

Touptek Microscope - USB-Camera E3ISPM C-Mount - USB 3.0 - CMOS-Camera

E3ISPM adopt SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the transfer interface.

E3ISPM hardware resolutions range from 3.1M to 20M and come with the integrated CNC aluminum alloy compact housing. E3ISPM integrated with 12 bit Ultra-fine™ Hardware Image Signal Processor Video Pipeline (Ultra-fine™ HISP VP) for Demosaic, Adjustments, Automatic Exposition, Gain Adjustment, One Push White Balance, Chrominance Adjustment, Saturation Adjustment, Gamma Correction, Luminance Adjustment, Contrast Adjustment, Bayer and finally form RAW data for 8/12 bit output. This will move the heavier burden of the processing from the PC to the Ultra-fine™ HISP VP and greatly accelerating the processing speed.

E3ISPM comes with advanced video & image processing application ToupView; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, DirectShow, Twain Control API;

The E3ISPM can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate..



The cameras are available in price valued version C with rolling shutter and in professional version GS (global shutter) which is perfect for stitching images and Live-EDF function.

The basic characteristic of E3ISPM cameras are as follows:

- SONY Exmor, Exmor R(Back-illuminated), Exmor RS CMOS sensor with USB3.0 interface;
- Real-time 8/12bit depth switch (depending on sensor)
- Ultra-fine™ HISP VP and USB3.0 5 Gbps interface ensuring high frame rates(Up to 15 frames for 20M Resolution)
- Super high sensitivity up to 1120mV (IMX264)
- Ultra low noise and low power dissipation by using column-parallel A/D conversion
- With hardware resolution among 3.1M to 20M
- Rolling Shutter or Global Shutter
- Standard C-Mount camera
- CNC aluminum alloy housing
- With advanced video & image processing application ToupView
- Providing Windows/Linux/Mac OS multiple platforms SDK
- Native C/C++, C#/VB.Net, DirectShow, Twain, LabView

Possible applications are:

- Scientific Research, Training, Academic Training;
- Darkfield microscopes
- Digital laboratories, medical laboratories and research
- Industrial development, printed circuit board, assembly, IC technology, surface treatment;
- Medical development, pathology, forensics
- Nutrition Science, Microbiology, Astronomy
- Aerospace, military, and many of the most advanced technological areas

This camera is also used by well-known manufacturers of scientific microscopes.

Available versions:

E3ISPM Series C-mount USB3.0 CMOS Camera with Hardware ISP and Video Pipeline

10.4.2 E3ISPM Datasheet (20)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
E3ISPM21000KPA IP121000A	21M/IMX269 (C) 4/3" (17.4x13.0)	3.3 x3.3	399mv with 1/30s 0.1mv with 1/30s	17@5280x3954 17@3952x3952 56@2640x1976 67@1760x1316 192@584x438	1x1 1x1 2x2 3x3 9x9	0.1ms~15s
E3ISPM20000KPA IP120000A	20M/IMX183(C) 1" (13.06x8.76)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	15@5440x3648 50@2736x1824 60@1824x1216	1x1 2x2 3x3	0.1ms~15s
E3ISPM18000KPA IP118000A(New)	18M/SONY Special(C) 1/2.2" (5.86x4.46)	1.2 x1.2	130mv with 1/30s 0.1mv with 1/30s	17@4880x3720 40@2448x1836 50@1728x1296	1x1 2x2 3x3	0.1ms~15s
E3ISPM15600KPA IP115600A(New)	15.6M/SONY Special (C) 1.1" (13.0x13.0)	3.3 x3.3	399mv with 1/30s 0.1mv with 1/30s	17@3952x3952 56@1976x1976 67@1316x1316	1x1 2x2 3x3	0.1ms~15s
E3ISPM12300KPA IP112300A(New)	12.3M/IMX304(C, GS) 1.1" (14.13x10.35)	3.45x3.45	1146mv with 1/30s 0.1mv with 1/30s	23.4@4096x3000 46.3@2048x1500	1x1 1x1	0.244ms~15s
E3ISPM12000KPA IP112000A	12M/IMX226(C) 1/1.7" (7.40x5.55)	1.85x1.85	280mv with 1/30s 0.1mv with 1/30s	25@4000x3000 50@2048x1080	1x1 2x2	0.1ms~15s
E3ISPM09000KPA IP109000A(New)	9.0M/IMX305(C, GS) 1" (14.13x7.45)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	34@4096x2160 60@2048x1080	1x1 1x1	0.1ms~15s
E3ISPM09000KPB IP109000B(New)	9.0M/IMX533(C) 1" (11.31x11.28)	3.76x3.76	535mv with 1/30s 0.04mv with 1/30s	40@3008x3000 123@1488x1500 186@992x998	1x1 2x2 3x3	0.1ms~15s
E3ISPM08300KPA IP108300A(New)	8.3M/IMX274(C) 1/2.5" (6.22x3.50)	1.62x1.62	236mv with 1/30s 0.1mv with 1/30s	32@3840x2160 65@1920x1080	1x1 2x2	0.244ms~15s
E3ISPM08300KPB IP108300B(New)	8.3M/IMX334(C) 1/1.8" (7.68x4.32)	2.0x2.0	505mv with 1/30s 0.1mv with 1/30s	35@3840x2160 60@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM08300KPC IP108300C(New)	8.3M/IMX485(C) 1/1.2" (11.14x6.26)	2.9x2.9	2188mv with 1/30s 0.15mv with 1/30s	45@3840x2160 70@1920x1080	1x1 2x2	0.02ms~15s
E3ISPM06300KPA IP106300A	6.3M/IMX178(C) 1/1.8" (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	30@3072 x2048 38@1536x 1024 @8 or 12bit	1x1 2x2	0.1ms~15s
E3ISPM06300KPB IP106300B(New)	6.3M/IMX178(C) 1/1.8" (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	59@3072 x2048 59@1536x 1024 @8 or 10 bit	1x1 2x2	0.02ms~15s
E3ISPM05000KPA IP105000A(New)	5.0M/IMX264(C, GS) 2/3" (8.45x7.07)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	35@2448x2048 50@1224x1024	1x1 1x1	0.1ms~15s
E3ISPM03100KPA IP103100A(New)	3.1M/IMX265(C, GS) 1/1.8" (7.07x5.30)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	53@2048x1536 85@1024x768	1x1 1x1	0.1ms~15s
E3ISPM03100KPB IP103100B	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	50@2048x1536 50@1920x1080	1x1 1x1	0.1ms~15s
E3ISPM02000KPA IP102000A(New)	2M/IMX385(C) 1/2" (7.2x4.05)	3.75x3.75	2350mv with 1/30s 0.15mv with 1/30s	125@1920x1080	1x1	0.1ms~15s
E3ISPM01500KPA IP101500A(New)	1.5M/IMX273(C, GS) 1/2.9" (4.968x3.726)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	164@1440x1080 320@720x540	1x1 2x2	0.1ms~15s
E3ISPM45000KPA IP145000A(New)	45M/SONY Special(C) 1.4" (18.93x13.00)	2.315x2.315	108mv with 1/30s 0.03mv with 1/30s	8.1@8176x5616 30.0@4088x2808 8.1@7408x5556 33.0@4088x2808 10.4@8176x4320 34.7@4096x2160 62.5@2048x1080 86.5@1360x720	1x1(3:2) 2x2(3:2) 1x1(4:3) 2x2(4:3) 1x1(17:9) 2x2(17:9) 3x3(17:9) 4x4(17:9)	0.1ms~15s
E3ISPM32000KPA IP132000A(New)	32M/SONY Special(C) 1.15" (12.96x12.96)	2.315x2.315	108mv with 1/30s 0.03mv with 1/30s	8.1@5600x5600 30.0@2800x2800 30.0@1400x1400	1x1 2x2 4x4	0.1ms~15s

C: Color; M: Monochrome; GS: Global Shutter 15901901534

Specifications:

Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-fine™ HISPVP /NA for Monochromatic Sensor
Capture/Control API	Native C/C++, C# /VB.Net,, DirectShow, Twain and Labview
Recording System	Still Picture and Movie
Cooling System*	Natural

Operating Environment

Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port

Software Environment

Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17" or Larger
	CD-ROM

Packing Information E3ISPM:

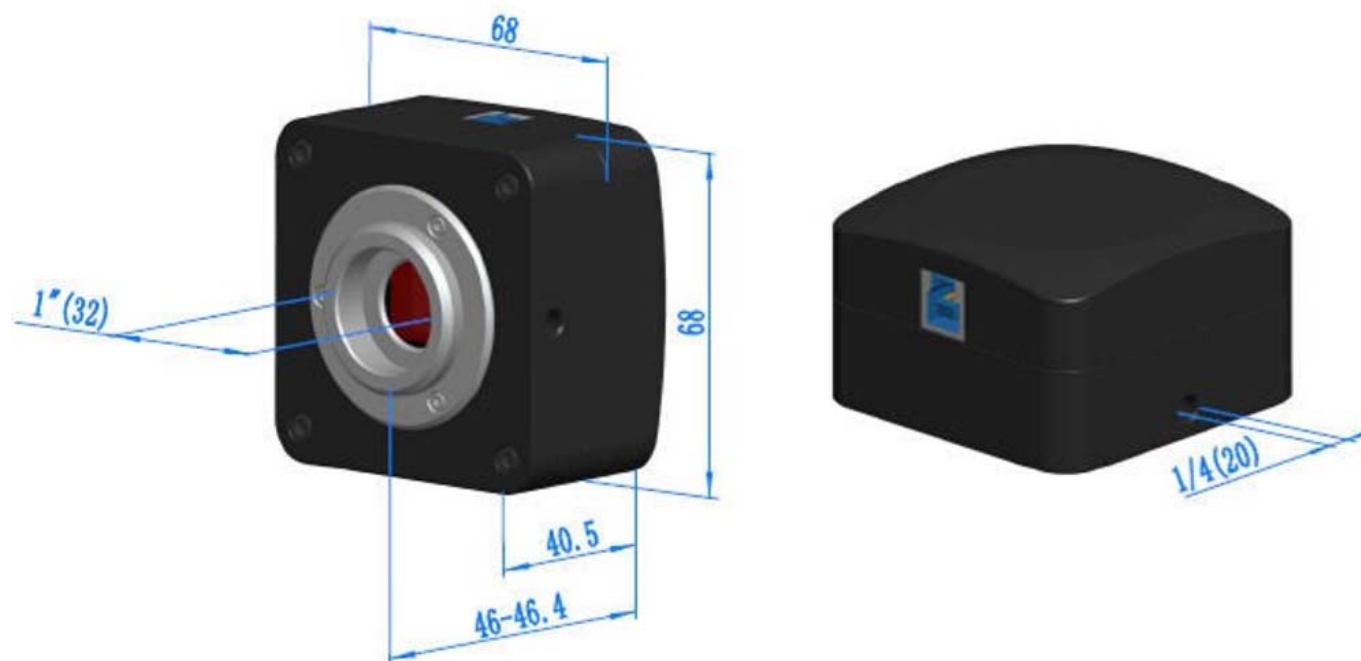


Standard Camera Packing List

A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)		
C	E3ISPM series USB3.0 C-mount CMOS camera		
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m		
E	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
F	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
G	Fixed lens Adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-Mount to Dia.31.75mm Eyepiece Tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;			
H	108015(Dia.23.2mm to 30.0mm Ring)/Adapter rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm Ring)/ Adapter rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
K	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

The E3ISPM body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.

Sizes:



Optional Adapters

Extension	Picture	
C-mount Camera		Machine vision; Medical imaging; Semiconductor equipment; Test instruments; Document scanners; 2D barcode readers; Web camera and security video; Microscope imaging;
Microscope Camera	 E3ISPM+AMAXXX(23.2mm Adapter)  E3ISPM+FMAXXX(23.2mm Adapter)	
Telescope Camera	 E3ISPM+ATAXXX(31.75mm Adapter)  E3ISPM+FTAXXX(31.75mm Adapter)	

About the E3CMOS06300KPA and IMX 178LQJ

E3SPM06300KPA uses IMX178LQJ sensor. The Sony IMX178LQJ sensor is a back-illuminated structure CMOS image sensor, supporting three formats of 4:3, 5:4, and 16:9 ratio with type 1/2 in 5M-effective pixel. Adopting back-illuminated structure with 2.4 μm unit pixel and 14 bit ADC, it provides all three advantages of high resolution, high sensitivity, and high dynamic range, which are necessary for security cameras. The sensor has the following characteristics:

- Back-illuminated structure 2.4 μm unit pixel
- 10 bit/12 bit/14 bit A/D converters
- Supporting type 1/2 5M effective pixels in 3 formats
- HLP (High Light Performance) mode
- LLP (Low Light Performance) mode
- Pin compatible with the existing product "IMX185LQJ"

High Sensitivity

To achieve high sensitivity, which is one of the most important characteristics for security cameras, this time Sony developed back-illuminated structure 2.4 μm unit pixel and accomplished the equivalent sensitivity as the existing back-illuminated structure 2.8 μm unit pixel, "IMX136LQJ"*2. Also near infrared sensitivity was improved from the IMX136LQJ, which is equivalent to the IMX236LQJ*3, and it is suitable for Day/Night cameras and near infrared LED used as auxiliary light.

