E3CMOS Basic Characteristic

E3CMOS adopt SONY Exmor CMOS sensor as the image-picking device and USB3.0 is used as the data transfer interface.

E3CMOS hardware resolutions range from 2.3M to 12M and come with the integrated CNC aluminum alloy compact housing.

E3CMOS comes with advanced video & image processing application ToupView; Providing Windows/Linux/ OSX multiple platforms SDK; Native C/C++, C#/VB.NET, Direct Show, Twain Control API;

TheE3CMOS can be widely used in bright field light environment and microscope image capture and analysis with higher frame rate.

The basic characteristic of E3CMOS cameras are as follows:

- SONY Exmor, Exmor R(Back-illuminated), Exmor RSCMOS sensor with USB3.0 interface;
- Real-time 8/12/14/16bit depth switch(depending on sensor);
- Super high sensitivity up to 1120mV(IMX185);
- Ultra low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution among 2.3M to 12M;
- Rolling Shutter or Global Shutter;
- Standard C-Mount camera;
- CNC aluminum alloy housing;
- USB3.0 5 Gbps interface ensuring high frame rates;
- With advanced video & image processing application ToupView;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain, LabView

Sizes
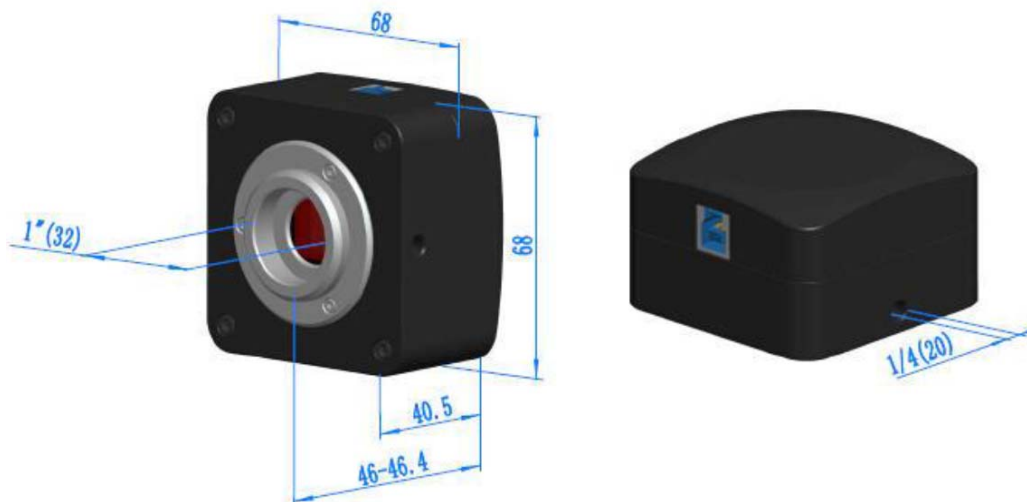
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
E3CMOS20000KPA EP120000A (Suspended)	20M/IMX183(C) 1 "(13.06x8.76)	2.4 x2.4	462mv with 1/30s 0.21mv with 1/30s	5.5@5440x3648 16@2736x1824 21@1824x1216	1x1, 2x2, 3x3	0.1ms~15s
E3CMOS20000KMA EM120000A (New)	20M/IMX183(M) 1 "(13.06x8.76)	2.4 x2.4	776mv with 1/30s 0.21mv with 1/30s	17.5@5440x3648 40@4080x2160 48@2736x1824 60@1824x1216	1x1, 1x1, 2x2, 3x3	0.1ms~60s
E3CMOS12000KPA EP112000A	12M/IMX226(C) 1/1.7"(7.40x5.55)	1.85x1.85	280mv with 1/30s 0.1mv with 1/30s	7.1@4000x3000 30@2048x1080	1x1, 2x2	0.244ms~2000ms
E3CMOS12300KMA EM112300A (New)	12.3M/IMX304(M) 1.1 "(14.13x10.35)	3.45 x3.45	1146mv with 1/30s 0.1mv with 1/30s	23.4@4096x3000 46.3@2048x1500	1x1, 1x1,	0.244ms~15s
E3CMOS06300KPA EP106300A	6.3M/IMX178(C) 1/1.8" (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	15@3072 x2048 26@1536x 1024	1x1, 2x2	0.244ms~2000ms
E3CMOS06300KMA EM106300A	6.3M/IMX178(M) 1/1.8" (7.37x4.92)	2.4x2.4	425mv with 1/30s 0.15mv with 1/30s	30@3072 x2048 50@1536x 1024	1x1, 2x2	0.244ms~2000ms
E3CMOS05000KPA EP105000A (Suspended)	5.0M/IMX264(C, GS) 2/3" (8.45x7.07)	3.45x3.45	1146mv with 1/30s 0.15mv with 1/30s	15@2448x2048 51@1224x1024	1x1	0.1ms~60s
E3CMOS05000KMA EM105000A	5.0M/IMX264(M, GS) 2/3" (8.45x7.07)	3.45x3.45	915mv with 1/30s 0.15mv with 1/30s	35@2448x2048 60@1224x1024	1x1, 2x2	0.1ms~60s
E3CMOS03100KPA EP103100A (Suspended)	3.1M/IMX036(C) 1/2.8" ((5.12x3.84)	2.5x2.5	200mv with 1/30s 0.5mv with 1/30s	28@2048x1536 28@1024x768	1x1, 2x2	0.244ms ~2000ms
E3CMOS03100KPB EP103100B	3.1M/IMX123(C) 1/2.8" (5.12x3.84)	2.5x2.5	600mv with 1/30s 0.15mv with 1/30s	25@2048x1536 30@1920x1080	1x1	0.244ms~2000ms
E3CMOS03100KMC EM103100C (New)	3.1M/IMX265(M, 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
E3CMOS02300KPA EP102300A	2.3M/IMX185(C) 1/1.9" (7.20x4.50)	3.75x3.75	1120mv with 1/30s 0.15mv with 1/30s	38@1920x1200 66@960x600	1x1, 2x2	0.244ms ~2000ms
E3CMOS02300KPB EP102300B	2.3M/IMX249(C, GS) 1/1.2" (11.25x7.03)	5.86x5.86	1016mv with 1/30s 0.15mv with 1/30s	30@1920x1200	1x1	0.244ms~2000ms
E3CMOS02300KMC EM102300C	2.3M/IMX174(M, GS) 1/1.2" (11.25x7.03)	5.86x5.86	1016mv with 1/30s 0.15mv with 1/30s	120@1920x1200	1x1	0.244ms~2000ms
E3CMOS01500KMA EM101500A (New)	1.5M/IMX273(M, GS) 1/2.9" (4.968x3.726)	3.45x3.45	1830mv with 1/30s 0.15mv with 1/30s	228@1440x1080 530@720x540	1x1 2x2	0.1ms~60s
E3CMOS01200KPA EP101200A	1.2M/IMX224(C) 1/3"(4.80x3.60)	3.75 x3.75	2040mv with 1/30s 0.15mv with 1/30s	60@1280x960 120@640x480	1x1, 2x2	0.105ms~15s
E3CMOS00400KPA EP100400A (New)	0.4M/IMX287(C, GS) 1/2.9"(4.97x3.73)	6.9x6.9	4584mv with 1/30s 0.15mv with 1/30s	520@720x540	1x1	0.244ms~15s
E3CMOS00400KMA EM100400A (New)	0.4M/IMX287(M, GS) 1/2.9"(4.97x3.73)	6.9x6.9	7469mv with 1/30s 0.15mv with 1/30s	520@720x540	1x1	0.244ms~15s

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

For the suspended models, customer can choose the corresponding models from E3ISPM series with faster frame rate.

Other Specification for E3CMOS Camera

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™ Color Engine/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

Packing Information of E3CMOS

	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	E3CMOS 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
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075
G	Fixed lens adaptor	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075
		C-Mount to Dia.31.75mm Eyepiece Tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075
	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)/Adaptor rings for 30mm eyepiece tube		
I	108016(Dia.23.2mm to 30.5mm Ring)/ Adaptor rings for 30.5mm eyepiece tube		
J	108017(Dia.23.2mm to 31.75mm Ring)/ Adaptor 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.)	

