CHRISTINA MCCULLEY

www.linkedin.com/in/chmcculley65

SKILLS

Software – Gaussian, GaussView, Spartan 10, CYLView, Putty, ChemDraw, PyMol, Microsoft Office (Excel, Word, Publisher, PowerPoint), MestReNova, FRED, VIDA, Maestro 12.2

Organic chemistry – organic synthesis, air and moisture sensitive reactions, extractions, chromatography

Instrumentation – NMR spectroscopy, HPLC, mass spectrometry, IR spectroscopy

EDUCATION

Doctor of Philosophy, Organic Chemistry — June 2019
University of California Davis, CA

Bachelor of Science, Chemistry (Honors) — May 2012
California State University, Chico

Bachelor of Science, Applied Mathematics — May 2012
California State University, Chico

RESEARCH EXPERIENCE

Postdoctoral Researcher, Department of Chemistry, Aarhus University, Center for Catalysis — September 2019-September 2021

- Examined chemical pathways and mechanistic proposals based on computed energy profiles developed with advanced modelling software (Gaussian 09, Maestro 12.2)
- Leading collaborative projects with chemistry graduate students
- Suggested organocatalytic strategies for cycloaddition and stereoselective aldehyde chlorination reactions
- Analyzed conformers using Maestro 12.2, Gaussian, and Microsoft Excel
- Published 1,3-Dipolar [6+4] Cycloaddition project results as co-author in *Chemical- A European Journal* in 2020
- Managing and communicating between scientist teams
- Gained experience presenting research to a broad and international audience
- Learned python coding language
- English language consultant and technical editor

Graduate Student Researcher, Department of Chemistry, UC Davis — January 2015- June 2019

- Lead projects in collaboration with synthesis collaborators
- Computationally predicted chemical properties and reactivity for structural elucidation and mechanistic insight utilizing Gaussian 09 and Spartan 10
- Predicted pharmacokinetic properties using OpenEye and Pymol
- Analyzed reaction mechanisms utilizing molecular dynamics (Progdyn)
- Utilized computational methodology to produce theoretical NMR results for comparison to experimental results
- Mentored in their projects and trained three undergraduate researchers
- Managed, edited and update the Tantillo group instructional manual 2017- 2020
- Acted as Graduate student representative on the Chemical Biology Program executive committee, 2016-2019
- Participated in the Chemical Biology Program at UCD and received a two-year research fellowship, 2015-2017
- Optimize Held Teaching assistant position for organic, physical organic chemistry, theoretical pharmaceutical chemistry, and advanced bio-organic chemistry laboratory courses at UCD and for theoretical pharmaceutical chemistry (computer-aided drug design) courses at Academia Sinica, Taipei
- Developed introductory skills in cellular growth, proliferation and maintenance while cross-training in a biomedical engineering laboratory at UCD

Undergraduate Summer Researcher, Utah State University, Logan — June- August 2011

Synthesis and antibacterial study of a sorbistin analog

- Worked on the synthesis and purification of organic compounds
- Expanded experience in HPLC and NMR spectroscopy

Undergraduate Summer Research Project Fellow, Humboldt State University, California — May- August 2010

Computational investigations into phallotoxins and the organic conductor 7,7,8,8-tetracyanoquinodimethane

- Worked on a team to computationally examine a class of phallotoxins through structural optimization utilizing Gaussian and Spartan 10
- Examined 7,7,8,8-tetracyanoquinodimethane computationally with respect to the effect of substituents

- Presented the project at the Humboldt State University Summer Researcher Symposium

Undergraduate Researcher, California State University, Chico May 2008 - May 2012

Synthesis of gallicynoic acids/ a mechanistic study of the thermal rearrangements of allylic sulfonates to sulfones

- Gained experience in carrying out anhydrous and anaerobic reactions and handled highly air and moisture sensitive Pd based catalysts
- Optimized 2,3-sigmatropic rearrangements of allylic sulfonates to sulfones utilizing Gaussian and Gaussview

