Alexander Krammer

apk93@case.edu | (303) 449-4524 | www.linkedin.com/in/akrammer/

Education

Case Western Reserve University (CWRU) - Cleveland, OH

August 2022 - May 2026 (anticipated)

Biochemistry, Computational Health Science Track, B.S.

Systems Biology Secondary Major; Minors in Chemistry, Biology, and Computer Science

Cumulative GPA: 4.0

Activities and societies: Johannes von Lintig Lab Research, Veterans Affairs Medical Center Volunteering (student organization founder and executive council member), Organic Chemistry TA, Civic Engagement Scholars Program (CESP scholar each year), Phi Delta Epsilon International Medical Fraternity (Secretary/Risk Management Officer), USG Judicial Board (Member and Secretary), Case Undergraduate Biochemistry Society, Case Neuroscience Society, and CWRU EMS

Fairview High School - Boulder, CO

August 2018 - May 2022

IB graduate

Cumulative GPA: 4.813 weighted, 4.0 unweighted

Activities and societies: Marching Band (Drum Major, President, Class Representative), National Honor Society (Co-Vice President), Science Olympiad, Quiz Bowl, National Ocean Sciences Bowl (Team Captain)

Professional Experience

Student Researcher, Johannes von Lintig Lab - Cleveland, OH

April 2024 - Present (ongoing)

The von Lintig lab focuses on the question of how carotenoid and vitamin A homeostasis is maintained in the physiological state and how disturbances in this process contribute to blinding disease states. My research has focused largely on the function, regulation, and localization of Beta-Carotene-Oxygenase-2 (BCO2). BCO2 is critical for carotenoid homeostasis, which is intimately linked to vitamin A metabolism, the retinoid cycle, and retinoic acid signaling. I have demonstrated the importance of two separate, highly-conserved regions of the enzyme and discovered vicinal disulfide-based redox regulation of BCO2, with possible implications for carotenoid loss in chronic inflammatory diseases, including age-related macular degeneration, cardiovascular disease, and diabetes. I have also made some forays into novel computational analysis methods of retinal pigment epithelial cells and tight junctions and of reaction dynamics of the broad substrate specificity of BCO2. I will continue mentoring a younger student, investigating BCO2 redox regulation and refining protein purification to enable cryoEM and improved structural and functional studies in the upcoming year.

Organic Chemistry TA, CWRU Department of Chemistry - Cleveland, OH

September 2024 - Present (ongoing)

After taking Organic Chemistry I and II with Dr. Rekha Srinivasan, I was asked to become a TA, and I enthusiastically agreed, completing a training course and beginning promptly. As a TA for both Organic Chemistry I and II, I teach concepts and guide understanding, coming up with practice problems, generating summaries and useful guides, and working with individuals and groups of students. This year, I anticipate assuming grading responsibilities in addition to my current role.

Varied Shadowing - wider Boulder/Denver area, CO

May 2023 - July 2024

I shadowed Family Medicine, Neurology, and various Ophthalmology subspecialties, both in the clinic and in the operating room. Each experience was in a different healthcare setting, ranging from a collective community practice to a hospital to a private practice.

Academic Tutor - Boulder, CO

October 2019 - May 2022

I worked with students individually and in small groups to improve their knowledge and understanding of subjects ranging from biology to chemistry to proof-based calculus.

Volunteer/Community Service Experience

Coordinator and Volunteer, Louis Stokes VA Medical Center - Cleveland, OH

March 2023 - Present (ongoing)

With another student, I founded an organization that works with the VA volunteering program, administration, health care providers, and CWRU to facilitate student volunteering at the VAMC. Lessening bureaucratic hurdles has directly enabled hundreds of hours of volunteering and decreased student application times from six months to around two weeks. I also volunteer approximately 10 hours each week at the VA, myself.