Optional Adapters

Microscope Camera

E3CMOS+AMAXXX(23.2mm Adapter)

E3CMOS+FMAXXX(23.2mm Adapter)

Astronomy Camera:

E3CMOS+ATAXXX(31.75mm Adapter)

E3CMOS+FTAXXX(31.75mm Adapter)

E3CMOS06300KPA uses IMS178LQJ 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 senor has the following characteristic:

- 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 light 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. At the 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.
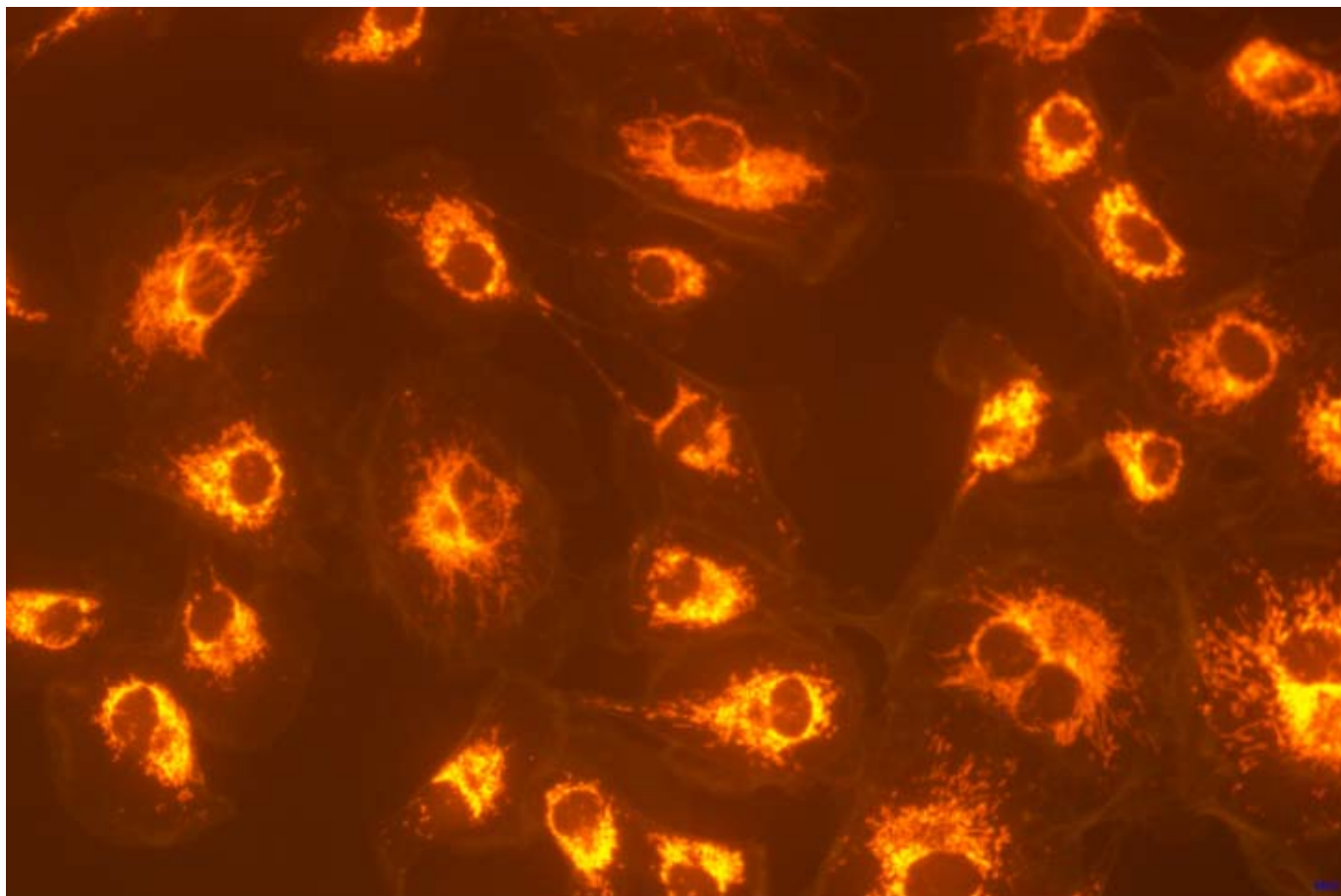
Compatibility with Existing Sony Products

