Heather R. MacGregor

Computational Chemistry </> Medical Technology Drug Design

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Education

• University of California, Santa Barbara

Santa Barbara, CA

College of Creative Studies, B.S. Biochemistry

09/2016 - 07/2020

- Grade: 3.8 of 4.0
- Coursework: Organic Chemistry with Lab, Biochemistry with Lab, Physical Chemistry, Biophysics and Biomolecular Materials, Drug Design, Chemical Applications of Group Theory, Inorganic Chemistry, Newtonian Physics, Mechanics and Waves

Ponderosa High School

Shingle Springs, CA

High School Diploma

08/2012 - 05/2016

Research Experience

• Kalju Kahn Research Group

Santa Barbara, CA

Department of Chemistry and Biochemistry, UC Santa Barbara

03/2018 - Present

- Independently determined a set of computational approaches most appropriate for the efficient calculation of the vibrational circular dichroism spectrum of chiral molecules.
- Developed software to automate job submission, batch creation of input files, and perform detailed analysis of large volumes of output data.
- Submitted regular written updates to communicate progression of the project to sources of funding.

• Katja Seltmann Research Group

Santa Barbara, CA

Cheadle Center for Biodiversity and Ecological Restoration, UC Santa Barbara

08/2019 - Present

- Independently developed software to enable automation of routine analysis, integration, and visualization of large volumes of environmental and geospatial data collected by remote sensors on a local server.
- Designed a GUI utilizing the Box API to allow public access to the raw data. Worked within the Drupal framework to port the application to a web environment.
- Regularly met with supervisors to present updates.

• Maribel Rios Research Group

Boston, MA

Department of Neuroscience, Tufts School of Graduate Biomedical Sciences

05/2019 - 08/2019

- Performed dissection of the model animal and cryostat brain tissue sectioning in regions of interest.
- Optimized an existing immunofluorescence protocol to best simultaneously visualize pre- and post-synaptic GABAergic synaptic terminals. Processed confocal microscope images using the Synapse Counter plugin for FIJI ImageJ.
- Performed routine genotyping of the mouse colony and assisted senior members with perfusions.

• Manzanita and San Clemente Restoration Project

Santa Barbara, CA

Cheadle Center for Biodiversity and Ecological Restoration, UC Santa Barbara

09/2016 - 03/2017

- Collected field data on vernal pools in the Manzanita Village Restoration Area.
- Removed and documented invasive plant species.

Grants and Fellowships

• Undergraduate Research Internship Grant

09/2019

UC Santa Barbara, Cheadle Center for Biodiversity and Ecological Restoration Associated Students Coastal Fund

• College of Creative Studies Axline Summer Undergraduate Fellowship

08/2019

UC Santa Barbara, College of Creative Studies

Create Fund

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• Building Diversity in Biomedical Sciences Summer Research Program Tufts School of Graduate Biomedical Sciences NIH Award # R25HL007785	05/2019
 Cooperative International Science and Engineering Internships (Declined) Eindhoven University of Technology & UC Santa Barbara Materials Research Laboratory & National Science Foundation Research Experiences for Undergraduates Gorman Scholars Program (Declined) UC Santa Barbara, Center for Science and Engineering Partnerships The Gorman Family 	05/2019 05/2019
• Edison Summer Research Program UC Santa Barbara, McNair Scholars Program Edison International	06/2018
Honors and Awards	
Focus Program Georgia Institute of Technology	12/2019
Diversity in Graduate Studies (DIGS) Visitation Program Graduate Admissions, Rensselaer Polytechnic Institute	11/2019
Graduate Diversity Visitation Program Office of Graduate Diversity Initiatives, Purdue University	11/2019
 Science, Technology, Engineering, and Math (STEM) Fall Open House The Graduate School, Pennsylvania State University 	10/2019
Undergraduate Student Travel Award Annual Biomedical Research Conference for Minority Students	09/2019
• Edison GRE Preparation Course Scholarship UC Santa Barbara, McNair Scholars Program Edison International	04/2019
Director's Award Ponderosa High School Music Program	05/2016
Presentations	
 Benchmarking Density Functional Methods for Prediction of Gas-Phase Vibrational Circular Dichroism Spectra Research & Creative Activities Conference, UC Santa Barbara College of Creative Studies 	11/2019
• Feeding State Dependency of Inhibitory Synaptic Dynamics in the Ventromedial Hypothalamus	,
Annual Biomedical Research Conference for Minority Students	11/2019
Research & Creative Activities Conference, UC Santa Barbara College of Creative Studies Summer Research Symposium, Tufts School of Graduate Biomedical Sciences	11/2019 08/2019
Quantum Mechanical Prediction of Gas-Phase Vibrational Circular Dichroism Spectra	
Undergraduate Research Colloquium, UC Santa Barbara	05/2019
Research & Creative Activities Conference, UC Santa Barbara College of Creative Studies Summer Research Colloquium, UC Santa Barbara	11/2018 08/2018

