CRYSTAL M. VANDER ZANDEN

ASSISTANT PROFESSOR
UNIVERSITY OF COLORADO, COLORADO SPRINGS

Colorado Springs, CO 80918
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Centennial Hall #224
www.vanderzanden-lab.com

2. EDUCATION

Post-Doctoral Training 2017-2019
University of New Mexico (Albuquerque, NM)
Department of Chemical and Biological Engineering
Advisor: Dr. Eva Chi

PhD – Biochemistry and Molecular Biology 2017
Colorado State University (Fort Collins, CO)
Advisor: Dr. P. Shing Ho
Dissertation Title: "5-Hydroxymethylcytosine and Endonuclease G as Regulators of Homologous Recombination"
GPA: 3.94/4.00

Bachelor of Science – Biochemistry 2011
Doane College (Crete, NE)
Undergraduate Research Advisor: Dr. Erin Wilson
Project Title: "Hydroxyapatite induces secondary structure changes in bone mineralization proteins"

3. PROFESSIONAL EXPERIENCE

Assistant Professor: 2019-Present
University of Colorado Colorado Springs, Dept. of Chemistry & Biochemistry (Colorado Springs, CO)

- Led a team of undergraduate and masters research students, with typically 8 students working in the lab during each semester.
- Performed research studying the structure of protein/membrane interactions, with applications in Alzheimer's disease, cell communication, and cardiovascular disease.
- Taught 15 contact hours per academic year, undergraduate and graduate courses.

NIH IRACDA Post-Doctoral Fellow: 2017-2019
University of New Mexico, Dept. of Chemical and Biological Engineering (Albuquerque, NM)
Advisor: Dr. Eva Y. Chi

- Characterized interactions between amyloid proteins (Aβ and Tau) and lipid membranes
- Simulated interactions between Aβ protein and lipid membranes
- Technical Skills: Langmuir trough, liquid surface x-ray reflectivity and grazing incidence x-ray diffraction, MD simulations, CD spectroscopy, fluorescence spectroscopy, transmission electron microscopy

Doctoral Researcher (NIH F31 Pre-Doctoral Fellow 2014-2016): 2011-2017
Colorado State University, Dept. of Biochemistry and Molecular Biology (Fort Collins, CO)
Advisor: Dr. P. Shing Ho

- Determined 5-hydroxymethylcytosine thermodynamically stabilizes Holliday junctions
- Crystallized Endonuclease G and discovered vertebrate-specific structural motifs
- Characterized Endonuclease G binding and affinity for Holliday junctions
- Derived molecular dynamics force field parameters for halogen atoms

- Technical Skills: crystallography, oligonucleotide purification (HPLC), DSC, ITC, QM calculations, MD simulations, Python, Unix/command line, general biochemistry, protein expression and purification, EMSA

Undergraduate Researcher: 2009-2011
Doane College, Dept. of Chemistry (Crete, NE)
Advisor: Dr. Erin Wilson

- Characterized osteopontin and osteocalcin-derived peptides adsorption onto bone mineral
- Developed circular dichroism technique for studying proteins adsorbed to solid surfaces
- Technical Skills: CD, IR, and UV/Vis spectroscopy

Summer Research Internship: 2009
University of Nebraska, Lincoln, Nebraska Center for Virology (Lincoln, NE)
Advisor: Dr. T. Jack Morris

- Studied secondary immune response in *Arabidopsis thaliana*
- Technical Skills: electrophoresis, western blot, PCR, ELISA

