



Innovative 5G WiFi (11ac) Interactive Microscope Classroom System

Install in minutes / Multiple operation systems supported / Free of tedious infrastructure

Support rapid digitization of pure optical trinocular microscope

Optical Embedded (built-in) Solution



Example of 5G WiFi (11ac) Microscope Classrooms



LOWER COLUMBIA COLLEGE



Training



- No.1 Classroom : 49 sets
- No.2 Classroom : 25 sets
- No.3 Classroom : 25 sets
- No.4 Classroom : 17sets



Example of 5G WiFi (11ac) Microscope Classrooms

1. CSCCP 2019 Cervical Cancer Cancer Training Course
2. CSCCP 2019 Cervical Cancer Cancer Training Course
3. Microscope interactive classroom of Changzhou Health Higher Vocational and Technical School
4. The 17th National Neuropathology Interpretation Symposium



System Overview

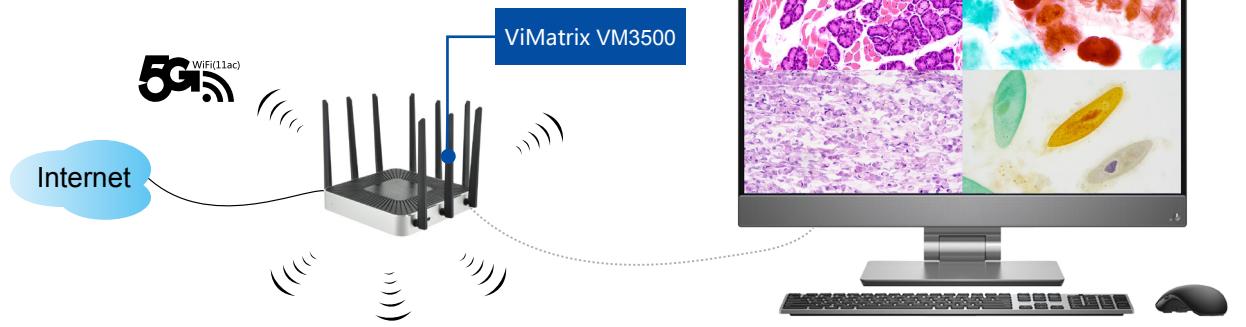
Smartphones, tablets, and laptops are the carriers of modern networked knowledge. 5G WiFi (11ac) Interactive Microscope Classroom System gives us a great sharing platform that liberates you from device or location and give you unlimited access and function to knowledge -making learning fun and engaging us in the 21st technology. Let's face it, everybody that has a smartphone /tablet are walking computers with access to data on moments notice via text or verbal commands. The future is here. It only takes a microscope, a WiFi camera and an App to let student / teacher collaboration meet anywhere. Where the students take this technology from here is the most exciting part.We have successfully integrated every microscope in the classroom with this new technology.

System advantages

- No tedious Infrastructure, efficient installation, plug and play.
- Not site restrictions, easy to move the system as you want.
- The modular camera structure designed for rapid upgrades in the future.
- Individual smart devices are involved into education activities and the efficiency of study is improved exponentially.
- Synchronous mixing supports three mainstream systems of Windows, iOS and Android.
- Self-built 5G WiFi LAN, high speed data transmission

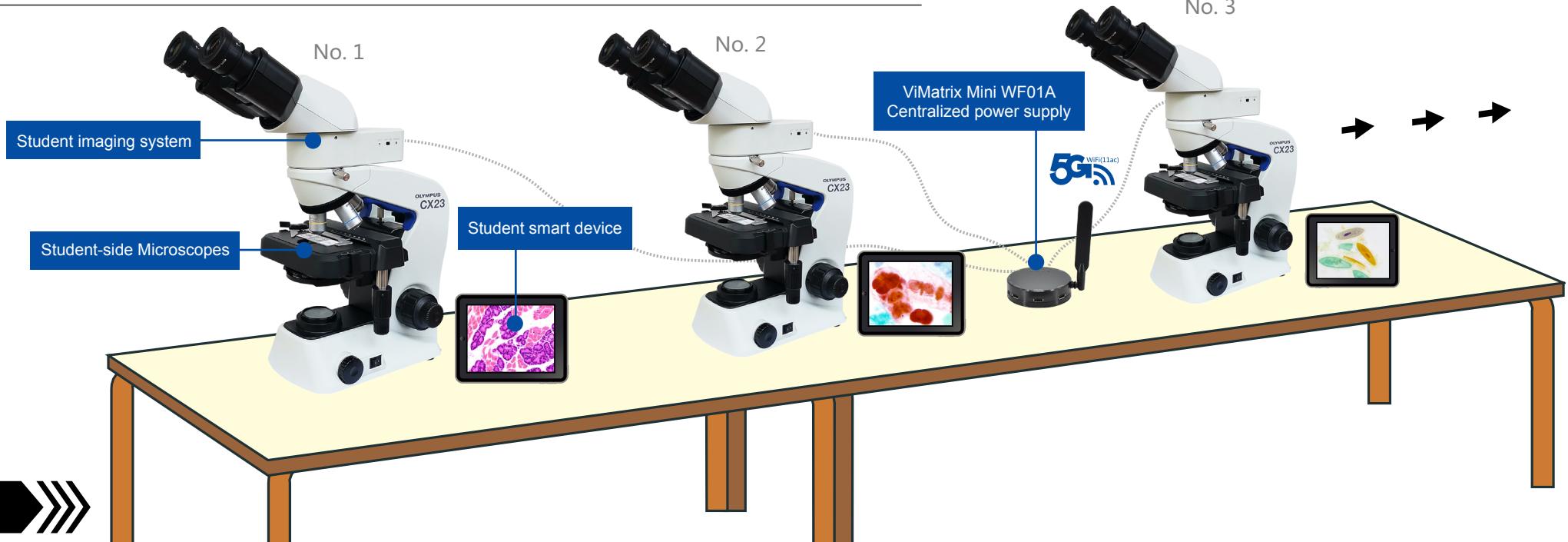
System layout

Master 5G WiFi (11ac) ViMatrix



Student-side

Real-time images under microscope are transmitted wirelessly to teacher-side computers and mobile mini PC via 5G WiFi (11ac) signals



