

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

B.S. IN CHEMISTRY, MINOR IN COMPUTER SCIENCE

Hsinchu, Taiwan

Sep. 2014 – Jun. 2018

National Tsing Hua University

M.S. IN PHYSICAL CHEMISTRY

Hsinchu, Taiwan

Sep. 2019 – Aug. 2021

Research & Working Experience

Undergraduate Research & Research Assistant

PROF. CHIN-HUI YU'S LAB, DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

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) method developed in our lab, incorporate with the energy and force calculation from Gaussian 09, to study how phenol and formaldehyde forms Hydroxybenzyl Alcohol in Alkaline Aqueous Environment.

Computational Cluster & Network Management:

- Served as the server room administrator, managing and maintaining the Linux-based computer cluster(30+ PCs) in our lab.
- Successfully compiled and deployed Gaussian 16 in our computational cluster.

Master Degree Research

PROF. LI-KANG CHU'S LAB, DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

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 interface.

Research Assistant

DR. KUO-HUA HUANG'S LAB, INSTITUTE OF MOLECULAR BIOLOGY, ACADEMIA SINICA

Taipei, Taiwan

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 programs to acquire images, do real-time image processing, and update VR to achieve a close-loop VR system.
- 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

CENTER FOR GENERAL EDUCATION, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

2014 Fall – 2016 Spring

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

Teaching Assistant of Undergraduate Courses

DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

2019 Fall – 2020 Spring

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

Honors & Awards

Excellent Poster Presentation Award

2021 CHEMISTRY NATIONAL MEETING, CHEMICAL SOCIETY LOCATED IN TAIPEI

Taoyuan, Taiwan

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

2022 CHEMISTRY NATIONAL MEETING, CHEMICAL SOCIETY LOCATED IN TAIPEI

Taipei, Taiwan

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

COLLEGE OF SCIENCE, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

2021 Spring

Awarded to the exceptional-performing student in the College of Science at NTHU

Honorary Membership

THE PHI TAU PHI SCHOLASTIC HONOR SOCIETY OF THE REPUBLIC OF CHINA

Taipei, Taiwan

2021 Spring

Awarded to the excellence in academic performance as well as moral conduct

Publications

- (1) Yang, Chih-Tsun; 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, Chih-Tsun; Chu, L.-K. Gaseous infrared spectra of the simplest geminal diol $\text{CH}_2(\text{OH})_2$ and the isotopic analogues in the hydration of formaldehyde. *Phys. Chem. Chem. Phys.* **2021**, 23, 14699–14705.
- (3) Wang, P.-Y.; Yang, Chih-Tsun; 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.

Presentations

1st author poster at the <2021 Chemical Society National Meeting>

CHEMICAL SOCIETY LOCATED IN TAIPEI

Taoyuan, Taiwan

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

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
Programming	C/C++, C#, Python, Java, MATLAB, LabVIEW, VBA, VBScript, Bash/Shell, PHP/MySQL
IDE & Tools	Git, Vim, make, Visual Studio Code, Jupyter, Unity 3D
OS & System Administration	Linux-based computer cluster management, Software installation & deployment, Network management, Windows, Linux(Fedora, Ubuntu, CentOS), macOS
Softwares	Gaussian 09/16, GaussView, Chemdraw, OriginLab, Gnuplot, Typesetting with \LaTeX engine, Microsoft Office, Adobe Illustrator, Blender, Autodesk Fusion 360

Extracurricular Activities

Clarinetist & Bass Clarinetist in NTHU Wind Club

DIVISION OF STUDENT ACTIVITIES, NATIONAL TSING HUA UNIVERSITY

- Sep. 2015 – Aug. 2016: **President** of 26th NTHU wind camp
- Sep. 2016 – Aug. 2017: **Treasurer** of NTHU wind band

Hsinchu, Taiwan

Sep. 2014 – Aug. 2018

Learning Assistant

HSINCHU DONG YUAN ELEMENTARY SCHOOL

Hsinchu, Taiwan

Sep. 2014 – Dec. 2014

Volunteer Service

HSINCHU MACKAY MEMORIAL HOSPITAL

Hsinchu, Taiwan

Mar. 2016 – Jun. 2016