一般社団法人日本生物物理学会　第 8 回 Biophysics and Physicobiology 論文賞受賞講演会

The 8th 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（火）12:40 ～ 13:20 ／ Sep. 24 Tue.

場　所：A 会場（サミットホール天蘭）／ Room A (Summit Hall Tenran)

形　式：講演会／ Lecture

第 8 回 Biophysics and Physicobiology 論文賞受賞者

David J. Castillo[1]，中村修一[2]，森本雄祐[3]，蔡栄淑[1]，上池伸徳[1]，工藤成史[2]，南野徹[1]，難波啓一[1,4]

David J. Castillo[1], Shuichi Nakamura[2], Yusuke V. Morimoto[3], Yong-Suk Che[1], Nobunori Kami-ike[1], Seishi Kudo[2], Tohru Minamino[1] and Keiichi Namba[1,4].

[1] 阪大・院生命機能，[2] 東北大・院工，[3] 九工大・院情工，[4] 理研・BDR&SPring-8

[1]Grad. Sch. Frontier Biosci., Osaka Univ., [2]Grad. Sch. Eng., Tohoku Univ., [3]Grad. Sch. Comp. Sci. and Sys. Eng., Kyushu Inst. Tech., [4]RIKEN BDR & SPring-8

細菌べん毛モーター固定子の組み込みと活性化のメカニズム

Stator assembly and activation mechanism of the bacterial flagellar motor

The bacterial flagellar motor is a rotary nanomachine fueled by the transmembrane electrochemical potential of ions, i.e., ion motive force (IMF). The flagellar motor comprises a rotor and multiple stators. The stator proteins MotA and MotB form a transmembrane complex containing two proton channels, and each stator unit is anchored to the peptidoglycan (PG) layer via a PG binding (PGB) motif of MotB. The stator can control its ion conductivity by a “plug” that resides in the periplasmic region of MotB. The stator unit is believed to be activated and inactivated by the detachment and attachment of the plug segment from and to the proton channel, respectively. Although 10 stator units can be incorporated to the motor, they alternate in assembly and disassembly even during rotation, accompanying transition between active and inactive states. Stator assembly and activation depend on external load, external ion concentration, and IMF. Castillo and Nakamura et al. [1] analyzed the rotation of the mutant flagellar motor lacking residues 72-100 of MotB, corresponding to a linker between the transmembrane proton channel and PGB domains, and suggested its critical role for load-dependent stator assembly. This seminar will review the current knowledge on stator assembly dynamics, and will discuss the mechanism by which flagellar stators sense load and input energy.

1. Castillo DJ and Nakamura S *et al.* (2013) The C-terminal periplasmic domain of MotB is responsible for load-dependent control of the number of stators of the bacterial flagellar motor. *Biophysics* 9: 173–181.