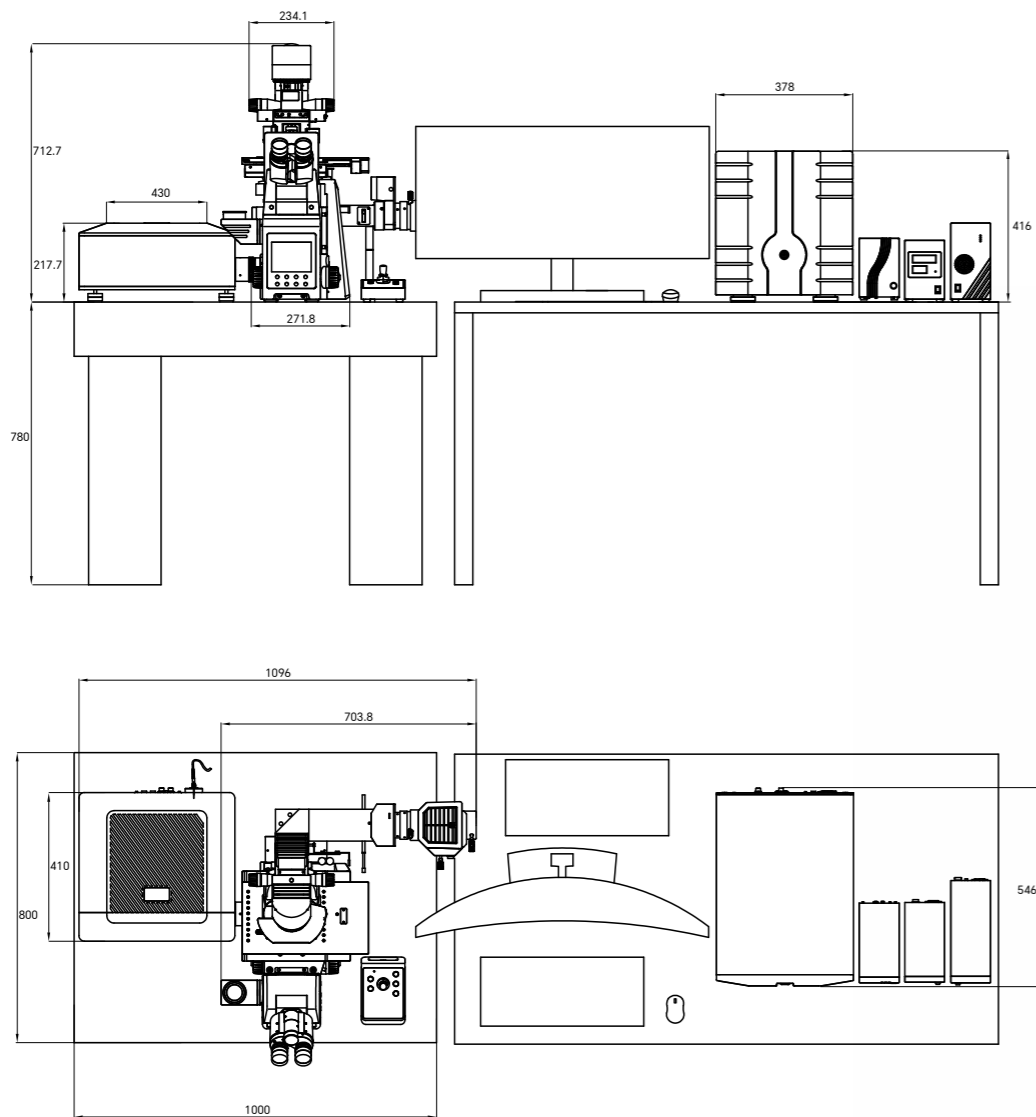


Dimension: mm

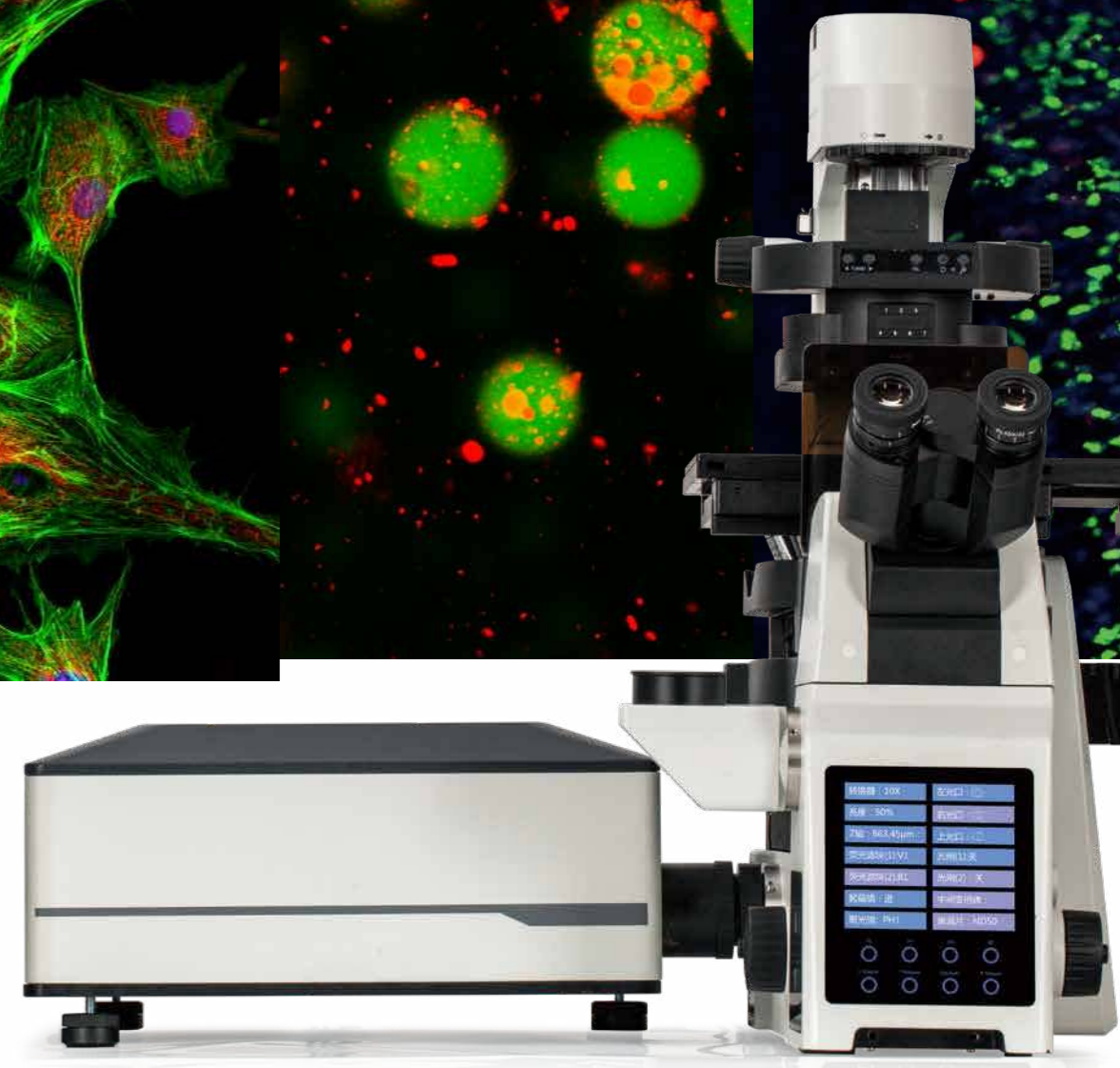


SOPTOP

Sunny Instruments

CLSM610

Confocal Laser Scanning Microscope



NINGBO SUNNY INSTRUMENTS CO., LTD.

www.sunnyoptical.com
C2001B-2406
No additional notice for changes on this specification or appearance



ADD: No.66-68 Shunyu Road, Yuyao, Zhejiang.
TEL: 0086-574-62530070
FAX: 0086-574-62530066
ZIP: 315400
E-mail: sales@sunnyoptical.com

**High precision obseration and accurate analysis
canbe realized in a ver shor time**

CLSM610

Fidelity the real image, co-focus the highlights

High S N Ratio

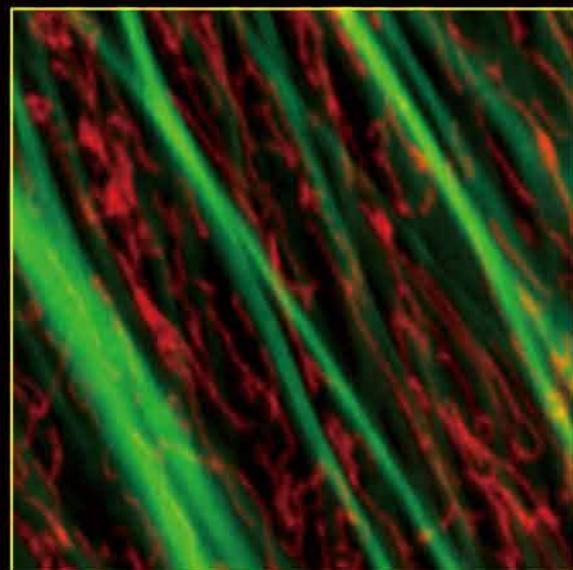
High efficiency confocal imaging optical path, is able to provide
highsignal-to-noise ratio images under weak fiuorescence

Excellent image

