

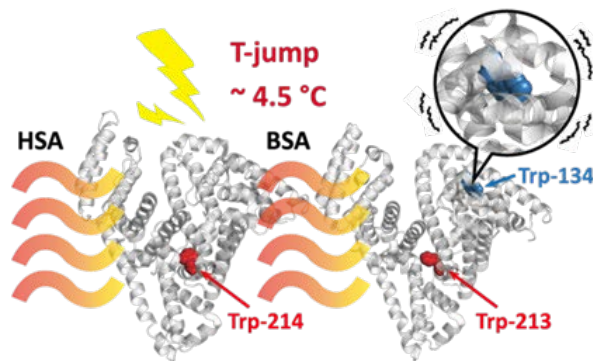
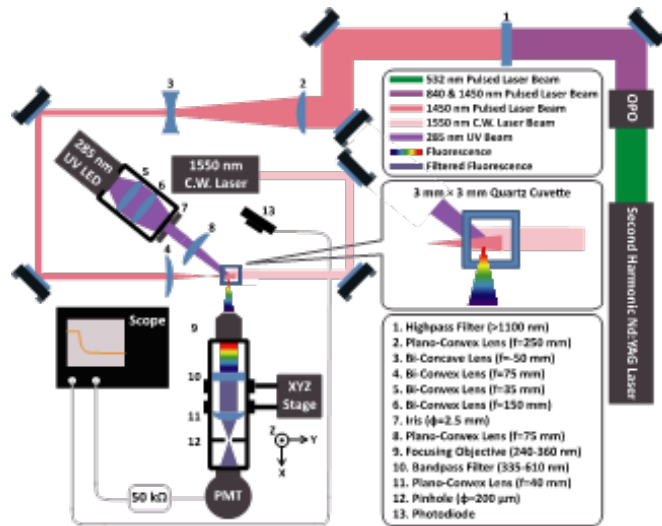


朱立岡教授-生物物理及時間解析光譜實驗室

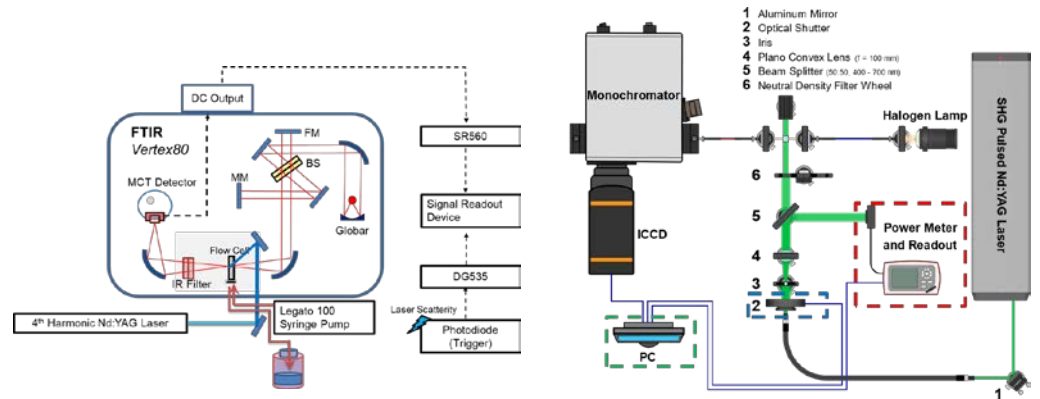
Biophysics & Time-resolved Spectroscopy Laboratory

聯絡分機: 33396: 辦公室: 化館B16

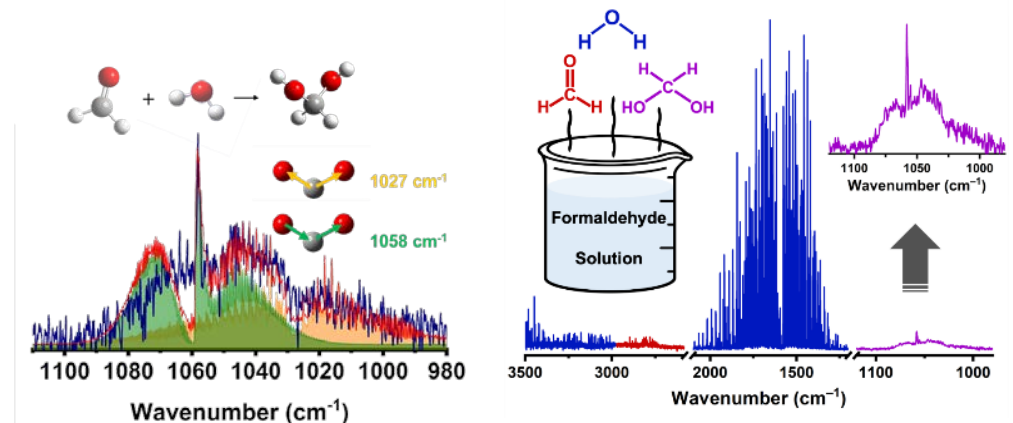
T-Jump & Protein Dynamics



Photochemistry in solutions



Gaseous IR spectroscopy



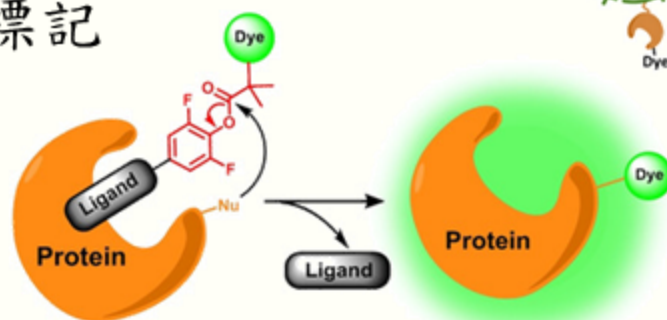
陳貴通實驗室 (化學館 R724)

化學生物學 分析化學



化學生物學

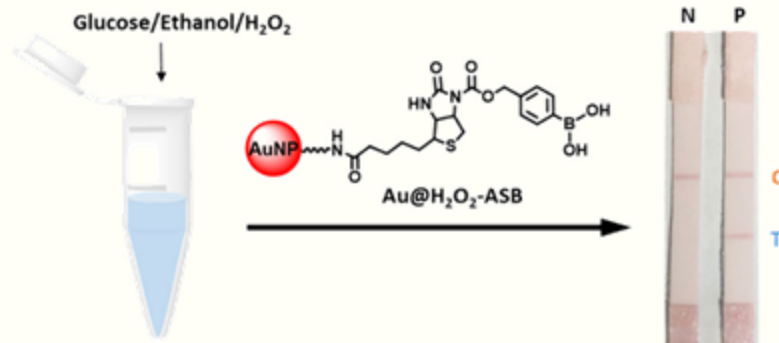
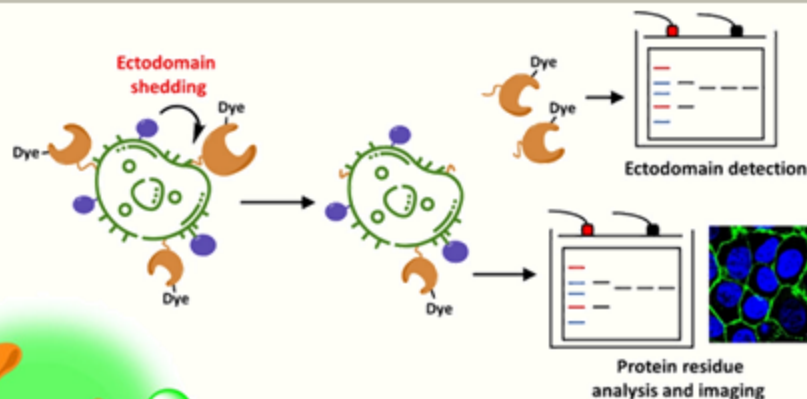
螢光染料
生物蛋白標記



- ✓ Intracellular and in vivo labeling
- ✓ Auto- and catalytic-hydrolysis resistance
- ✓ Long term stability
- ✓ Diverse dyes and ligands

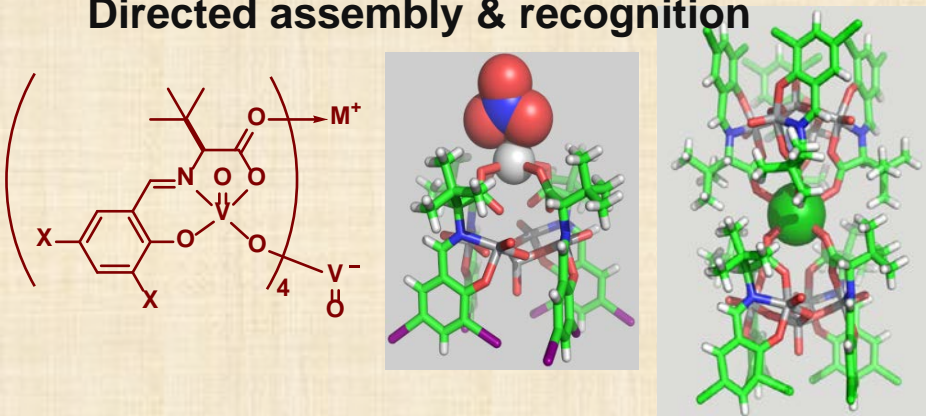
分析化學

小分子探針
可調控親和流量層析
微陣列生物晶片

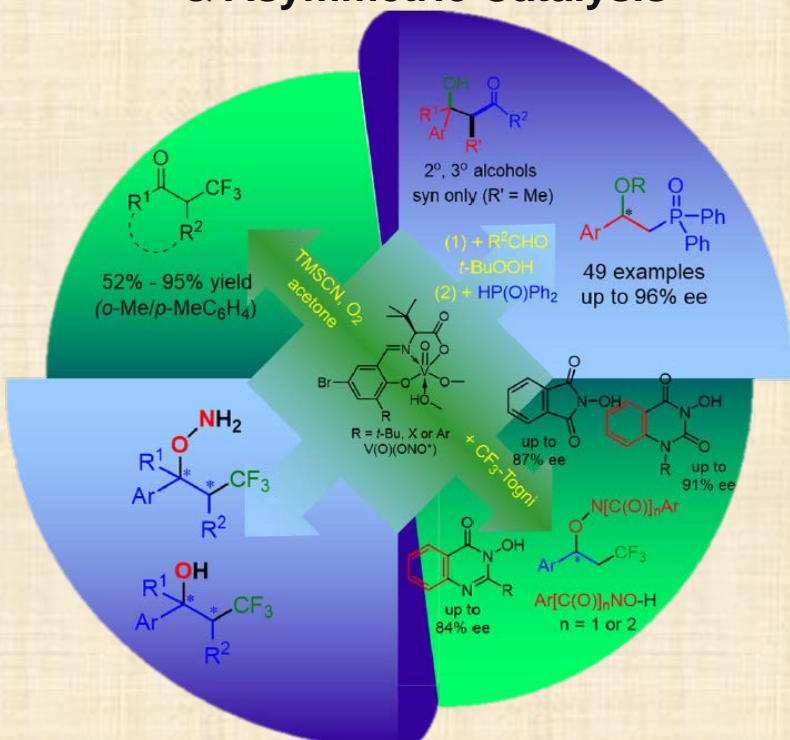


陳建添實驗室 - 增效型不對稱催化、光致切換催化和自組裝 導向型自組裝與辨識、有機〔掌性〕光電材料和氧鈦催化應用

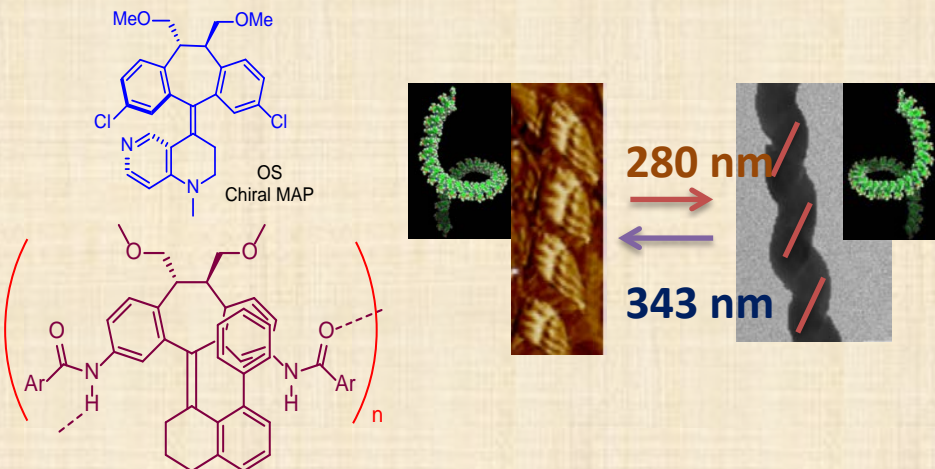
Directed assembly & recognition



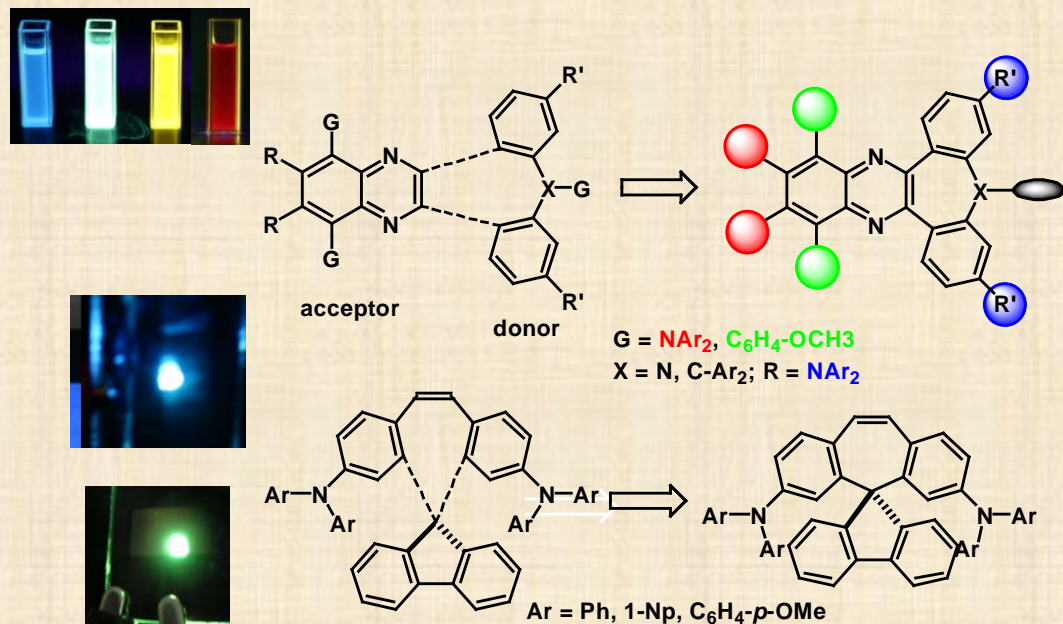
Vanadyl-catalyzed cross couplings & Asymmetric Catalysis



