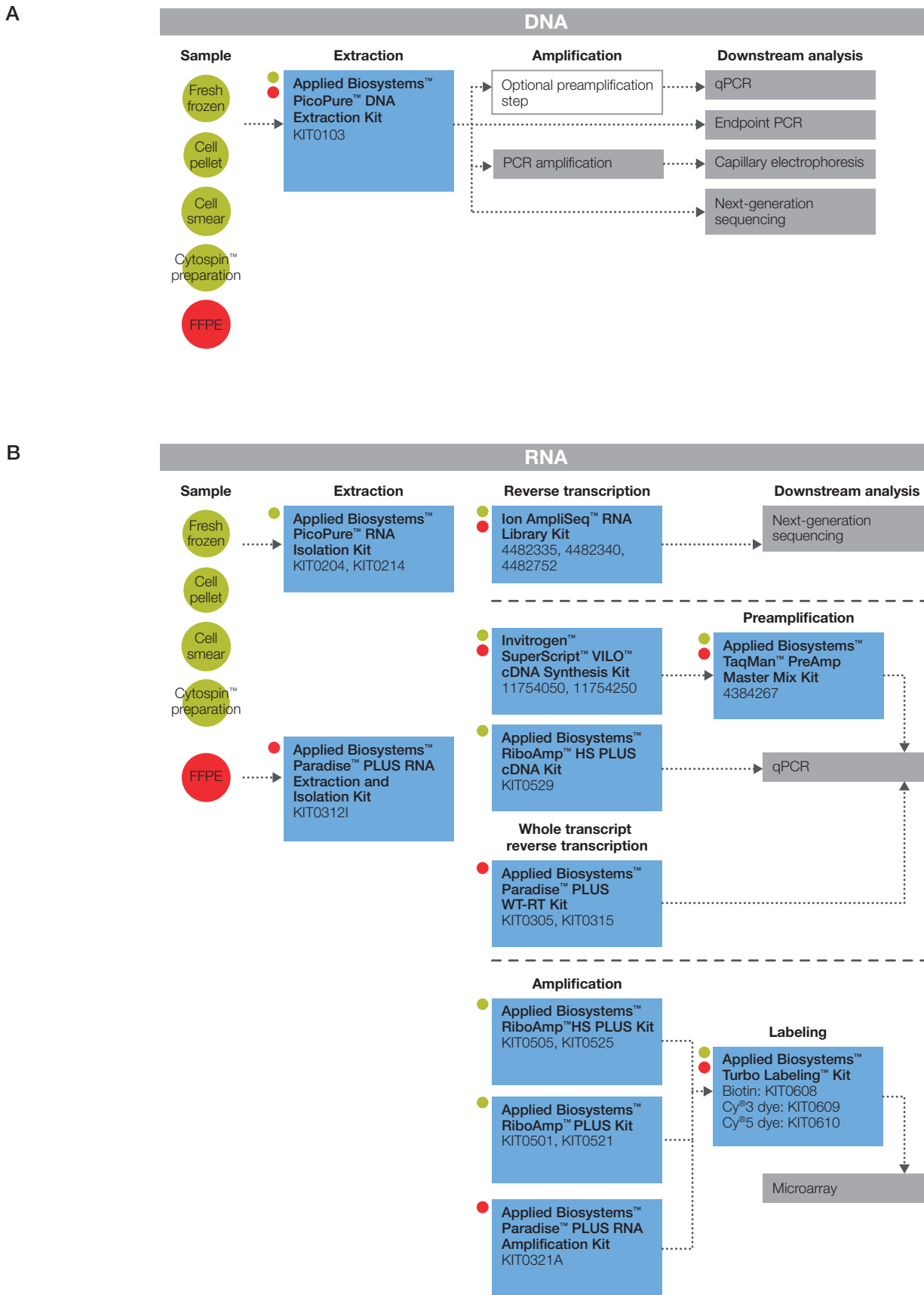


Figure 3. Sample preparation and analysis workflows. The family of products from Thermo Fisher Scientific is shown for extraction and downstream analysis of (A) DNA and (B) RNA from a variety of sample types.

Easy-to-use software

The Applied Biosystems™ ArcturusXT™ Software included with your instrument simplifies your LCM workflow. With the click of a mouse, you can control all 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

Automatic electronic documentation may be employed 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 Applied Biosystems™ 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 a microdissection experiment. 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 ArcturusXT instrument.

