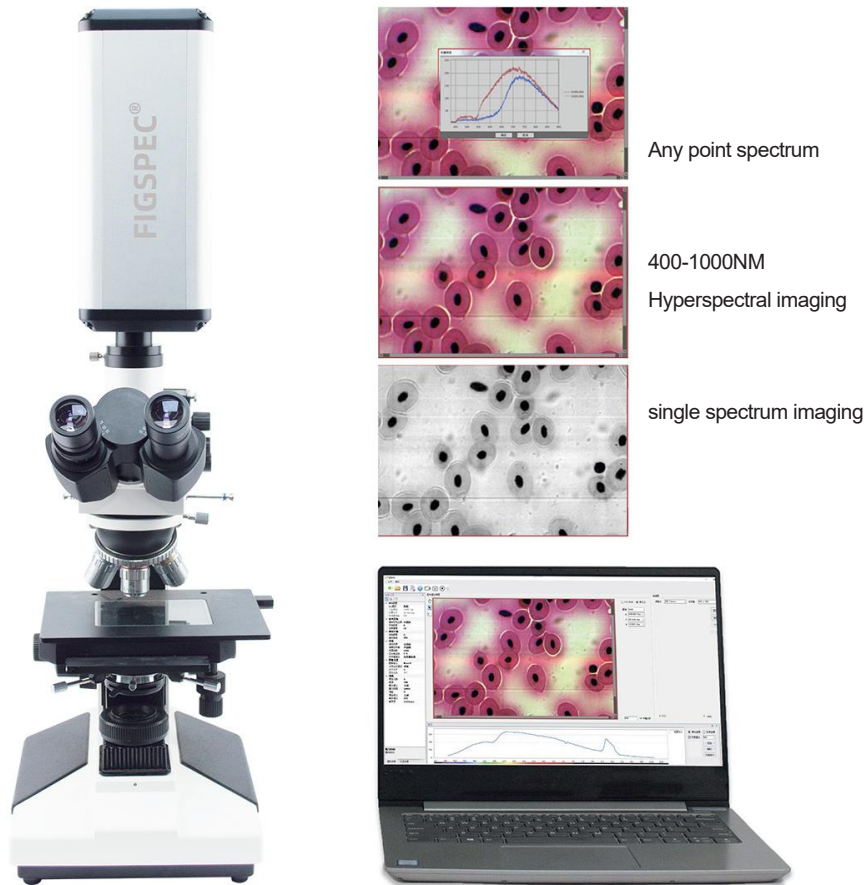


Microscopic hyperspectral imaging system



- Combining the advantages of microscope and imaging spectrometer, hyperspectral data acquisition of microscopic images can be performed at any time.
- It can transform existing biological microscopes, fluorescence microscopes, stereo microscopes, metallographic microscopes, etc., and easily transform ordinary microscopes into hyperspectral microscopes.
- Customers can customize microscope models according to their needs.
- The FigSpec® series of imaging spectrometers integrate a visual camera and a hyperspectral camera internally. The visual camera can be used to quickly preview the sampled images, and the hyperspectral image data collection can be performed after confirming that the images meet the requirements.

System composition

Hyperspectral imaging spectroscopic camera (optional FS-20/FS-22/FS-23)*1, Lens*1, Microscope (any manufacturer's model can be specified)*1, PC application software*1