Wide spectrum, high numerical aperure lens, is perect to shoot
alltypes of confocal samples

Easy to use

Fully electric frame with human-machine interaction interace, is easyto
operate



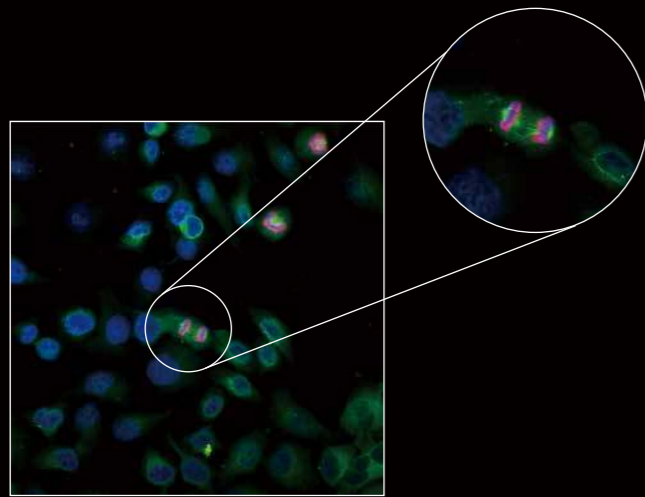
BPAC cell (TermoFisher) 60X
Mitochondria (Red), F-ACTIN (Green), cell nucleus (Blue)



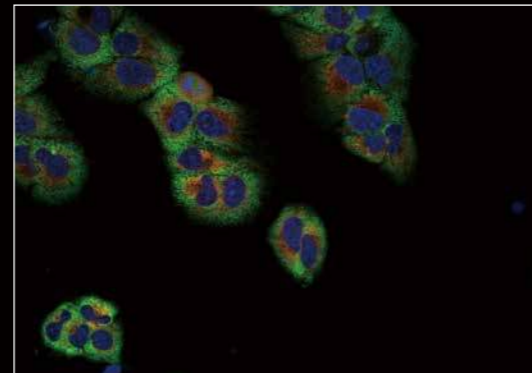
Biological and Life Sciences Applications

Cell Biology

CLSM610 is able to accurately image all cells labeled with various fluorescent proteins and multicolor probes, studying the fluorescence colocalization, dynamic properties and spatial relationships of two or more target proteins. Besides, CLSM610 can achieve the morphological structure of 3D cell culture such as organoids/globules by 3D reconstruction, finding out more hidden information.



