

細胞機能科学セミナー

Open scientific webinar

Cyanobacteriochromes: Introduction of unique photoreceptors and prospects for application

Speaker: Dr. Takahisa Suzuki

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The cyanobacteriochromes (CBCRs) are cyanobacteria-specific photoreceptors binding linear tetrapyrrole, which is distantly related to the plant phytochrome photoreceptors showing red/far-red reversible photoconversion. The chromophore binding region of the CBCRs consists of only a cGMP-phosphodiesterase/adenylate cyclase/FhIA (GAF) domain, while that of the phytochromes consists of three domains (PAS-GAF-PHY). Furthermore, in the case of the CBCRs, the spectral properties are highly diversified to sense wide range wavelengths covering UV and visible light regions. Most CBCRs, however, have a drawback to bind phycocyanobilin (PCB) that is not endogenously present in the mammalian cells. So, we have developed engineered CBCRs binding biliverdin (BV) as a chromophore that is endogenously present in the mammalian cells. These BV-binding molecules opened the door for application of CBCRs to fluorescent imaging and optogenetic regulation. In this talk, I will summarize the spectral properties of the various CBCRs and introduce the current project to modify the BV-binding CBCRs by site-directed saturation mutagenesis.

Note: This webinar will be held in English, but Japanese is available in Q&A session.

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