Parameters

Model	FS-20	FS-22	FS-23	FS-25
Spectroscopic method	Grating	Grating	Grating	Grating
Image resolution	1920*1920	1920*1920	1920*1920	320*320
Dynamic range	12 bits	12 bits	12 bits	14 bits
Imaging speed	≤15 seconds	≤15 seconds	≤5 seconds	≤5 seconds
Spectral channels number	600	1200	1200	254
Spectral region	400-700nm	400-1000nm	400-1000nm	900-1700nm
Spectral FWHM	2.5nm	5nm	2.5nm	8nm
Slit width	25um	25um	25um	25um
Transmission efficiency	60%	60%	60%	60%
Stray light level	0.5%	0.5%	0.5%	0.5%
Pixel size	5.86um*5.86um	5.86um*5.86um	5.86um*5.86um	30um*30um
Detector type	CMOS	CMOS	CMOS	InGaAs
Sensor imaging surface size	11.3*7.1mm	11.3*7.1mm	11.3*7.1mm	9.6mm x 7.68mm
Standard lens focal length	25mm	25mm	25mm	25mm
Minimum working distance	100mm-∞	150mm-∞	100mm-∞	100mm-∞
Field angle	25°	25°	25°	17°
Minimum exposure time	34us	21us	21us	1us
Maximum exposure time	10 seconds	10 seconds	10 seconds	1 seconds
SNR	600/1	600/1	600/1	600/1
Data interface	USB3.0	USB3.0	USB3.0	Gigabit network
Camera lens interface	C-Mount	C-Mount	C-Mount	C-Mount
Accessories	USB3.0 transmission line	USB3.0 transmission line	USB3.0 transmission line	Gigabit network transmission line
Imaging features	With ROI function	With ROI function	With ROI function	With ROI function
	Single area ROI can be achieved	Single area ROI can be achieved	Multi area ROI can be achieved	Single area ROI can be achieved
Auxiliary imaging features	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area	Auxiliary framing camera to monitor the shooting area
Power supply mode	Built-in battery	Built-in battery	Built-in battery	Built-in battery
Host engine size *	25.5cm*13.8cm*10.7cm	25.5cm*13.8cm*10.7cm	25.5cm*13.8cm*10.7cm	33.5cm*18.2cm*14.3cm
Weight**	Less than 2.8KG	Less than 2.8KG	Less than 2.8KG	Less than 5.3KG
Power dissipation	50W	50W	50W	50W

* size without lens and handle ** weight without lens



Microscope Hyperspectral Measurement System FS-MS



- Combining the advantages of both the microscope and the portable hyperspectral camera, hyperspectral data collection can be carried out for microscopic images at any time.
- The existing biological microscope, fluorescence microscope, stereomicroscope and metallographic microscope can be transformed, and the ordinary microscope can be transformed into hyperspectral microscope conveniently.
- FigSpec® The series portable hyperspectral camera is internally integrated with a visual camera and a hyperspectral camera. The visual camera can be used to quickly preview the sampled image, and hyperspectral image data acquisition can be carried out after it is determined that the image meets the requirements.

System Composition

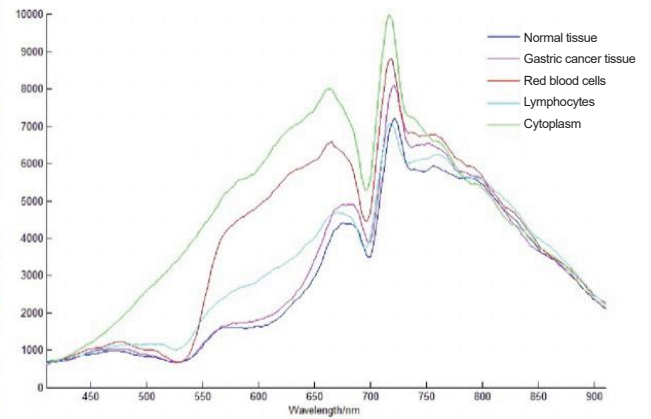
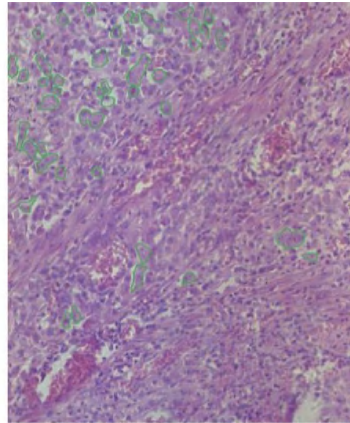
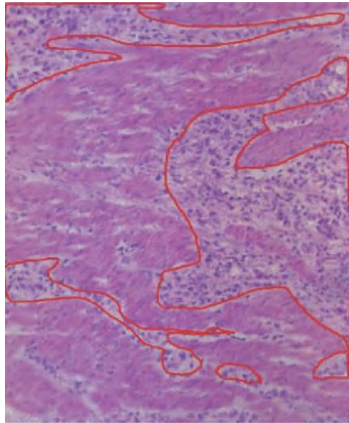
Portable hyperspectral camera (FS-IQ-VISNIR) *1, lens *1, microscope, PC application software *1.

Parameters

Model	Microscope hyperspectral measurement system
Spectroscopic splitting method	Transmission grating light splitting
Image resolution	1920*1920
Dynamic range	12 bits
Imaging speed	5 seconds
Number of spectral channels	1200
Spectral range	400-1000nm
Spectral FWHM	2.5nm
Slit width	25um
Transmission efficiency	≥60%
Stray light level	≤0.5%
Pixel size	5.86um*5.86um
Detector type	CMOS
Standard lens focal length	25mm
Minimum working distance	100mm
Field angle	25°
Minimum exposure time	21us
Maximum exposure time	10s
Signal-to-noise ratio	600/1
Data interface	USB3.0
Camera lens interface	C
Parts	USB3.0 Transmission line
Auxiliary imaging function	The auxiliary view camera monitors the shooting area
Eyepiece	Large Field of view WF10X(Φ18mm)
Objective lens	Long anomaly field achromatic objective (glass without cover) PL 5X/0.12 Long anomaly field achromatic objective (glass without cover) PL L10X/0.25 Long anomaly field achromatic objective (glass without cover) PL L40X/0.60 Long anomaly field achromatic objective (glass without cover) PL L60X/0.75 (spring)
Eyepiece tube	Triocular, tilted 30°, (built-in polarizer, can be switched)
Episcopic illumination system	6V 20W halogen lamp with adjustable brightness Fall illuminator with field light bar, aperture light bar, polarizer, (yellow, blue, green) color filter and frosted glass
Focusing mechanism	Coarse-adjustable coaxial focusing, coarse-adjustable cell value :2μm, coarse-adjustable elastic, with locking and limiting device
Converter	Four holes (inward ball positioning)
Stage	Double-layer mechanical mobile (size :185mmX140mm, moving range :75mmX50mm)

Application Cases

Example 1: Hyperspectral detection of gastric cancer tissue



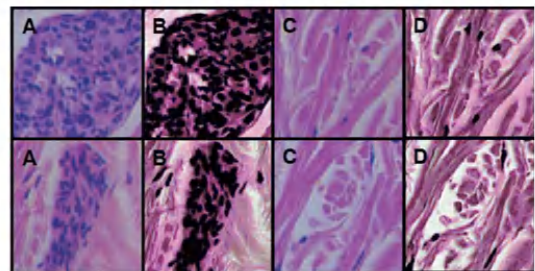
△ Gastric cancer tissue markers and gastric cancer cell markers

△ Comparison of spectral derivatives between gastric cancer tissue and normal tissue

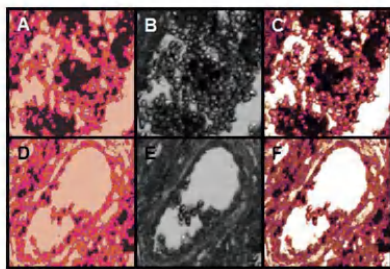
Example 2: Virtual staining of pathological sections based on hyperspectral technology



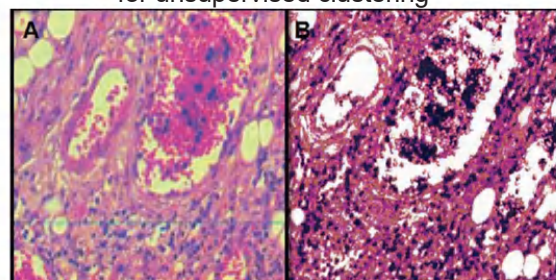
Hyperspectral pseudocolor images of unstained sections



Hyperspectral virtual staining results for unsupervised clustering



Hyperspectral virtual staining results of unsupervised clustering combined with spectral images



Comparison of hyperspectral virtual staining results and H-E staining

Accessories Introduction

Accessories Description	Quantity	Accessories Description	Quantity
Host	1	USB3.0 data cable	1
Standard lens	1	USB flash disk	1
Certificate of Conformity & Warranty Card	1	Packing List	1
Charger	1	Black aluminum alloy box	1
Outer packaging carton	1	Ziplock Bags	1
Reflectivity calibration plate 10*10cm	1	"This side is facing up, please do not turn it upside down;please do not drop this precision instrument."	1