System composition

Optical microscope		Teacher computer	 Recommend 
Optional 0.5x or 1x adapter		Software: Micro WiFi EDU When used on a PC, you need to install the interactive software Micro WiFi EDU which included in this System . 5G WiFi (11ac) supported tablet and smartphone (please bring yours or purchase with distributors)	
Camera for microscope		 APP: Micro WiFi EDU Scan provided QR code to download APP Micro WiFi EDU for iOS and Android smart devices	
Master 5G WiFi (11ac) ViMatrix VM3500		Projection The teacher side computer can use the projector for large-screen display, but also can use the lecturing mode of this system, real-time stream such as microscopic images, computer documents to the smart devices of students, so as to obtain high-quality teaching effect.	
Student side Vimatrix Mini		Audio system Teachers and students can do one-to-one voice communication; to ensure audio quality, dedicated high-quality microphone for teachers is provided by designated agents; students can use their own headphones.	
		Classroom requirements Student desks requirements: please provide enough physical space to the student microscope and Vimatrix Mini, 3 student microscope cameras share one Vimatrix Mini. It is recommended that three student cameras have a physical distance of less than 2 meters . Two mains outlets should available (rated output voltage is AC 100-240V).	

Olympus optical microscope

Bring stability
into classrooms



- Ergonomic grips add safety when retrieving the microscope from high places.
- Colored grips indicate the appropriate places to hold the microscope.
- Smooth, rounded design eliminates sharp edges.
- The CX23 microscope is one of the lightest in its class, with a total weight of approx. 5.9 kg (13.01 lbs).

1



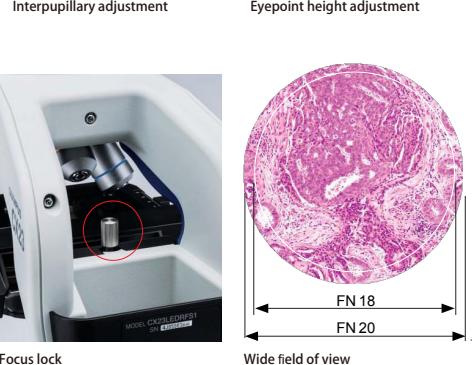
Convenient and easily accessible power cable storage



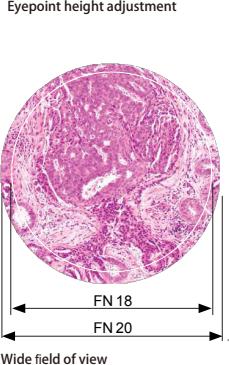
Locking pin for easy binocular rotation

- A locking pin keeps the observation tube in place.
- Interpupillary adjustments, ranging from 48 to 75 mm, enables individual users to set it to their needs.
- Eyepoint adjustments accommodate the user's height and provide greater comfort.
- Left and right diopter adjustment enable optimal focus for each eye.

3



Interpupillary adjustment



Eyepoint height adjustment

- The focus lock helps prevent the objectives from damaging the specimen.
- Field number (FN) of 20 provides a wide field of view.
- The CX23 microscope features plan achromat objectives that preserve outstanding image flatness throughout the field of view.
- The energy saving LED light source provides a long operation lifetime of 20,000 hours.
- Daylight balanced LED illumination preserves the vivid colors on HE-stained samples.

5



Angled arm enables comfortable carrying

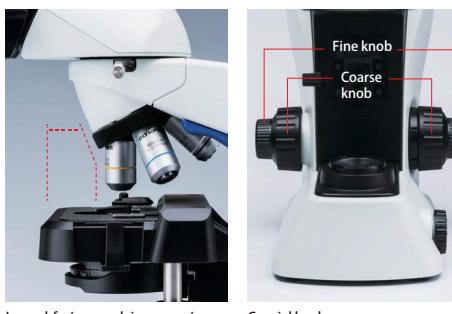
Ergonomic grip for easy carrying



Fixed eyepieces



Rackless stage and stage cover



Inward-facing revolving nosepiece

Fine knob

Coarse knob

Coaxial knobs

- A locking pin keeps the observation tube in place.
- Interpupillary adjustments, ranging from 48 to 75 mm, enables individual users to set it to their needs.
- Eyepoint adjustments accommodate the user's height and provide greater comfort.
- Left and right diopter adjustment enable optimal focus for each eye.

2



- An inward-facing rotating nosepiece facilitates a larger working area above the stage, enabling easier operation and specimen exchange or making it easier to apply oil to immersion objectives.

- Objectives with long working distances provide clearance for thick samples and slides.
- Bring specimens into focus quickly by using the coaxial knobs for fine or coarse adjustments. The microscope is built for durability and precise control, whether accessed from the left or right side.
- A torque release function helps prevent damage if excess force is applied to the coarse focusing knob or stage knob.

4

- A storage compartment on the back of the CX23 microscope makes it easy to stow the power cable after use.
- Protect your investment with an optional custom designed wooden case.
- When the CX23 microscope needs to be left unattended, a built-in security slot enables attachment of an anti-theft cable.