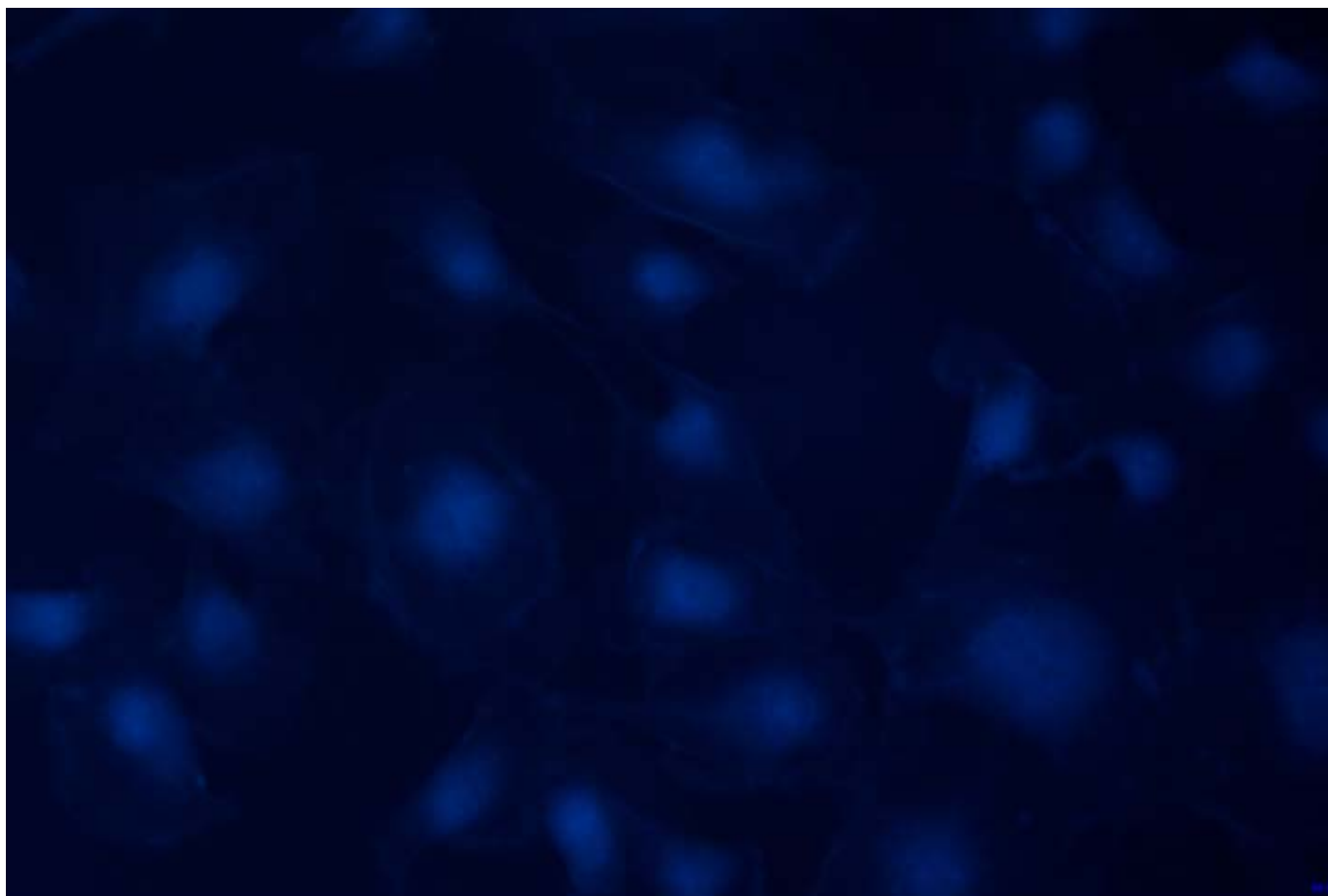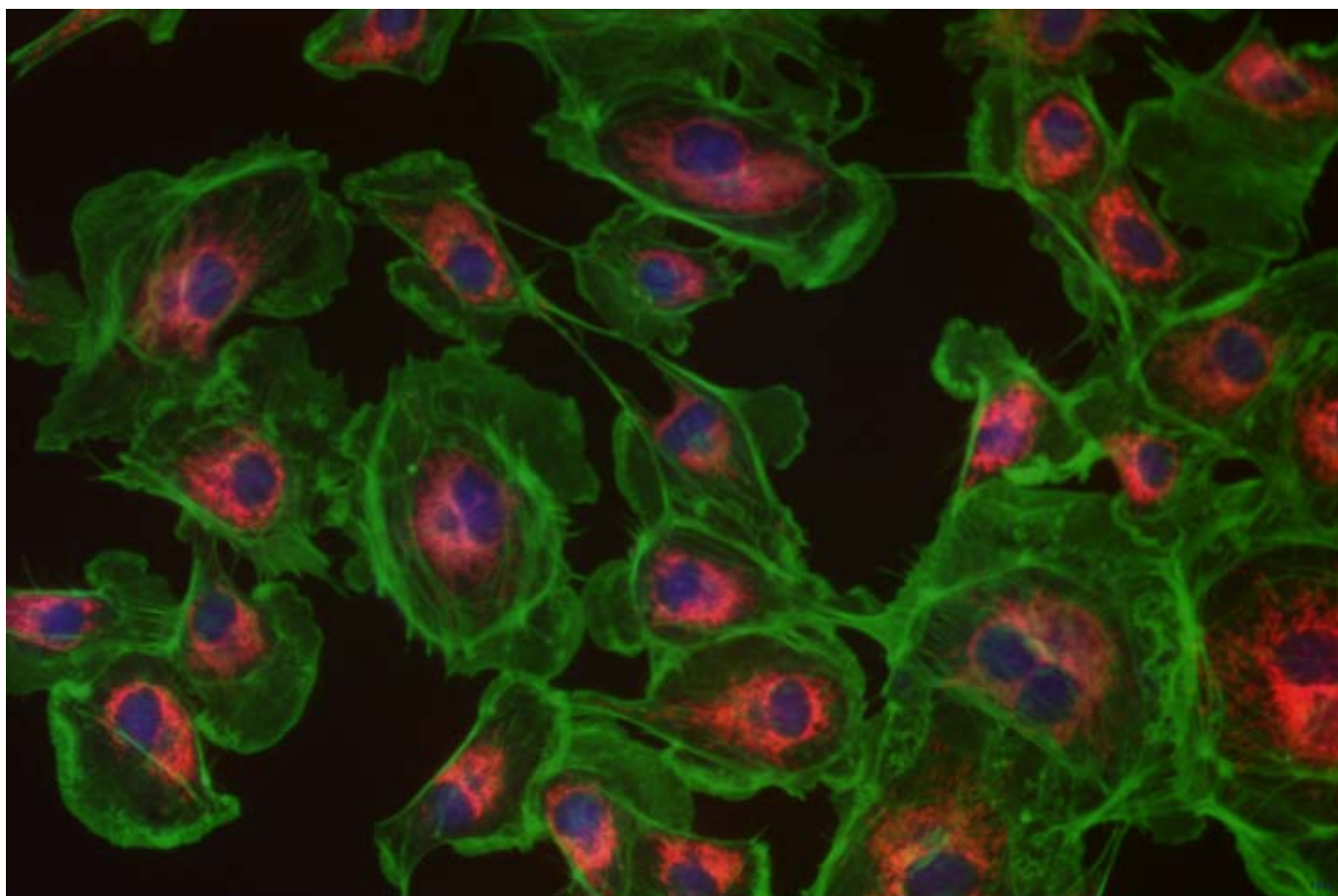**Images captured with E3CMOS02300KPA**

Red Fluorescent Image

Green Fluorescent Image

Blue Fluorescent Image

Fused Fluorescent Image