

# Capture more details from faint signals



## **ZEISS Axiocam 820 mono**

Your Sensitive 20 Megapixel Microscope  
Camera for Demanding, Large Field of View,  
Fluorescence Applications

[zeiss.com/axiocam820-mono](https://zeiss.com/axiocam820-mono)



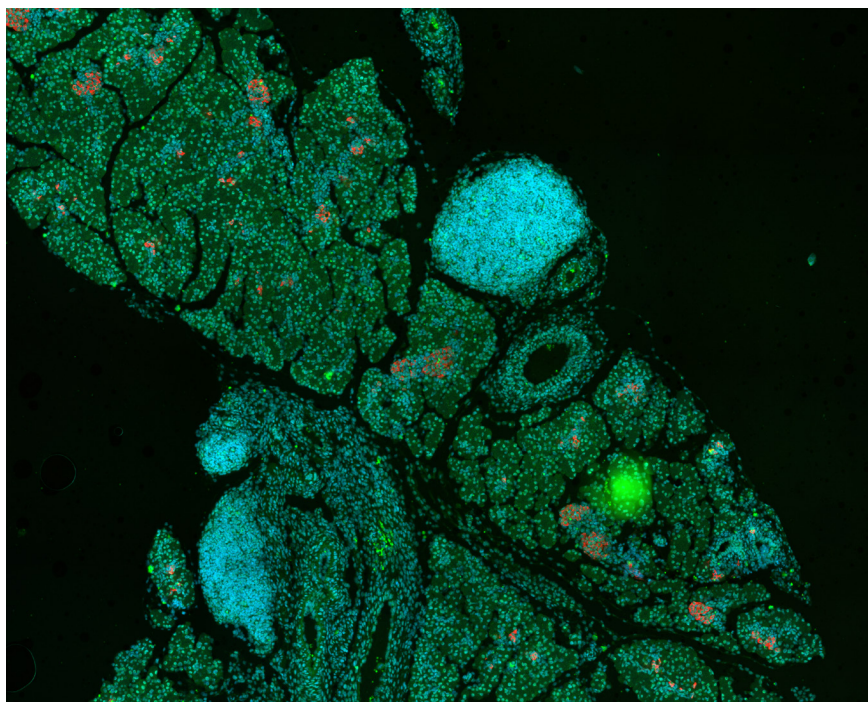
Seeing beyond

# ZEISS Axiocam 820 mono

## Your Sensitive 20 Megapixel Microscope Camera for Demanding, Large Field of View, Fluorescence Applications

A scientific camera that supports fluorescence microscopy imaging experiments must meet several requirements. A large field of view, high speeds and sensitivity are necessary in addition to high dynamic range and seamless integration into the imaging software. ZEISS Axiocam 820 mono was designed as the most flexible camera to address all these features for demanding fluorescence applications.

Its back-illuminated CMOS sensor has a peak quantum efficiency of 86% and minimized readout noise for high signal-to-noise imaging even with very dim samples. The actively cooled sensor provides stable imaging conditions directly after start of the microscope.



*Mouse pancreas tissue stained for DNA (blue), insulin (green) and glucagon (red) on pancreas islet. Sample courtesy of A. Feuchtinger, Helmholtz Zentrum München, Germany*