4. REFEREED PUBLICATIONS (UCCS student authors are underlined)

1. Talley, W.R.K., Bazan, D., Majewski, J., Kaltner, H., **Vander Zanden, C.M.**, Structure of Two Tandem Repeat Galectin Proteins Binding a Model Glycolipid Membrane, (**REVISED MANUSCRIPT UNDER REVIEW, revisions submitted 8/1/2025**) *Scientific Reports*
2. Nemri, J., Morales, C., Gilbert, N.C., Majewski, J., Newcomer, M.E., **Vander Zanden, C.M.**, Structure of a Model Lipid Membrane Oxidized by Human 15-Lipoxygenase-2, (2024) *Biochemical and Biophysical Research Communications*, 737, 150533.
3. Sallaberry, C.A., Voss, B.J., Stone, W.B., Estrada, F., Bhatia, A., Soto, J.D., Griffin, C.W., **Vander Zanden, C.M.** Curcumin Reduces Amyloid Beta Oligomer Interactions with Anionic Membranes, (2023) *ACS Chemical Neuroscience*, 14, 22, 4026-4038.
4. **Vander Zanden, C.M.**, Majewski, J., Weissbarth, Y., Browne, D.F., Watkins, E.B., Gabius, H.-J. Structure of Galectin-3 Bound to a Model Membrane Containing Ganglioside GM1, (2023) *Biophysical Journal*, 122, 1-12.
5. Sallaberry, C.A., Voss, B.J., Majewski, J., Beirnat, J., Mandelkow, E., Chi, E.Y., **Vander Zanden, C.M.**, Tau and Membranes: Interactions that Promote Folding and Condensation, (2021) *Frontiers in Cell and Developmental Biology*, 9, 725241.

The publications above this red line are works performed entirely since my UCCS appointment began, and **I am the corresponding author** on these publications.

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6. Majewski, J., Jones, E.M., **Vander Zanden, C.M.,** Biernat, J., Mandelkow, E., Chi, E.Y., Lipid membrane templated misfolding and self-assembly of intrinsically disordered tau protein, (2020) *Scientific Reports,* 10, 13324
7. **Vander Zanden, C.M.**[+], Czarny, R.S.[+], Ho, E.N.[+], Robertson, A.B., Ho, P.S., Structural Adaptation of Vertebrate Endonuclease G for 5-Hydroxymethylcytosine Recognition and Function, (2020) *Nucleic Acids Research*, 48 (7) 3962-3974. [+]**Shared first authorship.**
8. **Vander Zanden, C.M.,** Chi, E.Y., Passive immunotherapies targeting Aβ and tau oligomers in Alzheimer's disease, (2019) *Journal of Pharmaceutical Science,* 109 (1) 68-73.
9. **Vander Zanden, C.M.,** Wampler, L., Bowers, I., Watkins, E.B., Majewski, J., Chi, E.Y., Fibrillar and non-fibrillar amyloid beta structures drive two modes of membrane-mediated toxicity, (2019) *Lanmguir,* 35 (48) 16204-16036.

10. Fanni, A.M.,[+] **Vander Zanden, C.M.,**[+] Majewska, P.V., Majewski, J., Chi, E.Y., Membrane-mediated fibrillation and toxicity of the tau hexapeptide PHF6, (2019) *Journal of Biological Chemistry,* 294 (42) 15304-15317. [+]**Shared first authorship.**
11. **Vander Zanden, C.M.**, Rowe, R.K., Broad, A.J., Robertson, A.B., Ho, P.S., Effect of Hydroxymethylcytosine on the Structure and Stability of Holliday Junctions, (2016) *Biochemistry*, 55 (41) 5781-9.
12. Scholfield, M.R., Ford, M.C., **Vander Zanden, C.M.**, Billman, M.M., Ho, P.S., Rappé, A.K., Force Field Model of Periodic Trends in Biomolecular Halogen Bonds, (2015) *J. Phys. Chem. B*, 119 (29) 9140-9.
13. **Vander Zanden, C.M.**, Carter, M., Ho, P.S., Determining thermodynamic properties of molecular interactions form single crystal studies, (2013) *Methods*, 64: 12-18.
14. Scholfield, M.R.[+], **Vander Zanden, C.M.**[+], Carter, M., Ho, P.S. (2013) Halogen bonding (X-bonding): A biological perspective, *Protein Science*, 22: 139-152 (In this issue feature, cover article). [+]**Shared first authorship.**

5-8. NON-REFEREED PUBLICATIONS, PUBLICATIONS SUBMITTED, BOOKS, PUBLISHED REVIEWS

None.

