

# Chih-Tsun Yang

APPLYING FOR THE PH.D. IN CHEMISTRY PROGRAM AT THE 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 Researcher & Research Assistant

PROF. CHIN-HUI YU'S LAB, DEPARTMENT OF CHEMISTRY, NTHU

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) algorithm, combined with Gaussian 09, to study how phenol and formaldehyde form hydroxybenzyl alcohol in alkaline aqueous environment.

#### Computational Cluster & Network Management:

- Managed and maintained the Linux-based computer cluster(40+ PCs) in our lab.
- Successfully compiled and deployed Gaussian 16 in our computational cluster.

### Master's Student

PROF. LI-KANG CHU'S LAB, DEPARTMENT OF CHEMISTRY, NTHU

Hsinchu, Taiwan

Sep. 2019 – Aug. 2021

#### Thesis Topic:

*"Investigating the Protein Dynamics of Human Serum Albumin in Hypothermic and Normothermic 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 Spectrometer that uses ICCD as the detector.
- Programmed a script in PI's WinSpec to automatically acquire spectrum.

#### Side Project 2: Upgrade the Stopped-flow Apparatus in the Teaching Laboratory

- Repaired an old stopped-flow apparatus by replacing the ADC card and electronic components.
- Developed a new software in Java, including the data collecting routine 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 zebrafish 3D model and animated it in Blender.
- Developed a close-loop VR, including image acquisition, real-time image processing, and scene updating in Python & Unity.
- 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, NTHU

Hsinchu, Taiwan

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

DEPARTMENT OF CHEMISTRY, NTHU

Hsinchu, Taiwan

2019 Fall – 2020 Spring

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

## Publications

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- (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  $\text{CH}_2(\text{OH})_2$  and the isotopic analogues in the hydration of formaldehyde. *Phys. Chem. Chem. Phys.* **2021**, *23*, 14699–14705.
- (3) Wang, P.-Y.; Yang, 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

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### 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 Normothermic Conditions with Temperature Jump"

### College of Science Elite Student Award

COLLEGE OF SCIENCE, NTHU

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

## Presentations

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### 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

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**Chinese** Native

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

## Technical Skills

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### CHEMISTRY & SCIENTIFIC INSTRUMENTS

**Spectroscopy** Time-resolved absorption/fluorescence, Temperature-jump method, Steady-state IR/ATR absorption, Steady-state UV-Vis absorption/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  $\text{\LaTeX}$  engine, Microsoft Office, Adobe Illustrator, Blender