Fall 2008 New Course

**Instructor:** Hung-Wen Li (李弘文)

**Course Title:** 單分子化學生物學方法  
Methods in Single Molecule Chemical Biology

**Course Schedule:** Thursdays 10:20-12:10 (四 34).

**Course Audience:** 大三, 大四及研究生

**Course Goal:**
This course will present an overview of current experimental state-of-art *single molecule techniques used in chemical biology and biophysics*. Emphasis will be on two areas: (1) novel single molecule instrumentation and measurement methods, and (2) application of single molecule methods to study the mechanisms of chemical biology processes.

**Course Plan:**
- **Section 1:** Principles of single-molecule techniques and analysis
  - Optical microscopy
  - Single molecule fluorescence and single pair FRET
  - Optical tweezers, magnetic tweezers methods
  - Other novel method development
  - Single-molecule data analysis
  - Laboratory tour of single-molecule lab

- **Section 2:** Recent significant publications to illustrate how use single molecule methods are used to investigate biochemical mechanisms.

At the end of the second section, students are required to conduct a research project using single molecule methods to address biological mechanisms.

**Grading Scheme:**
- 15 %  Mid-term
- 35 %  Class participation
- 10 %  Homework
- 50 %  Research project

**Limitations:** Because of the discussion format in the second section of the course, and the fairness to students taking the class for credit, auditing is not permitted, unless with the instructor's permission.