



National Chiayi University

Department of Applied Chemistry



Introduction by Prof. Yu-Jang Li

Department of Applied Chemistry at NCYU

- faculty members: 18
 - Professor: 11
 - Associate Professor: 3
 - Assistant Professor: 2+2
- students: under: 172
 - master: 28, Ph.D.: 7





應化一館



應化二館

Facilities & Instruments



TEM



GC-Mass



CD-ORD



Electron Microscope



LCMS



FT-IR



300 MHz NMR



400 MHz NMR



X-Ray Diffractometer



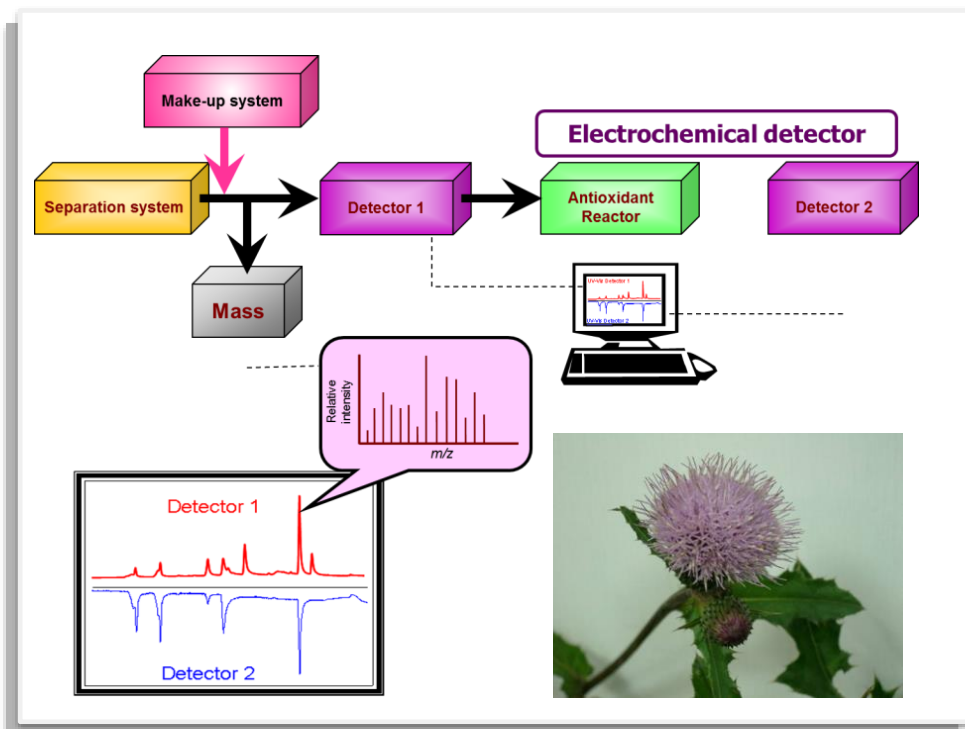
古國隆 教授 Professor **Kuo-Lung Ku**, Ph.D

Research Area: Analytical Chemistry, LC-UV-ECD-MS

Tel: 886-271-7405, E-mail: klku@mail.ncyu.edu.tw

Research Interests:

Integrating LC, electrochemical analysis, mass spectrometry for studying natural products.



Developing

- 1. Signal-Ratio-Based Antioxidant Index system**
- 2. Electrochemical recovery and detection technique** for probing activities and structures of plant secondary metabolites, peptides, and other natural products

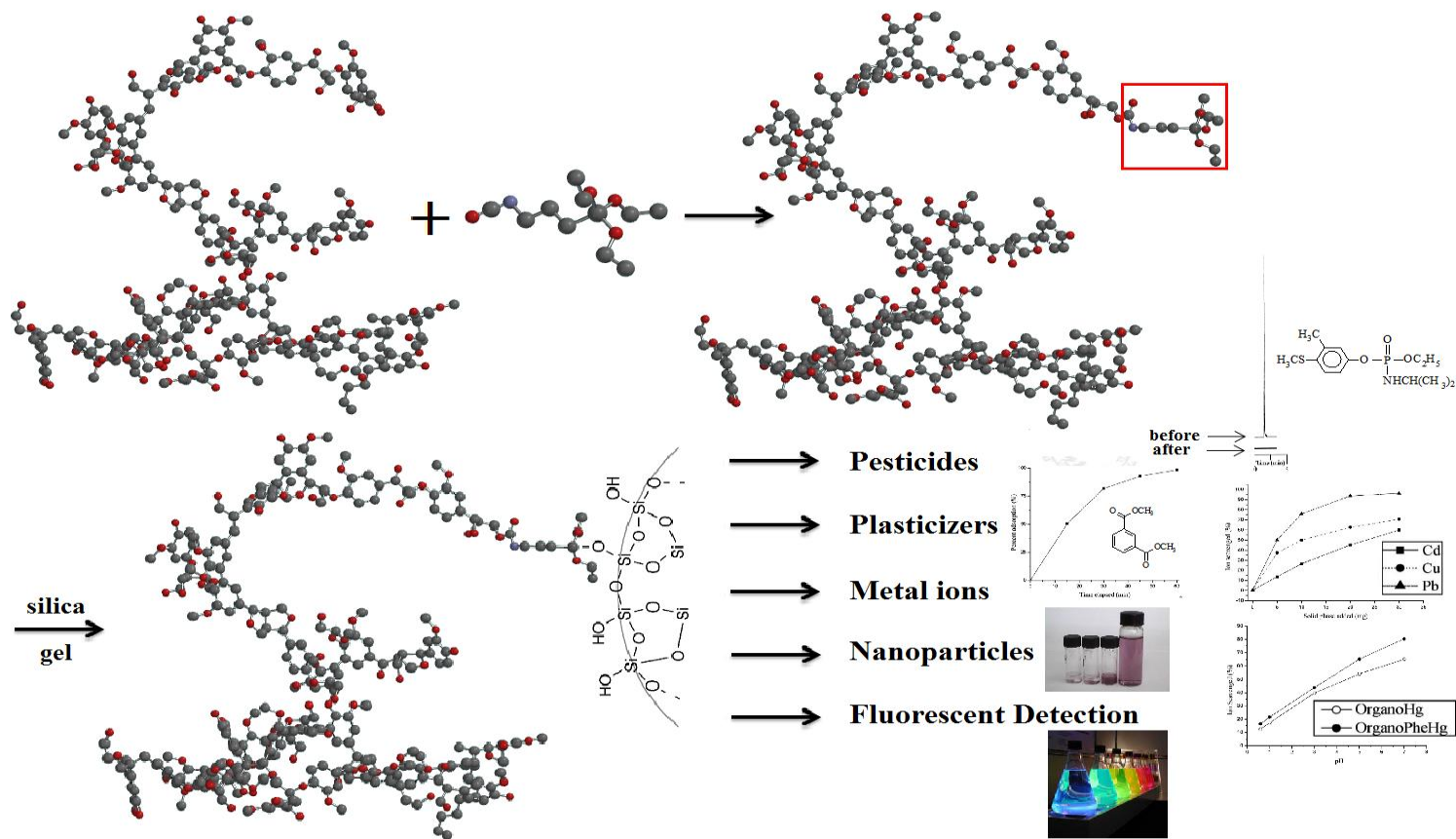


陳世晞 教授 Professor **Shushi Chen**, Ph.D.

Research Area: Analytical Chemistry

Tel: 886-271-7997, E-mail: schenphd@mail.ncyu.edu.tw

A Multipurpose Lignin-Based Adsorbent for Metallic Ions, Nanoparticles and Various Organophosphate Pesticides in Hexane





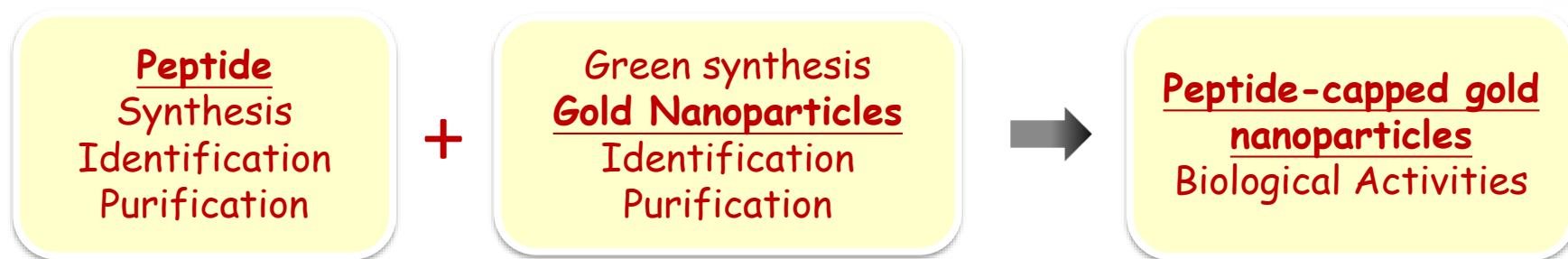
連經憶 助理教授 Assistant Professor

Ching-yi Lien, Ph.D

Research Area: Analytical Chemistry, Nanoanalysis

Tel: 886-271-7963, E-mail: kelly@mail.ncyu.edu.tw

Research Interests:



Cosmetic ingredients/products development

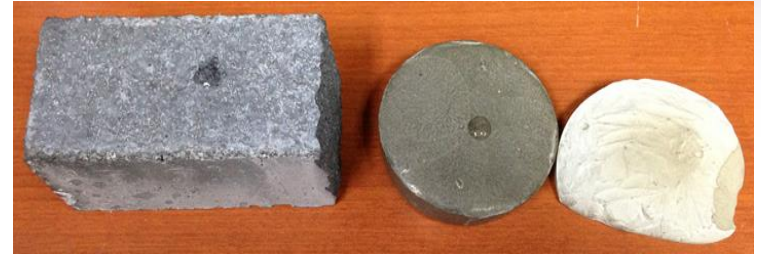
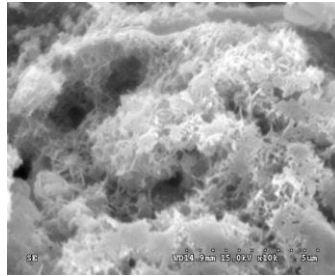
- Wild yam
- Orchid
- *Zingiber zerumbet* (Shampoo ginger, pinecone ginger)



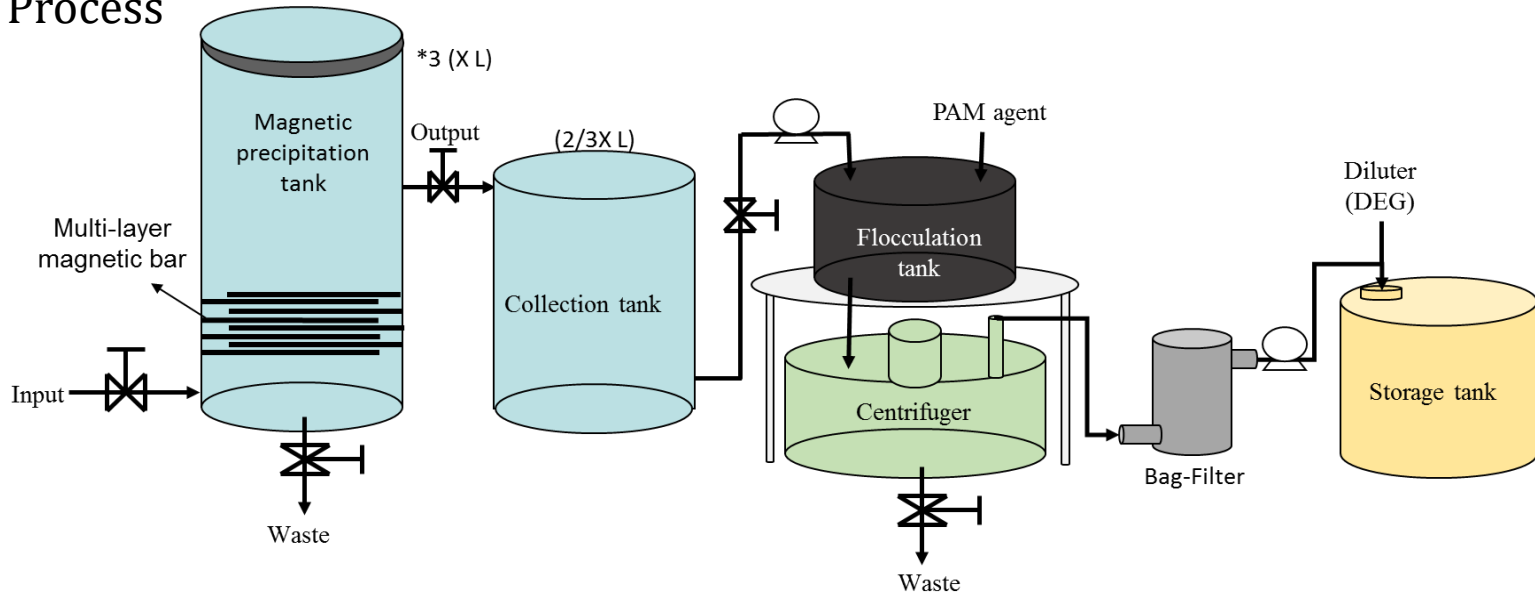


李茂田 教授 Professor **Maw-Tien Lee, PhD**
Research Area: Environment-Benign Materials
Tel: [886-271-7691](tel:886-271-7691), E-mail: mtlee@mail.ncyu.edu.tw

1. Hydrophobic rubcrete development



2. Improved Cutting Slurry Regeneration Scheme for the Chip Manufacturing Process

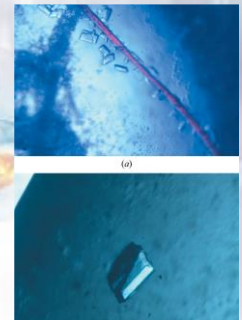




林榮流 教授 Professor Long-Liu Lin, Ph.D.

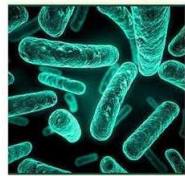
Research Area: Biochemistry; Microbial Biotechnology

Tel: 886-271-7969, E-mail: llin@mail.ncyu.edu.tw

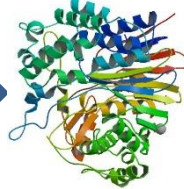


Research Interests:

