



第 79 期

94年03月15日 ~ 30日
 本期發稿日：94/03/31
 下期截稿日：94/04/13

[陽明焦點新聞](#)[行政會報摘要](#)[各處室訊息](#)[院系所傳真](#)[社團動態](#)[陽明人](#)[自然誌](#)[校園之美](#)[校史照片展覽](#)[編輯報告](#)

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院系所傳真

生醫光電工程研究所開設短期課程

陽明大學生醫光電工程研究所客座教授——葉教授，停留台灣期間於生醫光電工程研究所開設短期課程如下，歡迎全校各位老師與同學一同參與。

Special Topics in Biophotonics

Yin Yeh, Ph.D.

Prof., UC Davis

Associate Director for Science, CBST

03/24, Thursday 10:10am~12:00pm

I. Introduction of Optical techniques:

- A. Fundamental interaction of light and matter
- B. Imaging at high resolutions – Optical microscope and beyond
- C. The need for quantum mechanical description of matter
- D. Aspects of absorption/dispersion spectroscopy – ellipsometry, dichroism and birefringence

03/25, Friday 10:10am~12

- E. Scattering spectroscopy – elastic (diffraction) and quasi-elastic, Raman processes, imaging spectroscopy
- F. Fluorescence spectroscopy – FCS, FRET, TIRF
- G. Non-linear optical spectroscopy – SHG, SFG, SRS, CARS
- H. Optical traps for molecular manipulation and force measurements.

03/31, Thursday 10:10am~12:00pm

II. Structure and function relationship

- A. What are the driving forces for the formation of biologically significant molecules?
- B. Is dynamics of the biomacromolecule a result of structural constraints? Or vice versa?

04/01, Friday 10:10am~12:00pm

[特別報導]



◎大學報
 ◎高教簡訊
 ◎教育部電子報
 ◎國衛院電子報

III. Genomic properties - Sequence, structure and function of DNA

- A. Fluorescent labels with differential environmental responses.
- B. Fluorescence in situ hybridization (FISH) and flow cytometry.

04/07, Thursday 10:10am~12:00pm

IV. Manipulation of the DNA sequence

- A. Proteins that affect the replication process: Nuclease, helicase, topoisomerase, polymerase. Force measurements, level of twists in superhelices, ds-ssDNA.
- B. Involvement of signaling in DNA repair mechanisms. Colocalization, dynamics of signal transduction (FCS).

04/08, Friday 10:10am~12:00pm

V. Membrane property I - Selective transport

- A. Lipid-protein interaction – protein conformations and dynamics of protein assemblies. (FRET).
- B. Driving force of the membrane rafts: dynamic or static? (FRAP and FCS)
- C. Measuring transmembrane flux – selective permeability or active transport?

04/14, Thursday 10:10am~12:00pm

VI. Membrane property II – Recognition, adhesion and fusion

- A. Characterization of membrane diffusion – >From lipids to proteins. (FCS)
- B. Cellular signaling: Selectin and integrin; reactive signaling and secondary messengers. (FRET)
- C. Identification of membrane receptors by structure and dynamics. (Non-tagging modalities - ellipsometry, CARS).

04/15, Friday 10:10am~12:00pm

VII. Enzyme properties I - Protein-protein interactions & supramolecular organization

- A. Aggregation structure and dynamics – building the extracellular matrix. (SFG, SHG)
- B. Dynamics of proteins – translation, rotation and reaction. (DLS, FCS)
- C. Colocalization and reactive stoichiometry – At very close quarters. (FRET, Antibunching spectroscopy)

04/21,Thursday 10:10am~12:00pm

VIII. Enzyme properties II - Motility and Contractility

- A. Assembly and disassembly of filaments for cytosis.
- B. Force and step size in single molecule nucleotide utilization.
- C. Structural and orientational dynamics of motor proteins.

[回《院系所傳真》](#)

[關於電子報](#) [訂閱電子報](#) [聯絡編輯小組](#) [上期電子報](#) [回電子報首頁](#)