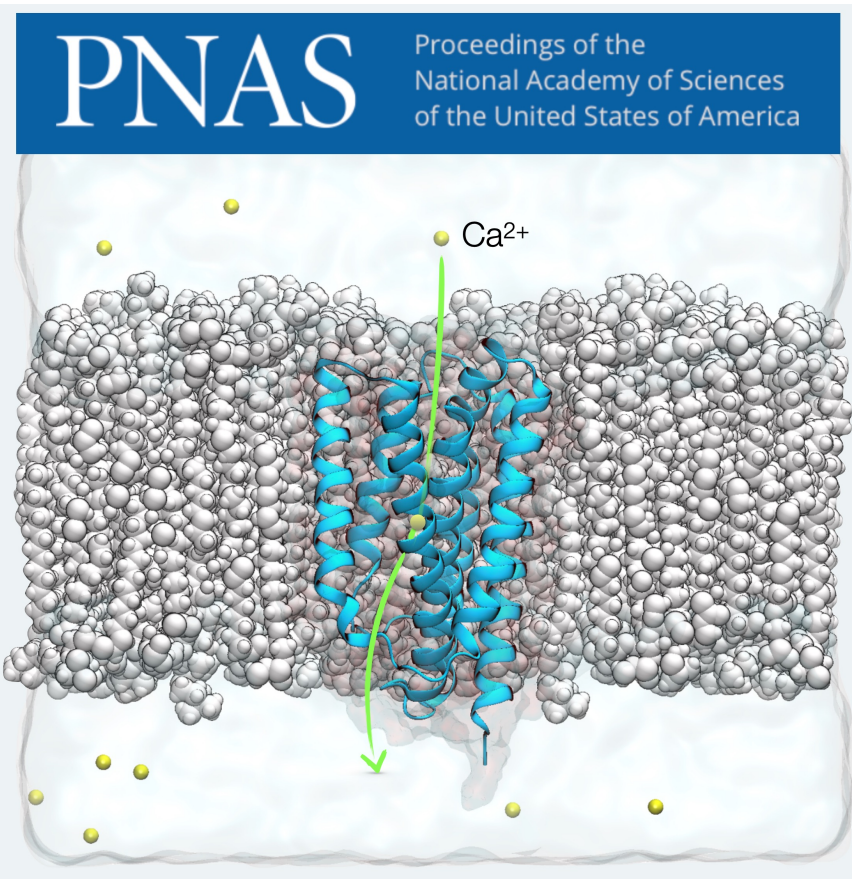
Optically switchable catalysis & Assembly



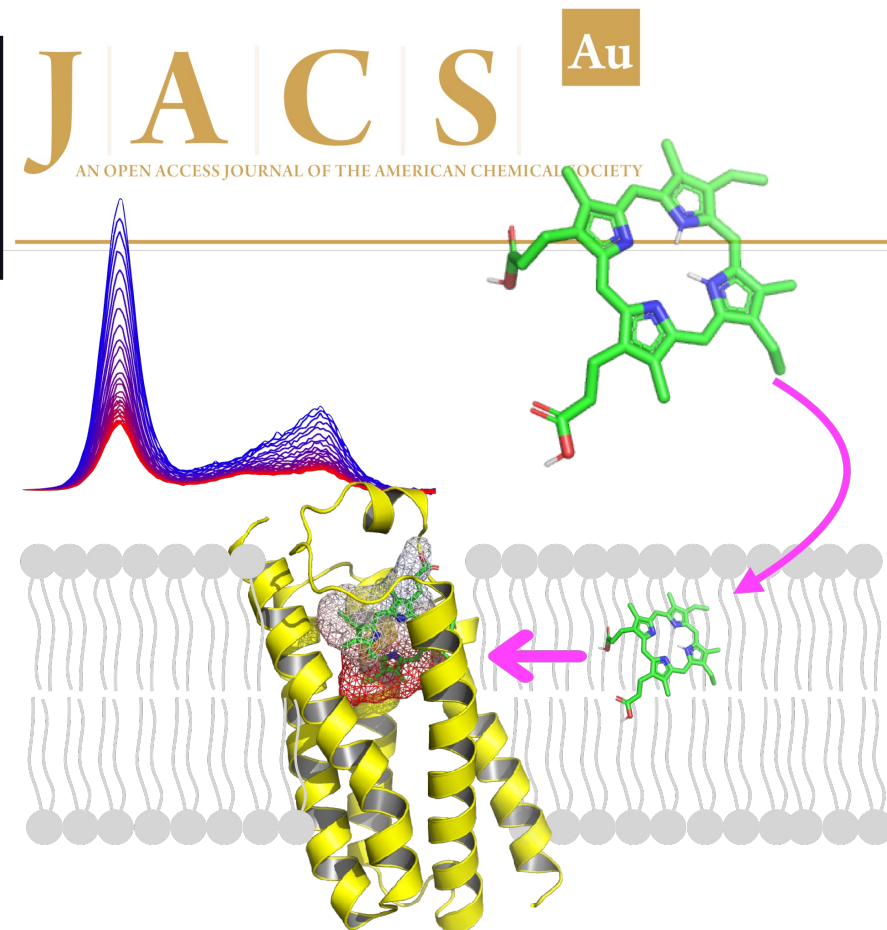
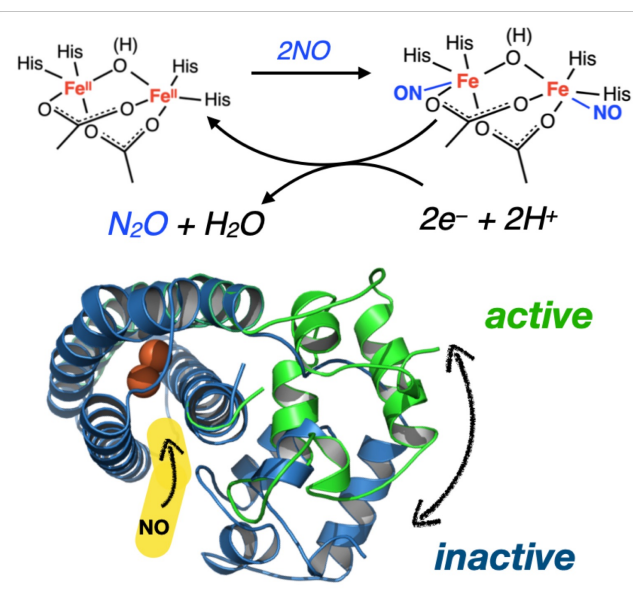
Organic optoelectronic materials & OPV



江昀緯教授Lab: Membrane Protein Activity and Biophysics



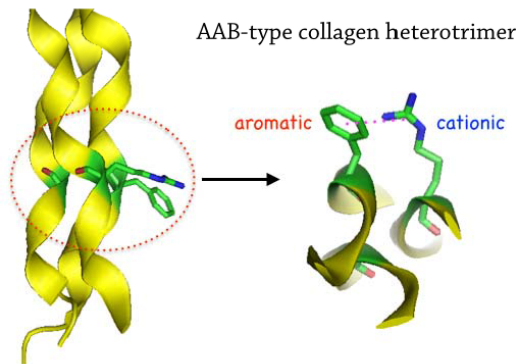
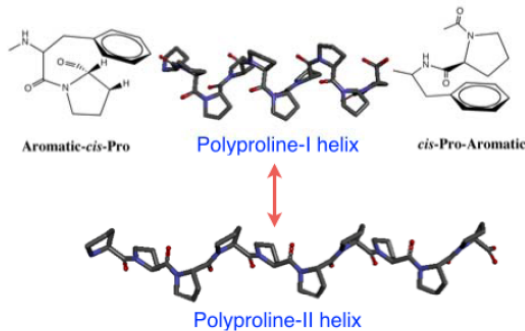
THE JOURNAL OF PHYSICAL CHEMISTRY LETTERS
A JOURNAL OF THE AMERICAN CHEMICAL SOCIETY



歡迎對從事物化研究、或是化學生物、細胞膜實驗工作有興趣同學加入！！

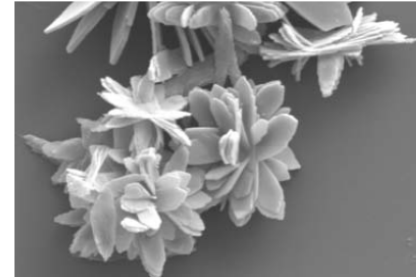
JCH Lab (洪嘉呈) – 胜肽化學、生物化學、生物物理化學

Protein/peptide folding (蛋白質與胜肽摺疊)