1. Structure-function studies of microbial enzymes

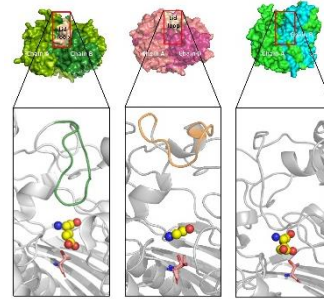


Enzyme purification & structural determination

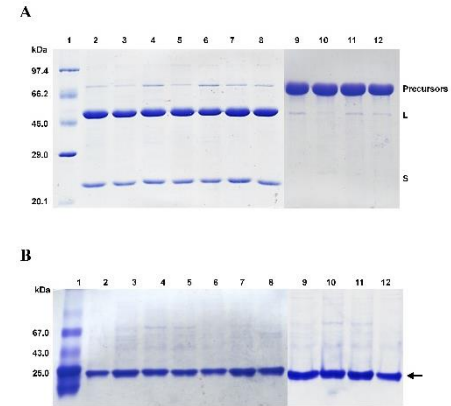


4OTT

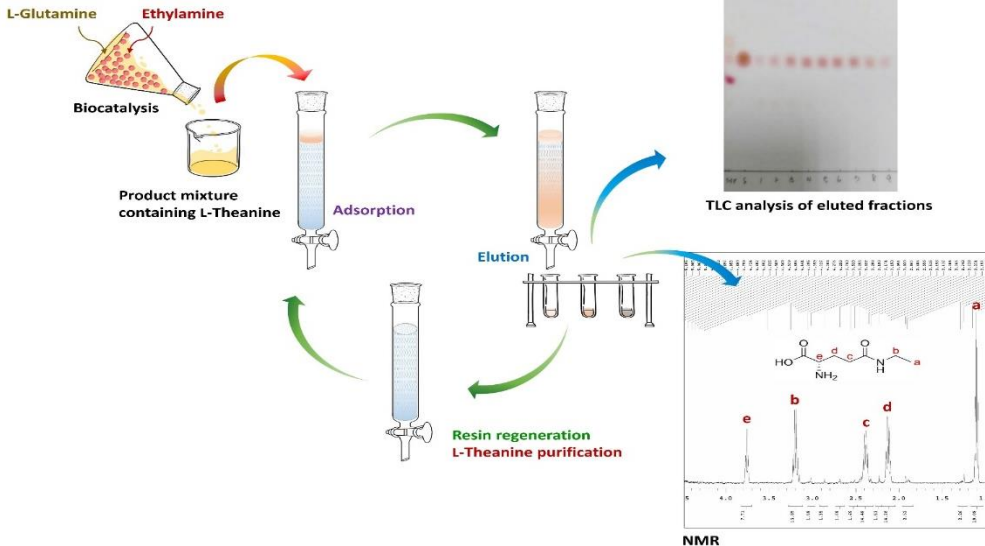
Structural comparison



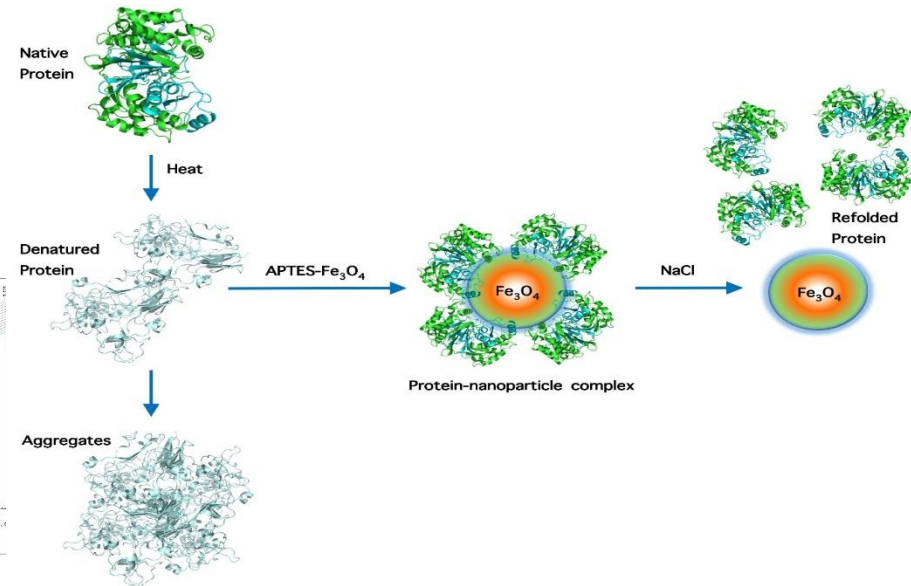
Mutagenesis



2. Biocatalytic synthesis of phytochemicals



3. Refolding of heat-denatured proteins by metal oxides





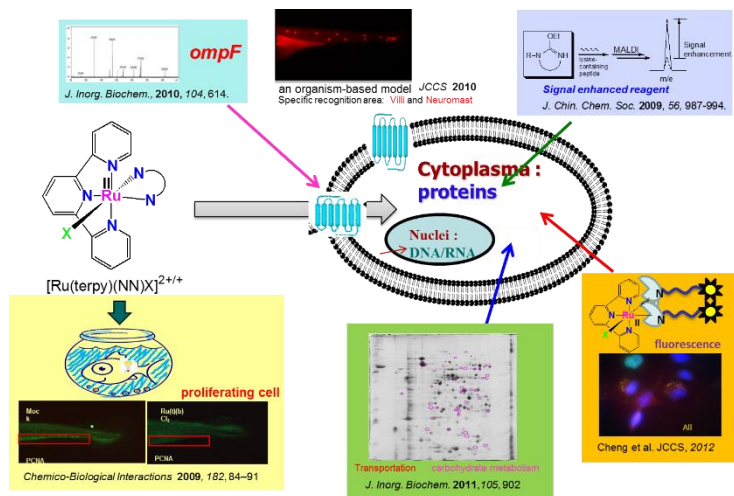
鄭建中 教授 Professor Chien-Chung Cheng, PhD.

Research Area: Bio-Organic and Bio-Inorganic Chemistry

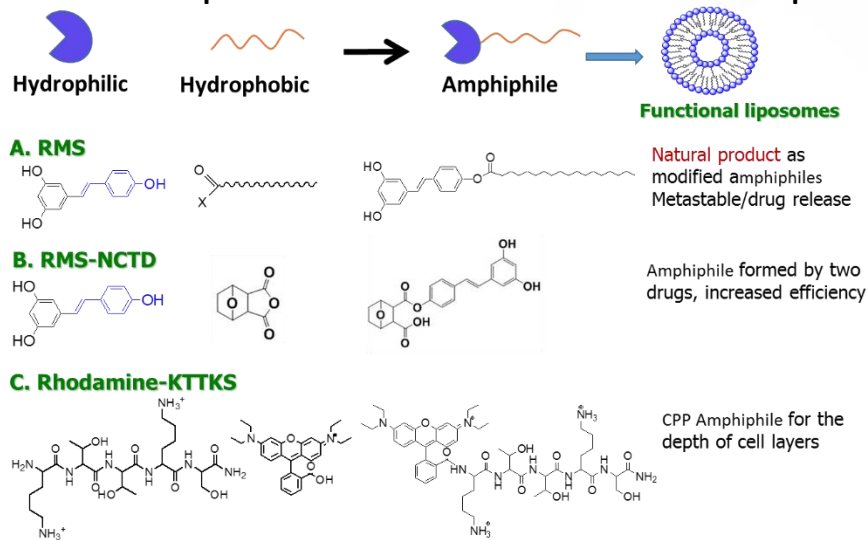
Tel: 886-5-2766084, E-mail: cccheng@mail.ncyu.edu.tw

Research Interests

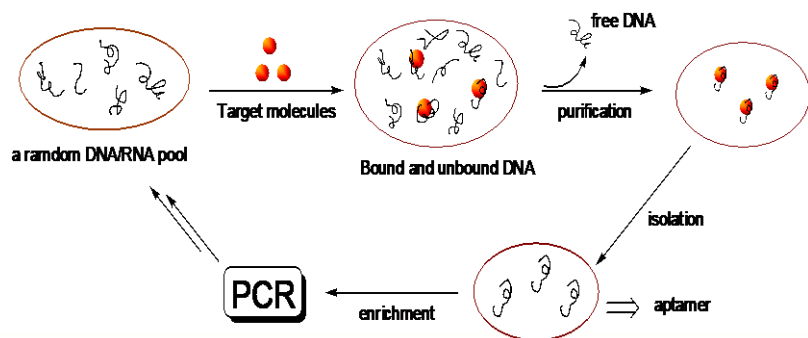
1. To study the relationship between bio-molecules structures and their functions;



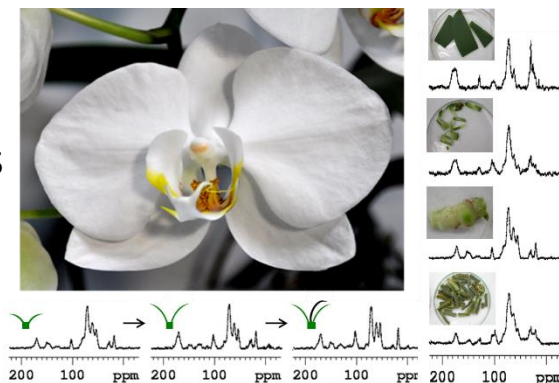
2. To develop chemical tools for cell transportation



3. To discover chemotherapeutic DNA drugs



4. To study the regulation factors of small molecules in plant growth



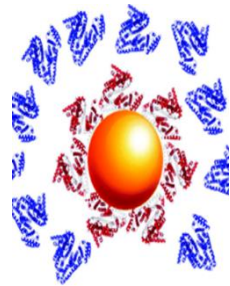


陳瑞彰 助理教授 Assistant Professor

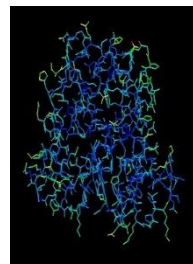
Jui-Chang Chen, Ph.D

Research Area: Biochemistry, Nanomaterials

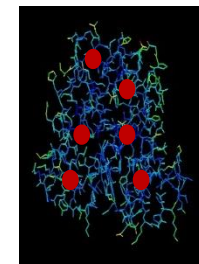
Tel: 886-271-7968, E-mail: chenjc@mail.ncyu.edu.tw