High Dynamic Range

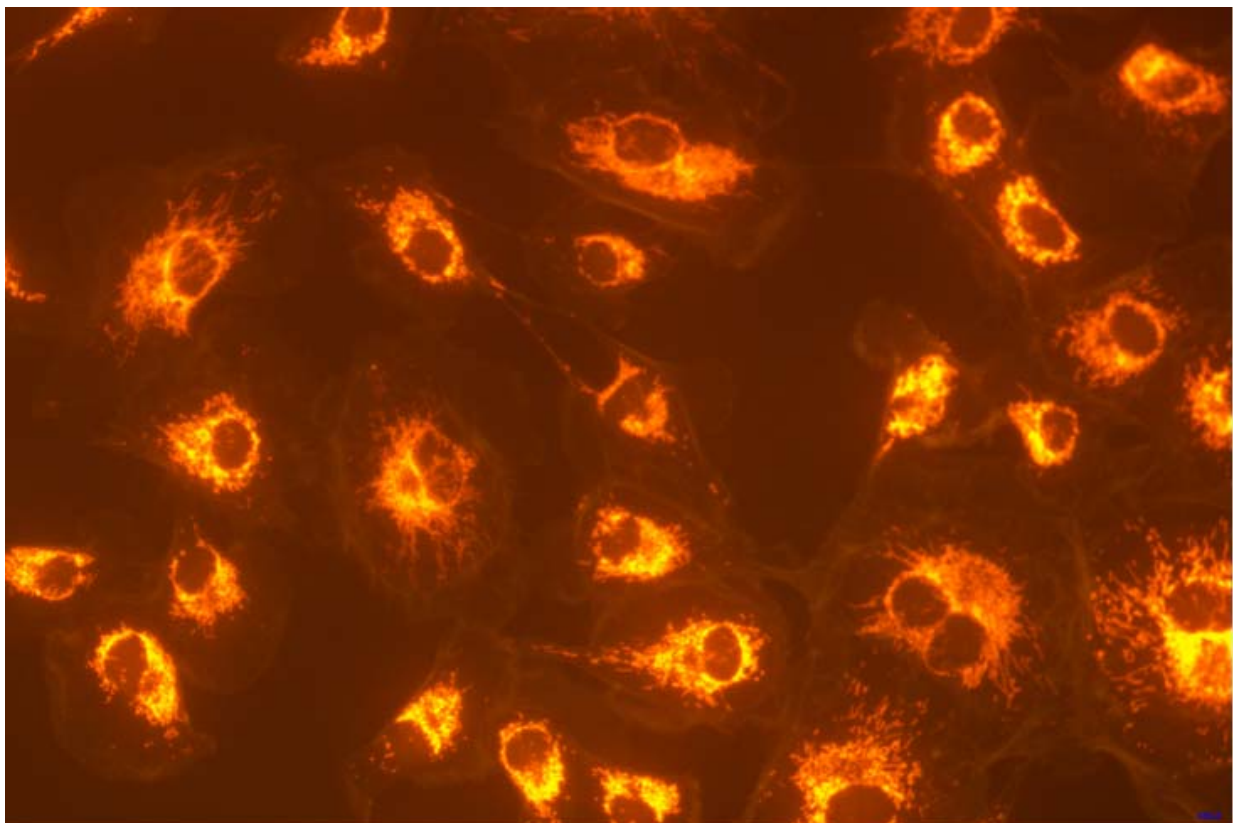
Dynamic range is determined by the ratio of saturation signal and dark random noise. The IMX178LQJ featuring 14 bit ADC reduced quantization noise and also suppressed dark random noise. As a result, high dynamic range was achieved, which is equivalent to the existing 3.75 μm unit pixel, the IMX104LQJ*4. It enables clear image quality in light and dark areas even for the objects with high contrast.

Image Format

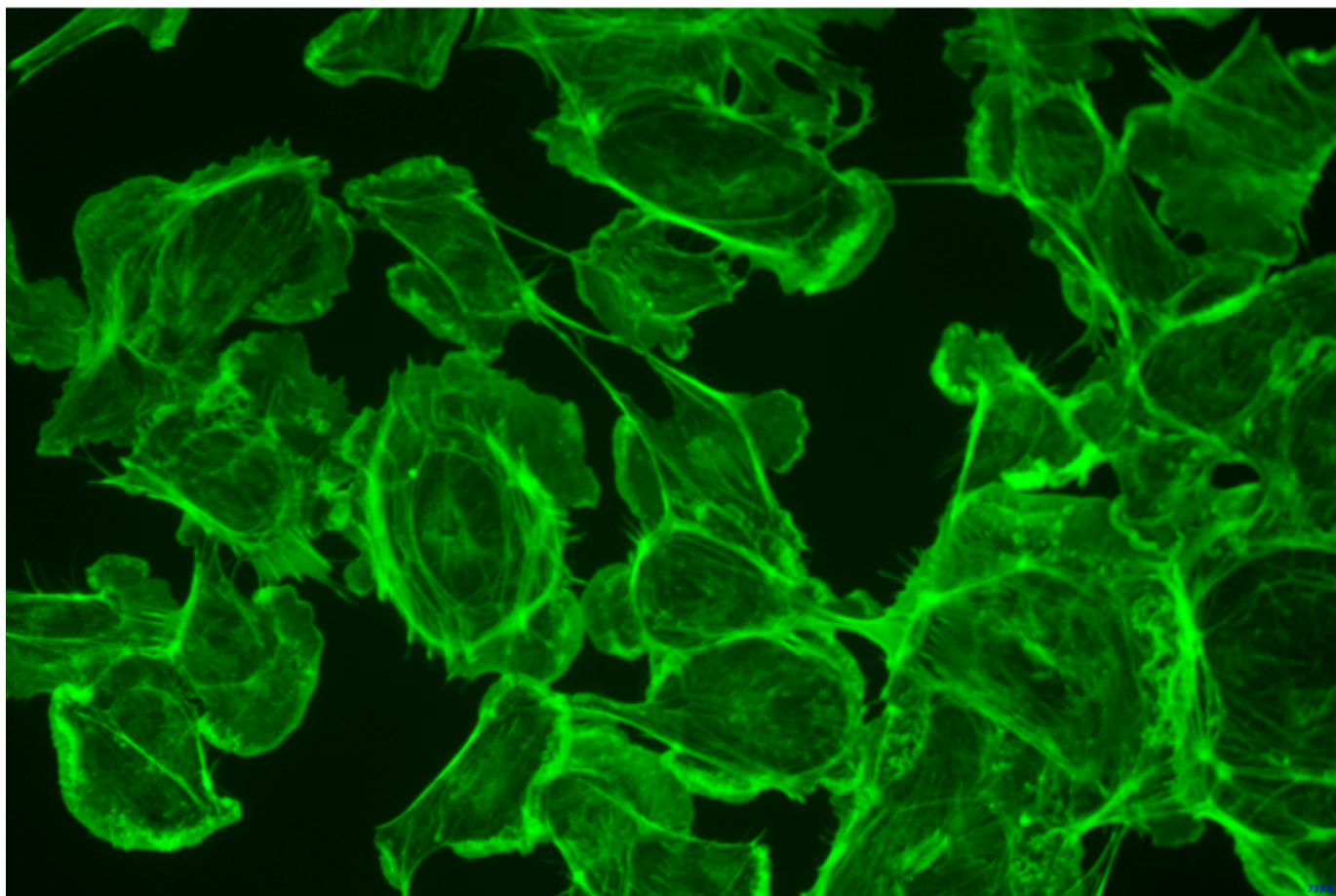
The format for image size of security camera is typically 4:3, 5:4 for fisheye lens, or 16:9 for full HD. The IMX178LQJ supports all these three formats in 5M pixels high resolution. Also it secures high resolution as well as high sensitivity and high dynamic range at the same time, therefore the specification works best for high performance security cameras with type 1/2 lenses.