6



Student imaging system

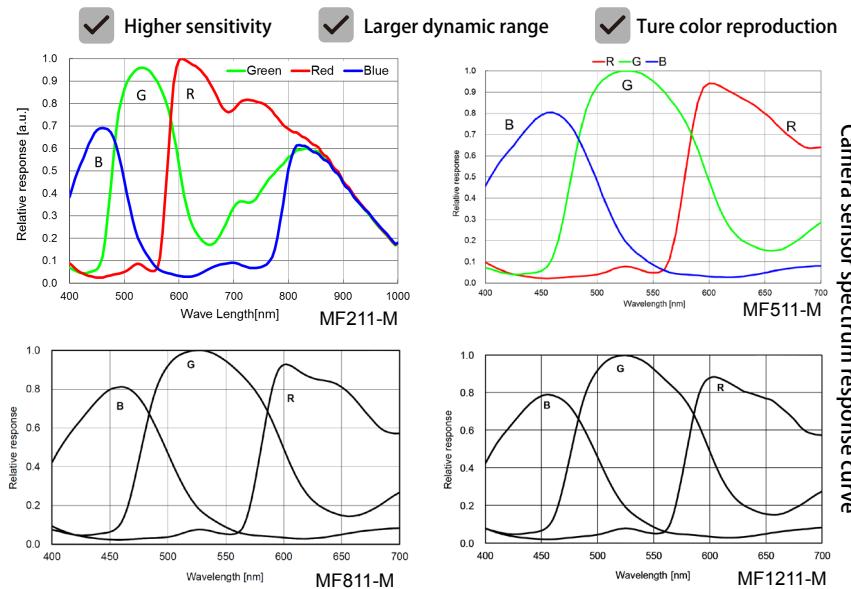


SONY
Color CMOS

- Optical embedded integrated design, does not destroy the original optical system.
- 5/5 spectrophotometry meets the requirement of simultaneous viewing with naked eye and digital camera.
- Built-in focal reducer to achieve a large field of view.
- Imaging modular design, easy to upgrade higher pixels in the future.
- Using Sony chip SONY IMX series CMOS color sensor for higher sensitivity, greater dynamic range and more realistic color reproduction.
- Only set the power switch and signal indicator to prevent students from misuse. Powered by the mini video matrix, plug and play, safe and reliable
- Simple and precise focusing method to achieve Synchronous focus between ocular and electronic imaging.
- Effective static, dynamic pixels real synchronization, no pixel interpolation.

Optional resolution:

- 2.0MP MF211-M 5.0MP MF511-M 8.0MP MF811-M 12.0MP MF1211-M



Master 5G WiFi (11ac) ViMatrix VM3500

The unique ViMatrix controls all cameras, and the teacher-side PC has all administrator rights of the system.

 9 strong signal antennas, can cover the diameter of up to 50 meters of spherical environment, to meet the requirements of teaching activities.

 Ultra-strong core to ensure stable real-time image and data transmission.

 Provides 1 WAN to support Internet connection and 4 LAN ports available to connect with teacher's PC.

 Multi-terminal data synchronization and transmission, the maximum transmission rate can reach 2600Mbps @ 5G Hz.



Student side 5G WiFi (11ac) ViMatrix Mini

 One high gain single frequency external antenna.

 Friendly-designed three 5V 2A USB charging interface, available for students to charge their smart devices in the classroom.

 Three power ports for microscope camera .

 Three cameras share one ViMatrix Mini.



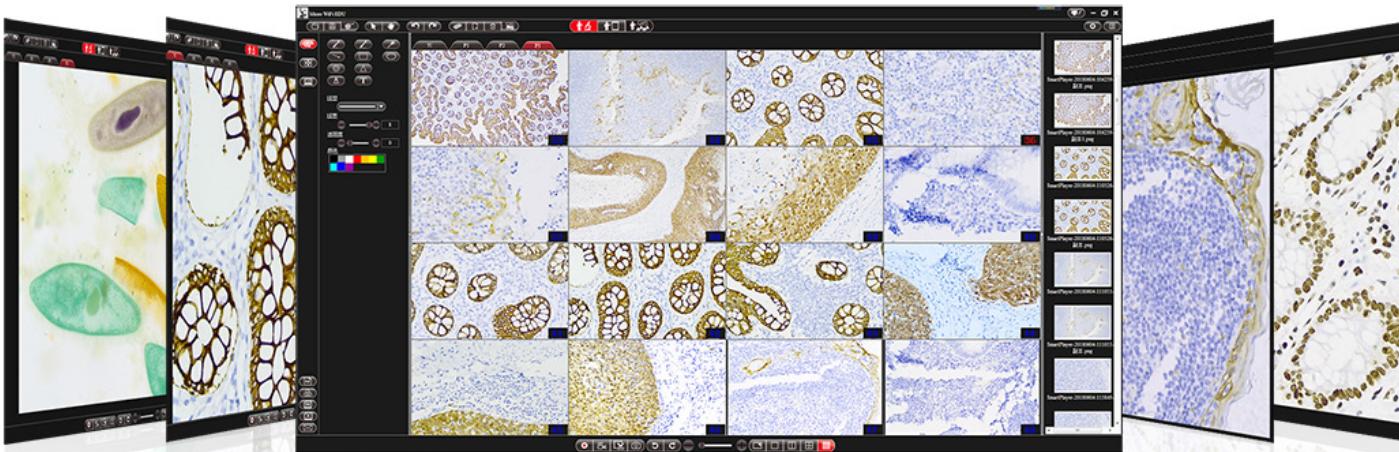
Optional accessories: Tablet bracket

- Made of aluminum alloy, strong and durable.
- Automatic hovering, stable and not shaking.
- Rotating shaft design, 360° adjustable Angle, convenient for multi-angle observation.
- Built-in anti-slip mat to fully protect the tablet.
- With screw fastening, it helps to prevent the tablet from falling off.



Teacher Interactive software Micro WiFi EDU

Six main interactive teaching methods allows arbitrary composition of use



Lecturing mode



The teacher PC screen or the selected student smart device screen is streamed to all student smart devices synchronously.