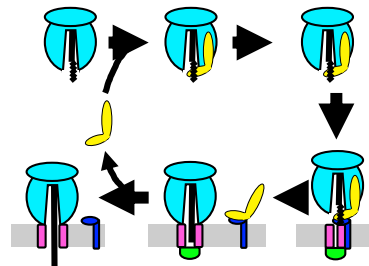
(A) binding affinities of proteins for nanoparticles



proteins



(B) synthesis of fluorescent nanoclusters with proteins



(C) Role of GTP/GDP in protein translocation

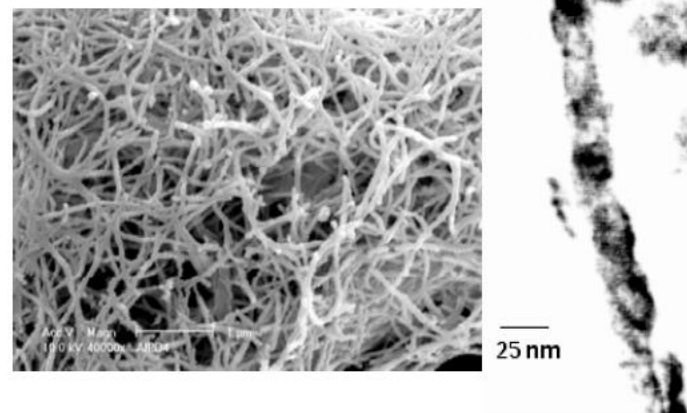
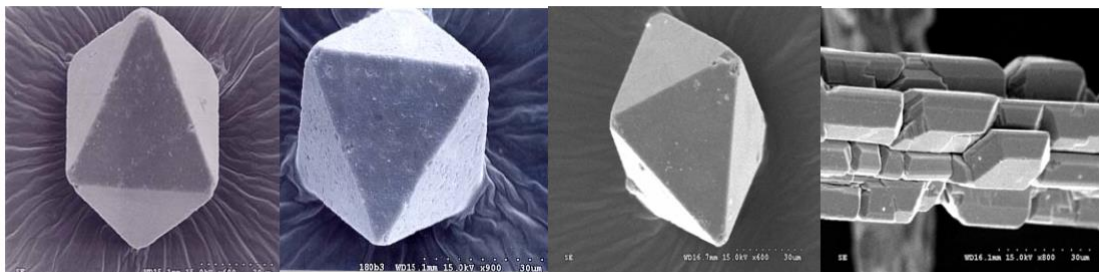
楊鐘松 教授 Professor Chung-Sung Yang PhD
 Research area: Solid State Chemistry; Nanomaterials

Tel: 886-5-271-7962 E-mail: csyang@mail.ncyu.edu.tw

Research Interests: 研究興趣

- *Solid State Synthesis. 固態合成:
- *Supramolecular Molecular Nanoclusters: 超分子奈米團簇
- *Nano- photocatalyst: 奈米光觸媒材料
- *Porous Materials Synthesis: 微孔及中孔洞材料合成