9A. PRESENTATIONS AND SEMINARS (TALKS) (UCCS student authors are underlined)

1. **Vander Zanden, C.M.**, (2025) The "Sugar Code" in Cell Signaling. Colorado Springs Science on Tap, **Invited Talk.**
2. **Vander Zanden, C.M.**, (2025) The "Sugar Code" in Cell Signaling. UCCS Curiosity Unlimited, **Invited Talk.**
3. **Vander Zanden, C.M.**, (2025) 2-Minute Stress Reduction Tools for STEM and Pre-Health Students. UCCS Teaching and Learning Conference
4. **Vander Zanden, C.M.,** Browne, D.F., Weissbarth, Y., Majewski, J., Watkins, E.B., Gabius, H.-J., Kaltner, H., Talley, W.K. (2024) Structure of Galectin Proteins Bound to a Model Membrane Containing Gangliosides. American Chemical Society Fall 2024 National Meeting.
5. **Vander Zanden, C.M.,** Sallaberry, C.A., Voss, B.J., Stone, W.B., Estrada, F., Bhatia, A., Soto, J.D., Griffin, C.W. (2023) Curcumin Reduces Amyloid Beta Oligomer Interactions with Anionic Membranes. Colorado Proteinopathy Symposium at University of Denver.
6. **Vander Zanden, C.M.,** Browne, D.F., Weissbarth, Y., Majewski, J., Watkins, E.B., Gabius, H.-J., Kaltner, H., Talley, W.K. (2023) Assessing Membrane Protein Structure Using Liquid Surface X-ray Scattering. University of New Mexico, Dept. of Chemical and Biological Engineering Seminar Series, **Invited Talk.**
7. **Vander Zanden, C.M.,** Detweiler, N., George, O., Duncan, T., Weise Cross, L., Woods, C. (2022) Strategies for Teaching and Research at Primarily Undergraduate Institutions, IRACDA 2022 Conference, Albuquerque NM. **Invited Panelist**.
8. **Vander Zanden, C.M.,** Edwards, M., Selwyn, V., Tauchman, E. (2022) Careers in the Life Sciences Workshop, Colorado State University, Fort Collins CO. **Invited Panelist.**
9. **Vander Zanden, C.M.,** Majewski, J., Watkins, E.B., Wampler, L., Bowers, I., Chi, E.Y., Sallaberry, C., Soto, J.D., Browne, D.F., Weissbarth, Y., Gabius, H.-J. (2022) Assessing Membrane Protein Structure Using Liquid Surface X-ray Scattering. University of Northern Colorado Dept. of Chemistry and Biochemistry Seminar Series, **Invited Talk.**
10. **Vander Zanden, C.M.,** Majewski, J., Watkins, E.B., Wampler, L., Bowers, I., Chi, E.Y., Sallaberry, C., Soto, J.D., Browne, D.F., Weissbarth, Y., Gabius, H.-J. (2022) Assessing Membrane Protein

Structure Using Liquid Surface X-ray Scattering. University of Colorado Denver Dept. of Chemistry Seminar Series, **Invited Talk.**

11. **Vander Zanden, C.M.** (2021) Treatment and Drug Development in Alzheimer's Disease. Colorado Spring Science on Tap, **Invited Talk.**
12. **Vander Zanden, C.M.** (2021) Cooking With Starches. Colorado Spring Science on Tap, **Invited Talk.**
13. **Vander Zanden, C.M.,** Wampler, L., Bowers, I. Majewski, J., Watkins, E.B., Chi, E.Y., Gilbert, N., Newcomer, M. (2020) X-ray Reflectivity and Grazing Incidence X-ray Diffraction Studies of Amyloidogenic and Peripheral Membrane-Binding Proteins. Argonne National Labs Soft Matter Interest Group, **Invited Talk.**

The presentations above this red line are talks I have given since my UCCS appointment began.