Lecture materials such as PPT/ WORD/ EXCEL are displayed on the smart device of students in real time to enrich the teaching content.



The operation process of the teacher PC or the selected student smart device is displayed to all student smart devices synchronously.

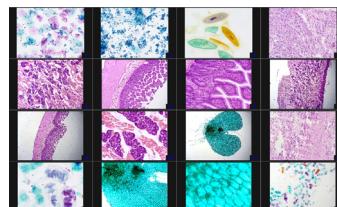
Demonstrate student works

Live-demo the selected camera video to the entire student smart devices.



Monitor live-image under microscope camera

Teachers can easily capture all camera live-image, confirming that all cameras are connected successfully.



Annotate student works

Annotate and edit selected images and documents, and send the operation process to all student smart devices in real time.



- User-friendly interface with icons, easy to identify and quickly use.

- Each function has been designed to be very accessible and helpful to education and research.

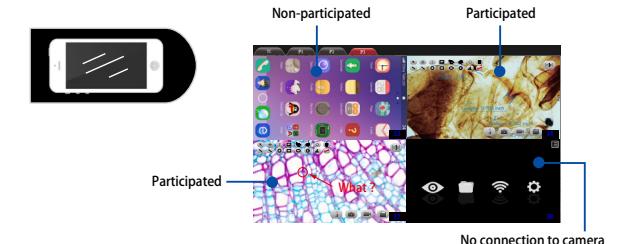
- Unique black background, eliminate miscellaneous light interference, improve microscope image recognition.

Scope of applications:

<input checked="" type="checkbox"/> Education teaching	<input checked="" type="checkbox"/> Cell Lab	<input checked="" type="checkbox"/> Pathological Studies
<input checked="" type="checkbox"/> Blood Science	<input checked="" type="checkbox"/> Parasite Science	<input checked="" type="checkbox"/> Microbiology
<input checked="" type="checkbox"/> Material analysis	<input checked="" type="checkbox"/> Environmental studies	<input checked="" type="checkbox"/> Food/Beverage Control
<input checked="" type="checkbox"/> General cytology such as agriculture, forestry, livestock		

Monitor smart devices screen

Real-time monitoring of all student smart devices screen to ensure that all students participate in learning. The students' annotations, measurements, and other operations in the APP are displayed on teacher's PC. The progress of the study can be checked at any time. The teacher can show the selected student smart devices screen to all students.



Multi-screen comparison teaching

- Static picture comparison
- Dynamic Video comparison
- Static vs. dynamic mixing comparison
- Support for cross-window annotating
- Support teacher-to-peer comparison with selected students

Teacher interactive software Micro WiFi EDU

Interactive shortcuts

Multi-page camera monitoring window, capturing the teacher-side image and all student-side real-time image simultaneously.

Take picture, record, screen-capture, screen-record for single or multiple student-side images.

Smart settings for camera : restore all camera default parameters; Restore all camera default names; Disable parameters adjustment on all smart devices. Modify the camera name; restore the current camera default name.

The teacher receives students' voice and answers one-on-one questions.

Delete all documents with one click and reset the system with one click (convenient for next class teachers and students).

Smart devices black and white list management: delete all white list and blacklist; allow Smart devices authorization message popup; The smartdevice is authorized to join into the system in order. Check all authorized samart devices list.

23 measurement tools to meet basic teaching requirements.



Student smart device APP Micro WiFi EDU

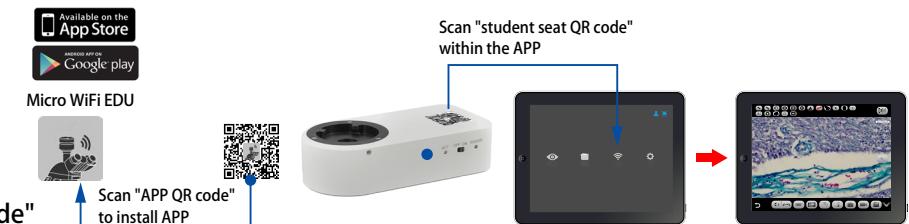
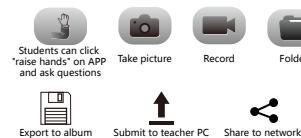


Scan supplied "student seat QR code" to access micro image directly.

Take photos / videos and record important content in real time.

Annotate, measure, doodle, add pictures, improve learning efficiency.

Tool bar



The student smart devices and the teacher-side PC can send each other voice realizes individual counseling.

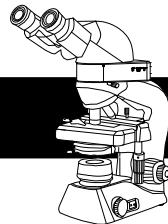
Generates learning / research reports within student APP easily and can sent to teacher's email immediately.