Publications

• Benchmarking Density Functional Methods for Prediction of Gas-Phase Vibrational Circular Dichroism Spectra. H. R. MacGregor, K. Kahn. *In Preparation*. (2019)

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Work Experience

• UC Santa Barbara Chemistry and Biochemistry Research Storeroom

Santa Barbara, CA

Storeroom Assistant

11/2018 - Present

- Stocked and filled orders for chemicals and laboratory supplies to research/instructional labs using the 4D relational database management system.
- Assisted with miscellaneous shipping and receiving duties as assigned by supervisor.

• UC Santa Barbara Disabled Students Program

Santa Barbara, CA

Notetaker and Exam Proctor

11/2016 - Present

- Acted as a liason between clients and their instructor while maintaining the integrity of the testing environment and ensuring that the client received the correct accommodation. Provided a detailed, time-stamped report to supervisors for each accommodation.
- Took clear, detailed notes for an ongoing course and uploaded them to an online portal.

Outreach and Societies

• Data Science UC Santa Barbara

Santa Barbara, CA

Member

09/2019 - Present

Women in Science and Engineering

Santa Barbara, CA

Mentor

09/2019 - Present

Mentored first- and second-year female-identifying students in science and engineering majors.

• Biology Mentoring and Engagement

Santa Barbara, CA

Learning Assistant

09/2019 - Present

- Mentored a small group of first-year pre-biology students.

• American Physical Society Conference for Undergraduate Women in Physics

Santa Barbara, CA

Volunteer

01/2019 – 01/2019

 Prepared conference materials and checked in attendees, then served as a point of contact between attendees and organizers for the duration of the event.

• SciTrek Santa Barbara, CA

Volunteer K-12 Science Instructor

01/2019 - Present

- Worked with a group of 3 people to develop and implement the organization's first high school program focusing on introducing biological macromolecules and analytical tests that are used to investigate them.
- Coordinated with ASBMB board members to recruit volunteers for the high school module.
- Worked with a team to compile scientific literature focused on active learning for eventual use in a journal publication.

American Society for Biochemistry and Molecular Biology

Santa Barbara, CA

Board Member

09/2018 - Present

- Planned and coordinated chapter events including career development, lab & industry tours, fundraising, research talks, and more.
- Developed and maintained the chapter website and Facebook page.

• College of Creative Studies Peer Mentorship

Santa Barbara, CA

Chemistry and Biochemistry Mentor

09/2017 - Present

- Served as a mentor and resource to first-year CCS students with similar academic and career interests.

• Residence Hall Association

Santa Barbara, CA

House Representative

09/2016 – 06/2017

- Worked with a team of House Representatives from Manzanita Village and San Rafael Residance Halls to select programs to fund and planned activities for students living in UCSB housing on- and off-campus.

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Skills

Software: QM and MD Simulations (Gaussian 16, Tinker, TurboMole); Molecular Visualization (Molden, PyVib2, PyMol, UCSF Chimera, QuteMol); Data Analysis (MNova, GraphPad Prism); Microsoft Office Suite

Programming: Python, Bash, Mathematica, LATEX, HTML/CSS/JavaScript

Environments: Linux (Ubuntu, Xubuntu), Windows (XP, 8, 10)

Organic and bio-chemistry: Thin layer chromatography, Extraction, IR spectroscopy, ¹H- and ¹³C-NMR, Mass spectrometry, Vibrational circular dichroism, PCR, Immunofluorescence, Cryostat tissue sectioning, Genotyping

Languages: English, French (Conversational)

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