一般社団法人日本生物物理学会　第 5 回 Biophysics and Physicobiology 論文賞受賞講演会
The 5th 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：11 月 25 日（金）16：00 ～ 16：30 ／ Nov. 25 Fri.

場　所：A 会場（中ホール 200）／ Room A (Convention Hall 200)

形　式：講演会 ／ Lecture

第 5 回 Biophysics and Physicobiology 論文賞受賞者

BPPB Outstanding Paper Awardee

須藤雄気

Yuki Sudo

岡山大学医歯薬学総合研究科（薬学系）

Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University

H^+ および Na^+ 透過型べん毛モーター固定子ユニット内のイオン透過経路の比較解析

Comparative study of the ion flux pathway in stator units of proton- and sodium-driven flagellar motors

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Organisms sense and respond to external stimuli to survive in the environments by changing their motile mode. Flagellar motors are essential for the motile microorganisms, and they are powered by the electrochemical potential gradient of specific ions across the membrane. Transmembrane proteins, MotA and MotB from *Escherichia coli*, work as a H^+ channel, while their homologs of *Vibrio alginolyticus*, PomA and PomB, work as a Na^+ channel. These MotA/B and PomA/B complexes play essential roles in torque generation as the stators. It is known that a conserved residue, Asp32 for MotB and Asp24 for PomB, forms one of the ion binding sites. Ala39 of MotB and Cys31 of PomB are located on the same sides as Asp32 of MotB and Asp24 of PomB, respectively, in a helical wheel diagram. In this study, a series of mutations were introduced into Ala39 of MotB and Cys31 of PomB. As a result, the motility of mutant cells was markedly decreased as the volume of the side chain increased. The loss of function was suppressed by mutations of M206S for MotA and L183F for PomA, respectively, and the increases in the volume caused by mutations of A39V for MotB and C31A for PomB were close to the decreases in the volume caused by mutations of M206S for MotA and L183F for PomA. From these results, we concluded that Ala39 of MotB and Cys31 of PomB form part of the ion flux pathway with Met206 of MotA and Leu183 of PomA in the MotA/B and PomA/B stator units, respectively.