Chih-Tsun Yang

Applying to the Doctor of Philosophy in Chemistry program at University of Colorado – Boulder
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Education

National Tsing Hua University
Hsinchu, Taiwan

B.S. in Chemistry, minor in Computer Science — *Sep. 2014 – Jun. 2018*

National Tsing Hua University
Hsinchu, Taiwan

M.S. in Physical Chemistry — *Sep. 2019 – Aug. 2021*

Research & Working Experience

Undergraduate Research & Research Assistant
Hsinchu, Taiwan

Prof. Chin-Hui Yu's Lab, Department of Chemistry, National Tsing Hua University — *Jan. 2017 – Mar. 2019*

Research Project Topic:

"Using Constrained Multi-Coordinate Driven Method to Study the Regioselectivity in Hydroxybenzyl Alcohol Formation Under Alkaline Aqueous Environments"

- Using the constrained reduced dimensionality (CRD) algorithm, incoporate with Gaussian 09, to study how phenol and formaldehyde forms Hydroxybenzyl Alcohol in Alkaline Aqueous Environment.

Computational Cluster & Network Management:

- Managed and maintained the Linux-based computer cluster(30+ PCs) in our lab.
- Successfully compiled and deployed Gaussian 16 in our computational cluster.

Master Degree Research
Hsinchu, Taiwan

Prof. Li-Kang Chu's Lab, Department of Chemistry, National Tsing Hua University — *Sep. 2019 – Aug. 2021*

Thesis Topic:

"Investigating the Protein Dynamics of Human Serum Albumin in Hypothermic and Normalthermic Conditions with Temperature Jump"

- Developed a tryptophan-based fluorescence temperature jump system to study the thermally-induced dynamic process of human serum albumin.

Side Project 1: Nanosecond Transient Absorption Spectrometer

- Constructed a nanosecond transient absorption spectroscopy system which uses ICCD as detector.
- Programmed an automation acquisition script in PI's WinSpec to automatically acquire the spectrum.

Side Project 2: Upgrade the Data Acquisition Part of a Stopped-flow Apparatus

- Replace the ADC card on an old stopped-flow apparatus, and redo the data acquisition components.
- Developed a new software in Java, including the data collection and the user intrface.

Research Assistant
Taipei, Taiwan

Dr. Kuo-Hua Huang's Lab, Institute of Molecular Biology, Academia Sinica — *Sep. 2021 – Aug. 2022*

Research Project Topic:

"Constructing Virtual Animal Models and Virtual Reality Environment to Allow Future Study on the Roles of Reciprocal Interaction in Zebrafish Social Behavior"

- Constructed a virtual zebrafish models in Blender, and a virtual reality(VR) environment in Unity.
- Developed a close-loop VR system, including images acquisition, real-time image processing, and VR updating.
- Utilized Python to analyze the behavior motif of freely-swimming zebrafish to make the animation more realistic.

Teaching Experience

Volunteer Teaching Assistant of Undergraduate Courses
Hsinchu, Taiwan

Center for General Education, National Tsing Hua University — *2014 Fall – 2016 Spring*

Forensic Science and Crime Prevention(*2014 Fall*, *2015 Fall*) & Crime Investigation Technology (*2015 Spring*, *2016 Spring*)

Teaching Assistant of Undergraduate Courses
Hsinchu, Taiwan

Department of Chemistry, National Tsing Hua University — *2019 Fall – 2020 Spring*

Physical Chemistry Laboratory I (*2019 Fall*) & Physical Chemistry II (*2020 Spring*)

Publications

(1) Yang, C.-T.; Chu, L.-K. Protein dynamics of human serum albumin at hypothermic temperatures investigated by temperature jump. *Phys. Chem. Chem. Phys.* **2022**, *24*, 11079–11085.

(2) Jian, H.-Y.; Yang, C.-T.; Chu, L.-K. Gaseous infrared spectra of the simplest geminal diol $CH_2(OH)_2$ and the isotopic analogues in the hydration of formaldehyde. *Phys. Chem. Chem. Phys.* **2021**, *23*, 14699–14705.

(3) Wang, P.-Y.; Yang, C.-T.; Chu, L.-K. Differentiating the protein dynamics using fluorescence evolution of tryptophan residue(s): A comparative study of bovine and human serum albumins upon temperature jump. *Chem. Phys. Lett.* **2021**, *781*, 138998.

Honors & Awards

Excellent Poster Presentation Award — *Taoyuan, Taiwan*
2021 Chemistry National Meeting, Chemical Society Located in Taipei — *Mar. 13 – 14, 2021*
"Thermally induced dynamic processes of Albumins probed with ICCD-embedded confocal fluorescent temperature jump system"

Physical Chemistry Thesis Award – Honorable Mention — *Taipei, Taiwan*
2022 Chemistry National Meeting, Chemical Society Located in Taipei — *Mar. 11 – 13, 2022*
"Investigating the Protein Dynamics of Human Serum Albumin in Hypothermic and Normalthermic Conditions with Temperature Jump"

College of Science Elite Student Award — *Hsinchu, Taiwan*
College of Science, National Tsing Hua University — *2021 Spring*
Awarded to the exceptional-performing student in the College of Science at NTHU

Honorary Membership — *Taipei, Taiwan*
The Phi Tau Phi Scholastic Honor Society of the Republic of China — *2021 Spring*
Awarded to the excellence in academic performance as well as moral conduct

Presentations

1st author poster at the <2021 Chemical Society National Meeting> — *Taoyuan, Taiwan*
Chemical Society Located in Taipei — *Mar. 13 – 14, 2021*
"Thermally Induced Dynamic Processes of Albumins Probed with ICCD-embedded Confocal Fluorescent Temperature Jump System"

Language

Chinese Native

English Fluent; TOEFL iBT score: 100 – R: 24, L:28, S:23, W:25 (*Apr. 9, 2022*)

Technical Skills

Chemistry & Scientific Instruments

Spectroscopy Time-resolved absorption/fluorescence,Temperature-jump method, Steady-state IR/ATR absorption, Steady-state UV-Vis absorption, Steady-state fluorescence, Steady-state far-UV circular dichroism

Softwares Gaussian 09/16, GaussView, Chemdraw, OriginLab, Gnuplot, Autodesk Fusion 360

Computer & Programming

Programming C/C++, C#, Python, Java, MATLAB, LabVIEW, Unity 3D, VBA, VBScript, Bash/Shell, PHP/MySQL

System Admin Linux-based computer cluster management, Network management, Windows, Linux, macOS

Softwares Git, Typesetting with LaTeX engine, Microsoft Office, Adobe Illustrator, Blender