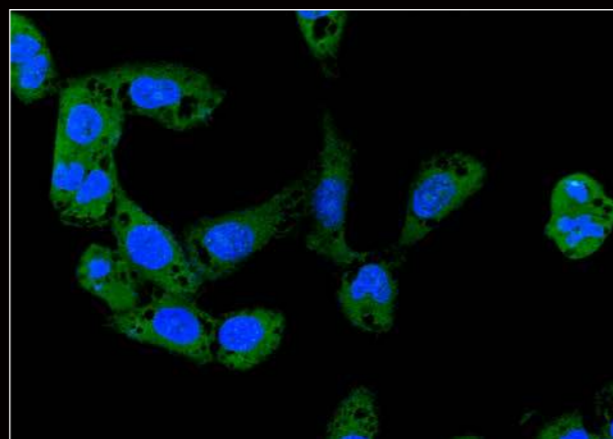
HELA Cell (Peking University Health Center) 60X



Human hepatocytes (Zhejiang University) 40X

Biochemistry and Molecular Biology

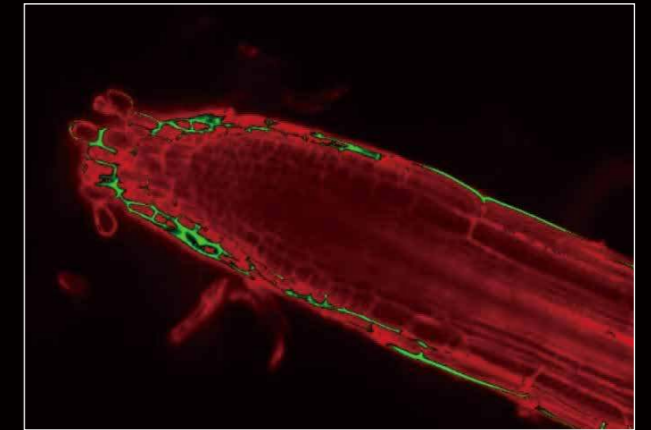
CLSM610 is a powerful tool for studying molecular and protein interactions, intracellular signaling pathways, and gene expression. It provides precise quantitative data on the exact locations and dynamic processes of these biomolecules within cells.



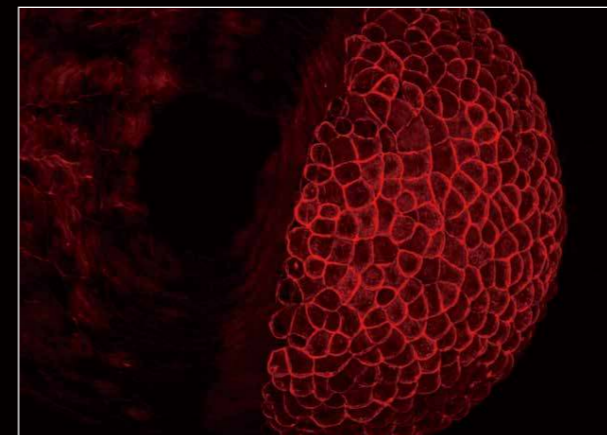
① HK-2 Cells (Wuhan Polytechnic University)

Developmental Biology

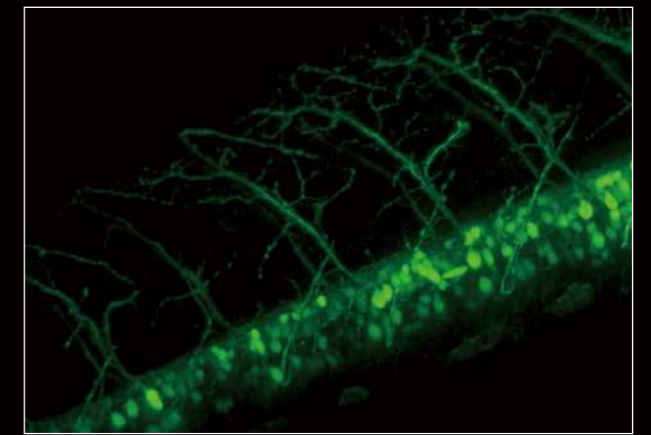
The CLSM610 laser confocal scanning microscope is ideal for observing model organisms such as zebrafish and fruit flies, which have large, complex, and dense structures. CLSM610 is suitable for non-destructive imaging, with its wide-field imaging and layer scanning functions helping to obtain detailed structural images of samples and present details from different depths of the sample, aiding development and growth research.



Arabidopsis root (Huazhong Agricultural University) 40X



Zebrafish embryo (West China Hospital) 20X

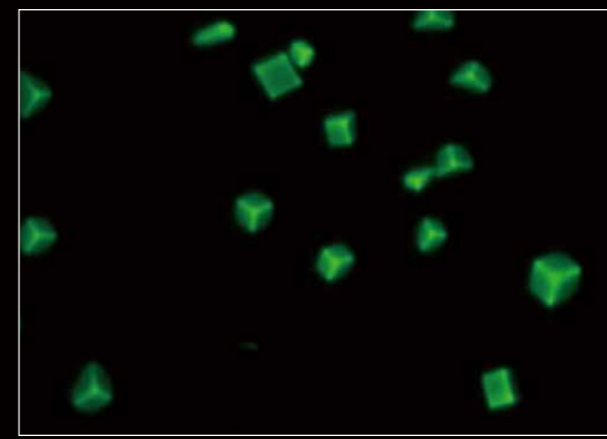


Zebra shiner (West China Hospital) 40X

Materials Science Applications

Biomaterial

In the field of biophotonics, the research heat of biological information and nanomaterials is increasing. In the study of photoelectric materials, CLSM610 can cooperate with the living cell environment monitoring module to observe the process of interaction between materials and cells for the fusion of new functional materials, inorganic nano hybrid materials and living cells.



Functional materials (Wuhan University of Technology) 60X

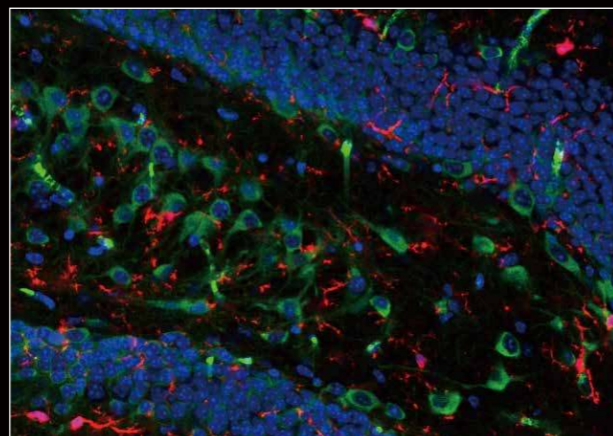
Medical and Pharmacological Applications

Pharmaceutical Chemistry

Can be used to study the mechanisms of drug actions in cells and tissues and screen for new drug candidates.

