

Date: Jan. 23 (Wed) 2019 18:00-19:00

Venue: 4 B104

Two bacterial survival strategies: Adjacent-Possible ecological niche (APEN) of lactic acid bacteria, and polyhydroxyalkanoates (PHA) as a carbon and energy storage compound

Dr. Kouhei Mizuno

Department of Creative Engineering, Kitakyushu National College of Technology, Kitakyushu, Japan

(This seminar will be held in English.)

Lactic acid bacteria (LAB) are nutritionally auxotrophs, with relatively small and phylogenetically close genomes that often encode niche-specific strategies such as protease production and mucus adhesion, which enables them to occupy diverse ecological niches (milk, wine, plants, and the human and animal intestine). Recent genome studies postulate that the niche-specific architectures of LAB genomes reflect their flexible adaptation and broad ecological distribution. However, how those auxotrophs could explore new niches is unknown. A potential interaction termed 'Adjacent-Possible ecological niche (APEN)' will be discussed. APEN would allow LAB to interact with adjacent microbiota to adapt to a new niche, which might cover the gap between the niche-specific nature of the physiology and the ecologically diverse distribution. The studies about the potential of *Lactobacillus* to interact with co-existing *E. coli* and grow in a strict nutrient-limiting condition will be introduced.

Another topic that will be discussed is intracellular lipid accumulation. Polyhydroxyalkanoates (PHAs) are produced by many bacteria and some archaea to store carbon and energy. Recently however, PHAs have been studied from multi-functional aspects such as infection process in plants, regulation of intestinal microbiota of insects, and further application for biocompatible plastics for medical devices. The basic information on PHA biosynthesis related genes and their classification will be introduced.

References

1. Mizuno K *et al. Sci Rep* **7**:12880 (2017).
2. Tsuge T *et al. Appl Microbiol Biotechnol* **99**:6231-6240 (2015).

Contact: Kazuya Morikawa (7882)