

## Microbiology

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### Other Faculty Members

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### Major Scientific Interests of the Group

We aim to understand fundamental biological systems of bacteria, which are distinct from eukaryotic/ multi-cellular organisms. Our research covers both Gram-positive (*Staphylococcus*, *Listeria*, *Lactobacillus*) and Gram-negative bacteria (*Salmonella*, *Escherichia coli*), with a focus on evolutionary adaptation strategies and regulatory mechanisms of gene expression.

### Projects for Regular Students in Doctoral or Master's Programs

- 1) Natural genetic competence in Gram-positive pathogens
- 2) Population heterogeneity
- 3) Dynamics of cellular structures: nucleoid and membrane
- 4) Functional RNA and gene regulation in *Salmonella*

### Study Programs for Short Stay Students (one week – one trimester)

- 1) Molecular genetic and biochemical techniques
- 2) Analysis of gene regulation

### Selected Publications

- 1) Nguyen Thi LT, Takemura AJ, Ohniwa RL, Saito S, and Morikawa K. Sodium Polyanethol Sulfonate modulates natural transformation of SigH-expressing *Staphylococcus aureus*. *Curr Microbiol* 75, 499. 2017.
- 2) Mizuno K, Mizuno M, Yamauchi M, Takemura AJ, Medrano Romero V, and Morikawa K. Adjacent-possible ecological niche: growth of *Lactobacillus* species co-cultured with *Escherichia coli* in a synthetic minimal medium. *Sci Rep* 7, 12880. 2017.
- 3) Ushijima Y, Ohniwa RL, and Morikawa K. Identification of nucleoid associated proteins (NAPs) under oxidative stress in *Staphylococcus aureus*. *BMC Microbiol* 17, 207. 2017
- 4) Cafini F, Nguyen le TT, Higashide M, Román F, Prieto J, and Morikawa K. Horizontal Gene Transmission of *cfr* gene to MRSA and *Enterococcus*: role of *S. epidermidis* as reservoir and alternative pathway for the spread of linezolid resistance. *J Antimicrob Chemother* 71, 587. 2016
- 5) Miyakoshi M, Chao Y, and Vogel J. Regulatory small RNAs from the 3' regions of bacterial mRNAs. *Curr Opin Microbiol* 24, 132. 2015.
- 6) Miyakoshi M, Chao Y, and Vogel J. Cross talk between ABC transporter mRNAs via a target mRNA-derived sponge of the GcvB small RNA. *EMBO J* 34, 1478. 2015.
- 7) Morikawa K, Takemura A, Inose Y, Tsai M, Nguyen Thi le T, Ohta T and Msadek T. Expression of a cryptic secondary sigma factor gene unveils natural competence for DNA transformation in *Staphylococcus aureus*. *PLoS Pathog* 8:e1003003. 2012

- 8) Tsai M, Ohniwa RL, Kato Y, Takeshita SL, Ohta T, Saito S, Hayashi H, and Morikawa K. *Staphylococcus aureus* requires cardiolipin for survival under conditions of high salinity. ***BMC Microbiol*** 11, 13. 2011.