tyler.roche@gmail.com **Tyler P. Roche** https://tyrochem.ist

EXPERIENCE

Trinity University 2022–2023

Visiting Assistant Professor

- Mentored students extensively in classroom, small-group, and one-on-one environments to ensure knowledge transfer
- **Biochemistry:** Utilized and improved upon flipped-classroom method for better student engagement and greater achievement of learning outcomes
- **Biochemistry Laboratory:** Executed laboratory instruction by training and managing up to twelve students in advanced instrumental techniques
- **Advanced Chemical Principles:** Engaged students in critical thinking exercises designed to ensure accurate and precise chemical measurements

Georgia Institute of Technology 2017–2022

Graduate Research Assistant

- Managed my dissertation project in an efficient and productive manner: completed a demanding Ph.D. with 3 publications in 5 years
- Generated SOP documents for sample prep and method execution for multiple analytical instruments, prioritizing safety and meticulous lab hygiene
- Developed analytical methods for HPLC, LC-MS, Circular Dichroism, and NMR analysis under different temperature, salt, and pH conditions.
- Performed troubleshooting and method development for advanced instruments
- Designed novel experiments, maintained meticulous lab notebook records, and executed a project across multiple institutions involving four senior collaborators

Graduate Teaching Assistant

- **Survey of Biochemistry:** Developed content and lectured for a survey course covering the essential suite of undergraduate biochemical topics
- **Quantitative Analysis:** Instructed a quantitative analysis laboratory course including developing and improving submission templating for assessment

Apple 2015–2017

Technical Expert

- Diagnosed technical problems on both mobile (iPhone) and desktop (Mac) platforms while setting expectations and maintaining customer satisfaction
- Engaged in thorough problem-solving utilizing established SOPs, deviating when necessary to address anomalous issues
- Developed expertise in troubleshooting hardware and software issues

University of Southern California 2012–2014

Graduate Research Assistant

- Cultured sulfur-reducing hyperthermophilic bacteria under anaerobic conditions, including utilizing glove-box sterile techniques
- Performed microbial growth experiments in chemostat-style continuous-flow bioreactors under steady-state conditions

Graduate Teaching Assistant

- **Climate Change:** Taught a general education course involving delivering scientifically accurate and socially relevant content to students with varying levels of subject competency and background knowledge

Pomona College 2008–2012

Undergraduate Researcher

- Designed primers for, cloned, and expressed a modified GDI (GDP dissociation inhibitor) protein in order to prevent N-terminal acetylation to determine phenotypic result in flies
- Used E. coli as a bacterial engineering platform to express desired protein products and analyzed via Western Blot

Children's Hospital, Los Angeles 2010

Research Intern

- Maintained and performed genotypic analysis via quantitative polymerase chain reaction (PCR) of a mouse model system
- Developed experience in organ removal and sectioning for microscopic analysis

EDUCATION

Ph.D. **Georgia Institute of Technology** **2022**
Chemistry and Biochemistry

B.A. **Pomona College** **2012**
Molecular Biology

AWARDS AND FELLOWSHIPS

Georgia Institute of Technology:

Tech to Teaching Certificate 2022

Astrobiology Fellowship 2021

Graduate Certificate in Astrobiology 2021

William Emerson Outstanding Second-Year Seminar Award 2018

University of Southern California:

President's Fellowship 2012

Additional:

Eagle Scout Award (Boy Scouts of America) 2008

PUBLICATIONS

Roche, T. P.; et al. One-Pot Formation of Complementary Proto-RNA Nucleotide Assemblies. *In preparation.*

Roche, T. P.; et al. A Plausible Path to Nucleosides: Ribosides and Related Aldosides are Generated from Ribulose, Fructose, and Similar Abiotic Precursors. *Chem. Eur. J.*, **2022**, e202203036 **doi:10.1002/chem.202203036**

Fialho, D. M.; **Roche, T. P.;** Hud, N. V. Prebiotic Syntheses of Noncanonical Nucleosides and Nucleotides. *Chem. Rev.*, **2020**, 120, 4806–4830. **doi:10.1021/acs.chemrev.0c00069**

Garcia, O.; Carraro, G.; Turcatel, G.; Hall, M.; Sedrakyan, S.; **Roche, T.;** Buckley, S.; Driscoll, B.; Perin, L.; Warburton, D. Amniotic Fluid Stem Cells Inhibit the Progression of Bleomycin-Induced Pulmonary Fibrosis via CCL2 Modulation in Bronchoalveolar Lavage. *PLoS ONE*, **2013**, 8(8): e71679. **doi:10.1371/journal.pone.0071679**

SELECTED PRESENTATIONS

Roche, et al. Ketoses: The Key to Prebiotic Nucleoside Formation? Prebiotic Chemistry and Early Earth Environments Seminar Series, **2021** **https://www.youtube.com/live/xwOHUG1WSDc**

Roche, et al. Prebiotic Relevance of Ketose Sugars to the Origin of Aldose Nucleosides. AbSciCon **2019** (Bellevue, WA)