**Course Title:** Advanced Microbiology  
**Instructor:** Yasurou KURUSU, Hirofumi NISHIHARA  
**Code:** MA051700  
**Semester:** 2nd (Oct-)  
**Credit(s):** 1  
**Day/Period:** Fri, 3  
**Description Code:** A-AGC-612  

**Outline**  
Molecular mechanisms of plasmid replication and stable partition will be reviewed as well as examples of various bacteria as hosts. Microbial energy metabolism, functional redox molecules, and application of such redox reactions will also be reviewed.

**Keywords**  
Plasmid, genetic engineering, DNA replication, plasmid partition, energy metabolism, biological redox carrier, biosensor, biofuel cell, hydrogenase

**Goals**  
Deepen your understanding concerning above key words through the lecture. These terms should be explained appropriately in both basic and applicatory aspects after the lecture.

**Course Plan**  
1. Molecular character of plasmids  
2. Molecular mechanism of plasmid replication  
3. Molecular mechanism of plasmid partition  
4. Application for various bacteria as hosts (Short exam: 50%)  
5. Energy metabolism and functional redox carriers  
6. Application of redox carriers – Biosensor  
7. Application of redox carriers - Biofuel cell (Short exam: 25%)  
8. Hydrogen-oxidizing bacteria and hydrogenase (Short exam: 25%)  

**Elements of Diploma Policy:**  
1. Academic and research skills in the specialized field

**Advice for Preview and Review**  
The contents of lecture will be questioned by several short examinations to check the level of your understanding. We recommend re-studying your note and handout after lecture.

**Prerequisite**  
This class needs a knowledge of molecular biology.  
Office hour /Wednesday 11:50~12:40 (Kurusu, Nishihara)

**Grading Criteria**  
Examination (100 %; sum of short exam.)

**Texts/References**  
Handouts are used.