Compatibility with Existing Sony Products

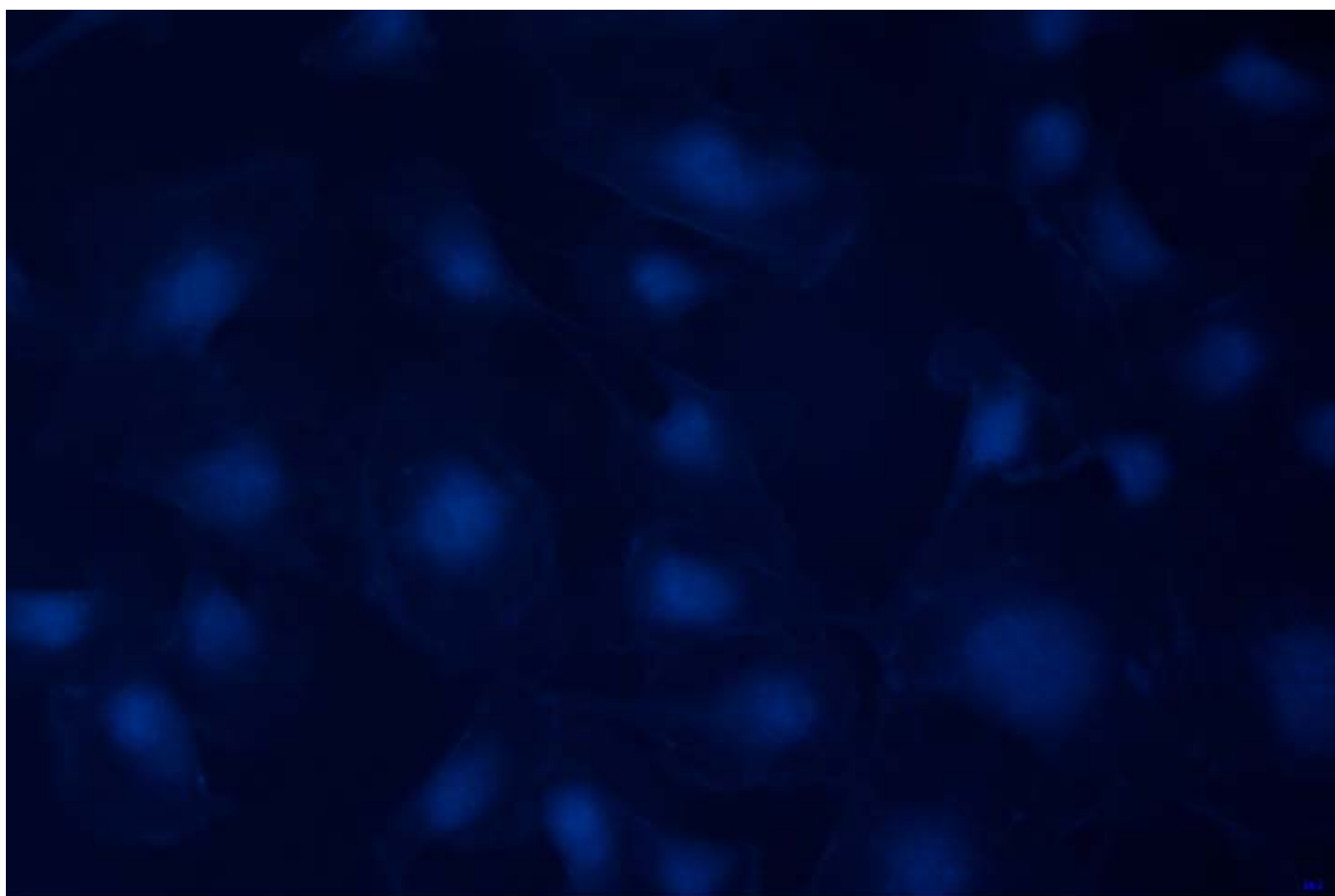
Sample images taken with E3CMOS06300KPA