Pathology

The layer scanning of CLSM610 is suitable for different histopathological sections of animals and plants, especially for large tissue. Much more details and more accurate data are available.

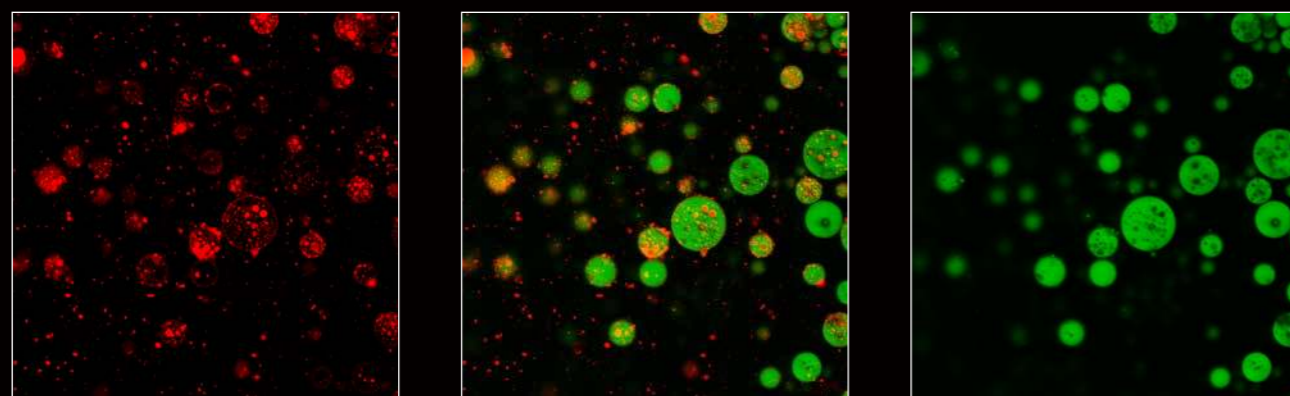


Hippocampal slice (Chinese Militar Academy of Science) 40X

Agricultural, Forestry, and Food Science Applications

Food Safety and Quality Control

Utilizing its advanced imaging technology, CLSM610 provides excellent resolution and image clarity, effectively reducing background signal interference and enhancing image contrast. This ensures clear observation even with complex or opaque samples such as high internal phase emulsions (HIPEs). The brightness and penetration of its laser light source offer significant advantages for in-depth analysis and understanding of these challenging samples.



② High Internal Phase Emulsions (HIPEs) (Xihua University)

Paper Information

① Baicalin inhibits monosodium urate crystal-induced pyroptosis in renal tubular epithelial cell line through Panx-1/P2X7 pathways: Molecular docking, molecular dynamics, and in vitro experiments. *Chem Biol Drug Des.* 2024 Apr;103(4):e14522. doi: 10.1111/cbdd.14522. PMID: 38580458.

Wuhan Polytechnic University

② Tunable rheological properties of high internal phase emulsions stabilized by phosphorylated walnut protein/pectin complexes: The effects of pH conditions, mass ratios, and concentrations. *Food Res Int.* 2024 Jan;175:113670. doi: 10.1016/j.foodres.2023.113670. Epub 2023 Nov 10. PMID: 38129023.

Xihua University

High internal phase emulsions stabilized by walnut protein amyloid-like aggregates and their application in food 3D printing[J]. *Food Hydrocolloids*, 2024, 147: 109444.

DOI: 10.1016/j.foodres.2023.112858

Xihua University

Ultrahigh pressure field: A friendly pathway for regulating the cellular adhesion and migration capacity of collagen. *Int J Biol Macromol.* 2024 Feb;257(Pt 1):127864. doi: 10.1016/j.ijbiomac.2023.127864. Epub 2023 Nov 7. PMID: 37939762.

Wuhan Polytechnic University

Nanofiber reinforced alginate hydrogel for leak-proof delivery and higher stress loading in nucleus pulposus. *Carbohydr Polym.* 2023 Jan 1;299:120193. doi:10.1016/j.carbpol.2022.120193. Epub 2022 Oct 7. PMID: 36876807.

Renhe Hospital, Affiliated to China Three Gorges University

rAAV2-Mediated Restoration of GALC in Neural Stem Cells from Krabbe Patient-Derived iPSCs. *Pharmaceuticals (Basel).* 2023 Apr 20;16(4):624. doi: 10.3390/ph16040624. PMID: 37111381; PMCID: PMC10143348.

Peking Union Medical College

HMGB3 promotes the malignant phenotypes and stemness of epithelial ovarian cancer through the MAPK/ERK signaling pathway. *Cell Commun Signal.* 2023 Jun 16;21(1):144. doi: 10.1186/s12964-023-01172-7. PMID: 37328851; PMCID: PMC10273509.

Qilu Hospital of Shandong University

All electric control system

The height of electric Z-axis is able to be fast adjusted according to real-time image. Auto focusing by AF key, eliminate the step of fine-tuning, improve work efficiency. Integrated control buttons on both sides of the frame, can quickly switch or rotate the condenser, brightness, objective lens, attenuator disc and fluorescence disc, improve the operation convenience.

Electric Z-axis

Electric condenser

Electric nosepiece

Electric stage

Electric turntable of light reduction filters

Electric fluorescence turntable

Electric left light port

Electric up light port

Electric diaphragm

Remove control

Tilting transmitted illumination

The transmission system adopts the tilting structure to ensure larger working space, easier to change samples.



Front LCD panel

It is able to display the status of electric parts in real time, and set the observation mode, switch the light brake, etc., which greatly improves the user experience and makes the research work more convenient.



Focus Locking

Once the ideal observation area is located, the manual mechanical stage can lock the X and Y positions, ensuring sample stability. This enhances operational convenience, especially during long-term dynamic process observations, maintaining the field of view, reducing sample drift, and improving imaging accuracy.