NCYU-1 嘉大 1 號 NCYU-2 嘉大 2 號 NCYU-3 嘉大 3 號

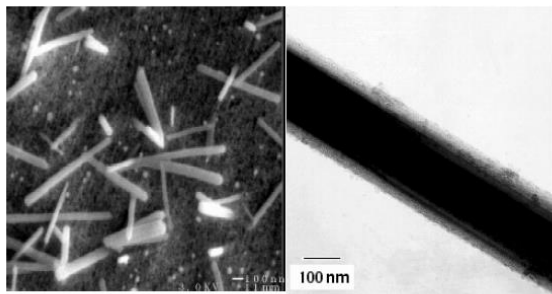


AlPO₄ Nanowire

TEM for AlPO₄

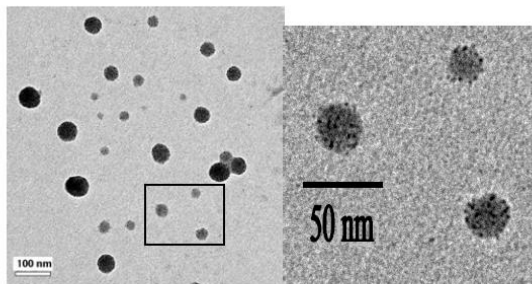


Self-assembly Cu₂S

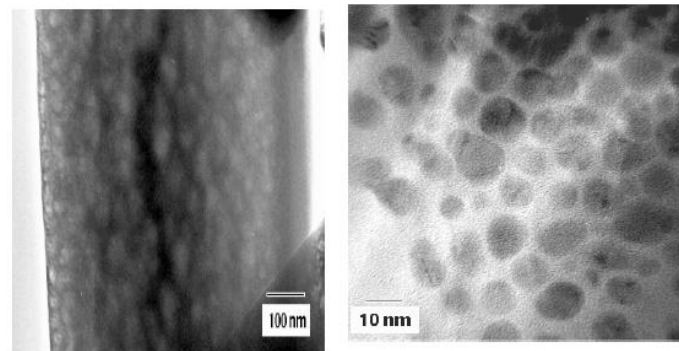


TiO₂ nanorods

SiO₂ ^ TiO₂ rods



Alumina doped titania (Al₂O₃⊙TiO₂) nps



Mesoporous GaPO₄ Rod

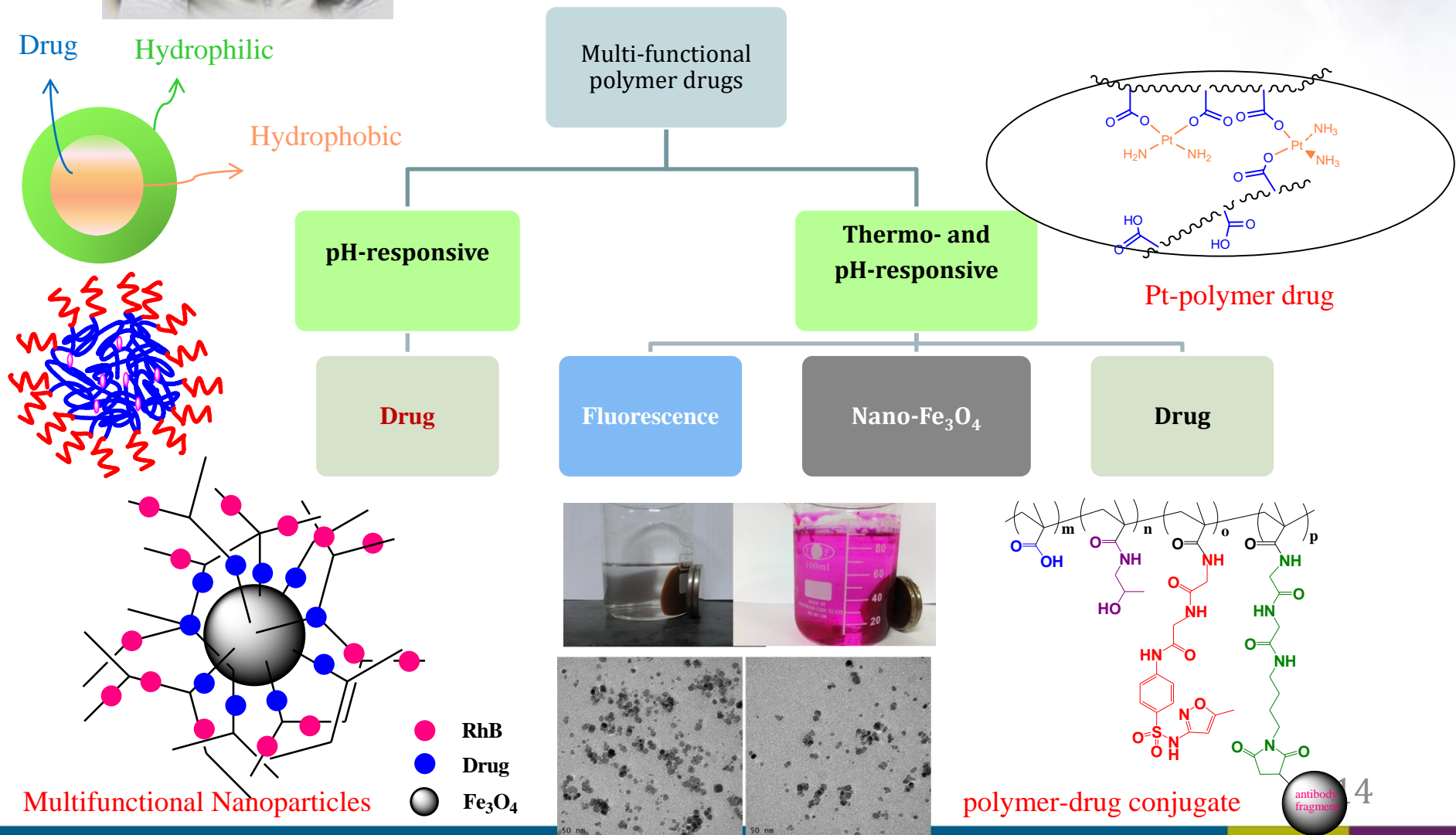
InPO₄ nanoparticles



梁孟 教授 Professor **Mong Liang**, Ph.D

Research Area: Polymer Chemistry, Catalysis

Tel: 886-271-7952, E-mail: mliang@mail.ncyu.edu.tw





邱秀貞 副教授 Associate Professor

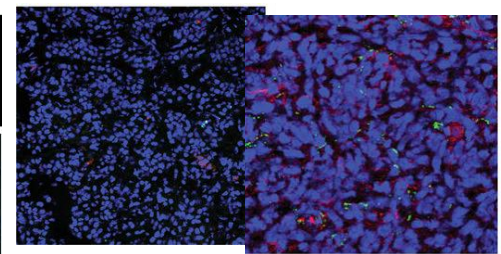
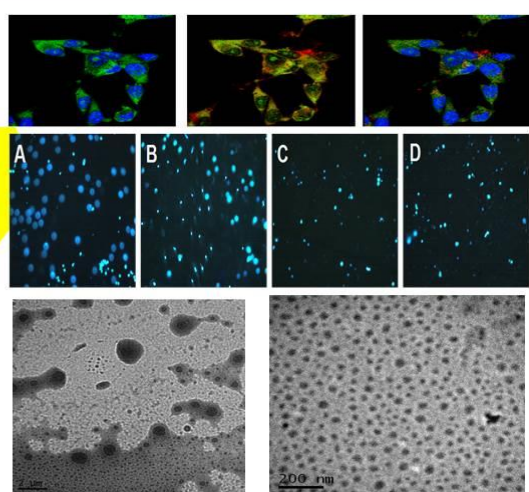
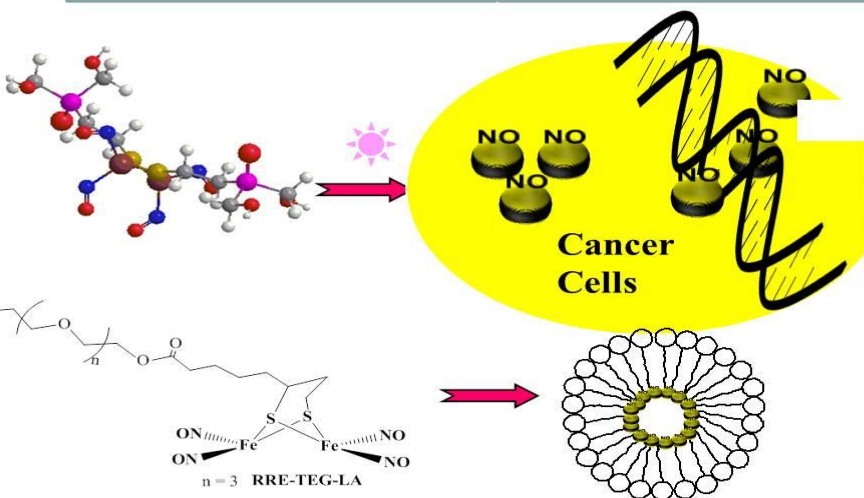
Show-Jen Chiou, Ph.D

Research Area: Bioinorganic/organicmetallic Chemistry

Metal biomedical materials

Tel: 886-271-7951, E-mail: genechiou@mail.ncyu.edu.tw

Research Interests



1. *Nature Nanotechnology* **2019**, *12*, 1160-1169.
2. *Inorg Chem*, **2018**, *57*, 12425-12443.
3. U.S. Patent Application No. 15/413,428, January 24, **2017**.



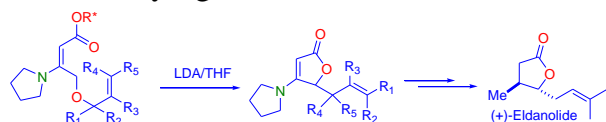
李瑜章 教授 Professor Yu-Jang Li, Ph.D.

Research Area: Asymmetric Synthesis

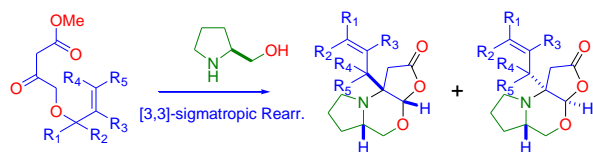


Research Interests :

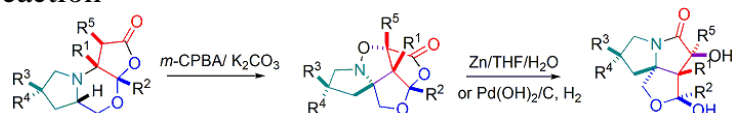
1. Chiral [2,3]-Wittig rearrangement of γ -allyloxy substituted vinylogous urethane enolates.



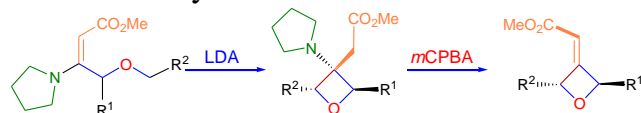
2. [3,3]/[1,3]-Claisen rearrangement of γ -allyloxy substituted vinylogous urethanes.



3. Tandem Cope elimination/1,3-dipolar cycloaddition reaction



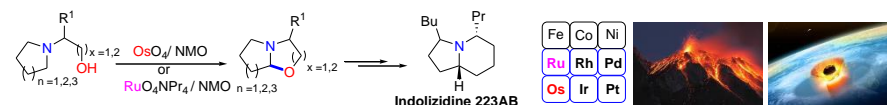
4. Synthesis of Polysubstituted Oxetanes



5. Synthesis of Biologically active Natural Product



6. OsO₄ and TPAP (RuO₄-Pr₄N⁺) mediated oxidative cyclization of cyclic aminoalcohols.



Publications:

1. Total synthesis of Indolizidine Alkaloids (-)-167B, (-)-209I, and (-)-223A by Using a Common Tricyclic Lactone. Yu-Jang Li,* Chung-Chien Hou, and Kuei-Chen Chang. *Eur. J. Org. Chem.* **2015**, 1659-1663.
2. Stereoselective Synthesis of 2,3,4-highly Substituted Oxetanes by Intramolecular C-C Bond Forming Michael Addition, Guo-Ming Ho and Yu-Jang Li*. *Chem. Commun.* **2016**, 52, 12108-12111.
3. *anti*-Selective aldol reactions of chiral alcohol-substituted gamma-benzyloxy vinylogous urethanes and the synthesis of 3-benzyloxy-4-hydroxylalkane-2-ones. Yu-Jang Li*, Chuan-Chung Chung, Pin-Zu Chen. *Tetrahedron: Asymmetry* **2017**, 28, 1573-1581.
4. Tandem [1,2]-Wittig Rearrangement/Lactonization of gamma-benzyloxy vinylogous urethanes: Application to the Synthetic studies of Maculactone A, Planchol C and gamma-Lycorane. Guo-Ming Ho, Yu-Jang Li*. *Asian J. Org. Chem.* **2018**, 7, 145-149.
5. C-H Functionalization of Amino Alcohols by Osmium Tetroxide/NMO or TPAP/NMO: Protection Group-Free Synthesis of Indolizidines (-)-223AB and 3-epi-(-)-223AB. Wei-Lun Chen, Lee-Ya Wang, Yu-Jang Li*. *Eur. J. Org. Chem.* **2020**, 103-107.



陳清玉 副教授 Associate Professor

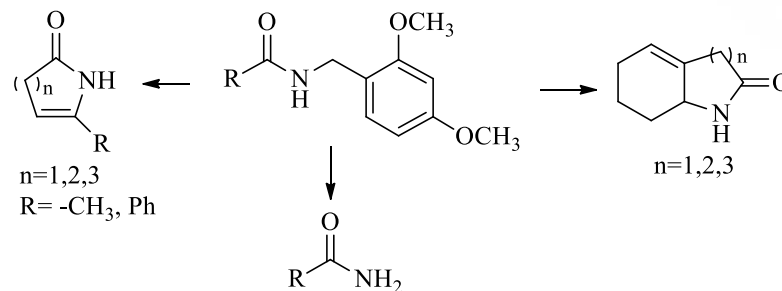
Ching-Yuh Chern, Ph.D

Research Area: Organic Chemistry, Synthesis Methodology and Mechanism

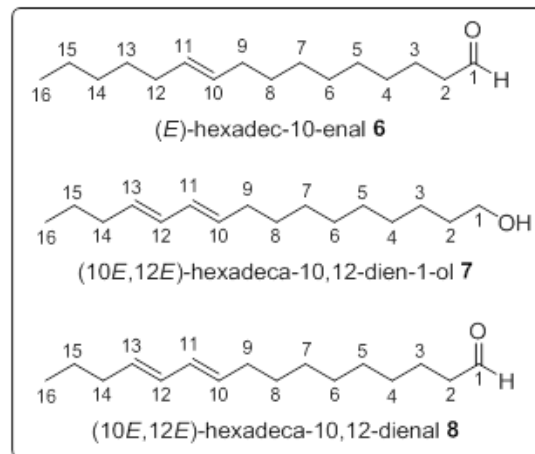
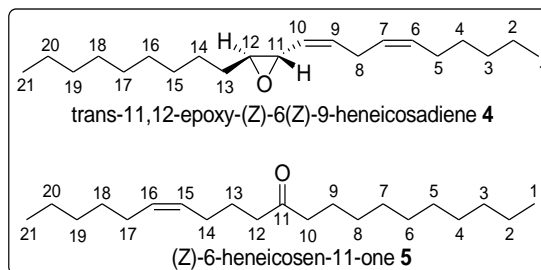
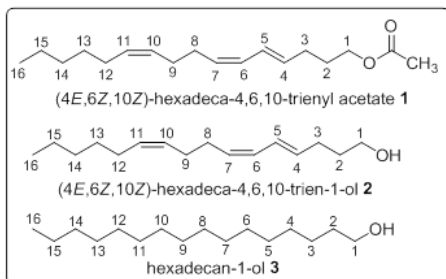
Tel: 886-271-7970, E-mail: cychern@mail.ncyu.edu.tw