Streamlined user interface simplifies your workflow



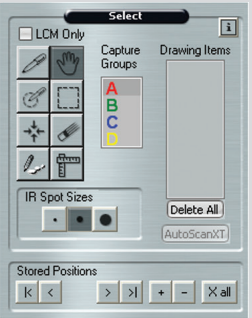
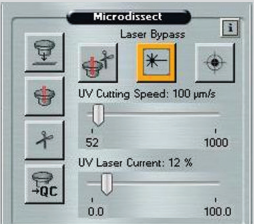
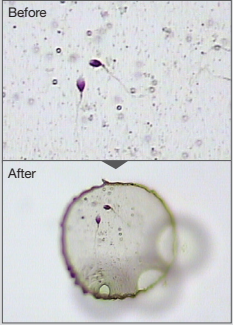
Step 1: setup	Step 2: inspect	Step 3: select	Step 4: microdissect	Step 5: QC
Load materials onto stage and input important study information.	Identify cells of interest using the fully automated microscope tools, including autofocus and digital zoom.	Use simple drawing tools to designate cells for microdissection by drawing freehand or using defined-area circles.	Save time and increase productivity with easy-to-use tools for laser cutting and laser capture.	Inspect the microdissected material on the CapSure LCM cap for positive identification of captured material and assurance of proceeding downstream with the exact cells of interest.
				

Figure 4. Simple operation. Go from sample loading to extraction of biomolecules in just five steps.

Ensure the integrity of microdissected cells

Specially designed for research use with the ArcturusXT LCM System, all CapSure LCM caps have a transfer film bonded to the lower cap surface. Using the ArcturusXT LCM System, an infrared laser pulses through the top of the cap during LCM and interacts with the transfer film, which then melts and bonds to the cells or regions of interest. The film absorbs the laser radiation—instead of the tissue or cell sample—creating a gentle, nondamaging microdissection that preserves the integrity of the captured material.

Complete solution for microgenomics

Thermo Fisher Scientific offers everything you need for your microgenomics workflow (Figure 5). From tissue staining kits and LCM instrumentation, to kits for extraction, amplification, and labeling, we have what you need for your microgenomics project.

We also provide superior applications and technical support with a dedicated team of highly qualified and expertly trained application scientists and technical support specialists to assist researchers in any molecular or cellular biology research area.

Find the products you need for every step

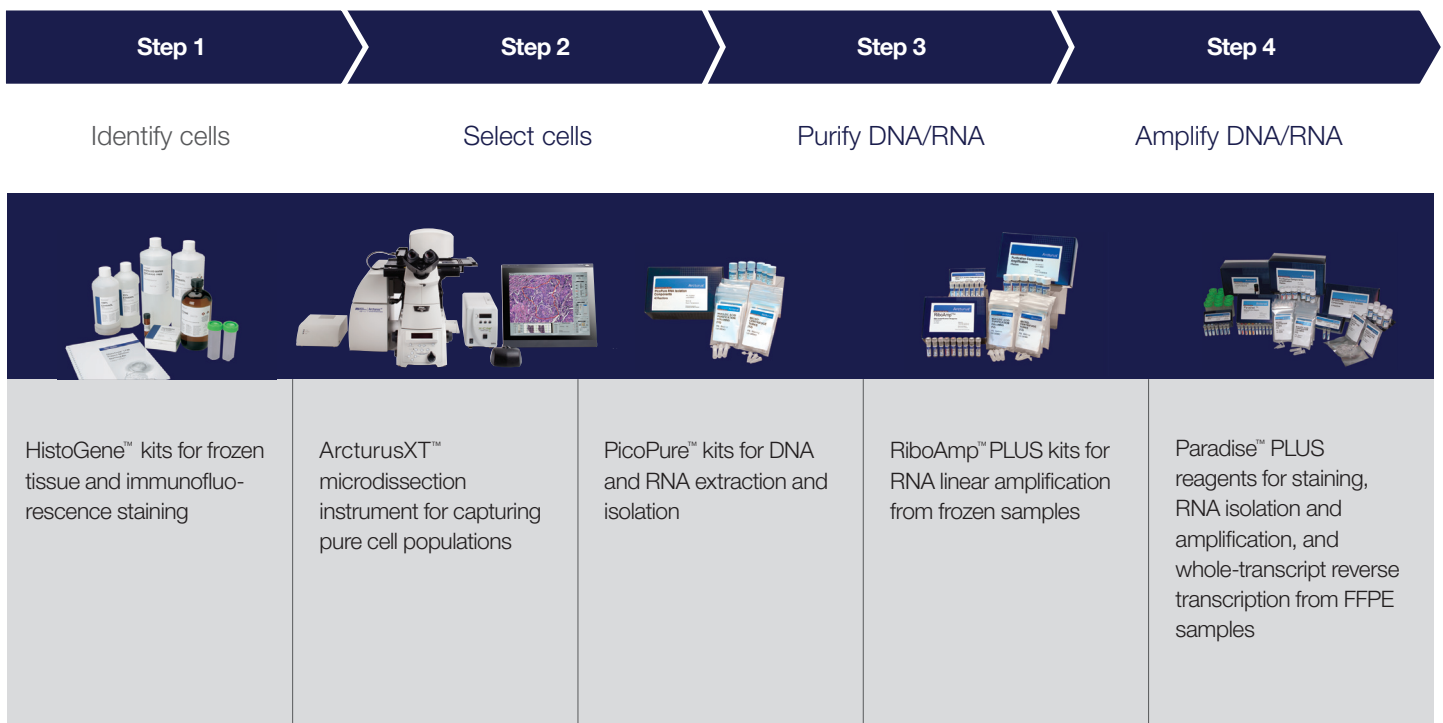


Figure 5. Experimental workflow. Depending upon the sample types and the applications needed in the microgenomics workflow, we offer a variety of kits to choose from.

Family of ArcturusXT LCM systems allows for research flexibility

	ArcturusXT	ArcturusXT Plus	ArcturusXT Premium
Laser	Standard UV laser	Enhanced UV laser	Enhanced UV laser
Illumination	Bright-field illumination	Bright-field and phased illumination	Bright-field and phased illumination
Phase contrast		✓	✓
Differential interference contrast (DIC)		Optional	Optional
Binoculars		✓	✓
Motorized phase-contrast fluorescence			✓
Fluorescence (filter cubes, light source)	Optional	Optional	Optional
Cat. No.	A26818	A26819	A26820

The ArcturusXT LCM System has an open platform that can be upgraded and expanded to meet changing research requirements. The available microscope port allows users to modify the system for alternate applications, such as adding a second camera for high-resolution imaging. The open system design also makes possible the easy exchange of stage inserts to accommodate alternate sample formats such as larger slides, which are ideal for neurobiology studies, and petri dishes, which enable you to perform live cell experiments.

Each instrument has IR-enabled LCM, an interactive pen display, and a trackball-actuated stage for easy and ergonomic navigation. The Arcturus XT Plus System may be upgraded to the ArcturusXT Premium System and configured with LED bright-field illumination or high-intensity halogen illumination. This enables phase-contrast and differential interference contrast (DIC) microscopy applications.

Specifications for all systems

Magnification	Objectives provided: 2x, 10x, and 40x Nikon CF160 1.5 digital zoom
Optional objective options	4x, 20x, 60x, 100x oil

Ordering information

Description	Quantity	Cat. No.
ArcturusXT LCM System	1 system	A26818
ArcturusXT Plus LCM System	1 system	A26819
ArcturusXT Premium LCM System	1 system	A26820

Description	Quantity	Cat. No.
CapSure LCM caps and accessories		
CapSure LCM MicroCaps	48 caps	A30153
CapSure LCM MicroCaps, Bulk Pack	240 caps (5 x A30153)	A30155
MicroCap Incubation Block Base	1 base	A30843
MicroCap Incubation Block Top	1 top	A30846
CapSure HS LCM Caps Starter Pack with Alignment Tray and Incubation Block	24 caps	LCM0213
CapSure HS LCM Caps	32 caps	LCM0214
CapSure HS LCM Caps, Bulk Pack	160 caps (5 x LCM0214)	LCM0215
PEN Membrane Frame Slides	50 slides	LCM0521
PEN Membrane Glass Slides	50 slides	LCM0522
PEN Membrane Frame Slides for Live Cell Microdissection	5 slides	LCM0530
PEN Membrane Frame Slides for Live Cell Microdissection, Bulk Pack	25 slides	LCM0531
ArcturusXT Live Cell Growth Chambers	6 chambers (sterile)	5000300
ArcturusXT Microdissection Petri Dishes	6 petri dishes (sterile)	5000301
Arcturus microgenomics reagents		
HistoGene LCM Frozen Section Staining Kit	72 slides	KIT0401
HistoGene LCM Immunofluorescence Staining Kit	32 slides	KIT0420
PicoPure DNA Extraction Kit	30 extractions (MicroCap) 150 extractions (HS Cap)	KIT0103
PicoPure RNA Isolation Kit	40 isolations	KIT0204
RiboAmp PLUS RNA Amplification Kit	(12) 1-round or (6) 2-round amplifications	KIT0521
RiboAmp HS PLUS RNA Amplification Kit (High Sensitivity)	(6) 2-round amplifications	KIT0525
Paradise PLUS Reagent System	12 samples	KIT0312
Paradise PLUS Whole Transcript RT Reagent System	12 samples	KIT0315

Find out more at thermofisher.com/lcm