
一般社団法人日本生物物理学会 第 13 回 Biophysics and Physicobiology 論文賞受賞講演会
The 13th Award Seminar for outstanding Biophysics and Physicobiology paper

オーガナイザー：日本生物物理学会 Biophysics and Physicobiology 論文賞選考委員会

Organizers: Award committee for outstanding Biophysics and Physicobiology paper

日 時：9 月 24 日（水）15:10 ～ 18:10

場 所：2 階 K 会場（天平ホール）

形 式：講演会

第 13 回 Biophysics and Physicobiology 論文賞受賞者

小島 慧一

Keiichi Kojima

岡山大・学術研究院医歯薬

Fac. Med. Dent. Pharm. Sci. Okayama Univ.

アニオンチャネルロドプシンの分子理解と改変

Molecular characterization and engineering of anion channelrhodopsins

Microbial rhodopsins are a family of photoreceptive proteins containing retinal as a chromophore and play crucial roles in the photoreception of microorganisms. Recently, they have become essential tools in optogenetics to regulate biological phenomena by light. In this symposium, we will introduce recent studies on the molecular diversity and structure–function relationships of rhodopsins, including anion channelrhodopsins, based on experimental and theoretical approaches, and discuss future perspectives.

辻村 真樹

Masaki Tsujimura

理化学研究所 開拓研究所

Pioneering Research Institute, RIKEN

アニオンチャネルロドプシンの分子機構の理論解析

Theoretical insights into the molecular mechanism of anion channelrhodopsins

塚本 卓

Takashi Tsukamoto

北海道大学大学院先端生命科学研究院（北大院・先端生命）

Faculty of Advanced Life Science, Hokkaido University (Fac. Adv. Sci., Hokkaido Univ.)

アニオンチャネルロドプシンの実験的研究からわかった思いがけないこと

Unexpected Insights Gained from Experimental Studies of Anion Channelrhodopsins

一般社団法人日本生物物理学会 第 14 回 Biophysics and Physicobiology 論文賞受賞講演会
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第 14 回 Biophysics and Physicobiology 論文賞受賞者

関口武治

Takeharu Sekiguchi

東京科学大学 工学院 電気電子系

Dept. of EEE, Sch. of Eng., Inst. of Sci. Tokyo

蛍光ナノダイヤモンドを用いた細胞内部温度センサ

Fluorescent nanodiamonds as a robust temperature sensor inside a single cell

Diamond quantum sensors have been attracting great attention worldwide due to their potential sensitivity and their wide range of applications. Nitrogen-vacancy centers are fluorescent paramagnetic defects in diamond and serve as spin-based sensors to detect tiny signals such as temperature and magnetic field. The sensing is based on monitoring the fluorescence intensity from the diamond while applying microwave to cause electron paramagnetic resonance. Among a variety of applications, we have reported in 2018 a temperature sensing inside a single cell by using fluorescent nanodiamonds (FNDs). A single FND inside a single cell allowed temperature sensing with 1°C accuracy with robustness against various cellular environmental factors such as pH and viscosity. In the session, we'd also like to review further developments of diamond quantum sensors in particular as a high-sensitivity magnetometer for medical and other applications by using millimeter-scale diamonds. This work was supported by JSPS KAKEHNI 26220602, by MEXT KAKENHI 15H05931, by JSPS Grant-in-Aid for JSPS Research Fellow A18J002870, and by MEXT Q-LEAP JPMXS0118067395.

波多野雄治

Yuji Hatano

東京科学大学 工学院 電気電子系

Dept. of EEE, Sch. of Eng., Inst. of Sci. Tokyo

ミリメートルスケールダイヤモンド量子センサの応用

Applications of millimeter-scale diamond quantum sensor