Annotation tools

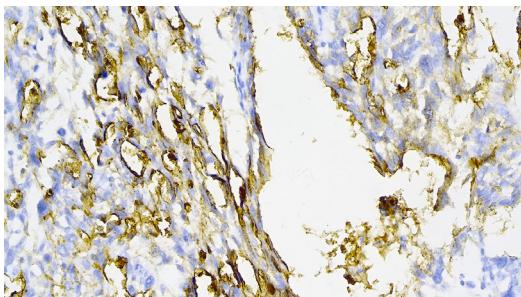


System Image Samples

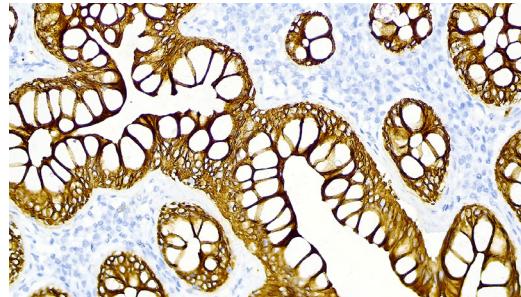
Taken by CX23 and camera MF811-M



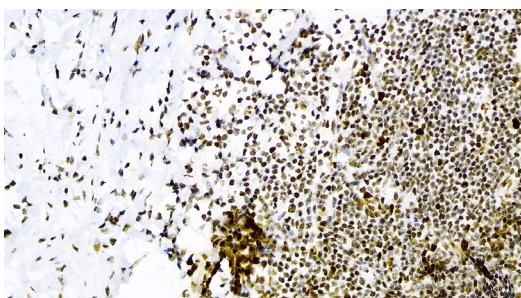
Immunohistochemistry



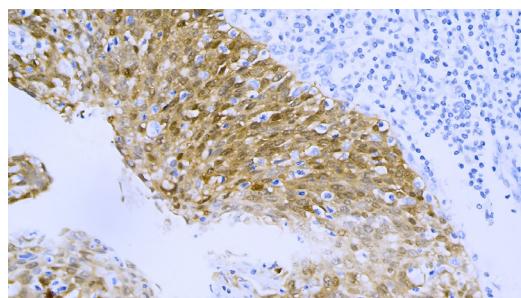
Ovarian cancer membranes 40X



Colon pulp 40X

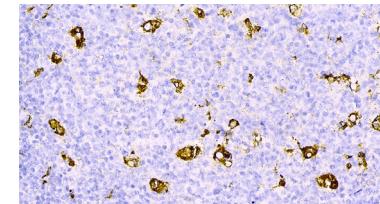


Appendix nucleus 40X

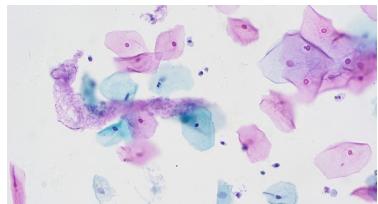


Cervical cancer nuclear slurry 40X

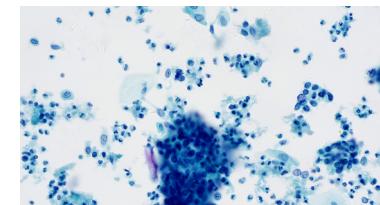
Pathological samples



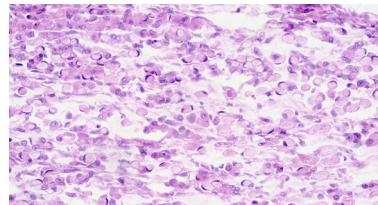
40X



40X

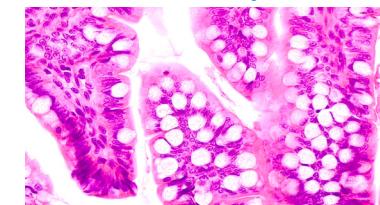


40X

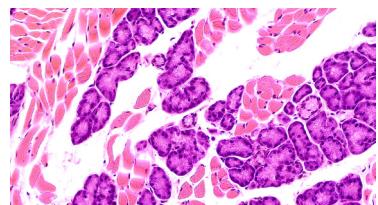


40X

Animals samples

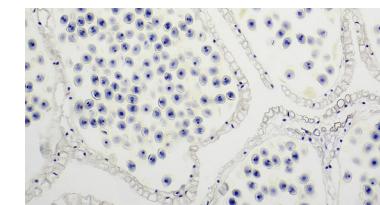


Canine ileum 40X

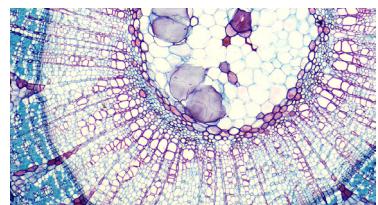


Dog taste buds 40X

Plant

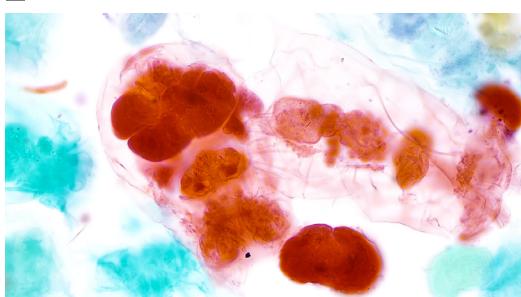


Pine young male cone longitudinal 10X



Lime tree stem cross 10X

Insect

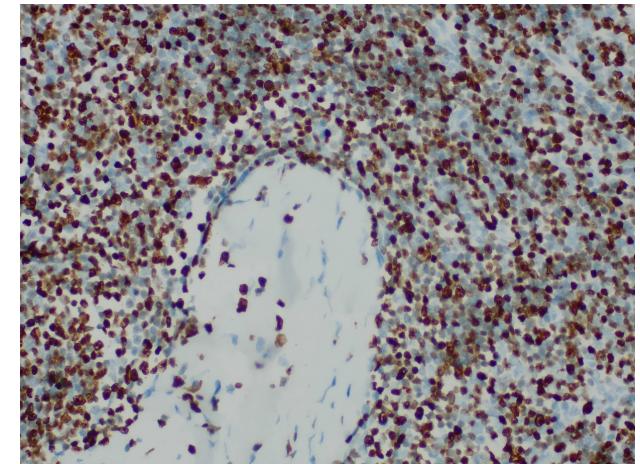
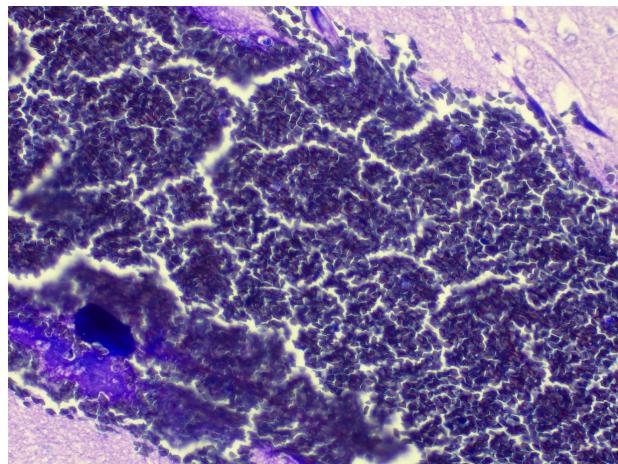
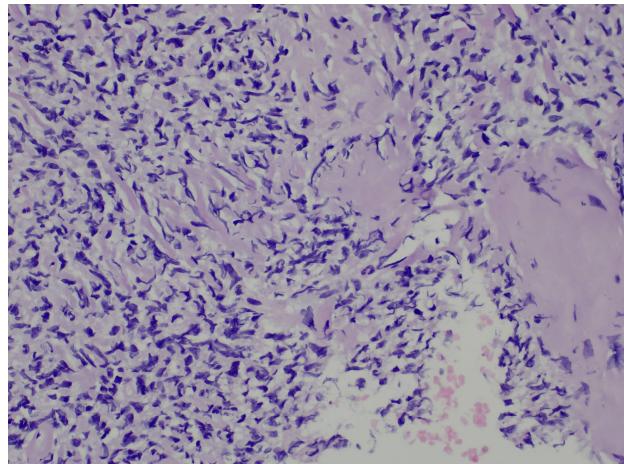
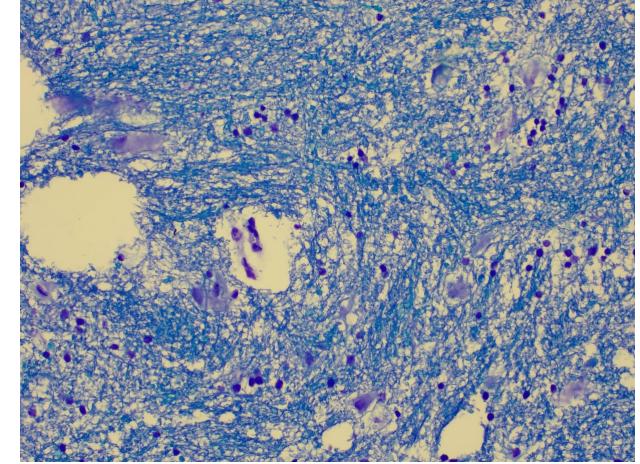
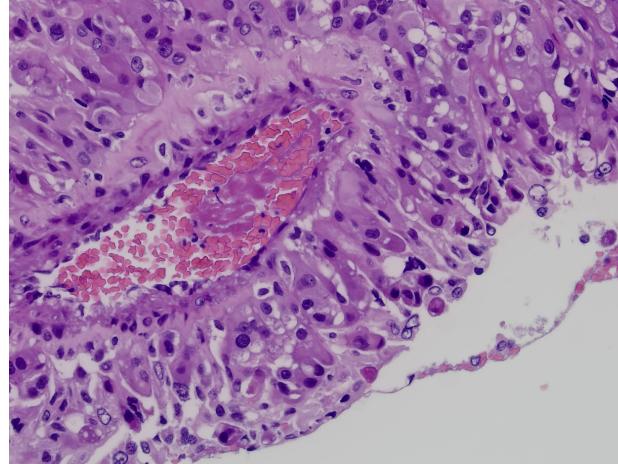
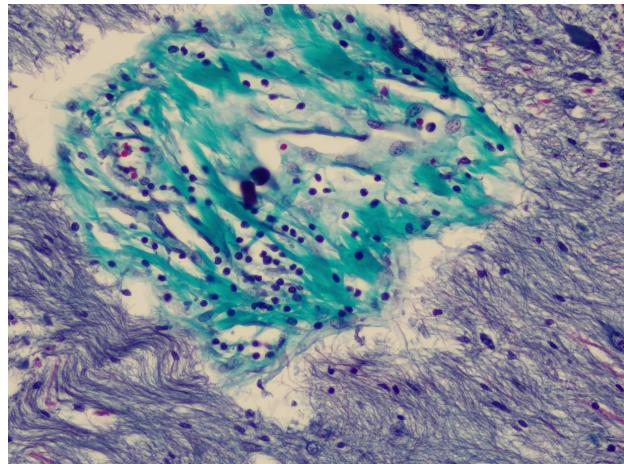


Wheel-worm 40X



Paramecium stons 40X

System Image Samples



Technical specifications

Microscope model	CX23
