

CELL-PERMEABLE ORGANIC FLUORESCENT PROBES FOR LIVE-CELL SUPER-RESOLUTION IMAGING OF ACTIN FILAMENTS

Yubing Han^{1,2,3}, Meihua Li^{1,3}, Meng Zhang^{1,3}, Xiaoshuai Huang⁴, Liangyi Chen⁴, Xiang Hao², Cuifang Kuang^{2,5,6}, Xu Liu^{2,5,6}, Yu-Hui Zhang^{1,3}

1 Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology-Wuhan National Laboratory for Optoelectronics, Wuhan, China 430074

2 State Key Laboratory of Modern Optical Instrumentation, College of Optical Science & Engineering, Zhejiang University, Hangzhou, China 310027

3 MoE Key Laboratory for Biomedical Photonics, Department of Biomedical Engineering, Huazhong University of Science and Technology, Wuhan, China 430074

4 State Key Laboratory of Membrane Biology, Beijing Key Laboratory of Cardiometabolic Molecular Medicine, Institute of Molecular Medicine, Peking University, Beijing 100871, China.

5 Collaborative Innovation Center of Extreme Optics, Shanxi University, Taiyuan, Shanxi 030006, China.

6 Ningbo Research Institute, Zhejiang University, Ningbo 315100, China
E-mail: hanyubing@zju.hust.edu.cn

KEYWORDS: Organic fluorescent probes, living cells, super-resolution imaging, actin filaments

ABSTRACT

The recently developed super-resolution microscopy has been applied to characterize the nanometer-scale structure of actin filaments in live cells, owing to its live-cell imaging ability at sub-diffraction resolution. However, there are still some limitations in existing live-cell labeling methods for super-resolution imaging of F-actin. A series of cell-permeable fluorescent probes was developed for super-resolution imaging of actin filaments with the introduction of a cell-penetrating peptide (rR)₃R₂. These probes are highly specific, multicolor available, and suitable for different cell lines. With these probes, we resolve actin filaments at ~60-nm spatial resolution in live-cell super-resolution imaging. Our results here extensively expand the types of probes for live-cell super-resolution imaging of F-actin and open up a new avenue in the design of cell-permeable fluorescent probes.

REFERENCE

[1] Y. Han, M. Li, M. Zhang, X. Huang, L. Chen, X. Hao, C. Kuang, X. Liu, and Y.-H. Zhang, "Cell-permeable organic fluorescent probes for live-cell super-resolution imaging of actin filaments," *J. Chem. Technol. Biotechnol.*, **94**, 2040-2046 (2019).