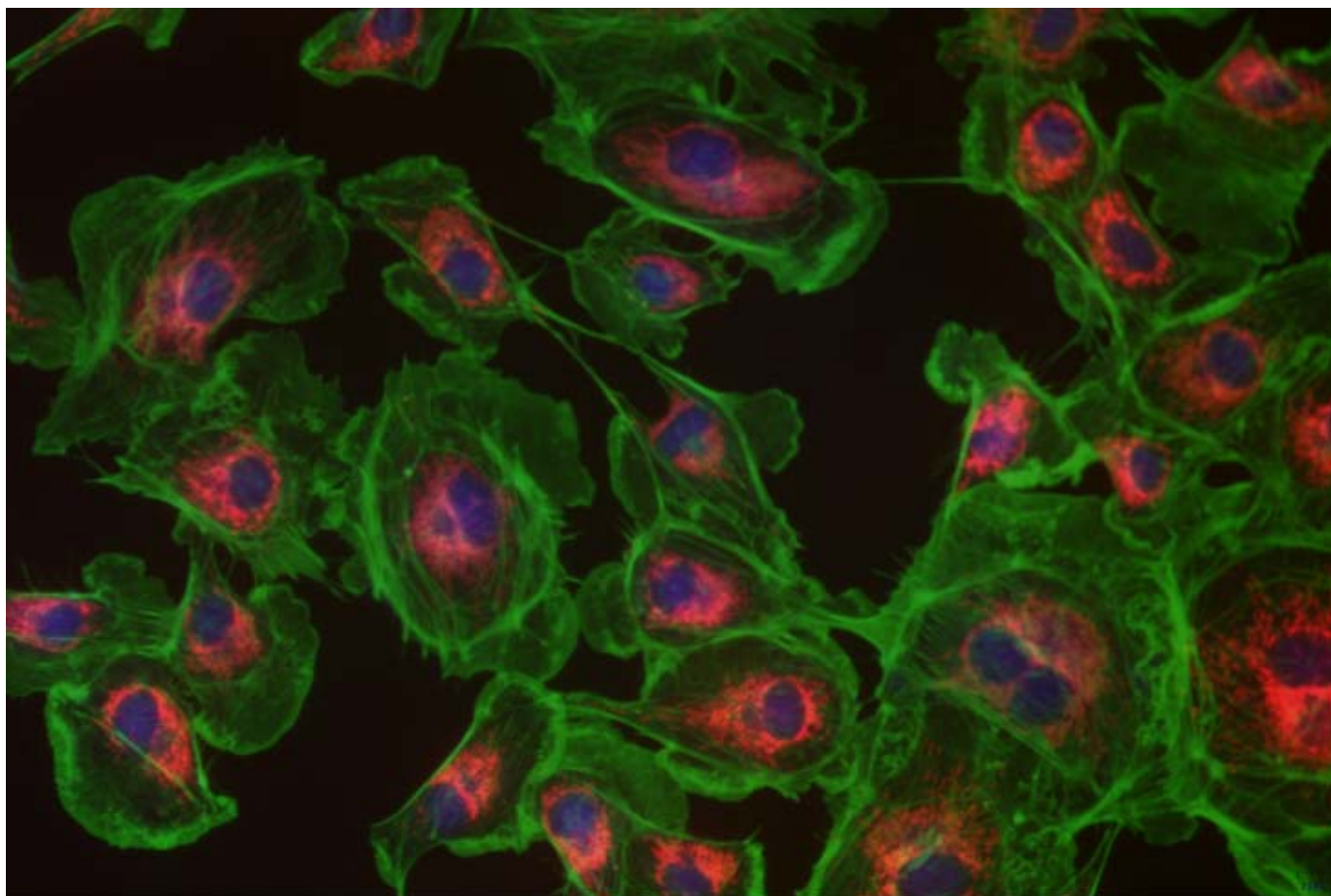
Red Fluorescent Image



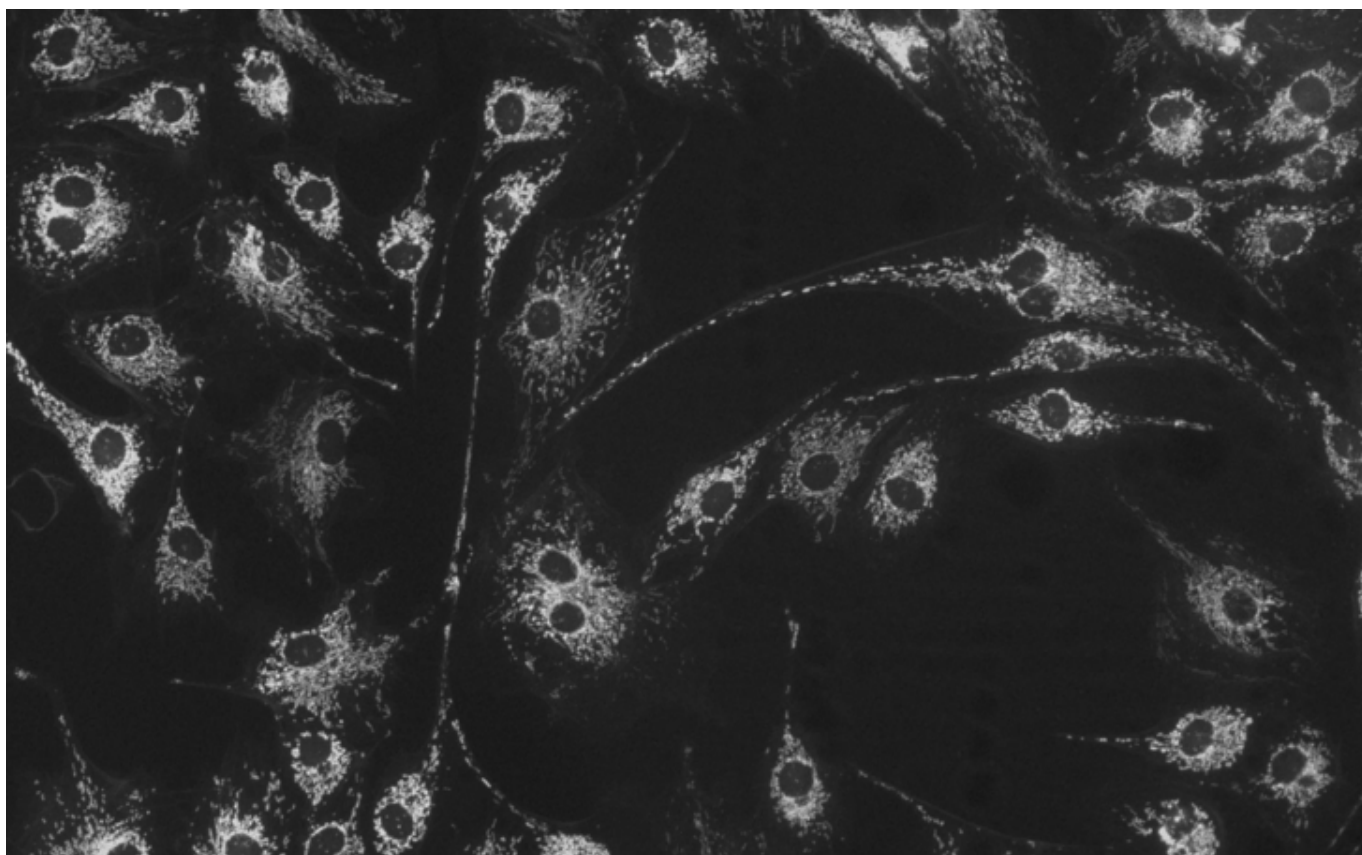
Green Fluorescent Image