Research Interests :

1. Employ different method to develop new synthesis methodology and mechanism study.



2. Synthesis of sex pheromone of insects





黃建智 副教授 Associate Professor

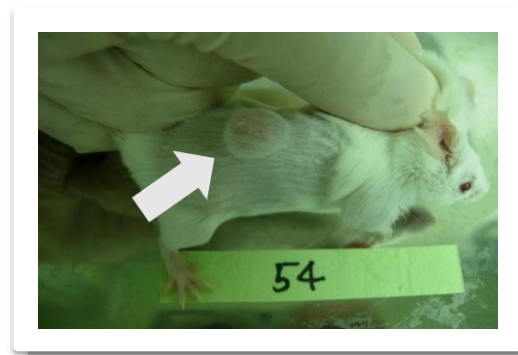
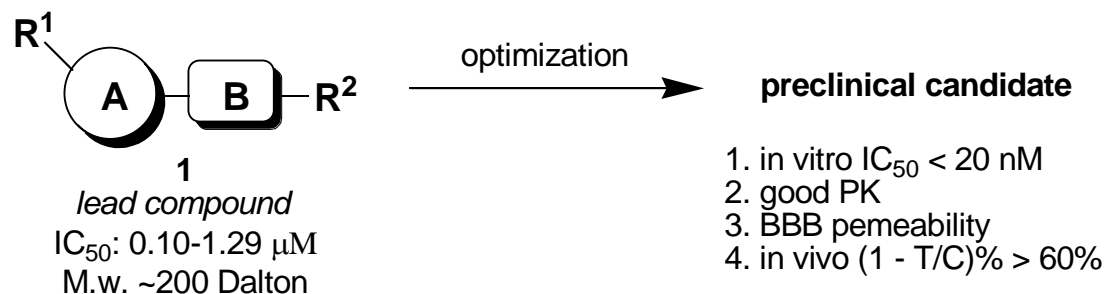
Jiann-Jyh Huang, Ph.D

Research Area: Medicinal Chemistry

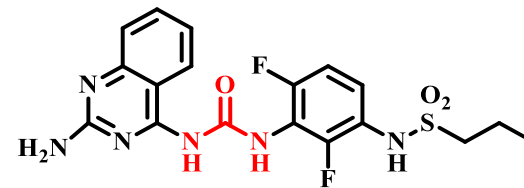
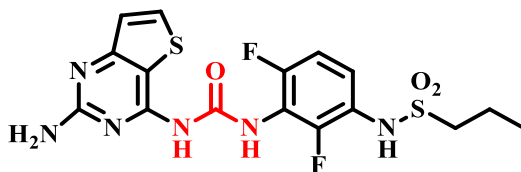
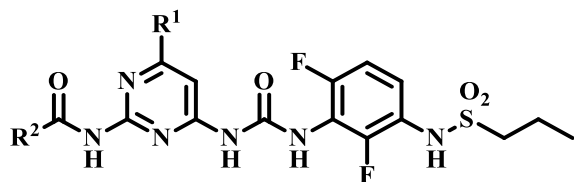
Tel: 886-271-7959, E-mail: lukehuang@mail.ncyu.edu.tw

Research Interests :

1. Discovery of New Anti-Cancer Drug for Brain Cancer



2. Novel B-Raf Inhibitors (Me-Too and Me-Better Approach)





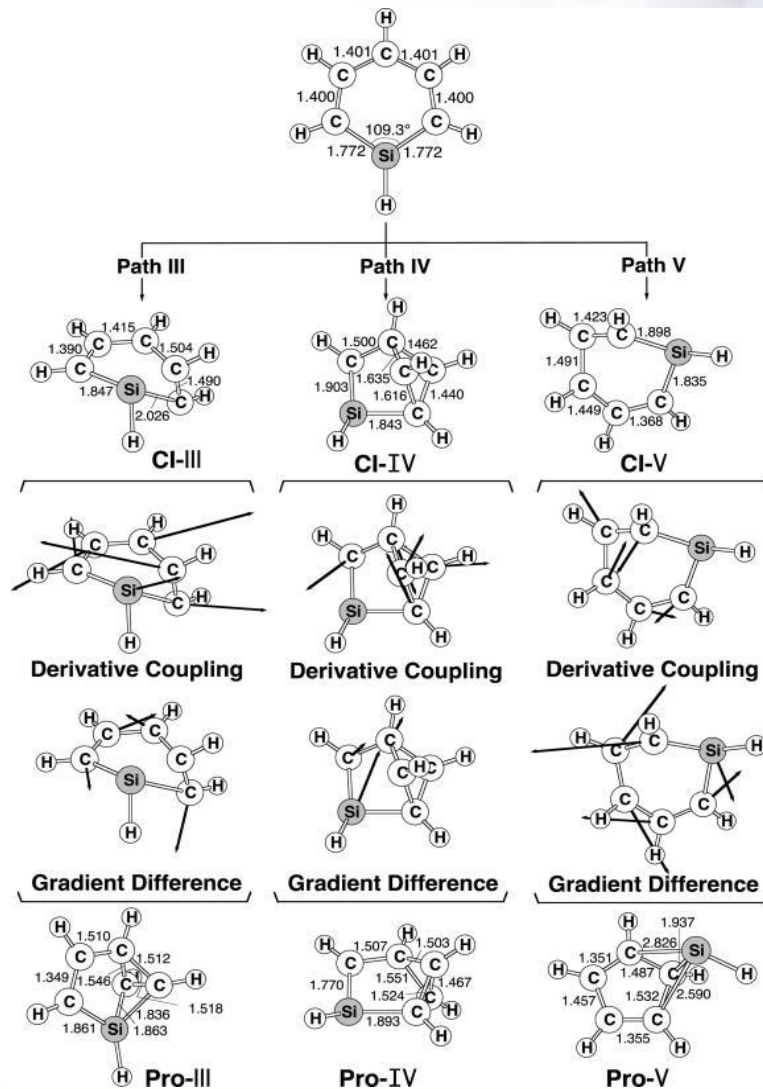
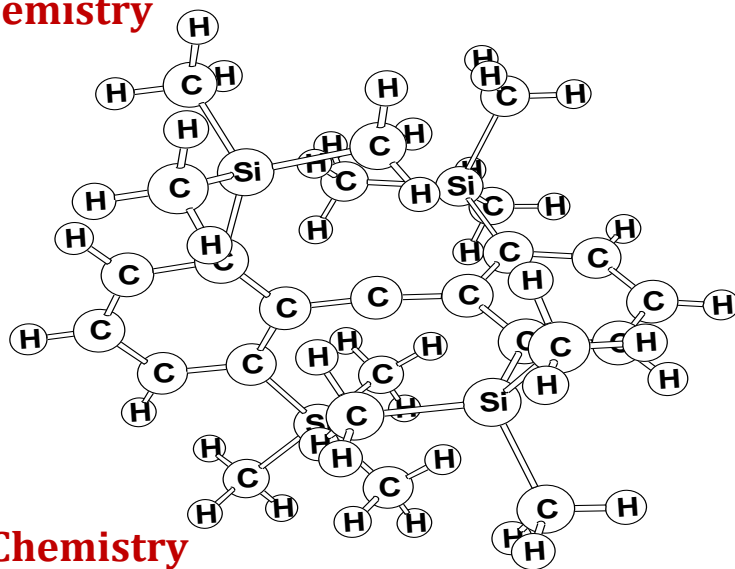
蘇明德 教授 Professor **Ming-Der Su, Ph.D**

Research Area: Theoretical Chemistry

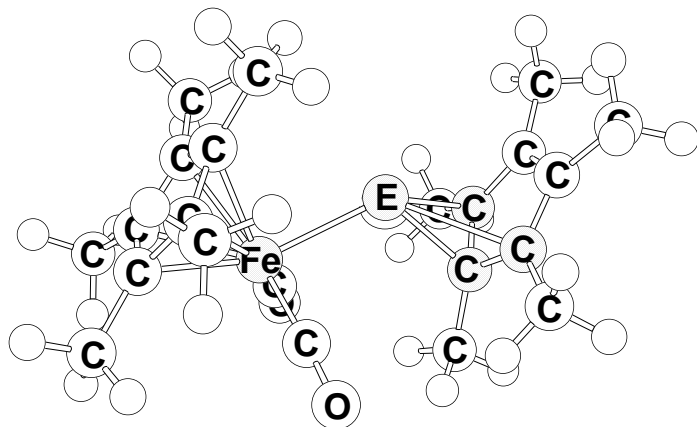
Tel: 886-271-7964, E-mail: midesu@mail.ncyu.edu.tw

Research Interests:

(1) Organic Chemistry



(2) Inorganic Chemistry





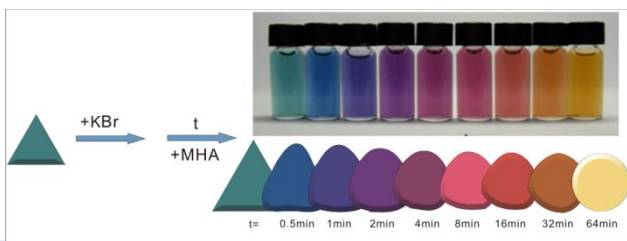
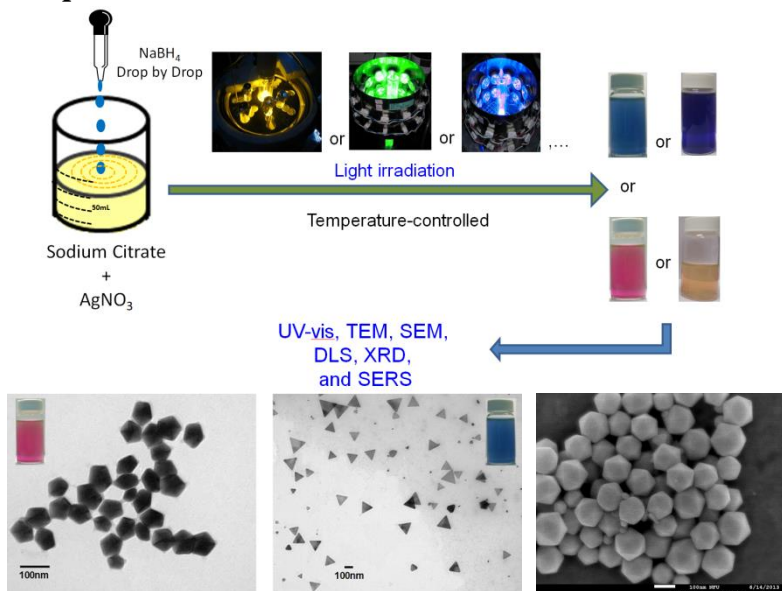
黃正良 教授 Professor Cheng-Liang Huang

Research Area: Raman and optical spectroscopy, Nanomaterials

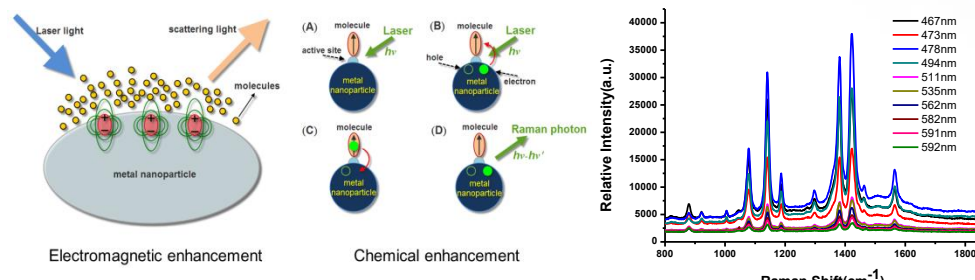
Tel: 886-271-7963, E-mail: clhuang@mail.ncyu.edu.tw

Research Interests :

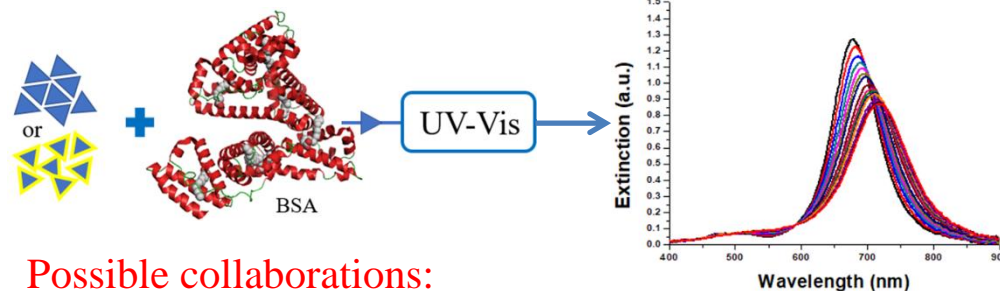
1. Synthesis of silver nanoparticles with specific shapes or LSPR bands using the photochemical reaction.



2. Applications of silver nanoparticles:
a. Surface-Enhanced Raman spectroscopy



b. Chemical sensors or biosensors based on the time-resolved LSPR spectra of silver nanoparticles.



Possible collaborations:

1. More plasmonic and sensing applications based on silver or gold nanomaterials.
2. Mechanism study of the growth, shape transformation and aggregation of silver nanoparticles.



王梓帆 助理教授 Assistant Professor **Tzu-Fan Wang, Ph.D**

Research Area: Biochemistry, Biochemical Analysis

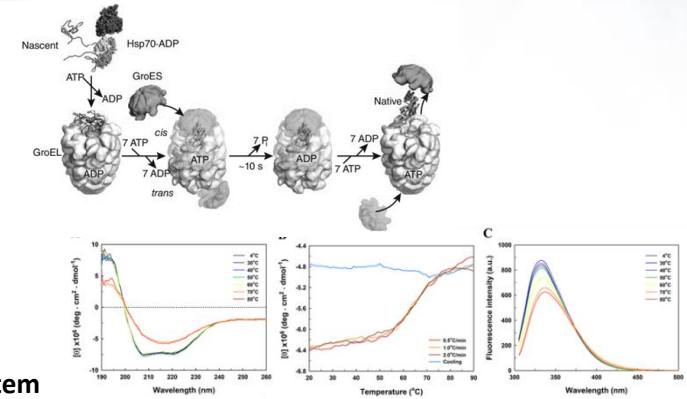
Tel: 886-271-7969, E-mail: tfwang@mail.ncyu.edu.tw

Research Interests:

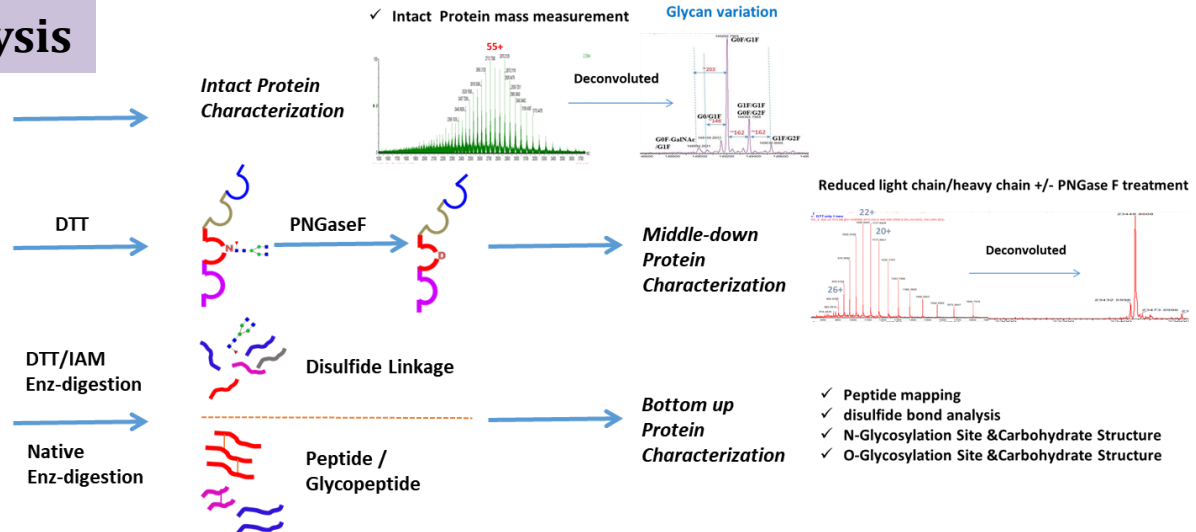
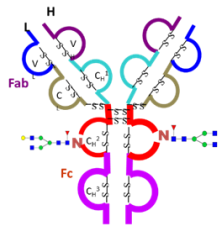
Phosphotriesterases

- *Escherichia coli* prolidase (*EcPepQ*)
- *Pseudomonas diminuta* phosphotriesterase (*PdPTE*)

1. Expression system optimization
 - High-Yield Expression System
 - Chaperone Co-expression
 - Protein Refolding System
2. Structure and Function Characterization
 - Enzym activity assay
 - Secondary and Tertiary Structure
3. Application
 - Enzyme Immobilization
 - Chemical and Organic Co-solvent System



Protein Drug analysis



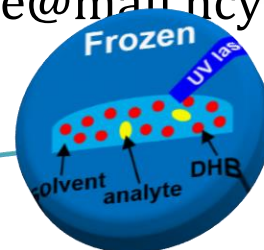
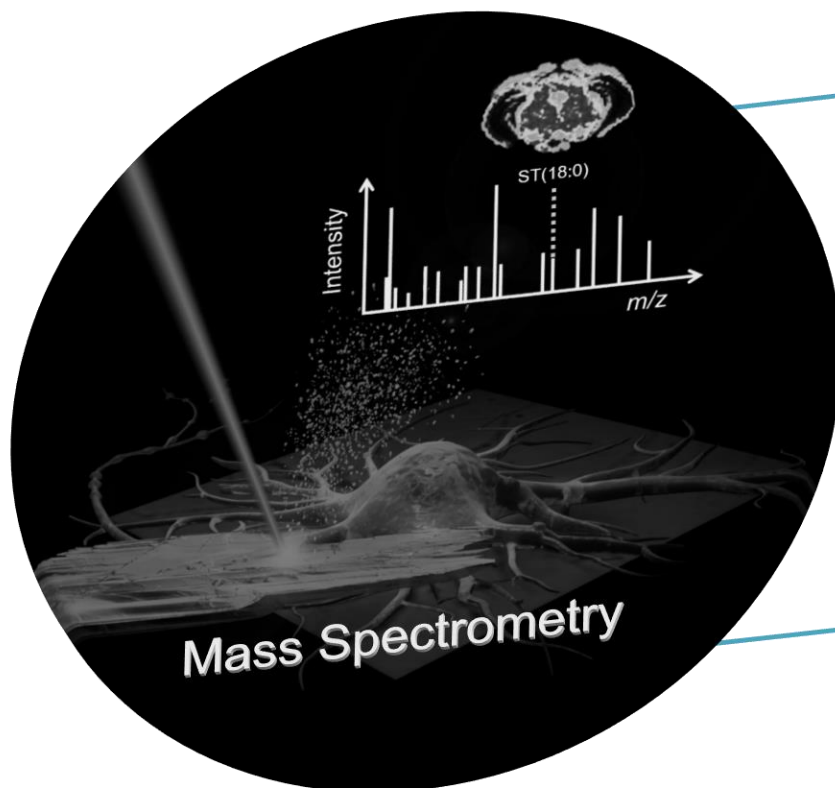


李竹平專案 助理教授 Assistant Professor

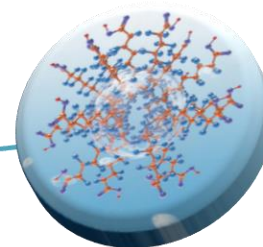
Chuping Lee, Ph.D

Research Area: Mass Spectrometry

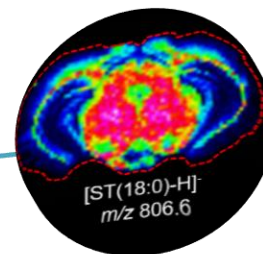
Tel: 886-271-7947, E-mail: cplee@mail.ncyu.edu.tw



Ionization mechanism
Ionization technique



Analyte enrichment
Nanoparticles



MALDI
MS imaging
Lipidomic

Selected Publications

Applied Chemistry

- Radical and Atom Transfer Halogenation (RATH): A Facile Route for Chemical and Polymer Functionalization. Han, Y. J.; Lin, C. Y.; Liang, M.; Liu, Y. L. *Macromol. Rapid. Commun.* **2016**, *37*, 845-850.

Analytical Chemistry

- C. W. Hsu, C. C. Huang, J. H. Sheu, C. W. Lin, L. F. Lin, J. S. Jan, L. A. Chau, W. Chen*(**2016**) Novel Method for Differentiating Histological Types of Gastric Adenocarcinoma by Using Confocal Raman *Microspectroscopy*. *PLoS One* 0,1-12

Biochemistry

- Lin MG, Chi MC, Naveen V, Li YC, Lin LL*, Hsiao CD* (**2016**) Bacillus licheniformis trehalose-6-phosphate hydrolase structures suggest keys to substrate specificity. *Acta Crystallographica D*72:59-70.
- Deyue Yan, Lin-Kai Ni, Ho-Lun Chen, Li-Chou Chen, Yau-Hung Chen, Chien-Chung Cheng "Amphiphilic Nanoparticles of Resveratrol-Norcantharidin to Enhance the Toxicity in Zebrafish Embryo", *Bioorganic and Medicinal Chemistry Letters*, **2016**, 770-774.

Selected Publications

Inorganic Chemistry

- Microwave-Assisted Synthesis of Thermo- and pH-responsive Antitumor Drug Carrier Through Reversible Addition—Fragmentation Chain Transfer Polymerization. Wang, Y. M.; Zheng, S. X.; Chang, H. I.; H.Y. Tsai, H. Y.; Liang, M.* *Express Polym. Lett.* **2017**, 11, 293-307.
- "Photo-catalytic selectivity of anthranilic acid over iron oxide-incorporated titania nanoparticles Influence of the Fe₂ Fe₃ ratio of iron oxide" Ya-Hui Chang, Chun-Chang Ou, Hui-Wen Yeh, and Chung-Sung Yang*, *Journal of Molecular Catalysis A-Chemical.* **2016**, 412, 66–77.
- Tsai-Te Lu*,†, Yun-Ming Wang*,‡, Chen-Hsiung Hung*,§, Show-Jen Chiou*, Wen-Feng Liaw*, Bioinorganic Chemistry of the Natural Fe(NO)₂ Motif: Evolution of a Functional Model for NO-Related Biomedical Application and Revolutionary Development of a Translational Model. *Inorg Chem*, **2018**, 57, 12425-12443.

Organic Chemistry

- C-H Functionalization of Amino Alcohols by Osmium Tetroxide/NMO or TPAP/NMO: Protection Group-Free Synthesis of Indolizidines (-)-223AB and 3-epi(-)-223AB. Wei-Lun Chen, Lee-Ya Wang, Yu-Jang Li*. *Eur. J. Org. Chem.* **2020**, 103-107.
- " Facile One-pot Synthesis of Methyl 1-Aryl-1H-1,2,4-triazole-3-carboxylates from Nitrilimines with Vilsmeier Reagent" S.-E. Tsai, K.-H. Chiang, C.-C. Tseng, N.-W. Chen, C.-Y. Chern,* and F.-F. Wong*, *Eur. J. Org. Chem.* **2019**, 1754-1762.

- Rational Design of Cyclopenta[2,1-b;3,4-b']dithiophene-bridged Hole Transporting Materials for Highly Efficient and Stable Perovskite Solar Cells. Yan-Duo Lin,* Kun-Mu Lee,* Bo-Yu Ke, Kai-Shiang Chen, Hao-Chien Cheng, Wei-Juih Lin, Sheng Hsiung Chang, Chun-Guey Wu,* Ming-Chung Kuo, Hsin-Cheng Chung, Chien-Chun Chou, Heng-Yu Chen, Kang-Ling Liao, Shih-Sheng Sun,* Tahsin J. Chow.* *Energy Technol.* **2019**, 7, 307 – 316.

Physical Chemistry

- A Theoretical Study on the Stability of PtL₂ Complexes of Endohedral Fullerenes: The Influence of Encapsulated Ions, Cage Sizes, and Ligands. Ming-Chung Yang and Ming-Der Su*. *ACS Omega* **2019**, 4, 3105-3113.
- A Versatile NHC-Parent Silyliumylidene Cation for Catalytic Chemo- and Regioselective Hydroboration, Bi-Xiang Leong, Jiawen Lee, Yan Li, Ming-Chung Yang, Chi-Kit Siu*, Ming-Der Su*, and Cheuk-Wai So*, *J. Am. Chem. Soc.* **2019**, 141, 17629-17636.
- Efficient organic solar cells based on PTB7/PC71BM blend film with embedded different shapes silver nanoparticles into PEDOT: PSS as hole transporting layers, Chih-Ping Chen, I-Chan Lee, Yao-Yu Tsai, Cheng-Liang Huang, Yung-Chung Chen, Guan-Wei Huang, *Organic Electronics*, **2018**, 62, 95-101.



College of Science & Engineering



Chemistry Building I



Chemistry Building II

WELCOME to NCYU!!