

第384回生命科学セミナーのお知らせ

下記の通り生命科学セミナーが開催されますので、教員・院生・学生を問わず、多数ご参加下さい。
記

日時：平成27年9月4日(金) 15:30~17:00

場所：放射光科学研究センター 2階 セミナー室

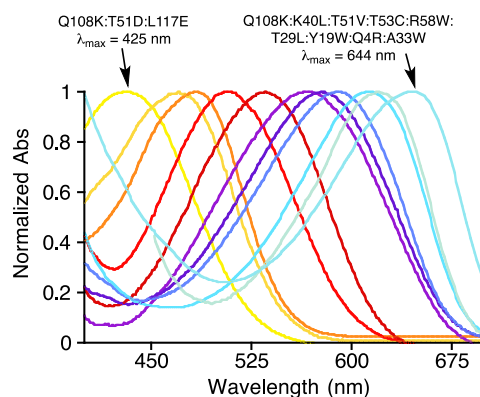
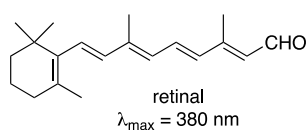
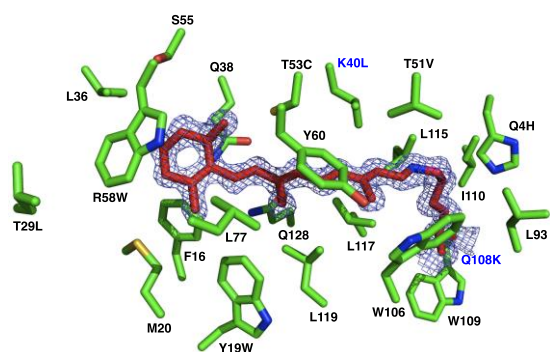
演題：Lessons from Rhodopsin and Bacteriorhodopsin: Engineered protein/chromophore systems with unique spectroscopic properties

演者：Babak Borhan 氏
(Michigan State University)

《講演要旨》

Protein-chromophore interactions are a central component of a wide variety of critical biological processes, such as color vision. Nature has perfected stereoelectronic interactions in each opsin such that a single chromophore (11-*cis*-retinal) is responsible for the perception of the entire visible spectrum. The sum of the unique interactions between the retinylidene chromophore and the opsins is responsible for wavelength regulation of the colored visual pigments. Our goal is to understand the underlying principles that govern wavelength regulation and to use this knowledge to produce new colorimetric and fluorescent protein tags.

To study the fundamental elements that contribute to spectral tuning of a chromophore inside the protein cavity, we have redesigned small, cytosolic retinoid binding proteins as rhodopsin protein mimics, which fully encapsulate all-*trans*-retinal as a protonated Schiff base. We can regulate the absorption maximum of the pigment from 425 nm to 644 nm using rational mutagenesis designed to alter the electrostatic environment within the binding pocket of the host protein. In addition to retinal, this system can bind a number of diverse chromophores and fluorophores bearing an aldehyde functionality and produce rationally designed protein/chromophore systems that can yield complete control over their spectral properties. In addition to retinal, we are exploring these proteins as hosts for a number of diverse chromophores and fluorophores bearing an aldehyde functionality. The protein/chromophore complexes yield systems that have favorable spectral characteristics for far-red applications, utility as fluorescent protein tags, protein pH sensors, and photochemical switching behavior. These systems are being developed for real world applications as colorimetric and fluorescent protein fusion tags for a host of *in vivo* applications. Our recent findings in this area will be presented.



Retinal bound to Q108K:K40L hCRBP11 as a protonated Schiff base

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なお、今回のセミナーは HiSOR セミナーとの共同開催となります。

(注) 生命科学共同セミナーを受講する生物圏科学研究科の院生は、特に積極的に参加してください。

(注) このセミナーは5研究科共同セミナーの一環として開催されます。

(注) このセミナーは総合科学演習または研究演習の一部として認められています。