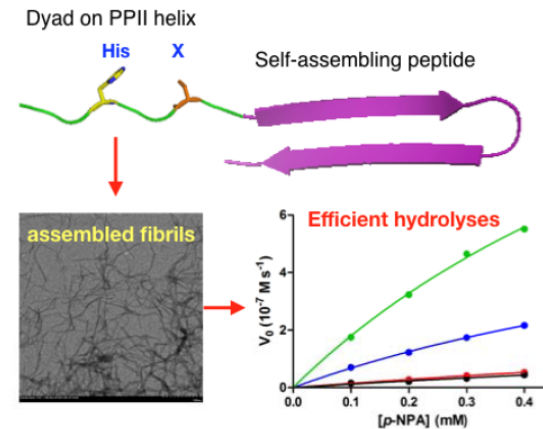


Lab: Chemistry Building R403 & R404
Website: <http://mx.nthu.edu.tw/~jchorng>

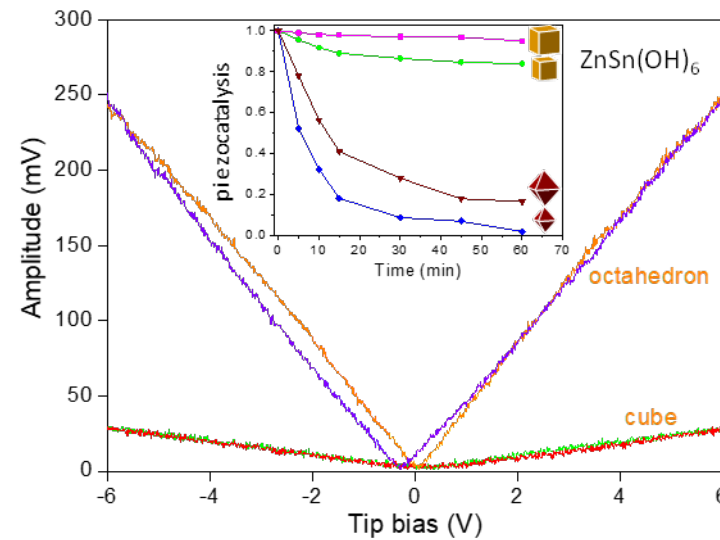
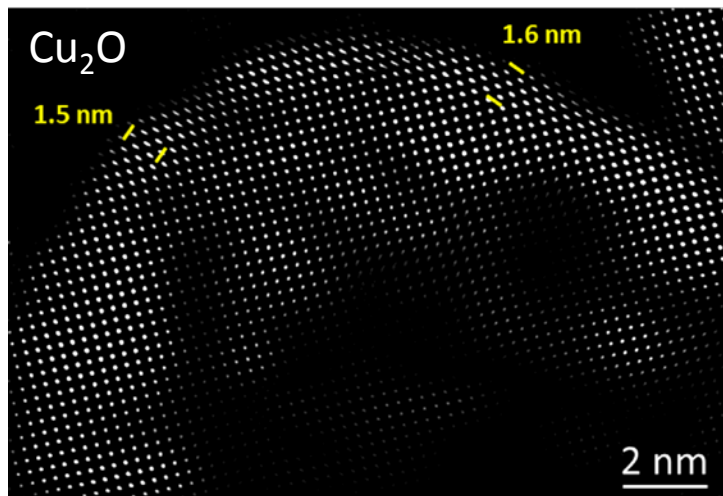
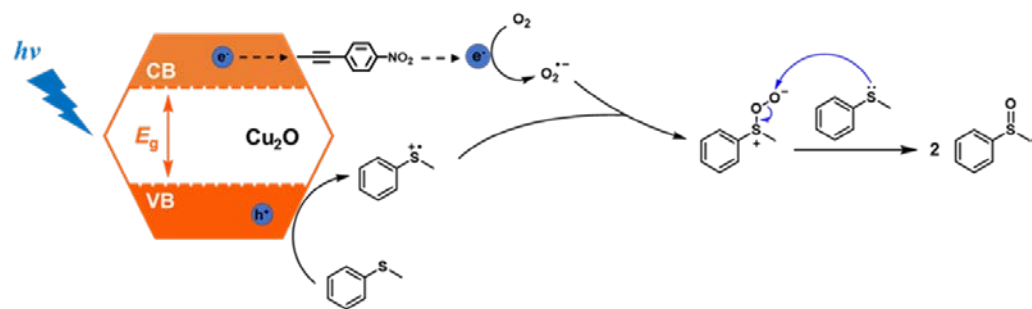
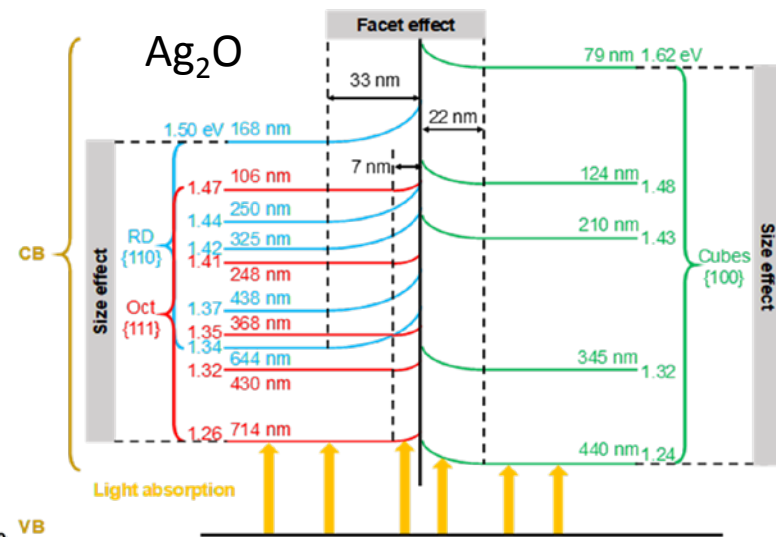
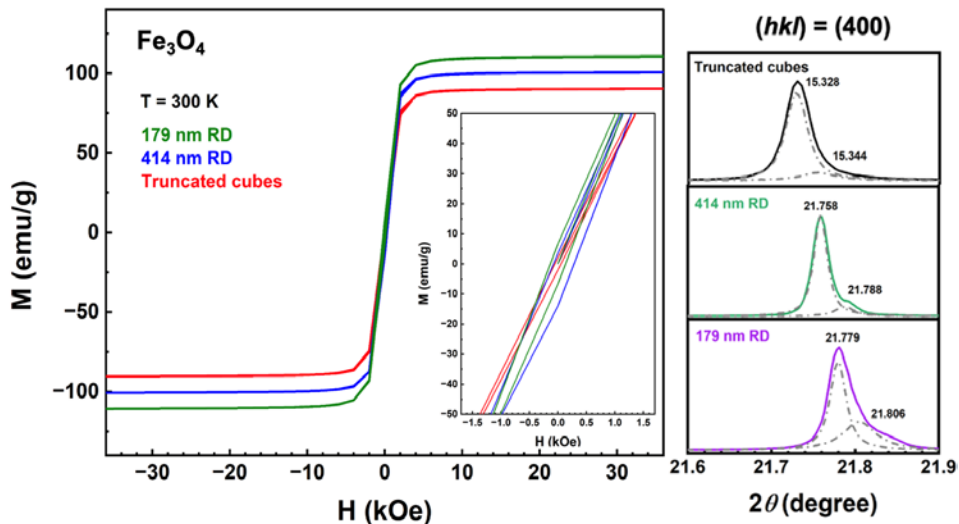
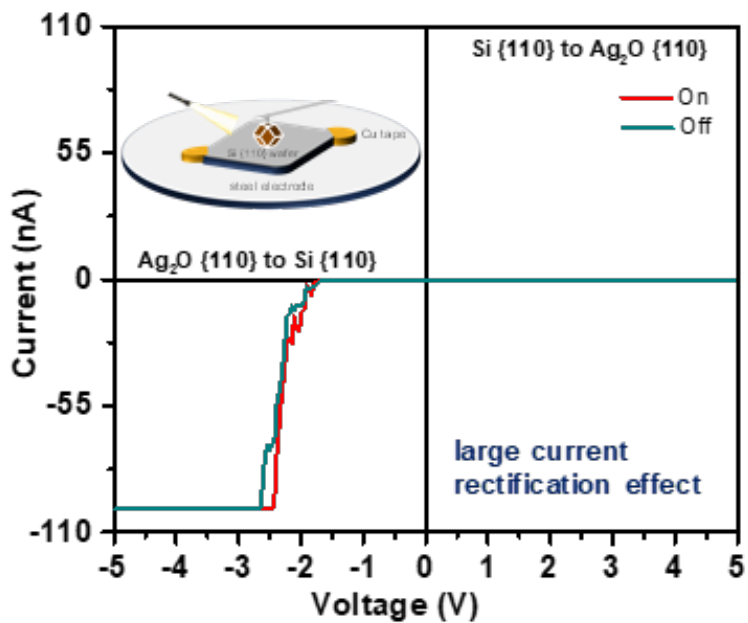
Collagen peptide assembly (膠原蛋白胜肽自組裝)



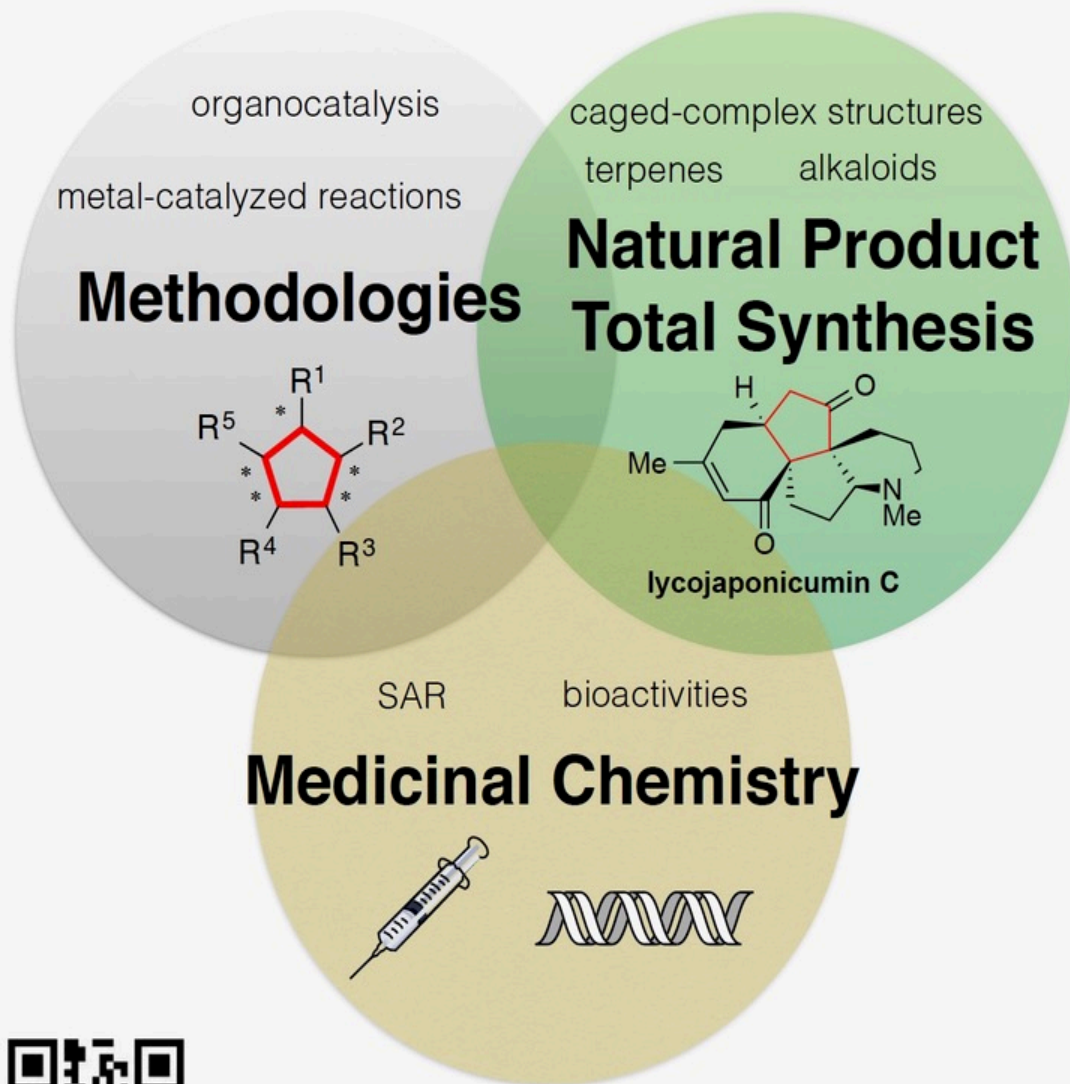
Functional peptide design (胜肽功能化與設計)



黃暄益實驗室 Synthesis of diverse semiconductor nanocrystals with size and shape control for facet-dependent property demonstrations and structural elucidation of the origin of these phenomena. All semiconductor properties including electrical conductivity, photocatalytic dye degradation and organic transformation, optical, magnetic, piezoelectric, piezocatalytic, thermoelectric, and even superconductivity behaviors can be examined. Interior lattice deviations, plus presence of bulk and surface layer lattices, cause these facet effects.



Yu-Wen Huang (黃郁文) Research Group (Organic Synthesis)



Methodologies

- carbon-carbon bond forming reactions
- asymmetric catalysis

Total Synthesis

- asymmetric natural product synthesis
- complex carbon skeleton

Medicinal Chemistry

- evaluation of bioactivities of natural products

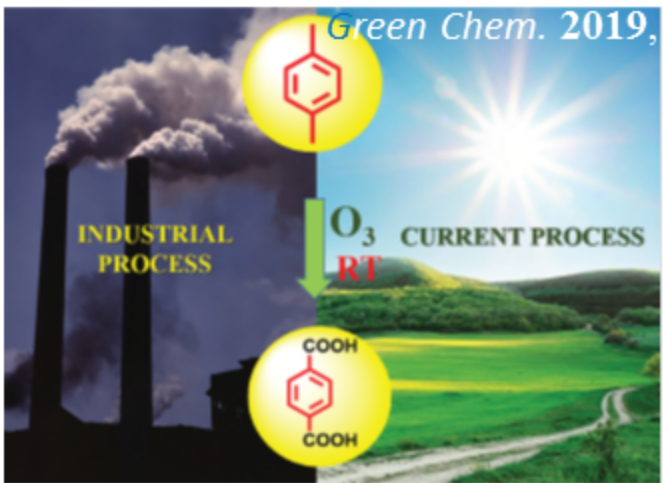


Office: (301) lab: (705-707 & 716)

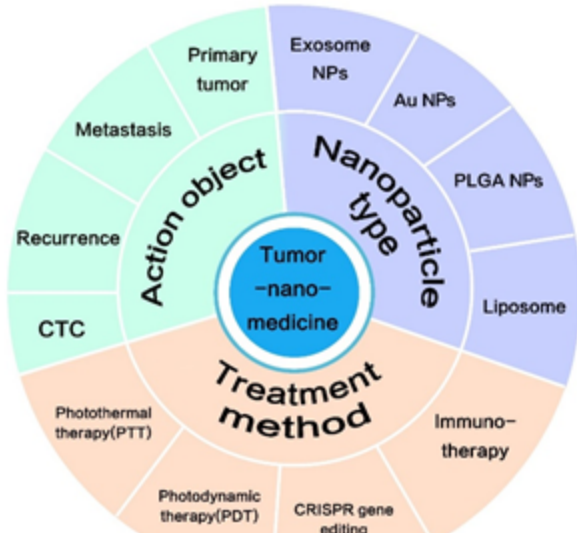
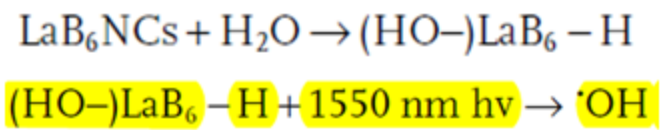
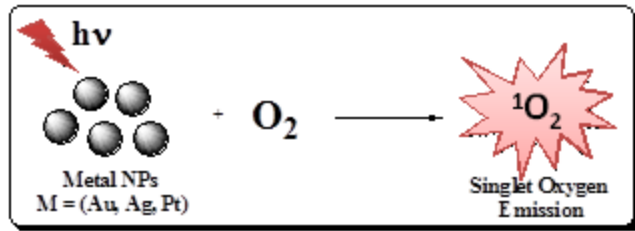
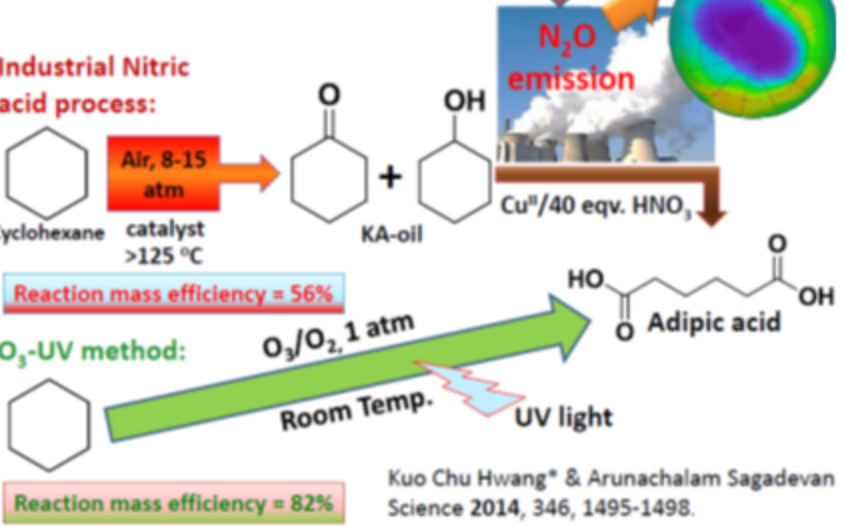
lab website: <https://yuwenhuanglab.com>

黃國柱實驗室 – 奈米材料合成與生醫應用 / 有機無機光化學

- (a) Developing Inorganic nanomaterials as gene/drug nanocargoes and near infrared light photodynamic therapy (NIR PDT) reagents for targeted cancer therapy.
- (b) Nanomaterials-mediated Gd/Boron Neutron Capture Therapies.
- (c) Photoredox initiated Cu-catalyzed C-C, C-N, C-O, C-S couplings