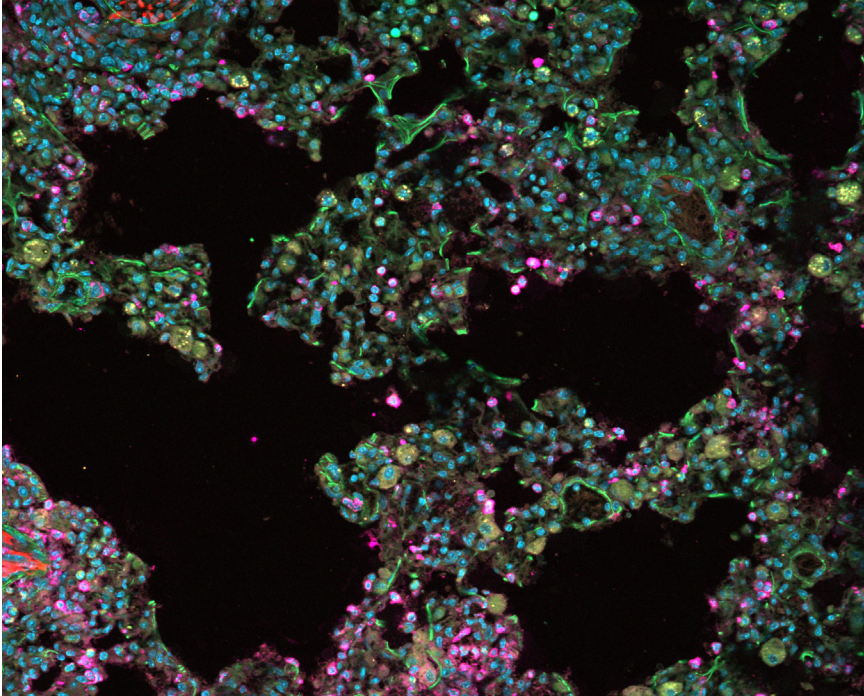


With 2.74  $\mu\text{m}$  pixels and a large 20 megapixels sensor, ZEISS Axiocam 820 mono can resolve the finest structures at all magnifications over a large area.

The high frame rate of 28 images per second at full sensor resolution can be improved further by binning or using a sub-array of the sensor. Distortion-free imaging is ensured by the global shutter technology. The dual USB 3.0 connection uses standardized interfaces for robust and rapid data transfer and does not rely on proprietary interface cards.

With ZEISS Axiocam 820 mono, the efficiency and throughput of the microscope is also significantly improved. The square sensor geometry utilizes the microscope optics most efficiently for acquiring more details in the field of view. Due to the large sensor diagonal of 17.5 mm, the number of tiles required for scanning large areas is minimized thereby increasing efficiency and throughput.

With a combination of a high spectral range, high sensitivity, speed, and resolution, ZEISS Axiocam 820 mono is a flexible camera flexible with an imaging performance for even the most challenging samples in life science research.

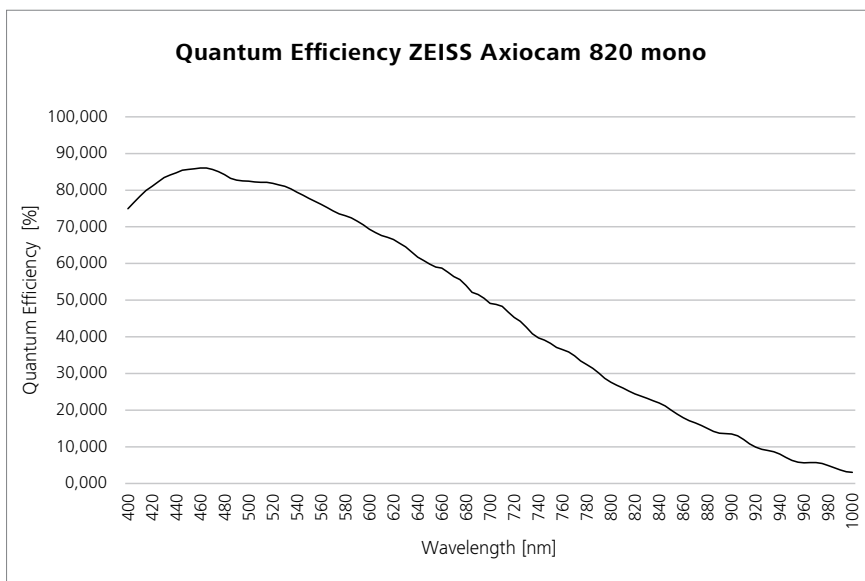


Murine lung tissue with tumor metastasis fixed with 4% PFA and stained for: tumor cells (RFP), macrophages (siglech-GFP), T-cells (Ly6-G647) and DNA (DAPI). Sample courtesy of H. Ishikawa-Ankerhold, Walter-Brendel-Zentrum für Experimentelle Medizin München, Germany