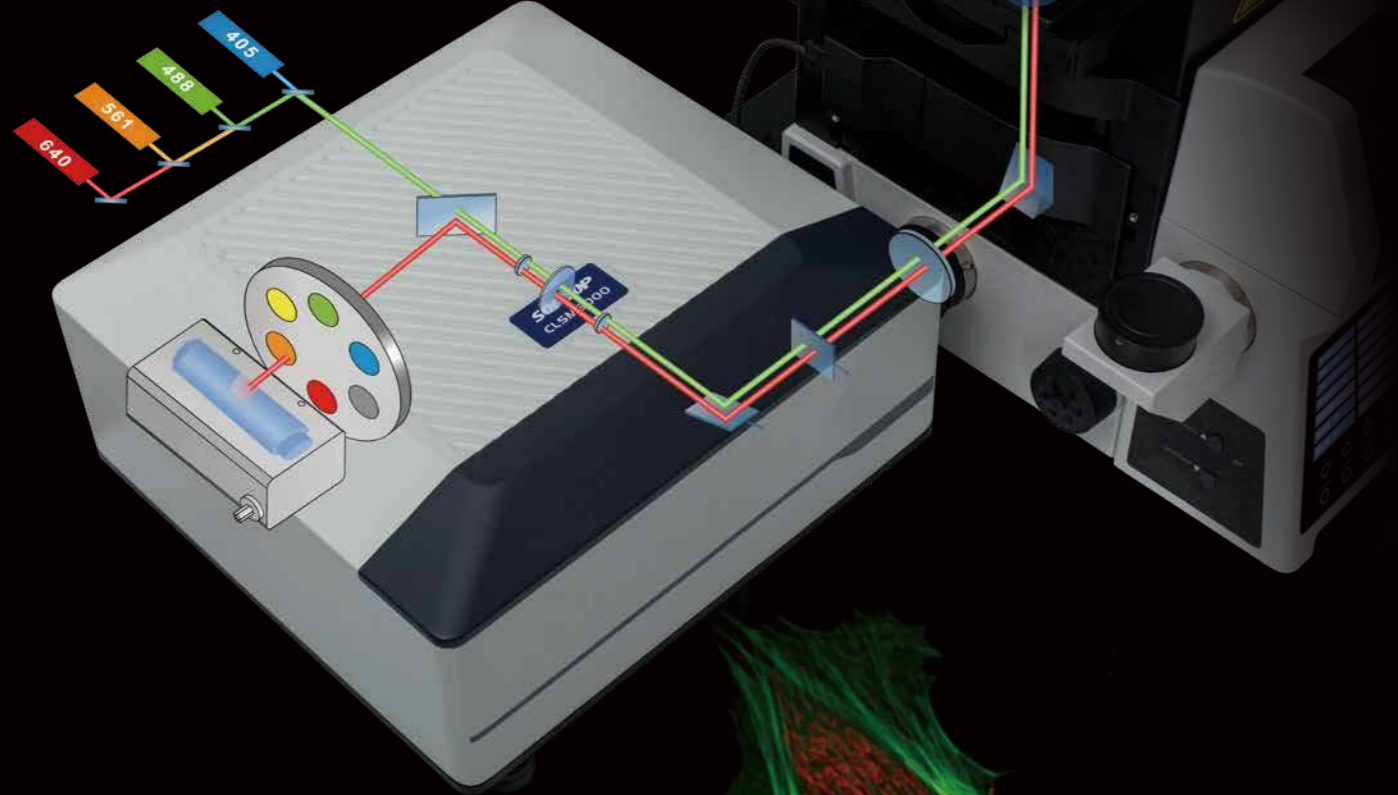


High scalable

The big frame provides sufficient space for third-party configurations. Single-layer optical path or double-layer optical path can be selected as required. It can be loaded into 16 filters at most, providing maximum scalability for the in-depth research.



Distinguished confocal imaging optical components

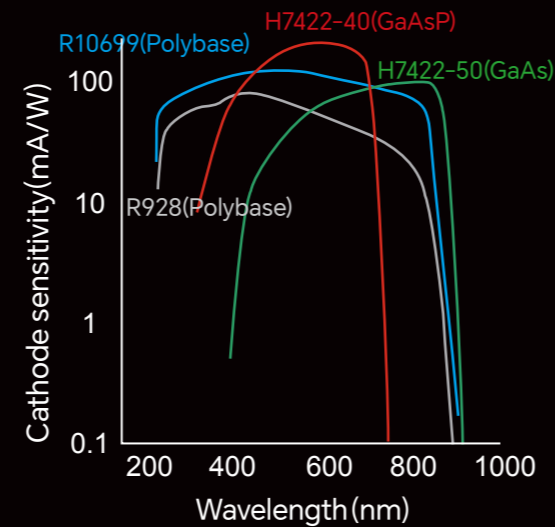
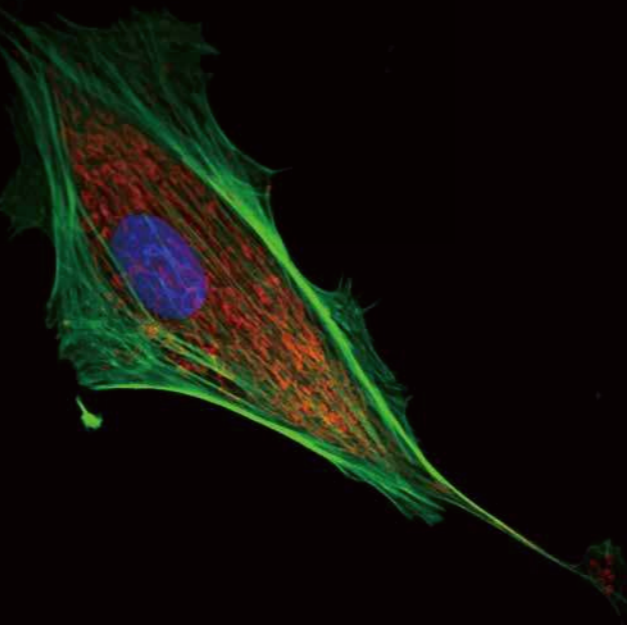


Innovative confocal pinhole unit

Pinhole design is based on the principle of light reversibility. The excitation light of the lamp and the emission light of the sample pass through the same pinhole, and they keep a 100% conjugate relationship. It not only ensures the acquisition efficiency of fluorescence signal, but also improves the filtering of non-focal plane signal, for the higher detection sensitivity and better image resolution.