PUBLICATIONS AND PRESENTATIONS

Peer-reviewed Journals

- Mohr L.; **McCulley, C. H.**; Blom J.; Lamhauge, J. N.; Jorgensen, K. A. "Investigation of the Organocatalytic Chlorination of 2-Phenylpropanal." *Chem. Eur. J.* 2021, 27, 17465-17475.
- McLeod, D.; Cherubini-Celli, A.; Sivasothirajah, N.; **McCulley, C. H.**; Christensen, M. L.; Jorgensen, K. A. "Enantioselective 1,3-Dipolar [6+4] Cycloaddition of Pyrylium Ions and Fulvenes towards Cyclooctanoids." *Chem. Eur. J.* 2020, 26, 11417-11422.
- **McCulley, C. H.**; T. A.; Tantillo, D. J. "Predicting Rearrangement-Competent Terpenoid Oxidation Levels" *J. Am. Chem. Soc*. 2020, 142, 6060-6065.
- **McCulley, C. H.**; Tantillo, D. J. "Secondary Carbocations in the Biosynthesis of Pupukeanane Sesquiterpenes." *J. Phys. Chem. A* 2018, 122, 8058-8061.
- **McCulley, C. H.**; Geier, M. J.; Hudson, B. M.; Gagne, M. R.; Tantillo. D. J. "Biomimetic Platinum-Promoted Polyene Polycyclizations: Influence of Alkene Substitution and Pre-cyclization Conformations." *J. Am. Chem. Soc*. 2017, 139, 11158-11164.
- Lim, N.-K.; Weiss, P.; Li, B. X.; **McCulley, C. H.**; Hare, S. R., Bensema, B. L.; Palazzo, T. A.; Tantillo, D. J.; Zhang, H.; Gosselin, F. "Synthesis of Highly Stereodefined Tetrasubstituted Acyclic All-Carbon Olefins via a Syn- Elimination Approach" *Org. Lett*. 2017 19(22) 6212.

Conferences and Symposia

- Invited seminar speaker for the Chemistry and Biochemistry Department at CSU, Chico, 2018
- Invited oral presentations at UC Davis Chemical Biology Program Retreat, 2017
- Poster presentations at 24th IUPAC International Conference on Physical Organic Chemistry, Chemical Biology in the Bay Area Day, 2018; the Miller Symposium (UC Davis), 2017 & 2018; UC Davis Chemical Biology Program Retreat, 2015 & 2016; ACS National Meeting 2009 (Salt Lake City, Utah) and 2011 (Anaheim, CA)

RECENT LEADERSHIP AND VOLUNTEER ACTIVITIES

- *Student member*, executive committee for the Miller Symposium, UC Davis Department of Chemistry, 2017 - 2019
- *Graduate student representative*, the Chemical Biology Program executive committee, UC Davis, 2016 - 2019
- *Student coordinator*, National Organic Symposium, UC Davis, June 2017
- *Graduate student in charge*, the Tantillo group instructional manual, UC Davis, 2017 - 2020
- *Student mentor*, for undergraduate students performing summer research in the Tantillo laboratory

SELECTED AWARDS AND SCHOLARSHIPS

- 24th IUPAC International Conference on Physical Organic Chemistry (ICPOC) registration grant award, 2018
- UC Davis Miller Symposium Award for Best Poster Presentation, 2018
- UC Davis Department of Chemistry Travel Grant, 2018
- UC Davis Chemical Biology Fellowship recipient, 2015-2017
- Outstanding Graduating Senior in Chemistry, by the Department of Chemistry & Biochemistry at CSU, Chico , 2012
- Floyd L. English Natural Sciences Scholarship recipient, 2008-2011

TEACHING EXPERIENCE

Teaching Assistant, UC Davis September 2014- June 2019

Organized discussion sections for general and organic chemistry, instructed classes of 30-40 students in computational tools used for theoretical pharmaceutical chemistry, oversaw general, organic, and advanced bio-organic chemistry experiments, hosted office hours and review sections, handled course logistics and provided feedback on original student drug design proposals and presentations.

Courses: Physical Organic Chemistry (graduate level); Pharmaceutical Chemistry 2 (upper division); Advanced Bio-organic Chemistry Laboratory (upper division); Organic Chemistry (upper division) and General Chemistry (freshman level)