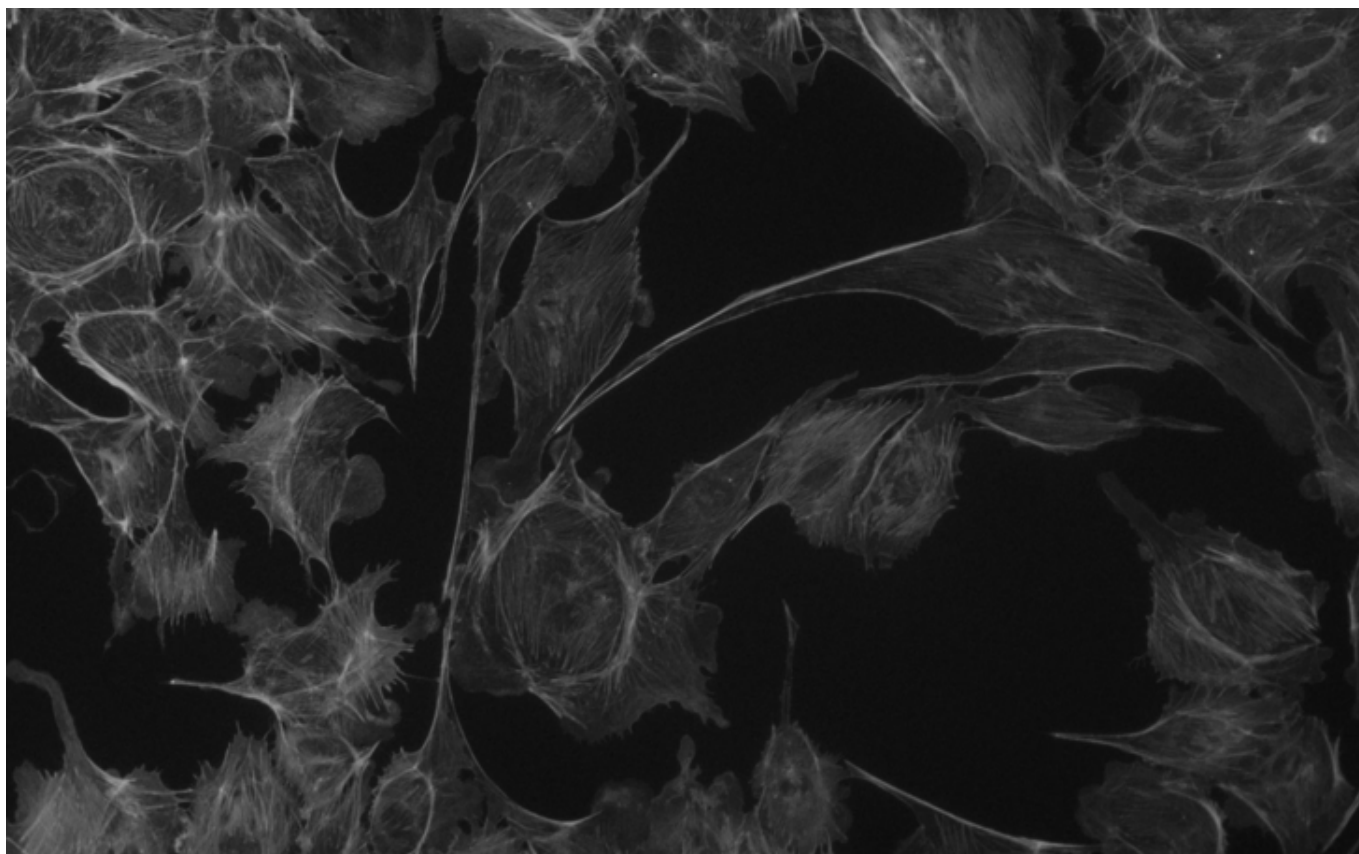
Blue Fluorescent Image



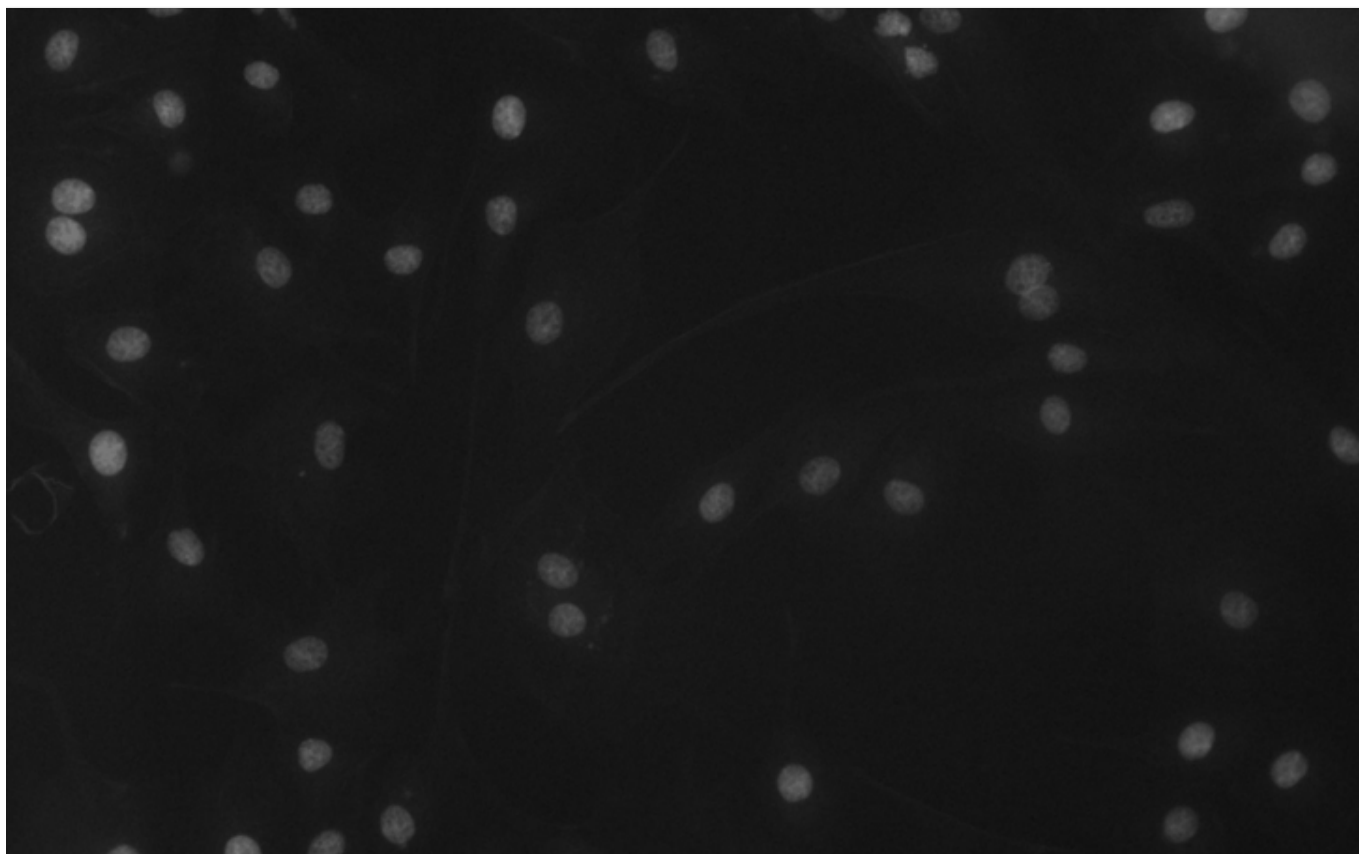
Fused Fluorescent Image



Red Fluorescent Image



Green Fluorescent Image



Blue Fluorescent Image

All images made by ToupTek

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