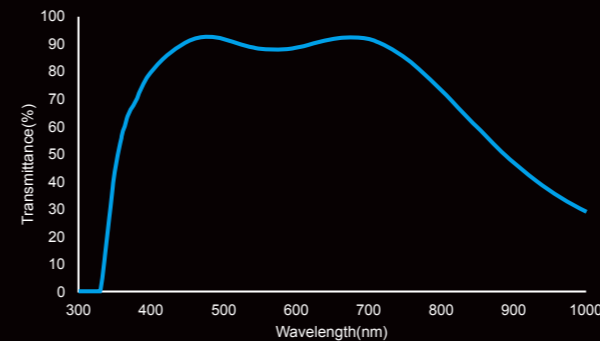
Controller probe unit

The probe unit consists of a 6-position electric filter turntable with 4 filters as standard and a single high-sensitivity multi-base photomultiplier tube (MA PMT, $QE \geq 25\% @ 500nm$), is able to easily and quickly automatically complete multicolor fluorescence confocal imaging.



SAPO series super apochromatic objectives

Converging the optic axes of red, green and blue to one focal plane, correcting the axial chromatic aberration of violet light, the original color of samples such as red/green/blue is able to be presented. The resolution and brightness are improved based on large numerical aperture. Wide spectrum correction ensures flat field and increase the color difference correction range from 400nm to 1000nm.



SAPO 60X transmittance curve

Model	Magnification	N.A. (N.A.)	W.D. (mm)	C.G. (mm)	Immersion oil
APO series apochromatic objectives	2X	0.08	6.20	/	/
	4X	0.16	12.80	/	/
SAPO series super apochromatic objectives	10X	0.40	3.10	0.17	/
	20X	0.80	0.60	0.17	/
	40X	0.95	0.18	0.17	/
	60X	1.42	0.17	0.17	oil
	100X	1.45	0.14	0.17	oil

Confocal software

Provides advanced image acquisition features, including pixel dwell time control, histogram threshold adjustment, and multi-dimensional imaging modes, capable of real-time large image stitching, depth of field extension, and pseudo-color annotation. In processing, it supports 3D reconstruction, colocalization processing, and various editing tools such as flipping and background removal. For image analysis, the system can perform morphological parameter measurements, grayscale analysis, cell counting, and protein tracking, providing a comprehensive image processing and analysis solution, offering researchers and professionals powerful tools and convenient operation experience.

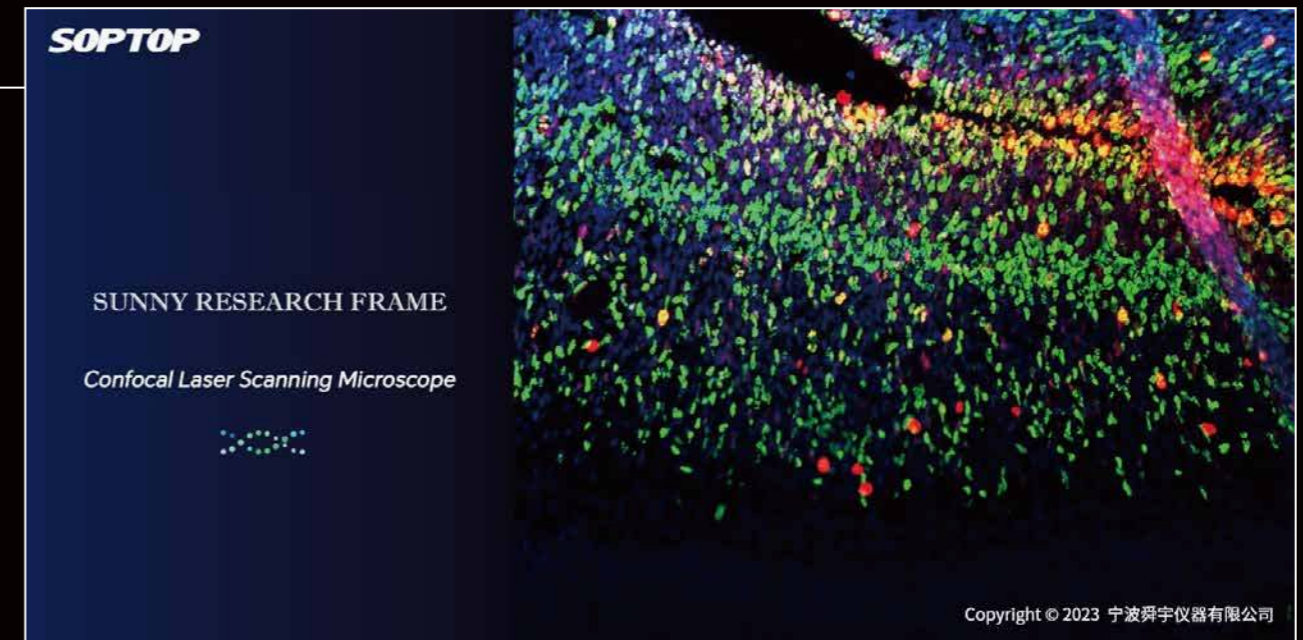
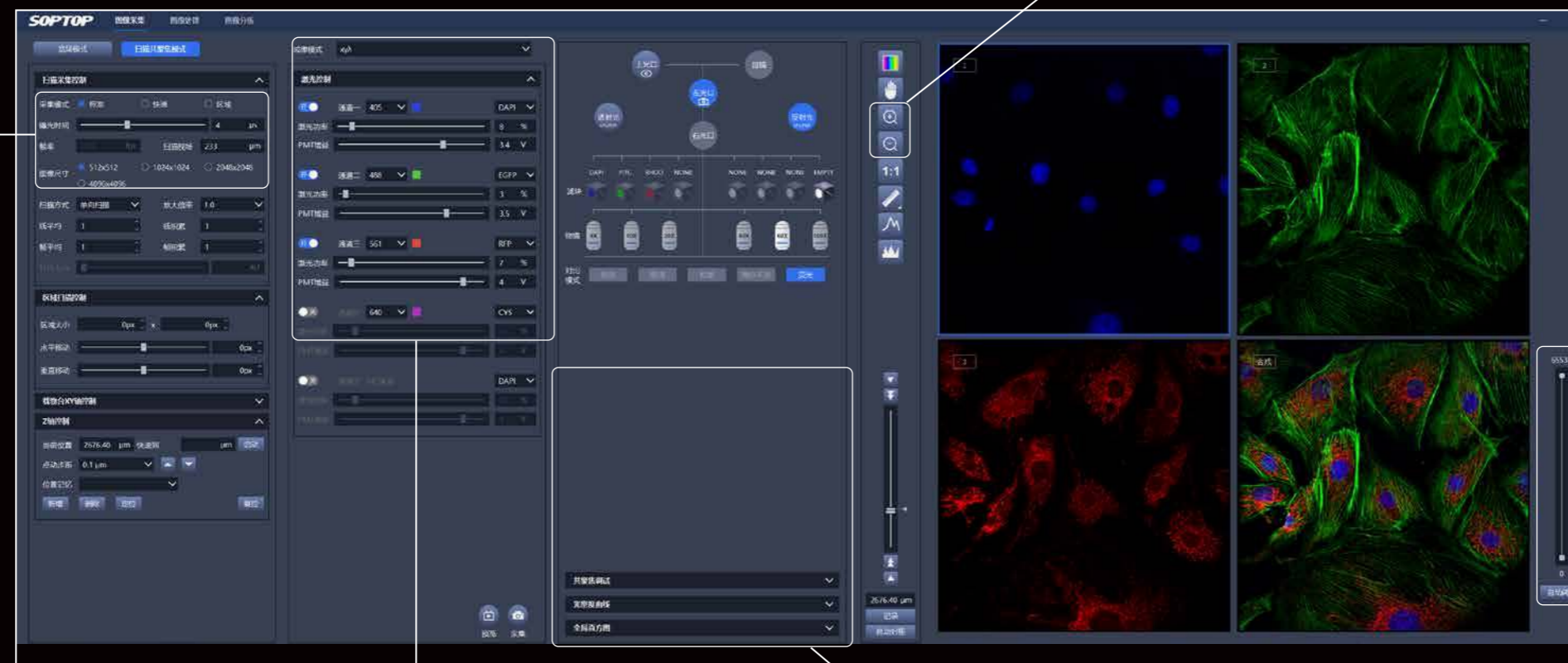


Image acquisition

- Precisely control pixel dwell time to ensure optimal image exposure.
- Freely set image resolution to meet the needs of different detail levels.



- Achieve six-dimensional (x, y, z, λ, t) imaging, capturing comprehensive sample information.
- Provide various custom acquisition modes, such as xyz, xyt, xyzt, xyλ, xyλt, xyzλt, to meet different experimental requirements.
- Support real-time stitching of large images, seamlessly integrating multiple fields of view for a complete view.
- Enhance image depth perception through depth of field extension technology.
- Apply pseudo-color marking in real-time to improve the visual effect and interpretability of images.

- Allow users to zoom in on images for detailed observation or a general overview.

- Intelligently adjust histogram thresholds to achieve optimal image contrast.

- Support real-time optical density measurement for analyzing the transparency characteristics of samples.
- Provide real-time histogram display to understand the statistical distribution of images instantly.

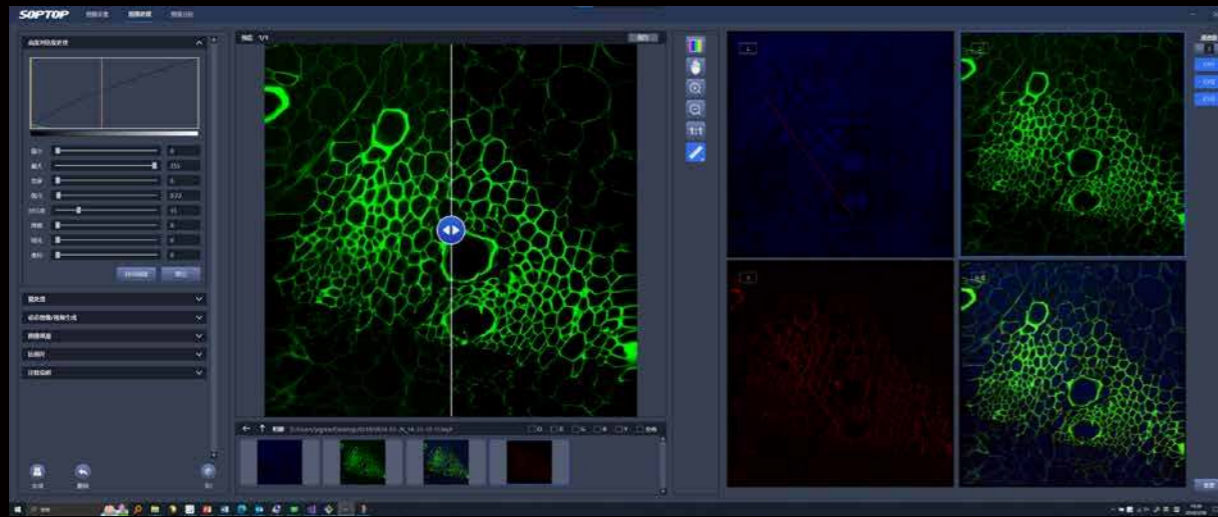


Image processing

- Support advanced 3D reconstruction and visualization, bringing three-dimensional structures to life.
- Ensure accurate overlay of multi-channel images through precise colocalization processing.
- Synchronize analysis of multiple marker points through colocalization linkage.
- Provide diverse image editing tools, including flipping, mirroring, and background removal.
- Generate dynamic image sequences to capture biological events in the time dimension.
- Stack processing function supports three-dimensional reconstruction and time series analysis.
- ROI (Region of Interest) processing focuses on detailed analysis of specific areas.

