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Prime 95B™ Scientific CMOS Camera

CUSTOMER REFERENCE

Super-Resolution Fluorescence Microscopy

Ke Xu, Principal Investigator and Assistant Professor of Chemistry

Ke Xu Group, University of California Berkeley, College of Chemistry

BACKGROUND

The Ke Xu Group at Berkeley is an interdisciplinary lab that combines biophysics, physical chemistry and cell biology. Their goal is to understand how orders emerge in biological systems at the nano-meter scale from the interaction between biomolecules. They achieve this goal experimentally through the development and synergistic application of innovative quantitative methods such as super-resolution fluorescence microscopy.

Ke Xu, principal investigator and assistant professor of chemistry, successfully opened his lab in 2013 and today, leads a team that includes post-doctoral researchers and graduate students. The team recognizes and respects how living systems achieve versatile structural organizations at the nanoscale. Their dedication to gaining a greater understanding of this phenomenon has led to their ability to consistently achieve publication of their research findings.

“ [Prime 95B] allows us to conduct our STORM experiments with higher frame rates... 95 percent quantum efficiency allows for super-resolution imaging that’s not achievable with conventional sCMOS cameras. ”

CHALLENGE

Previously, EMCCD technology was the primary imaging solution in the Ke Xu Group. However, STORM experiments presented increasing demands on the existing imaging setup. The team decided to look at other technologies, specifically sCMOS solutions due to new advancements in CMOS sensors and more advanced capabilities becoming available.

Having reviewed available products, the team found the Prime 95B Scientific CMOS camera from Photometrics. The company was touting the first and only 95 percent quantum efficiency sCMOS camera which piqued their interest. Having the opportunity to fully test the camera, they discovered it offered comparable, if not better, results when compared to their existing EMCCD.

SOLUTION

When comparing to the EMCCD camera that was used previously, the Prime 95B provides many more benefits; faster imaging, comparable spatial resolution and a larger field of view. "The Prime 95B Scientific CMOS camera allows us to conduct our STORM experiments with higher frame rates and a larger field of view than with EMCCD technology," Xu shares. "Plus, the 95 percent quantum efficiency allows for super-resolution imaging that's not achievable with conventional sCMOS cameras," he adds.

Figure 1

Prime 95B
Scientific CMOS
Camera Test
 β 13-tubulin-AF647
160 Hz
50k frames

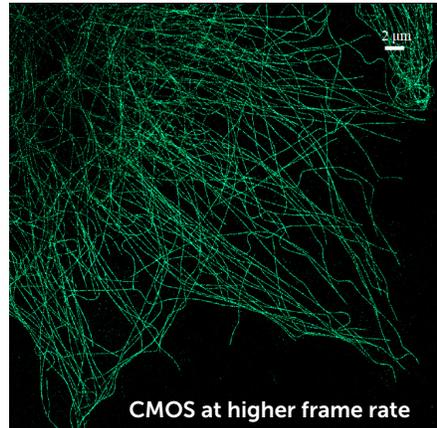
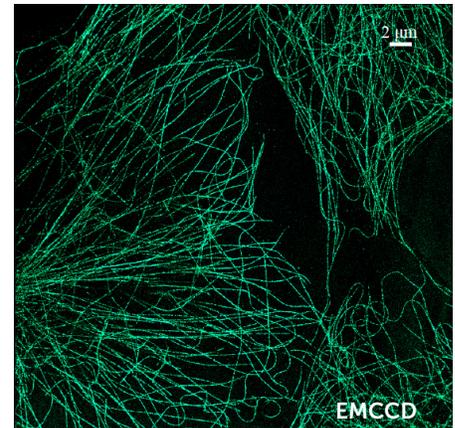
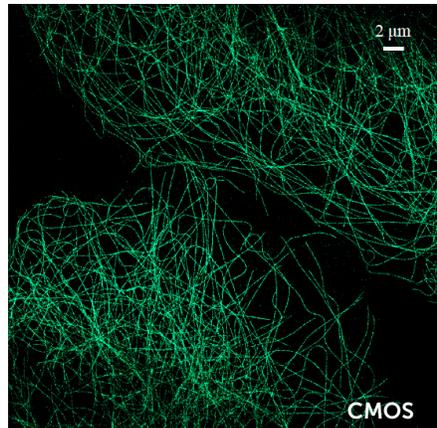


Figure 2

Prime 95B Scientific
CMOS vs EMCCD
Camera Test
 β 13-tubulin-AF647
110 Hz
50k frames



Learn more about the Ke Xu Group at the University of California Berkeley:

<http://www.cchem.berkeley.edu/xuklab/>

Images courtesy of Rui Yan and Ke Xu, UC Berkeley



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