

平成26年2月20日

応用物理学会北海道支部

会員各位

応用物理学会北海道支部講演会のお知らせ

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演題： Advances in high resolution microscopy: from developing probes to superresolution imaging in C. Elegans

講師： Johan Hofkens 氏 (Department of Chemistry, KULeuven, Professor)

日時： 平成26年3月3日（月） 14:00～15:30

場所： 北海道大学大学 電子科学研究所 1F 会議室

後援： 応用物理学会北海道支部

講演の要旨

In recent years, the development of new imaging techniques has allowed researchers to push the boundaries of fluorescence microscopy past the diffraction limit. Many of these techniques require the use of 'smart labels' such as photo-activatable and reversibly photoswitchable fluorophores. Although their performance is adequate for most basic visualization experiments, further improvement is needed if we want to push the state of the art past this basic level of 'straightforward super-resolution imaging'.

In the present work, we engineered photoconversion properties into the well-known reversibly photochromic protein Dronpa. We made ffDronpa, a Dronpa mutant that is formed up to three times as fast as Dronpa, while retaining the photochromic features of Dronpa. Using rational and random mutagenesis, we transformed ffDronpa to pcDronpa. This mutant combines Dronpa's photochromism with the feature of being photoconvertible to a red state and can be used for multimodal imaging (SOFI +PALM with the same protein).

Next, we developed new reversibly switchable fluorescent proteins based on rsEGFP with general improved behavior at 37°C. This protein is ideally suited for pcSOFI imaging.

Beside these examples of tailoring probes for specific imaging modalities, the application of super resolution imaging, eventually in combination with other techniques, in a variety biological related samples ranging from optical mapping to neural imaging in C Elegans will be discussed.

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