新的綠色化學製程

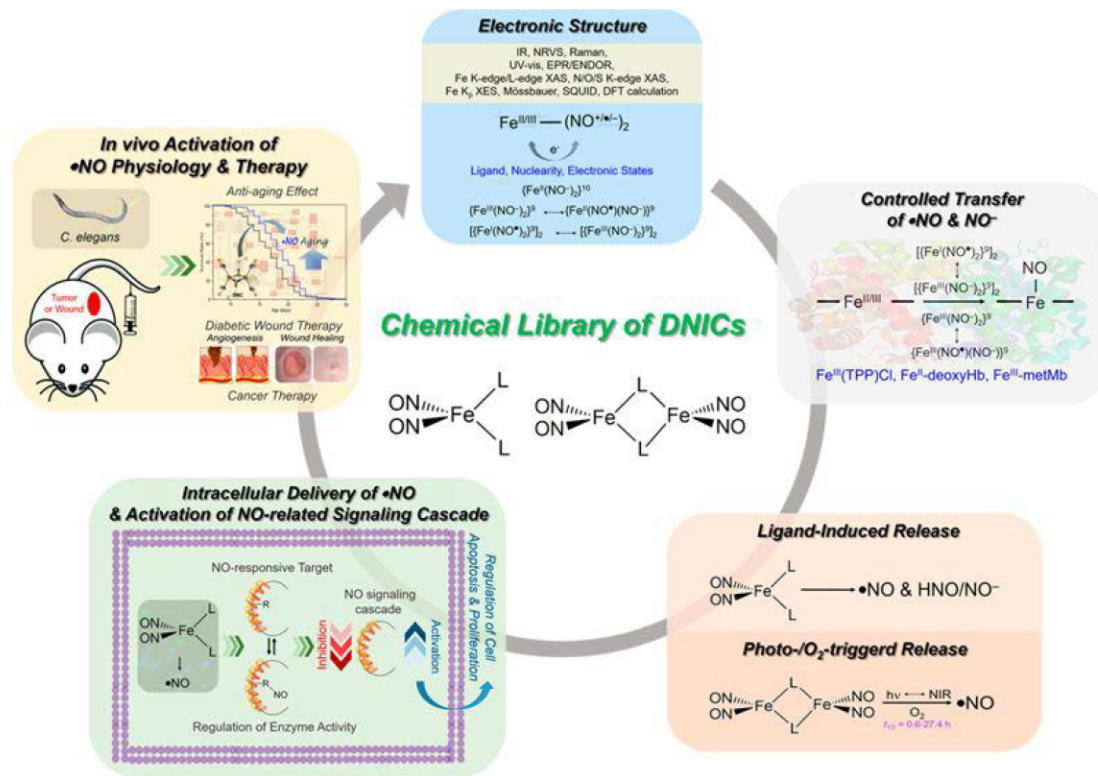


Nano Today 2021, 36, 101004

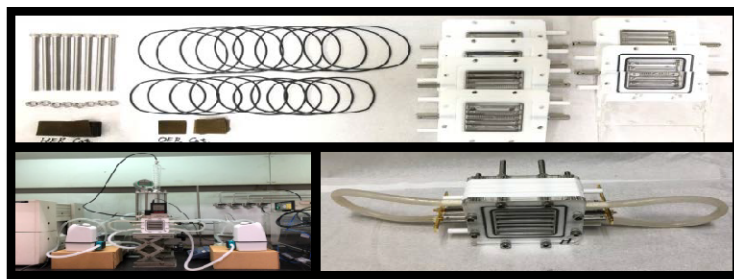


廖文峯 (Wen-Feng Liaw) 實驗室

生物無機及無機化學—鐵硫亞硝基(dinitrosyl iron complexes (DNICs))之研究



電與光裂解水(electrocatalytic/photoelectrocatalytic water splitting)產氫與氧



劉佳燕實驗室 醣體學與質譜分析

Glycomics and Mass Spectrometry

● What we study

- Glycan structural diversity and isomerism
- Glycan structures in biological systems
- Emerging glycosylation (glycoRNA & bacterial glycans)

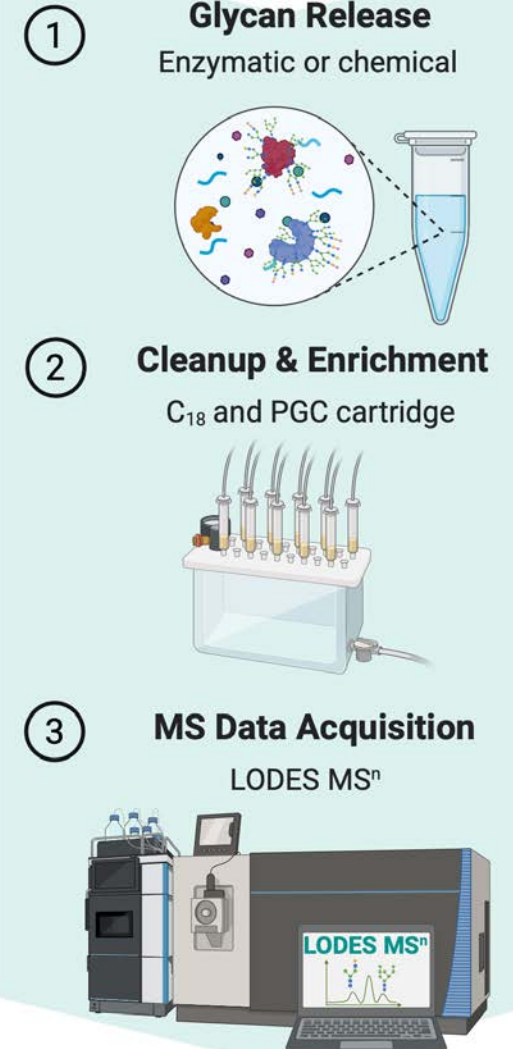
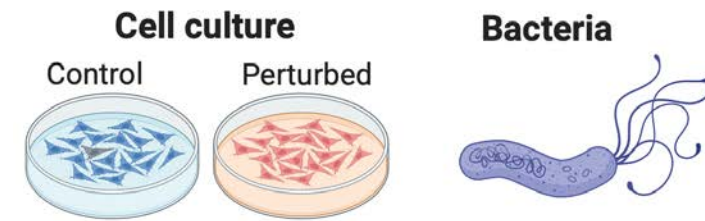
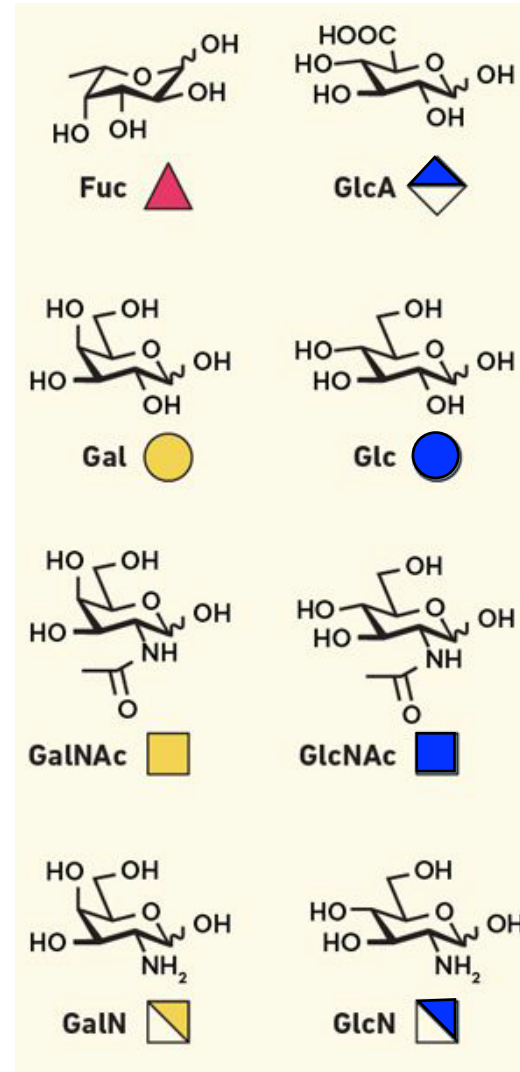
★ What we do

- Mass spectrometry (LODES/MSⁿ)
- Glycan structural analysis
- Sample preparation & enrichment

◆ Example projects

- GlycoRNA structural characterization
- p97-related glycosylation changes
- Bacterial glycan structure–function

Symbol Nomenclature for Glycans (SNFG)





Chemistry

- 癌細胞及致病菌表面
碳水化合物抗原合成
- 抗癌藥物設計及合成
- 分子探針設計及合成

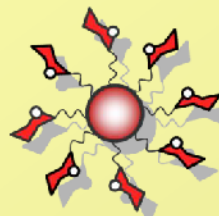


Chemical & Enzymatic Synthesis

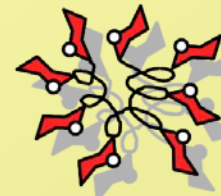


Technology

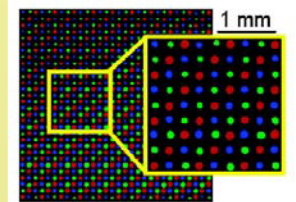
- 醣晶片及蛋白質晶片製作
- 功能化磁性奈米粒子製作



Bio-nanoparticle



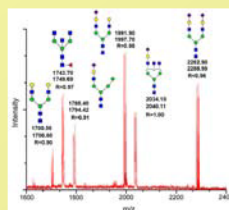
Carbohydrate Vaccine



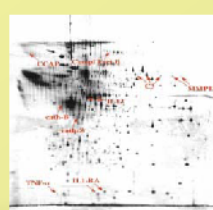
Microarray

Biology

- 生醫檢測
- 專一性藥物輸送
- 膜蛋白質質體學
- 疫苗開發



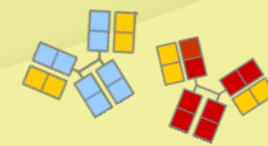
MS analysis



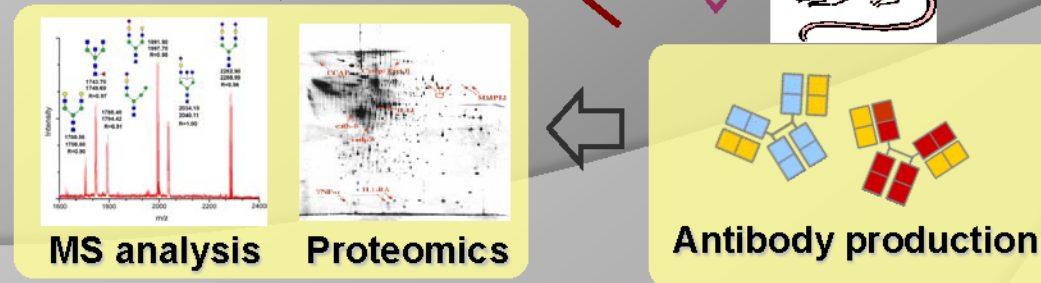
Proteomics



Antigen



Antibody production

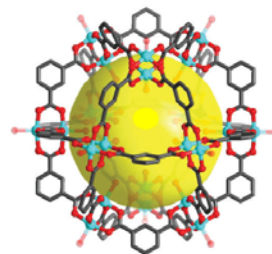
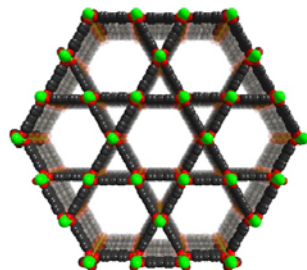
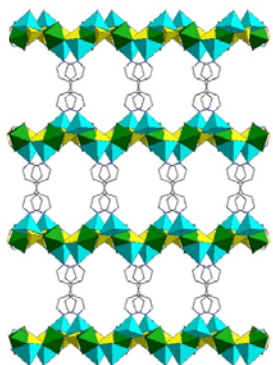
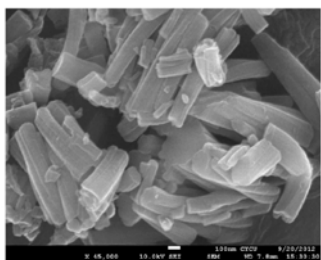


林嘉和教授實驗室

Solid State Inorganic Chemistry Laboratory

<https://chiaherlingroup.wixsite.com/chlin>

Nanoporous materials with metal ions

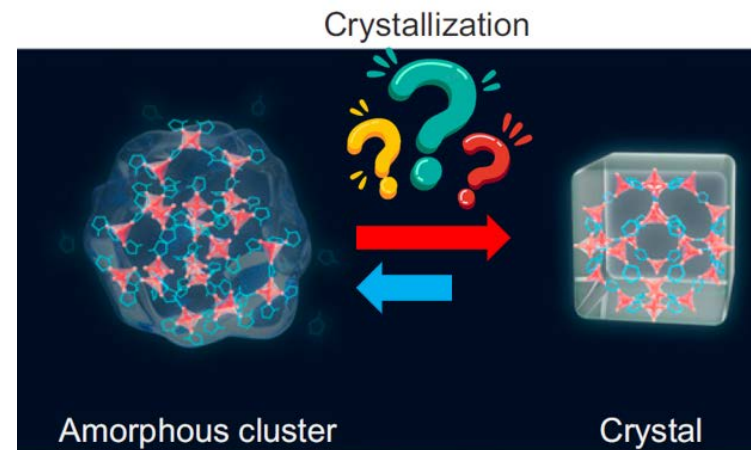
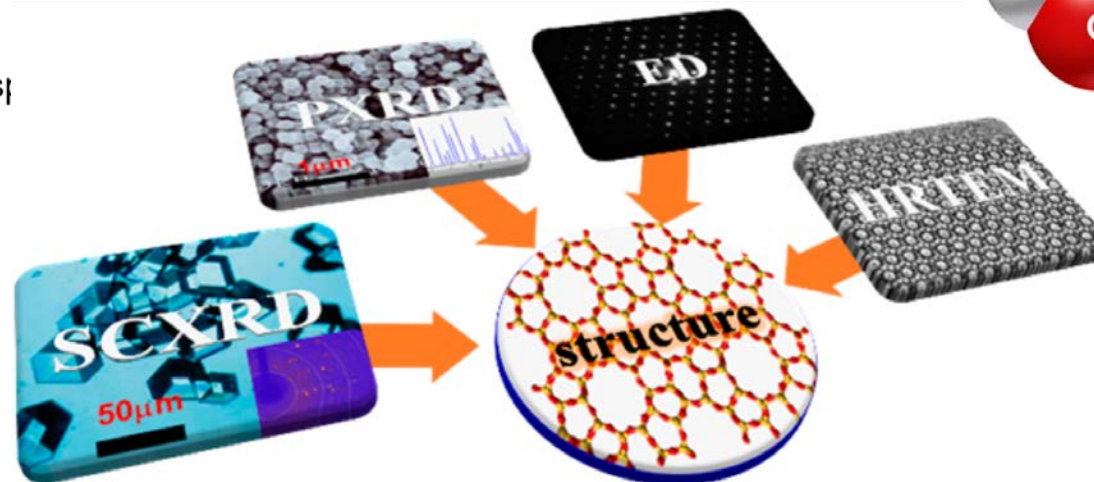
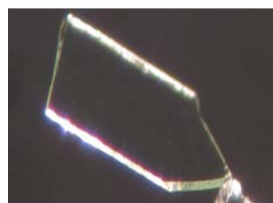


Metal-organic cages (MOC)

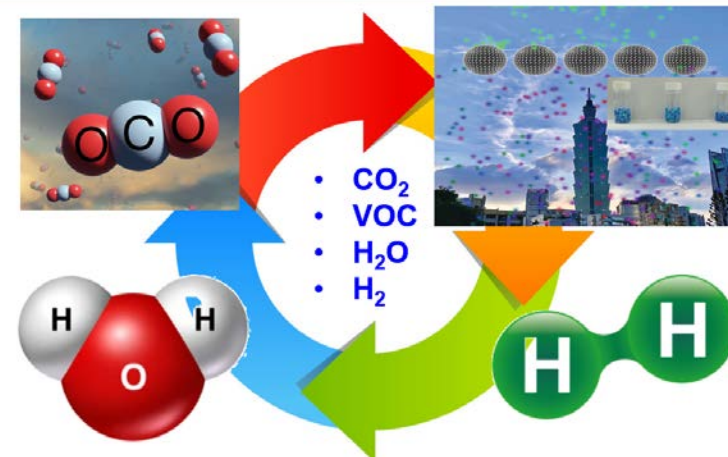
Metal-organic frameworks (MOF)

Organic-linked metal phosphates (OMPO)

Metal phosphates/phosphites/phosphonates (MPO)



How chemistry is helping to improve the environment around us ~ Save the world !



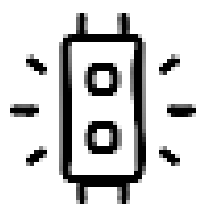
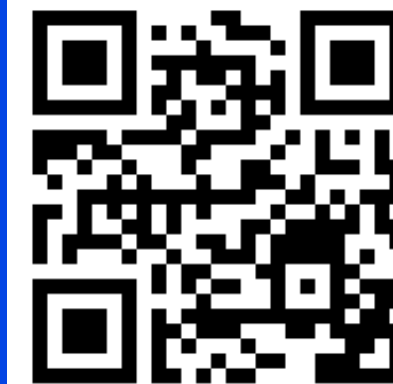
有機功能性與軟物質材料實驗室

CJLIN GROUP 林哲仁老師

lab: R603-606, 610

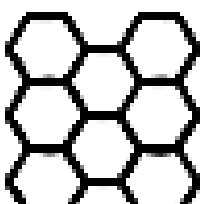
office: R502

<https://chejenlin.weebly.com>



刺激響應發光材料

合成可響應外部刺激的發光團，應用於環境感測與生物影像。



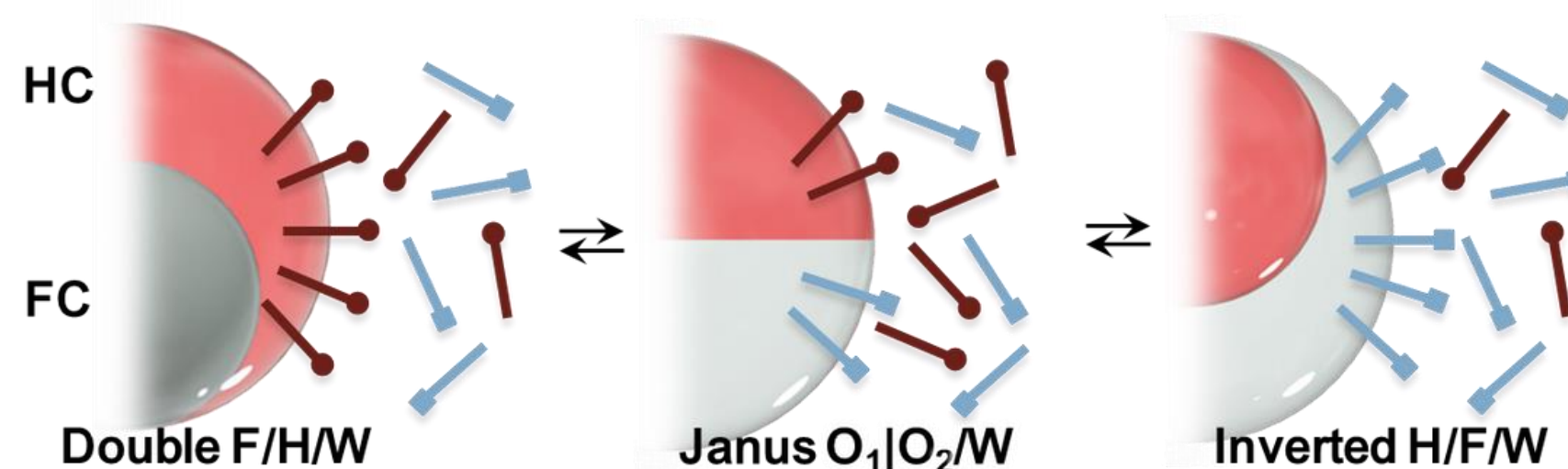
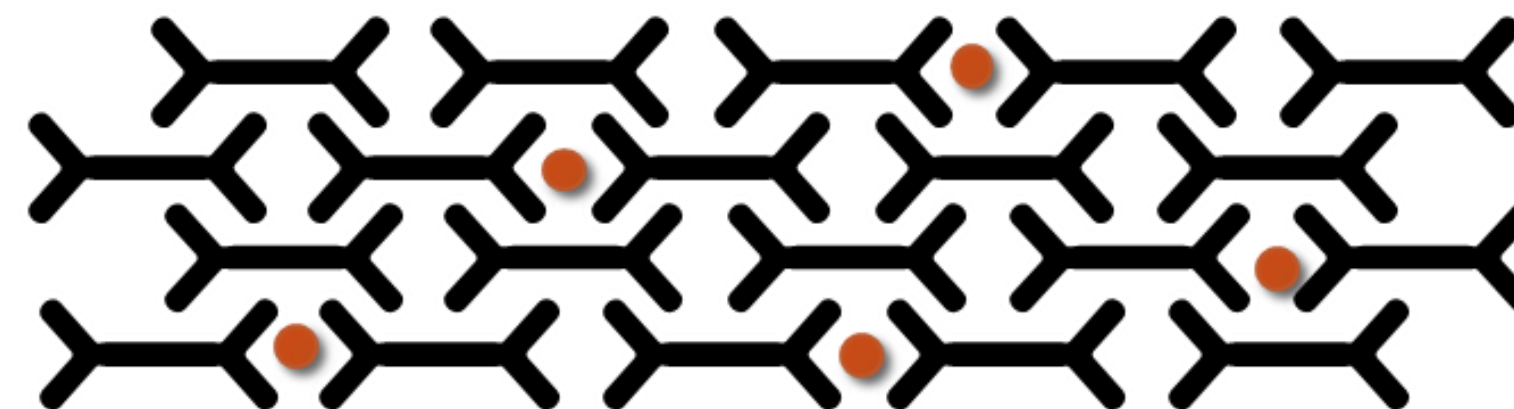
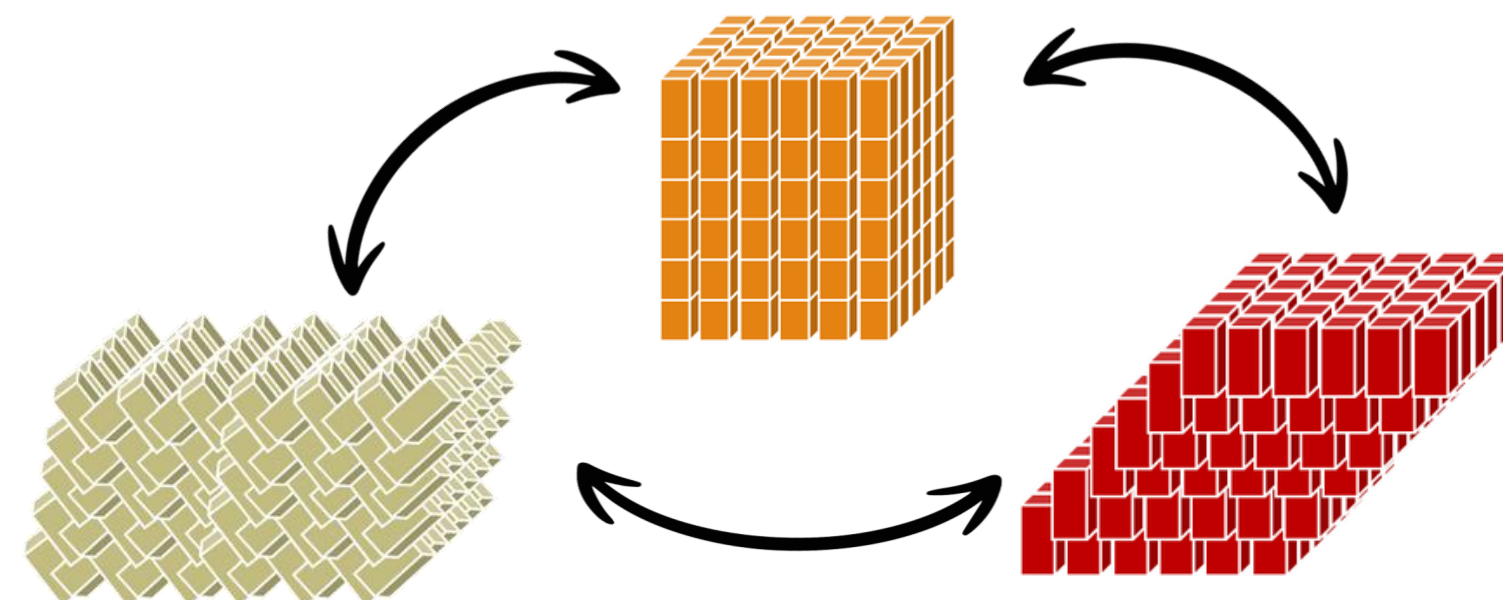
有機孔洞骨架材料

設計具高孔隙率與結構可調控的新穎有機骨架，應用於催化反應與能源儲存。



複合乳膠與微流體平台

開發自組裝發光團與功能性高分子，利用微流體技術發展流動注射分析法、微型反應器。



林峻偉 (Chun-Wei Lin) 實驗室

- 在分子層級, 研究:
 - 細胞訊號分子傳遞的機制
 - 膜蛋白分子間交互作用
 - 膜蛋白與上下游蛋白之交互作用

- ★ 主要目標:
 - 了解致病原理, 協助藥物開發

- 主要研究工具:
 - 單分子螢光顯微鏡

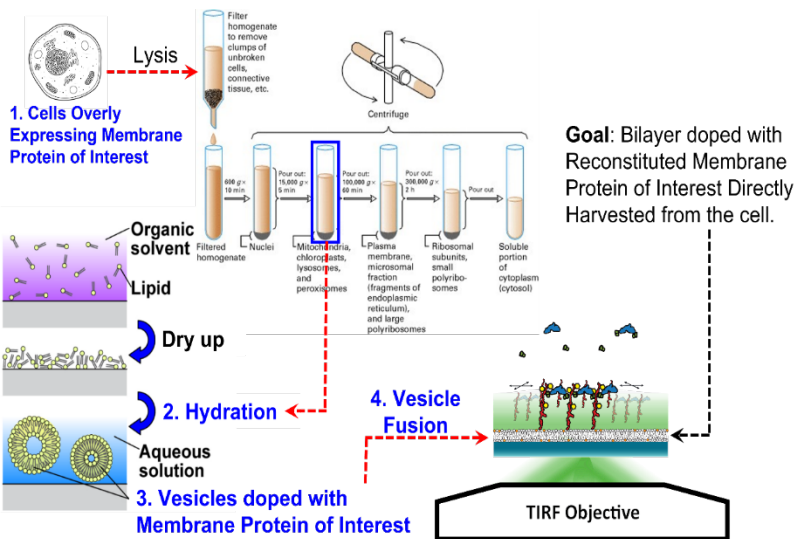
以化學方法
重建細胞訊
號的系統



細胞訊號傳遞

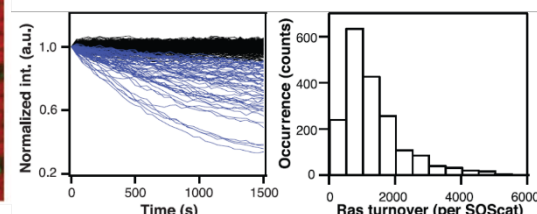
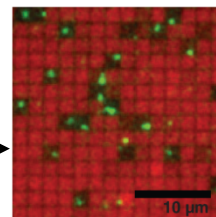
了解分子層級蛋白
質之間的作用機制

體外生物系統重建



透過螢光影像
分析與單分子
追蹤等技術以
物理化學和生
物物理的角度
進行分析

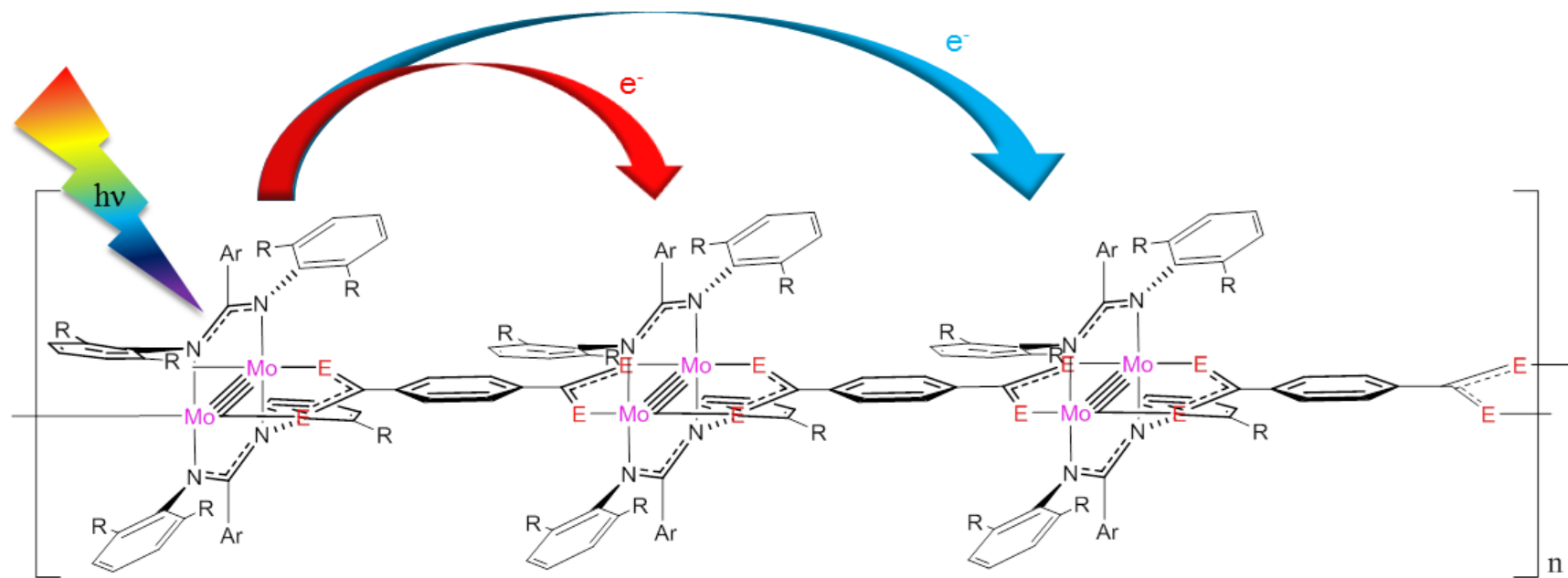
螢光標定影像分析



Iversen et al., *Science*, 2014, 345, 50

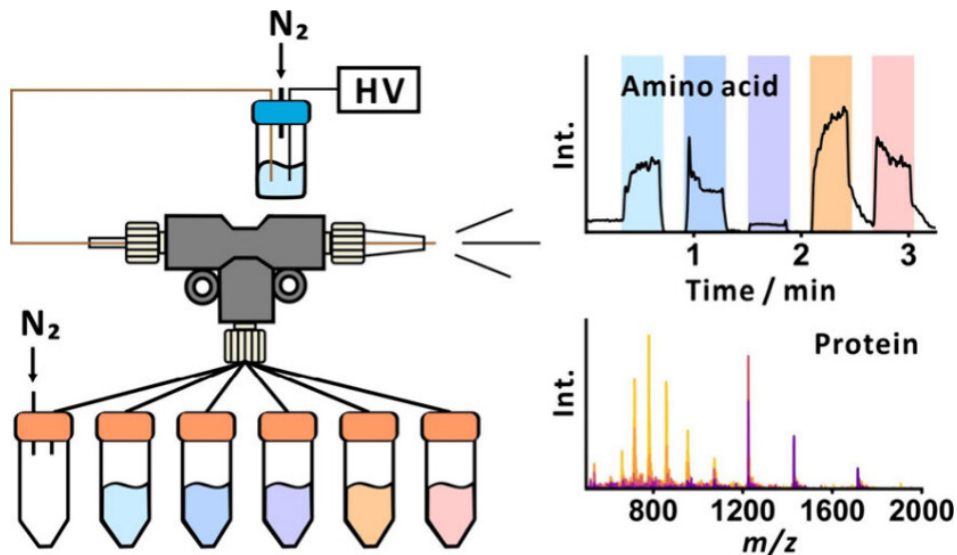
蔡易州實驗室 (Room 508)

有機和有機金屬合成



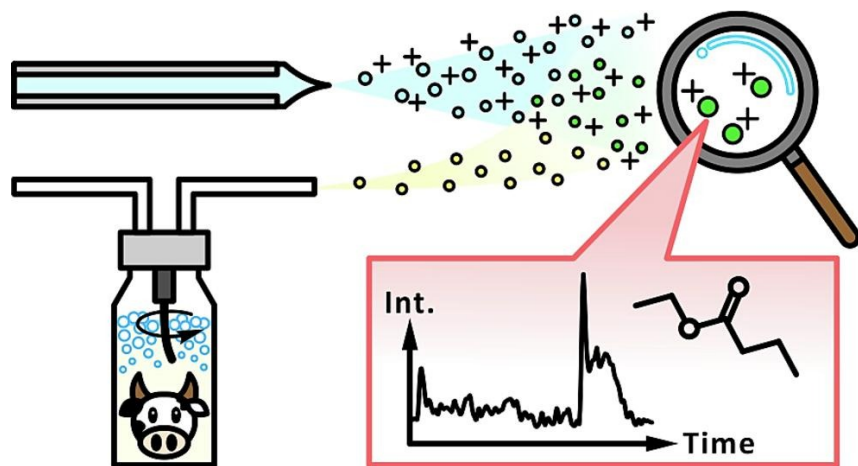
有機-無機混合型分子導線

Urban Lab 鄂本帕偉 生物分析化學實驗室



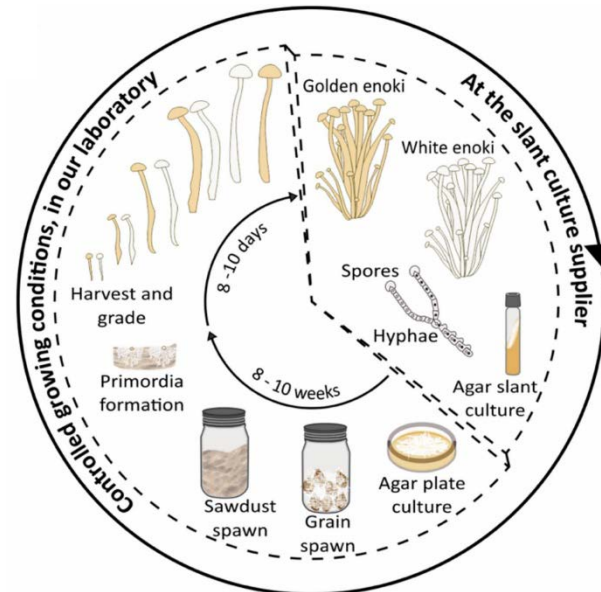
Advanced mass spectrometry

進階質譜研究分析



Volatile organic compound (VOC) analysis

揮發性有機化合物分析



Food and biological sample analysis

食物及生物樣品分析



化學館R308 分機: 33377

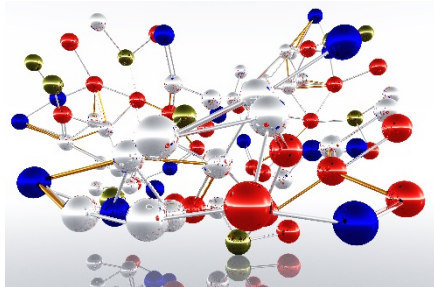
E-mail: urban@mx.nthu.edu.tw

Website: <https://urbanlab.tw/>

YHW Lab 無機催化實驗室 (王育恒老師)



Catalyst Design



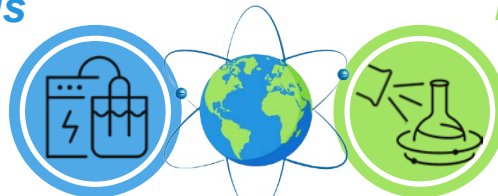
- ❑ Organic and inorganic synthesis
- ❑ 1st-row transition metal catalysts
- ❑ Spectroscopic techniques

Molecular Catalysts

Photocatalysis



Catalysis



YHW Research Group

Mechanism

Electrocatalysis



Photochemistry

Electrochemistry

- ❑ C-H bond functionalization
- ❑ Sustainable visible-light photocatalysis

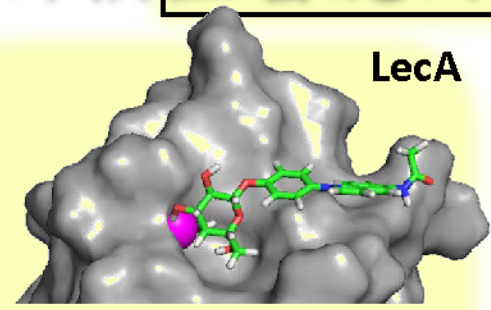
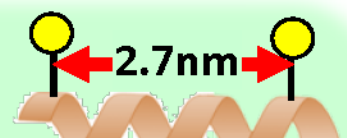
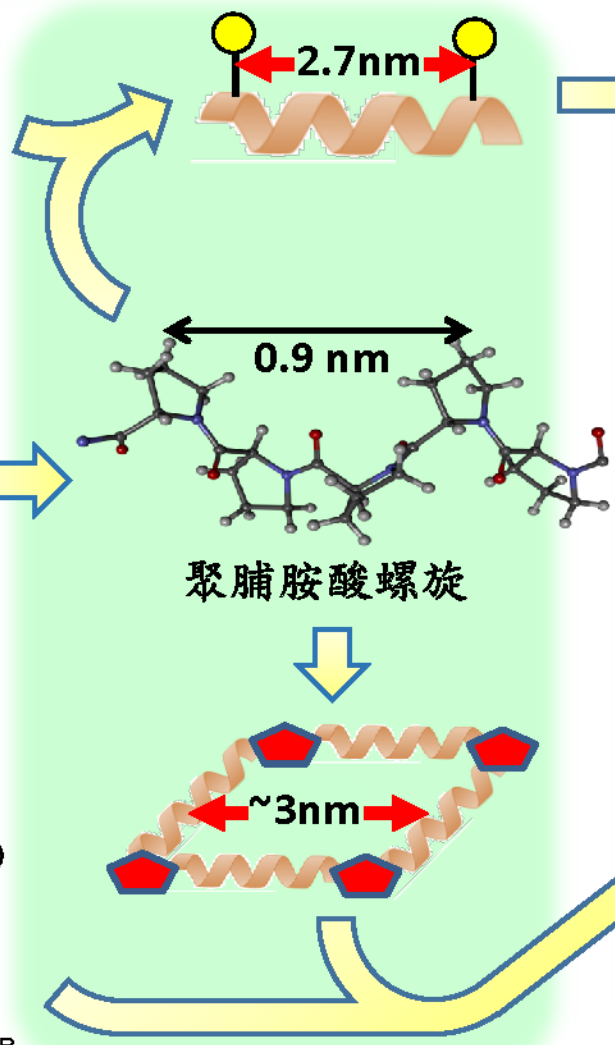
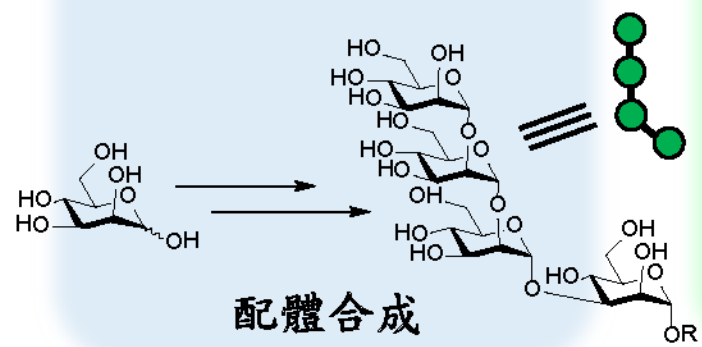
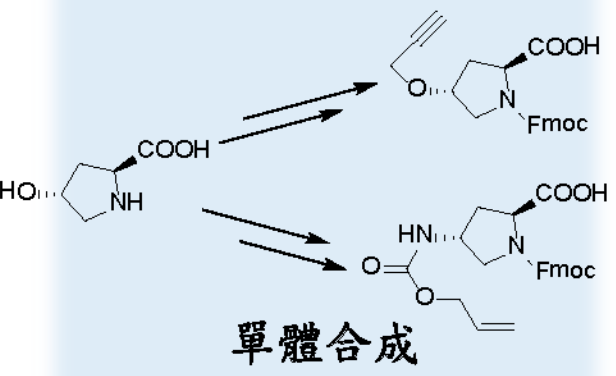
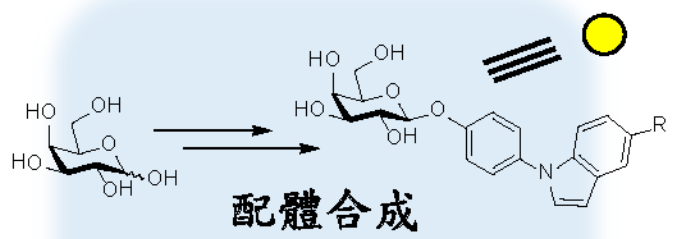
- ❑ Conversion of energy-related small molecules
- ❑ Mechanistic Investigation

化學館 R401 (office); R613, R614, R503, R504, R512 (lab)

Group Website: <https://www.nthuchemyhwlab.com/>; Email: wangyh2@mx.nthu.edu.tw

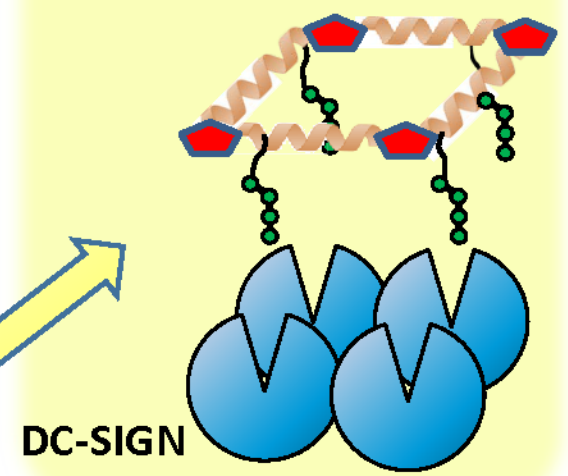
王聖凱實驗室

以有機合成創造精準奈米結構，進行新穎生醫應用



新穎多價性綠膿桿菌抑制物

詳情請見
more info



選擇性多價病毒抑制物

Photonic Chemistry Lab (Prof. Yu-Chen Wei)

<https://www.photonicchemlab.com/>



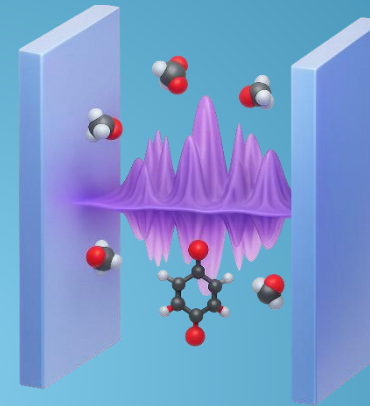
Modifying chemical properties via light-matter interaction

Metasurface Fabrications

- Fabrication of nanoparticle arrays
 - Plasmonic
 - Dielectric

Optical Characterizations

- UV-Vis spectroscopy
 - Time-resolved
 - Angle-dependent (Fourier optics)
 - Polarization-dependent
- FTIR spectroscopy

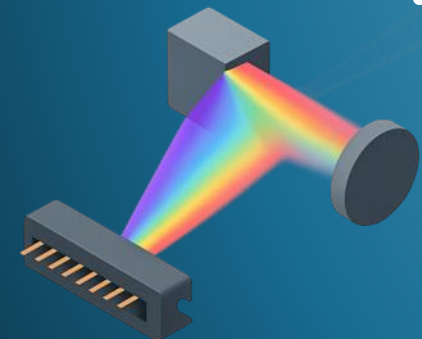
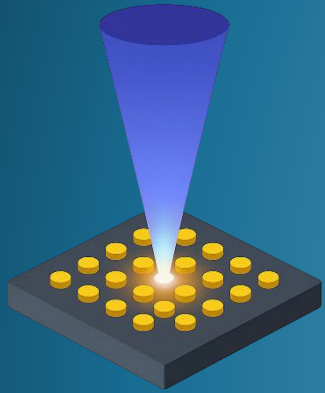


Theoretical Developments

- Photonic simulation
- Quantum electrodynamics
- Polaritonic Chemistry

Applications

- Catalysis
- Optoelectronics
- Chemical sensing
- Crystallization control



吳典霖教授實驗室

Materials Chemistry Photoelectronics



Synthesis

Polyaromatic Hydrocarbon

Organic/Inorganic Synthesis
Inert-Gas Condition (Glove box)
Mechanochemistry (Ball-Milling)



Purification

Multiple Methods

Column Chromatography (Liquid)
MPLC/HPLC/SFC - Chiral Separation
Sublimation System (Gas)



Website



EXPLORING THE LIGHT OF CHEMISTRY



國立清華大學

化學系

DEPARTMENT
of
CHEMISTRY

Characterization

Physical Property Study

Fluorescence & Phosphorescence
Thermal Stability
Electrochemistry



Application

Organic Semiconductor

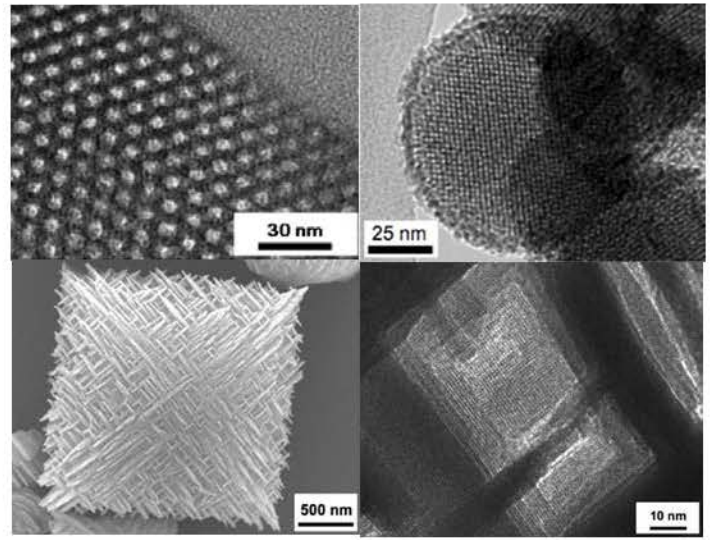
Organic Light-Emitting Diode (OLED)
Organic Field-Effect Transistor (OFET)
Organic Photovoltaic (OPV)



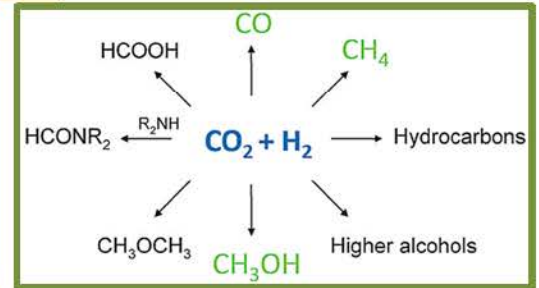
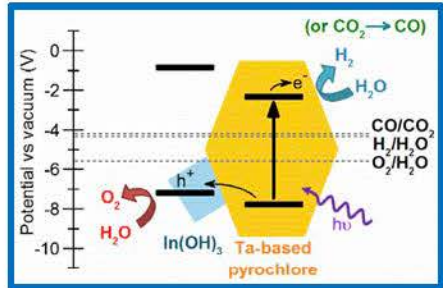
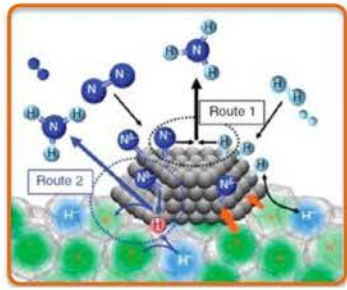
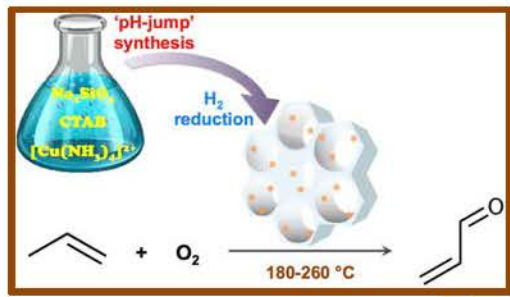
奈米複合材料與綠色催化實驗室 (楊家銘老師)

- 學習各式新穎奈米孔洞材料的設計與製備
- 研究與綠色化學相關的催化反應
- 參與各種先進的臨場反應研究
- 充實材料化學與觸媒化學的相關知識，為未來職涯打下堅實基礎

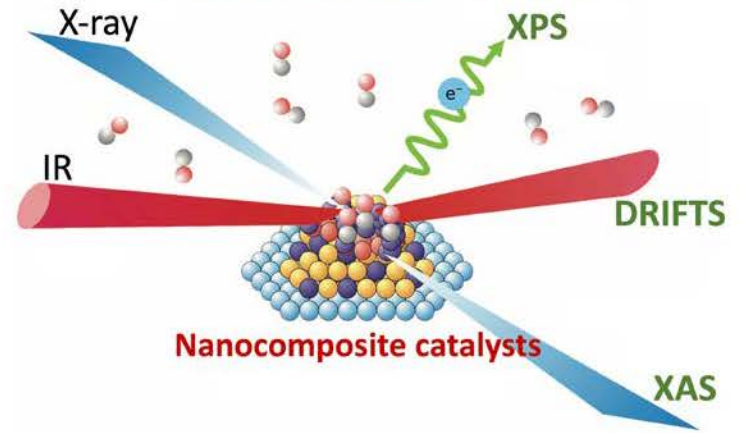
新穎奈米孔洞觸媒



綠色氧化還原催化反應



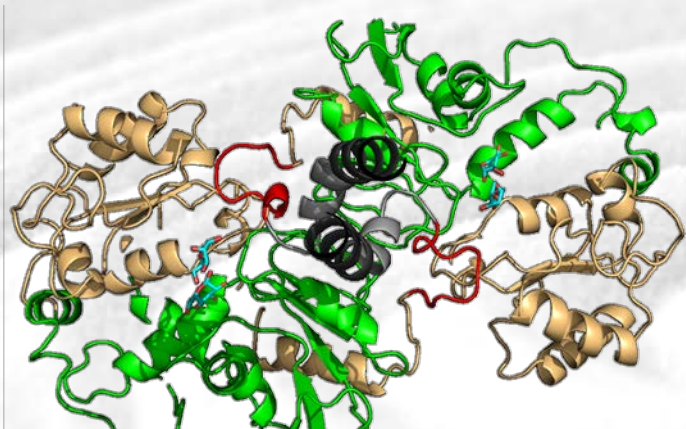
先進臨場催化反應研究





Current Projects (2024-2027):

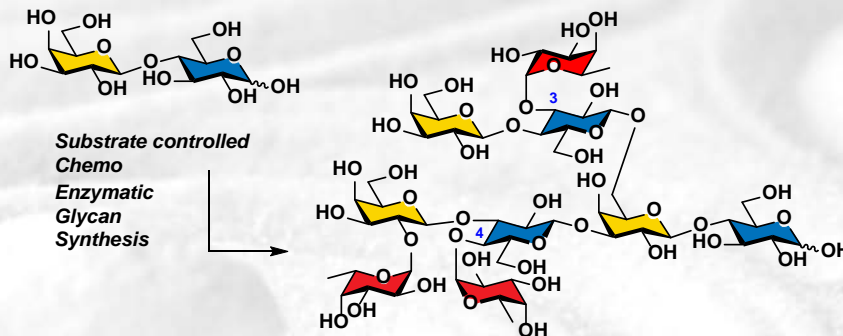
- ① 糖類酵素結構、反應機制與動力學
- ② 糖類酵素定向演化策略開發



- GT Structure, Mechanism, and Enzyme Kinetics
- Directed Evolution of GTs

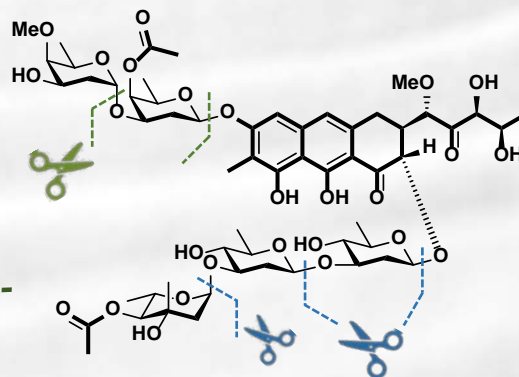
- Synthetic Studies of Glycan-containing Natural Product

③ 複雜寡糖化學酵素合成法開發

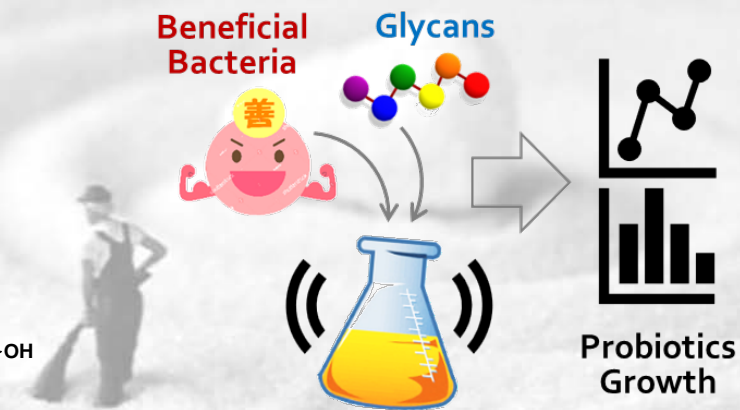


- Chemoenzymatic Synthesis of Complex Oligosaccharides

④ 含糖天然物化學酵素合成法開發

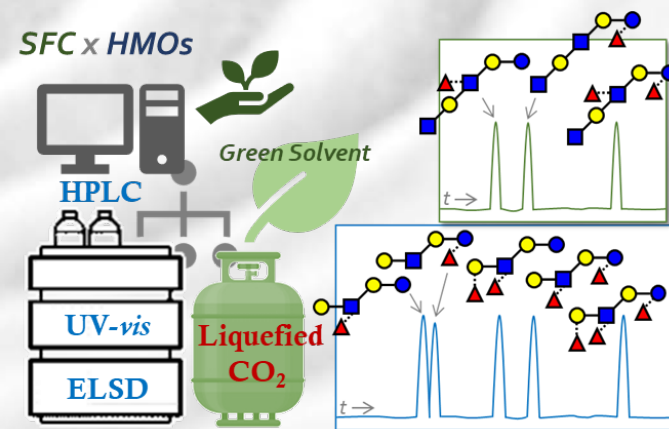


⑤ 母乳寡糖 x 腸道菌相生物活性探討



- HMOs x Human Microbiota Studies

⑥ 超臨界流體液相層析 x 生化分析

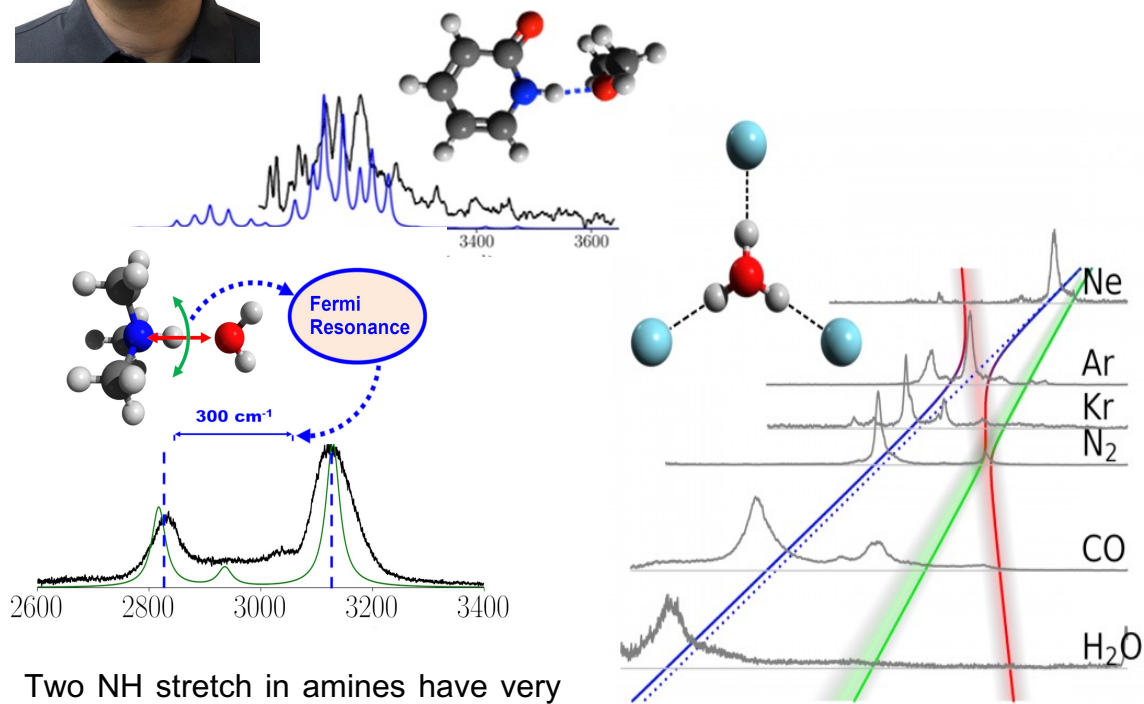


- SFC x Bio-analysis & Separation



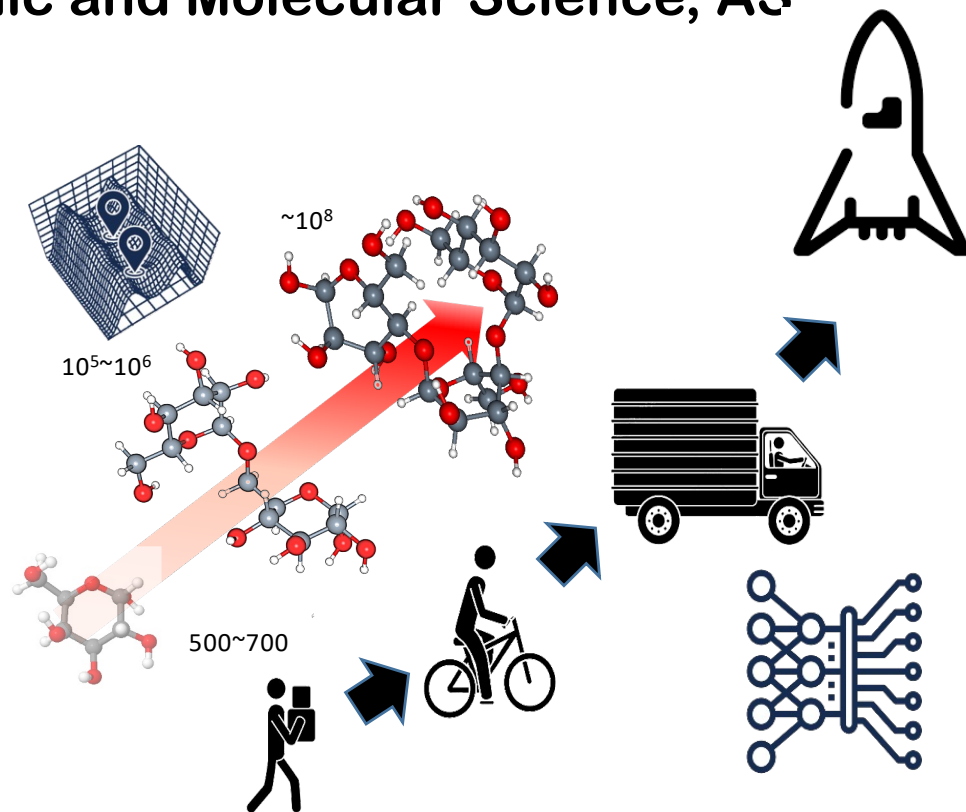
Molecular and Material Modeling Lab

Jer-Lai Kuo, Institute of Atomic and Molecular Science, AS



Two NH stretch in amines have very different Fermi-Resonance (FR) patterns. Our *ab initio* anharmonic algorithms (A³) do not require empirical parameters and are able to extract simple physical pictures behind the experimental spectra and thus reduce the chance of mis-interpretation. The parameter-free reduced Hamiltonians can be used to understand physical phenomena and make predictions to guide design of experimental observations.

Complex vibrational features in experimentally observed spectra of solvated H₃O⁺ lead us to understand the coupling between OH stretch and other degrees of freedom. Using *ab initio* anharmonic algorithms, we are able to assign the observed complex spectral features and to reveal simple pictures of the interplay between FR and CB in both mid- and near-IR.



We utilize deep-learning neural network potential (DL-NNP) to accelerate the exploration of energy landscape of mono-saccharides (500~1000 conformers) and di-saccharides ($\sim 10^5$ - 10^6) with the cost comparable to semi-empirical methods & the accuracy of a decent DFT methods. We are working to improve the efficiency of sampling schemes so that we can simulate systems containing sugar, peptides and nuclear acids. We believe DL-NNP can give a boost (by several orders of magnitude) to simulations of bio-molecules that requires first-principle accuracy.



洪上程博士實驗室

有機化學、醣化學、化學生物學



- 📖 發展醣之「一鍋化」保護和鏈結方法。
- 📖 開發自動化液相醣合成儀。
- 📖 合成細胞表面醣分子庫和醣蛋白。
- 📖 探討醣與疾病有關之蛋白質的作用關係。
- 📖 發展新立體控制方法以合成線形天然物。

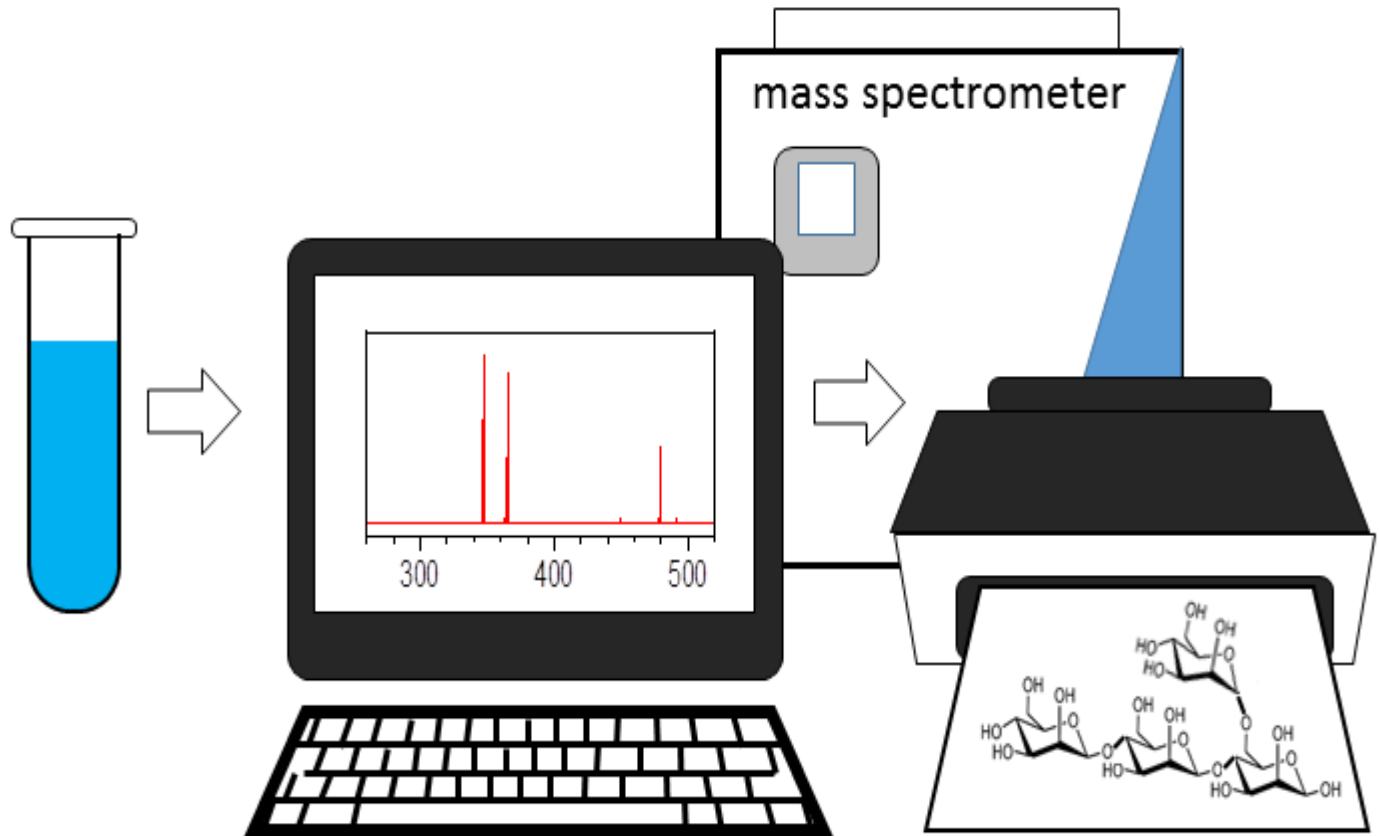
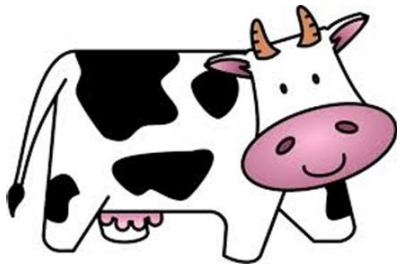
Carbohydrate Mass Spectrometry Lab



Chi-Kung Ni (倪其焜)

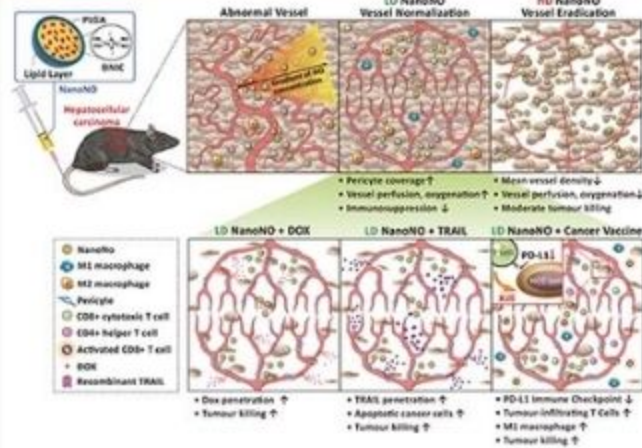
Experimental methods

- Extraction of carbohydrate from biological samples
- Separation of carbohydrate isomers
- Structural determination of carbohydrates by mass spectrometry



陳韻晶實驗室 專注於創新藥物與奈米型藥劑的開發

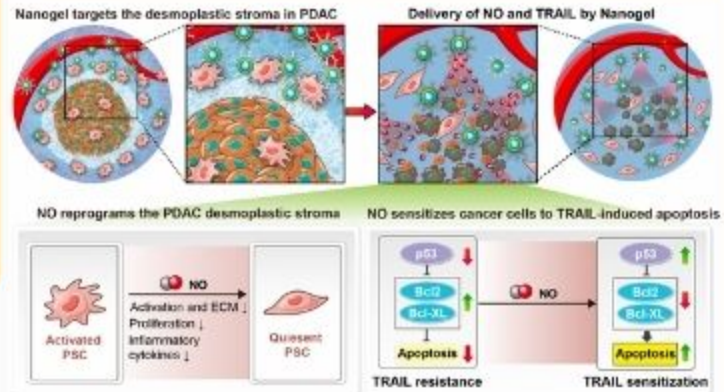
打通腫瘤血管，讓藥效更深入



Nature Nanotech 2018

💡 用藥物「疏通」腫瘤內異常血管，提高藥物傳遞效率。

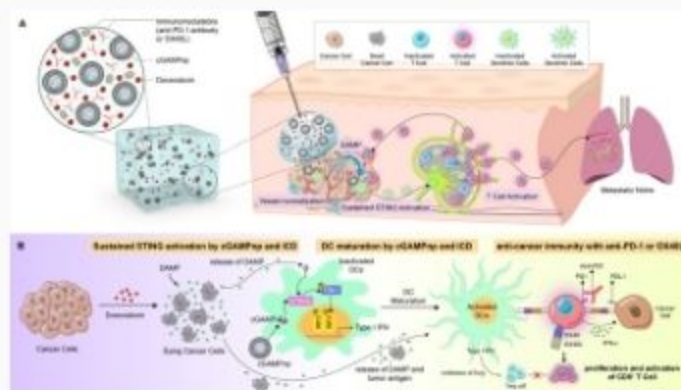
破解胰臟癌屏障，強化免疫治療



Gut, 2022

💡 運用奈米載體精準釋放藥物，改變腫瘤微環境。

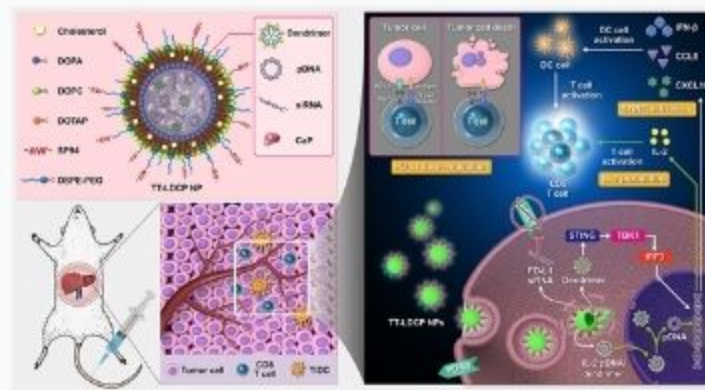
智慧型水膠疫苗，啟動癌症免疫防禦



Advanced Functional Materials 2024
ACS Nano 2024

💡 開發「溫感可注射水膠」，讓腫瘤疫苗長效釋放

基因療法新革命，精準啟動活化免疫細胞



Hepatology. 2018, Science Advances 2020
Journal of Controlled Release, 2022

💡 運用奈米載體輸送基因藥物，精準調控免疫細胞行為