Body	gnirevoc citsalp evitcetorp ,emarf latem tsac-eid munimulA
Optical system	UIS2 optical system (Infinity optical system)
Illumination system	Built-in transmited illumination system, LED power consumption: 0.5 W (nominal value)
Focusing	Stage height movement (Coarse movement stroke:15mm) ,Coarse adjustment limit stopper • Torque adjustment for coarse adjustment knob • Fine focus knob (minimum adjutments gradations: 2.5 μ m)
Revolving nosepiece	Fixed quadruple nosepiece with inward tilt
Stage	egats dexif lacinahem tnemevom eriW Traveling range (X × Y): 76 mm × 30 mm, Specimen holder, Specimen position scale
Observation tube	Tube inclinatio 30° Interpupillary distance adjusting range: 48 - 75mm, Eyepoint adjustment: 370.0 - 432.9mm
Objectives	Plan Achromat, anti-fungal 4x NA: 0.10 W.D.: 27.8 mm 10x NA: 0.25 W.D.: 8.0 mm 40x NA: 0.65 W.D.: 0.6 mm 100xOil NA: 1.25 W.D.: 0.13 mm (CX23LEDRFS1 built-in)
Eyepiece(10x)	Field of view (FN): 20 (mildew-proof treatment)
Optional accessories	Reflector (CH20-mm), 15 X eyepiece (WHSZ15X-H: FN12, mildew-resistance treatment), Special wooden box, eyepiece micrometer, dark field diaphragm (CH2-DS+ CH2-FH)
Weight	Approximately 5.9 kg
Rated voltage/Electric current	AC100 ~ 240 V 50/60 Hz 0.4 A
Power consumption	Less than 2W

Student camera	MF211-M	MF511-M	MF811-M	MF1211-M
Teacher camera	MC211-W	MC511-W	MC811-W	MC1211-W
Resolution	2.0MP	5.0MP	8.0MP	12.0MP
Image sensor	SONY IMX291 CMOS	SONY IMX178 CMOS	SONY IMX274 CMOS	SONY IMX226 CMOS
Exposure mode	Rolling exposure	Rolling exposure	Rolling exposure	Rolling exposure
Maximum resolution	1920 x 1080 (2,073,600 Resolution)	2592 x 1944 (5,038,848 Resolution)	3840 x 2160 (8,294,400 Resolution)	4000x 3000 (12,000,000 Resolution)
Sensor size	1/2.8"	1/1.8"	1/2.5"	1/1.7"
Pixel size	2.9 μ m x 2.9 μ m	2.4 μ m x 2.4 μ m	1.62 μ m x 1.62 μ m	1.85 μ m x 1.85 μ m
Dynamic range	128dB	>80dB	>80dB	>80dB
Signal-to-noise ratio	30dB	≥ 50dB	≥ 50dB	≥ 50dB
Spectral response	380-650nm			
Exposure capability	Real-time automatic, single-time automatic, manual adjustment			
White balance	Real-time automatic, single-time automatic, manual R B separately adjusted			
Record format	Photo Picture format: JPG Resolution: 1920x1080 Video Video format: MOV Resolution: 1920X1080@50FPS(50Hz), 1920X1080@60FPS(60Hz), 1280x720@50FPS(50Hz), 1280x720@60FPS(60Hz)	Photo Picture format: JPG Resolution: 2592x1944 Video Video format: MOV Resolution: 2592X1944@30 FPS, 2560X1920@30 FPS, 2048x1536@30 FPS, 1920x1080@30 FPS	Photo Picture format: JPG Resolution: 3840x2160 Video Video format: MOV Resolution: 3840X2160@25 FPS, 2592X1944@25 FPS, 2048x1536@25 FPS	Photo Picture format: JPG Resolution: 4000x3000 Video Video format: MOV Resolution: 4000X3000@15 FPS, 4096X2160@25 FPS, 3840x2160@25 FPS, 2592x1944@25 FPS

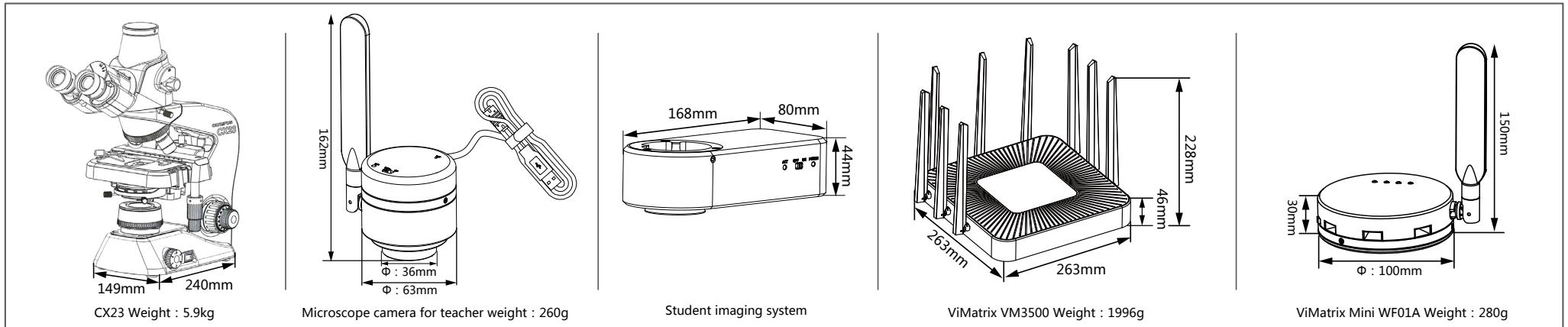
Master 5G WiFi (11ac) ViMatrix model	VM3500
Interface	4 x 10/100/1000BASE-T Ethernet RJ45 Interface 1 x 10/100/1000BASE-T Ethernet RJ45 Interface
Button	Power on/Off
Lights	Power Light, Status light
Antenna	9 high-gain single-band antennas
External power supply	AC100~240V/1.5A (Max)
Wireless parameters	
Protocol supported	5G WiFi IEEE802.11ac
Frequency	5.180-5.825GHz
Signal rate	2600Mbps
Transport security	WPA/WPA2, WPA-PSK/WPA-PSK2 encryption
WAN type	Dynamic IP
Protocol	Supports IPv4 and IPv6

Student - side 5G WiFi (11ac) ViMatrix Mini model	WF01A
Interface	3 x 10/100BASE-T Ethernet RJ45 Interface
Button	Power on/Off
Lights	Power Light, Status light
Antenna	1 high-gain single-band antennas
External power supply	DC12V 5A
Wireless parameters	
Protocol supported	5G WiFi IEEE802.11ac
Frequency	5.180-5.825GHz
Signal rate	450Mbps
Transport security	WPA/WPA2, WPA-PSK/WPA-PSK2 encryption
Protocol	Supports IPv4 and IPv6