### Simpler. More intelligent.

#### More integrated.

- 20 megapixel back-thinned square CMOS sensor with 17.5 mm diagonal
- 28 full-resolution images per second
- 30 frames per second of the entire field of view in live image mode
- Small 2.74 micron pixels for resolving the finest details at all magnifications
- High 86 % QE by back illuminated sensor architecture
- Low readout noise of 1.3 e- by high-quality noise inhibition technology for low light imaging
- Wide sensitivity spectrum from 350 nm to 1000 nm
- Fast read-out with global shutter architecture for distortion-free images
- Reproducible image quality due to active thermal stabilization of the sensor
- Robust, very fast and easy-to-use dual USB 3.0 connection
- Hardware triggering



#### Recommended for:

- The most demanding fluorescence applications in life sciences
- Imaging dim fluorescent signals with a good signal-to-noise ratio
- Fast tile scanning applications
- Dynamic events in live cell imaging
- Flexible setups with varying applications

# Technical Data and Conformity

Feature	Value
Sensor Type	Sony CMOS image monochrome sensor, global Shutter architecture Backside illuminated
Sensor Size	Image Diagonal 17.5 mm, equivalent to 1.1" Sensor Format Image Field 12.4 mm × 12.4 mm, square imaging area
Sensor Pixel Count	4512 (H) × 4512 (V) = 20 Megapixel
HW Subsampling	2256 (H) × 2256 (V) = 5 Megapixel, high speed full view mode
Pixel Size	2.74 µm × 2.74 µm
Bit Depth	14 bit/ 12 bit or 8 bit/pixel
Exposure Range	0.1 ms up to 60 s
Gain	1x, 2x, 4x, 8x, 16x
Binning	1 × 1, 2 × 2, 3 × 3, 4 × 4, 5 × 5 (combined analog and digital binning)
Dark Current Signal	< 0.1 e <sup>-</sup> /p/s at 25°C sensor temperature
HDR Mode	Extended dynamic range up to 1:25,000
Cooling System	Active cooling, regulated sensor temperature 25 °C
Spectral Sensitivity	Appr. 350 nm – 1000 nm, max. QE 86% at 460 nm, protection glass (coated)
Interfaces	Dual USB 3.0
Trigger Port	Connector for trigger cable: Trigger-in, trigger out, ready
Power Supply	By USB 3.0 connections, power consumption 7 W max.
Operation System	Win 10 x64 Enterprise
Software	ZEN 3.6 (blue edition) and higher, ZEN core 3.5 and higher
Image Enhancement Functions	Denosing, sharpening, shading correction, dark current compensation
Automatic Feature	Optional automatic exposure time adaption
Optical Interface	C-Mount
Dimensions and Weight	10.8 cm × 7.8 cm × 6.1 cm / 620 g
Order Number	Axiocam 820 mono: 426560-9190-000

Frame Rate	FPS
Live Image	30 (subsampling mode)
4512 × 4512	28
2256 × 2256	75 (2 × 2 subsampling, full field of view)
1920 × 1080	110
1024 × 1024	115
512 × 512	207
1920 × 256	346
1920 × 128	447

Read Noise (gain)	Full Well Capacity	Dynamic Range
2.3 e <sup>-</sup> (1x)	10,000 e <sup>-</sup>	4,440:1
1.8 e <sup>-</sup> (2x)	5,000 e <sup>-</sup>	2,720:1
1.6 e <sup>-</sup> (4x)	2,500 e <sup>-</sup>	1,540:1
1.5 e <sup>-</sup> (8x)	1,250 e <sup>-</sup>	850:1
1.3 e <sup>-</sup> (16x)	625 e <sup>-</sup>	470:1
HDR mode	10,000 e <sup>-</sup>	25,000:1



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