Civic Engagement Scholar, Case Western Reserve University - Cleveland, OH

August 2022 - Present (ongoing)

As a Civic Engagement Scholar, I commit to meaningful civic engagement and have been able to volunteer with a variety of organizations, including food banks, the American Cancer Society, the Red Cross, and MedWish International. I also have the opportunity and obligation as part of this program to learn from a variety of civic leaders through seminars and events.

Vice President, National Honor Society, Fairview High School - Boulder, CO

September 2019 - May 2022

The National Honor Society furthers leadership, service, character, and scholarship through chapters established throughout the country. I was inducted as a sophomore and became part of the 8-person leadership team for the 250-member chapter, volunteering in excess of 100 hours myself, and leading others in a combined total in excess of 10,000 hours of service.

Publications

Krammer A, Bandara S, von Lintig J. A conserved α-helix in β-carotene-oxygenase-2 substantially modulates enzyme activity. *Journal of Biological Chemistry*. 2025;301(5):109424. doi:10.1016/j.jbc.2025.109424

Presentations

Krammer A, Bandara S, von Lintig J. β-Carotene Oxygenase 2 is Redox Regulated via a Vicinal Disulfide. [Poster presented]. CWRU SURP Poster Session. 2025 July 31. Cleveland, OH.

Krammer A, Bandara S, von Lintig J. Conserved Structural Features in Beta-Carotene Oxygenase 2 Regulate Enzyme Activity. [Poster presented]. Visual Science Research Center Annual Symposium. 2025 May 30. Cleveland, OH.

Krammer A, Bandara S, von Lintig J. Conserved Structural Features in Beta-Carotene Oxygenase 2 Regulate Enzyme Activity. [Poster presented]. ASBMB Annual Meeting. 2025 April 11-16. Chicago, IL.

Conferences Attended

- ASBMB Annual Meeting - April 11-16, 2025 - Chicago, IL
- Visual Science Research Center Annual Symposium - May 30, 2025 - Cleveland, OH
- CWRU School of Medicine Department of Pharmacology Retreat - October 24-25, 2024 - Sandusky, OH
- Visual Science Research Center Annual Symposium – May 31, 2024 – Cleveland, OH

Awards, Scholarships, and Special Recognitions

- Civic Engagement Scholar, CWRU - 2022/3, 2023/4, 2024/5
- Dean's High Honors, CWRU - each semester
- Phi Beta Kappa Prize, CWRU - May 2024
- Alexander A. Treuhaft Memorial Scholarship, CWRU - April 2022
- National Merit Finalist, National Merit Scholarship Corporation and CWRU - February 2022
- German Language Certificate of the Education Ministers Conference (DSD I and DSD II)
- Colorado Seal of Biliteracy in Spanish, Boulder Valley School District - May 2022
- Outstanding Scholar Award, Fairview High School - May 2022
- Fairview High School Knight of the Round Table, Fairview High School - May 2022
- Outstanding Spanish 5 Senior, Fairview High School - May 2022
- Outstanding Bandsman of the Year, Fairview High School Band Program – all 4 years
- AP Scholar Award, College Board - July 2021
- Outstanding Achievement in the Social Sciences, Fairview High School - May 2019

Society Membership

American Society for Biochemistry and Molecular Biology (ASBMB)

I am a member of CWRU's chapter of ASBMB and received travel funding to attend the 2025 ASBMB Annual Meeting in Chicago, IL and present my poster.

American Society for Pharmacology and Experimental Therapeutics (ASPET)

As part of ASPET's Summer Undergraduate Research Fellow program, I was awarded a stipend as I continued my research on BCO2 in the Johannes von Lintig Lab at CWRU, and became a member of ASPET.

Specific Skills and Interests

- Computation
    - Programming Languages: Java, Python, Mathematica, and R
    - Use of PyMol, Coot, and other bioinformatics software
    - Design of novel image analysis methods
- Lab/Research
    - Protein Purification
    - Foundational biochemistry techniques including SDM, Agarose gel electrophoresis, SDS-PAGE and Western Blotting, Cell Transformation, Cell Culturing, and HPLC use
    - Critical thinking, time management, mentorship, communication