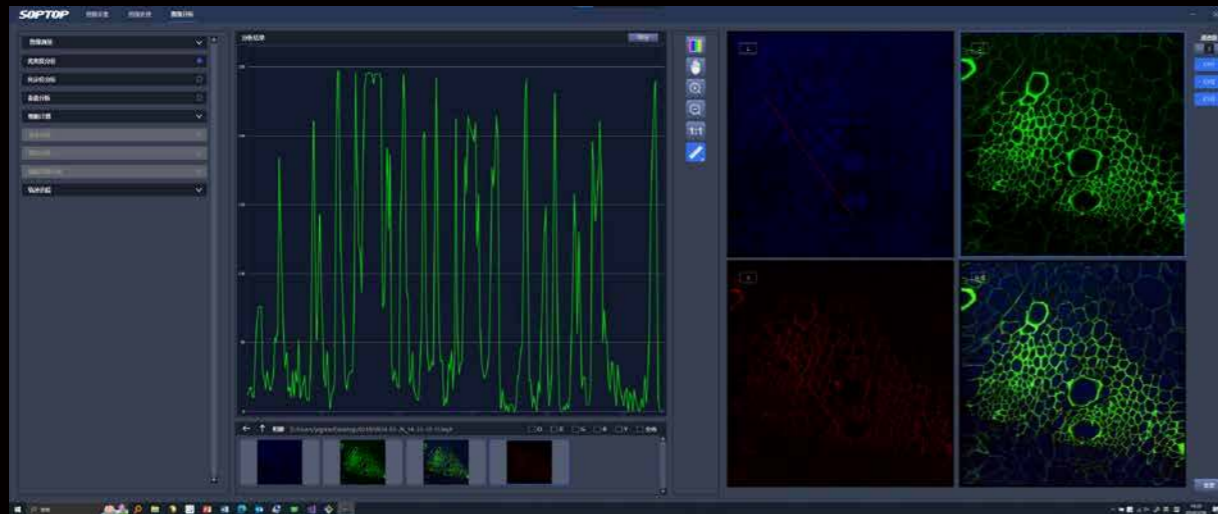


Image analysis

- Provide a series of morphological parameter analyses, including perimeter, area, roundness, etc.
- Measure the highest and lowest grayscale values of images to evaluate the contrast range.
- Perform colocalization analysis to quantify spatial relationships between multiple markers.
- Count cells and particles for various quantitative analysis experiments.
- Protein tracking function monitors the movement and changes of specific proteins.
- Subgroup analysis identifies and classifies characteristics of different groups.

CLSM6IO Specification

Laser light	Laser	405nm/50mW、488nm/50mW、561nm/50mW、640nm/40mW	
	Laser control	The switch and intensity are adjustable	
	Output mode	Polarization-maintaining single-mode fiber	
Scan module	Scan unit	X/Y dual axis high speed optical scanning galvanometer	
		Filed of view: 14mm X 14mm (≥ 19)	
		Scanning element: 512 X 512 ~ 4096 X 4096	
		Pixel time: 0.5μs ~8μs	
		Standard scanning speed: 1fps (512 X 512), fast scanning speed: 3fps (512 X 512, 0.5μs)Zoom	
	scanning: 1X~50X		
	Pinhole	Φ65/85/105μm	
Spectroscope & filter	Four-channel spectroscopy: 405/488/561/640nm		
	Six-position electric turret with 4 standard filters: 460nm/50, 525nm/50, 600nm/50 / 690nm/50		
Probe unit	MA PMT, QE ≥ 25%@500nm, 20%@600nm		
	GaAsP PMT, QE ≥ 45%@500nm, 40%@600nm		
IRX60 inverted microscope	Optical system	Infinity color correction optical system	
	Viewing tube	20~45 degree tilting binocular head, inversed image, interpupillar distance: 50 ~ 76mm	
	Eyepiece	High eyepoint wide filed plan eyepiece PL10X/22mm, diopter adjustable, micrometer attachable	
	Objective	Infinity plan apochromatic objectives	
		Infinity plan super apochromatic objectives	
	Frame	Low position coarse and fine coaxial electric focusing mechanism, range 10.5mm, precision 1μm; built-in electric upper camera port, built-in electric left camera port, dual optical paths; with fluorescent light barrier; 6-position electric nosepiece with DIC slot and C-mount adapter	
		Right Light Port: Manual two-position switch with a splitting ratio of 100:0/0:100, field number 16mm, built-in 1X CTV, C-type interface.	
	Stage	Manual Mechanical Platform, Platform dimensions: 300mm(X) × 240mm(Y), movement range: 135mm(X) × 85mm(Y), platform thickness: 30mm; right-hand low-position universal handle; XY movement lock function, lockable range: 50mm(X) × 50mm(Y), with slide clamp (for holding slides and culture bottles), includes Ø110mm glass round disk, inner diameter Ø 30, with waist-shaped hole metal stage plate.	
		Three-Layer Composite Motorized Platform, Platform dimensions: 350mm(X) × 200mm(Y), platform travel: 114mm(X) × 75mm(Y), resolution: 0.05μm, absolute positioning accuracy ≤ 2μm/10mm, unidirectional repeat positioning accuracy ≤ 1μm, bidirectional repeat positioning accuracy ≤ 2.5μm, maximum speed: 50mm/s, includes electric control box, controller, slide holder, Φ36 petri dish holder.	
	Condenser	Electric seven-position condenser, NA.0.55, WD27mm; 3 positions for Φ30mm (phase contrast), 4 positions for Φ38mm (DIC); support for bright field, phase contrast and DIC (including polarizing kit)	
	Transmitted illumination	10W LED light box (cold color temperature), Color temperature 5000K	
	Fluorescent illumination	Fluorescent mirror turret attachment with electric shutter and dust proof box; ND25/ND50 Plug plate with attenuation filter, B1/G1/UV1/R1 fluorescent filters for option	Multi-band LED Light Source Module, with 365/460/525/625nm four excitation channels, channel trigger control <500ms. Independent control of light intensity, 10W high-power LED, designed lifespan of over 20,000 hours, supports SDK control.
Fluorescent Mercury Lamp Light Source Module, U5 Mercury Lamp Power Supply Box, 100W DC Mercury Lamp (OSRAM)			
Operating software	Cameras	20 Megapixel Color Camera	
	Hardware control	Automated Control Imaging Process, Control motorized stage, focus, DIC switch, light path adjustment, camera, laser, scanning system, and support other peripheral device control.	
	Image acquisition	Pixel Dwell Time Control, Histogram threshold control, image resolution control, x, y, z, λ, t, five-dimensional acquisition, custom xyz, xyt, xyzt, xyλ, xyλt, xyzλt modes. Support real-time stitching of large images, depth of field extension, real-time pseudo-color annotation, real-time optical density measurement, real-time histogram display, and image zooming.	
	Image processing	Supports 3D reconstruction and display, colocalization processing, colocalization linkage, image flipping, mirroring, background removal, dynamic image generation, stacking processing, ROI processing.	
	Image analysis	Supports perimeter, area, roundness, maximum gray value, scale, minimum gray value analysis, colocalization analysis, cell counting.	