A unique monomeric reversibly switchable fluorescent protein for Super-resolution Optical Fluctuation Imaging (SOFI)

Xuanze Chen¹, Xi Zhang², Pingyong Xu², Peng Xi¹
¹Department of Biomedical Engineering, College of Engineering, Peking University, Beijing, China
²Key Laboratory of RNA Biology, Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
E-mail: xipeng@pku.edu.cn

KEY WORDS: reversibly switchable fluorescent protein, super-resolution microscopy, Skylan-S, protein engineering, live-cell imaging, SOFI

ABSTRACT:

Reversibly switchable fluorescent proteins (RSFPs) have a wide application in super-resolution optical fluctuation imaging (SOFI) based on their switching and fluctuation of single molecules [1, 2]. Here we developed a unique RSFP named Skylan-S, which exhibits very high brightness, photostability, and On/Off contrast ratio, suggesting that it is highly suitable for application in SOFI imaging [2]. Taking advantage of the excellent optical properties of Skylan-S (Sky lantern for SOFI), a 4-fold fluctuation range of the imaged pixels and higher SOFI resolution can be achieved compared with conventional Dronpa. In the experiment, the actin or tubulin structures and clathrin-coated pits (CCPs) in living U2OS cells labeled with Skylan-S was obtained using the SOFI technique. The outstanding photochemical properties of Skylan-S is promising for long-time SOFI imaging with high spatial-temporal resolution.

Fig. 1 Skylan-S has greater fluorescence intensity and fluctuation range over Dronpa, thus better suitable for high-order SOFI super-resolution imaging.

Fig. 1

References: