日本生物物理学会　第 2 回 BIOPHYSICS 論文賞受賞講演会
The 2nd Award Seminar for outstanding BIOPHYSICS paper

オーガナイザー：日本生物物理学会 BIOPHYSICS 論文賞選考委員会

Organizers: Award committee for outstanding BIOPHYSICS paper

日　時：2013 年 10 月 28 日（月）15:30 ～ 15:50

場　所：D 会場（国立京都国際会館　Room D）

形　式：講演会

第 2 回 BIOPHYSICS 論文賞受賞者

目次正一 [1], 上野山敦子 [2], Jun-Adan-Kubo[2], 宮田真人 [2], 河野秀俊 [3], 由良敬 [4], 郷信広 [3]

Shoichi Metsugi[1], Atsuko Uenoyama[2], Jun-Adan-Kubo[2] Makoto Miyata[2], Hidetoshi Kono[3], Kei Yura[4], Nobuhiro Go[3]

1) 中外製薬株式会社 2) 大阪市立大学 3) 日本原子力研究開発機構 4) お茶の水女子大学

1) Chugai Pharmaceutical. Co., Ltd. 2) Osaka City University 3)Japan Atomic Energy Agency 4)Ochanomizu University

Mycoplasma mobile の運動蛋白質の配列解析による機能・構造予測

Structure and function prediction by sequence analysis for gliding proteins of *Mycoplasma mobile*

Mycoplasma mobile glides at an average velocity of about 2.0 to 4.5 μm/s, about ten times faster than the other mycoplasmas. The motile mechanism of *M. mobile* has been believed to differ from any previously identified mechanisms not only in bacteria but also in any other species. To reveal the mechanism, we carried out sequence analyses of Gli349 which is responsible for both adhesion to glass surfaces and motility, and its ortholog MYPU2110 from *Mycoplasma pulmonis*. We found that Gli349 contains 18 repeats of about 100 amino acid residues each in 3,183 residues, and MYPU2110 contains 22 in 3,216 residues. We also showed that the repeat was not homologous to any other known protein and therefore predicted three-dimensional structure [1]. The model structure of Gli349 was proposed which fit well to the images obtained by electron microscopy, assuming that the cleavage by chymotrypsin tend to occur in the regions between the repeats, and that each repeat folds into an independent structural domain [2]. Based on this model, with inhibitory antibodies and mutants, the regions directly involved in movements of *M. mobile* were suggested on Gli349 and Gli521, which are also involved in the gliding machinery [3]. A further study suggested that Gli349 should be a "leg" for the motile apparatus with Gli521 that plays a role of a "crank" for *M. mobile* [4,5]. In the presentation, such a unique motile mechanism of *M. mobile* being elucidated is introduced.

[1] Metsugi et al., Biophysics 1, 33 (2005)

[2] Adan-Kubo et al., J. Bacteriol. 188(8), 2821 (2006)

[3] Uenoyama et al., J. Bacteriol. 191(6), 1982 (2009)

[4] Nonaka et al., J. Bacteriol. 192(3), 636 (2010)

[5] Miyata M. Ann. Rev. Microbiol. 64, 519 (2010)