



HIGH PERFORMANCE EMCCD & CCD  
CAMERAS FOR LIFE SCIENCES



CUSTOMER REFERENCE

Evolve™ 512 EMCCD Camera, DV2 Multichannel Imaging System

## Redox and Calcuim Imaging

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**BACKGROUND**

The research at the Shanghai Institute for Biological Sciences (SIBS) is primarily focused on functions and mechanisms of mitochondrial dynamics and mitochondria-related diseases. Considering the potential roles of mitochondrial motility in neurodegenerative diseases and metabolic diseases, there are still significant gaps in the understanding of core mitochondrial function. This research involves using integrated approaches, combining disciplines to study mitochondria and energy metabolism.

The team's long-term goals are to prevent or delay onsets of mitochondria related diseases, such as Alzheimer's disease, Parkinson's disease and diabetes by using nutritional interventions.

**CHALLENGE**

Lacking subtle techniques for mitochondrial studies, many fundamental questions about mitochondrial dynamics and functions have not been well characterized. Physiologically relevant functions remain such as the mechanisms of mitochondrial biogenesis and mitophagy, and the mitochondrial role in thermogenesis of brown adipocytes.

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## SOLUTION

The best solution was to setup a combined system (imaging, electrophysiology and optogenetics) to study mitochondrial dynamics and functions in living cells. The Evolve 512 EMCCD camera was selected for imaging, the DV2 multichannel system for FRET signaling, a monochromator (Cairn Research) and other lasers as light sources, and electrophysiological instruments (Axon, Molecular Devices).

The Evolve 512 camera enabled the ability to image auto-fluorescent signals of mitochondria, such as NADH and FAD for redox studying. Dr. Kang shares, "We found that the Evolve 512 EMCCD camera has excellent quantum efficiency for imaging. The DV2 multichannel system was convenient to use for collecting FRET signals, such as calcium imaging."

"We are very satisfied with the high quantum efficiency of the Photometrics cameras, and we enjoy the flexibility and possibilities of the combined system since all instrumental drivers are compatible with  $\mu$ Manager software," Dr. Kang concludes.

Additional information about Dr. Jian-sheng Kang and his team, and published research is available at:

[http://www.nutrition.ac.cn/e\\_Pi\\_kangjsh.asp](http://www.nutrition.ac.cn/e_Pi_kangjsh.asp)

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