Software operating requirements	
	Microsoft® Windows® 7 / 8 / 8.1/10(32 & 64 bit)
System requirements	CPU: Intel i5 Quad-core 3.0GHz or better (for 2.0MP /5.0MP/8.0MP) Intel i7 Quad-core 3.6GHz or better (for 12.0MP)
	Memory: 8G or above
	At least 10GB of available hard disk space
	Wireless network card(Support 5G WiFi IEEE802.11ac)
iOS requirements	iPhone X / 8 Plus/7/ 7 Plus/6s/6s Plus/ 6/ 6 Plus iPad Pro(12.9 inches,2nd Generation)/(12.9 inches,1st Generation)/(10.5 inches)/(9.7 inches) iPad Air 2/iPad mini 4 and other new devices that support the 5G WiFi (11ac) protocol
	iOS11.0 and later system
Android requirements	Android 5.0 and later system
	CPU: Dual core 1.7GHz and later
	Memory RAM:2G or more
	Storage ROM: 8G or more recommended

*Please confirm smart devices hardware must support 5G WiFi (11ac) protocol, otherwise it will not acquire image under microscope camera properly.

Dimensions



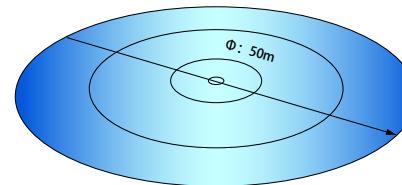
About 5G WiFi (11ac)



5G WiFi (11ac) advantages over 2.4G WiFi

2.4G	5G WiFi(11ac)
Slow network speed, easy to be congested 1. Less channels: The 11n protocol supports a maximum of 14 channels. 2. Channel bandwidth is narrow: The transmission bandwidth of each channel reaches to only 20M. 3. Transmission speed is slow: Through the existing technology is difficult to achieve high transmission speed. Current normal maximum transfer speed is only 300Mbps.	Have a faster network and solve congestion 1. More channels: The 11ac protocol supports more than 100 channels. 2. Larger channel bandwidth: The transmission bandwidth of each channel reaches up to 80M. 3. Higher transmission speed: MU-MIMO technology is very convenient to achieve a transmission speed of 2600Mbps, or even higher.
Poor signal quality and heavy interference At present, the 2.4GHz band WiFi network is not only used on mobile phones, tablets, laptops, etc., but also various mobile devices such as handheld game consoles, bluetooth mouse/keyboard, bluetooth headsets, and microwave ovens. A large number of devices accumulated in a small frequency band and easily interfere with each other.	Better signal quality, less interference The 5G WiFi (11ac) band is less used and radio interference is greatly reduced, signal quality is greatly improved.

5G WiFi (11ac) supports more channel bands and has a faster network. The 5G WiFi (11ac) ViMatrix has a maximum transmission rate of 2,600 Mbps, easily covering a spherical range of 50 meters in diameter, and is suitable for teaching activities.



Difference between 5G communication and 5G WiFi (11ac)



5G communication refers to the fifth generation mobile communication technology, referred to as: 5G, which is an extension after 4G, and its working frequency is 3.5GHz. 5G WiFi (11ac) refers to the fifth generation WiFi transmission technology, referred to as: 5G WiFi. WiFi technology working in the 5.180-5.825 GHz band. The way they are implemented is completely different from the purpose. 5G communication is used for telephone calls, SMS communication, and mobile Internet access. The 5G WiFi (11ac) is used for large-scale and high-speed video and image transmission in small areas.



Authoritative attestation

The interactive system is fully authorized to certify by the third-party certification company SGS and obtain the following certificates:

1. Comply with FCC certification of The US Federal Communication Commission.
2. Comply with European (standard) safety CE certification.
3. Comply with the MIC certification issued by the Ministry of Internal Affairs and Communications of Japan (Electric Wave Method and Electro-Optical Communication Business Law).
4. Comply with JATE certification of Japanese telecommunications law directive.
5. Complies with the "Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS) Directives in accordance with EU legislation.

Background of the third-party certification company SGS: SGS is the world's leading inspection, verification, testing and certification company. It is recognized as the global benchmark for quality and integrity. SGS-CSTC Standard Technical Service Co., Ltd. is a joint venture company established in 1991 by Swiss SGS Group and China Standard Technology Development Corporation affiliated to the former State Bureau of Quality and Technical Supervision. The meaning of the first word of "General Public Notary" and "Standard Measurement Bureau" was adopted. SGS has set up more than 50 branches and dozens of laboratories in China with more than 12,000 highly trained professionals.

Evaluation object	Certification	Certificate File Name & Report	Certificate number & corresponding report number
WF01A (5G WiFi 11ac module) ---SGS Certification	US FCC Report	SZEM180100024801-5G wifi RPT-WF01A FCC Report	SZEM180100024801
		SZEM180100024802-RF-WF01A FCC Report	SZEM180100024802
		Appendix A - Photographs of EUT Constructional Details for SZEM1801000248CR-FCC	SZEM1801000248CR
	US FCC ID Certification	2AFO3WF01A_NII---WF01A FCC ID	2AFO3WF01A
		SZEM180100024901 EN301489 RPT-WF01A CE Report	SZEM180100024901
	EU CE report	SZEM180100024902 WIFI5G RPT-WF01A CE Report	SZEM180100024902
		CSRT180084-WF01A Japanese MIC Certification	SZEM1801000250CR
The interactive system ---SGS Certification	Japanese JATE Certification	CSTT180018-WF01A Japanese JATE Certification	CSTT180018
	US FCC Report	GZEM1904012105-MC500W-G1 FCC Certification	GZEM1904012105CRV
		GZEM1904011889CRV-MC500W-G1 CE Certification	GZEM1904011889CRV



High-Tech Enterprise certificate
number: GR20174400114



ISO9001 Verification No:
00217Q26901R1S



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