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14. **Vander Zanden, C.M.,** Crockett, I.P. (2019) Incorporating Pre-Class Videos and In-Class Group Activities for Introductory-Level Courses. IRACDA National Conference, Ann Arbor, MI.
15. **Vander Zanden, C.M.,** Majewski, J., Watkins, E.B., Chi, E.Y. (2019) Synchrotron X-ray Scattering Studies to Determine Structure of Amyloid Beta Interactions with Lipid Membranes. Biophysical Society National Meeting, Baltimore, MD.
16. **Vander Zanden, C.M.,** Crockett, I.P. (2018) Incorporating Pre-Class Videos and In-Class Group Activities for an Introductory Chemistry Class at Central New Mexico Community College. UNM Valencia Two-Year College Chemistry Consortium, Albuquerque, NM.
17. **Vander Zanden, C.M**., Chi, E.Y. (2018) "Curing" Alzheimer's. Central New Mexico Community College STEMinar, Albuquerque, NM, Invited Talk.
18. **Vander Zanden, C.M.,** Robertson, A. B., Ho, P.S. (2014) Hydroxymethylcytosine Stabilizes Holliday Junctions and Promotes Recombination via Interaction with Endonuclease G. Oslo University Hospital, Oslo, Norway, Invited Talk.
19. **Vander Zanden, C.M**.; Wilson, M. V.; Kraye, H; Wilson, E. (2010) Study of Bone Mineralization through Analysis of Designed Peptides. Nebraska Academy of Science, Lincoln, NE.
20. **Vander Zanden, C.M**.; Wilson, M. V.; Kraye, H; Wilson, E. (2010) Study of Bone Mineralization through Analysis of Designed Peptides., Doane College Mind Expo, Crete, NE.
21. **Vander Zanden, C.M.**; Donze, T.; Ronhovde, K.; Morris, T.J. (2009) Confirming the Role of TIP in Resistance Against Turnip Crinkle Virus. Nebraska INBRE Conference, Grand Island, NE.

9B. PRESENTATIONS AND SEMINARS (POSTERS) (UCCS student authors are underlined)

1. Vanden Heuval, S., Vugmeyster, L. **Vander Zanden, C.M.** (2024) Impact of Phosphorylation and Pyroglutamate Modification on Amyloid Beta Interactions with a Lipid Membrane. Colorado Proteinopathy Symposium at University of Denver.
2. Talley, W.K., Kaltner, H., **Vander Zanden, C.M.** (2024) Importance of Disordered Linker on Structure of Tandem-Repeat Galectins Bound to a Model Membrane. Fall American Chemical Society National Conference.
3. Baroth, J., **Vander Zanden, C.M.** (2024) Amyloid Beta and Epigallocatechin Gallate Interactions with an Anionic Lipid Membrane. Fall American Chemical Society National Conference.
4. Senne, A., Hagen, G., Kaltner, H., **Vander Zanden, C.M.** (2024) Fluorescence Microscopy Measurements to Determine Galectin-3 Impacts on Glycolipid Distribution in a Supported Lipid Bilayer. Fall American Chemical Society National Conference.

5. Vanden Heuval, S., Vugmeyster, L. **Vander Zanden, C.M.** (2024) Impact of Phosphorylation and Pyroglutamate Modification on Amyloid Beta Interactions with a Lipid Membrane. Fall American Chemical Society National Conference.
6. Bazan, D., Talley, W.K., Tamarez, L., Kaltner, H., **Vander Zanden, C.M.** (2024) Galectin-4 and -8 Binding to Membranes Containing Sulfated Ligands. Fall American Chemical Society National Conference.
7. Bhatia, A., Voss, B.J., **Vander Zanden, C.M.** (2024) Amyloid Beta and Curcumin Interactions with Anionic Cell Membranes. Fall American Chemical Society National Conference.
8. Nemri, J., Morales, C., Gilbert, N.C., **Vander Zanden, C.M.** (2024) Structure of Membrane-Bound Human 15-Lipoxygenase-2. Fall American Chemical Society National Conference.
9. Unger, A., Nemri, J., Morales, C., Gilbert, N.C., **Vander Zanden, C.M.** (2024) Molecular Dynamics Simulations of Membrane-Bound Human 15-Lipoxygenase-2. Fall American Chemical Society National Conference.
10. Baroth, J., **Vander Zanden, C.M.** (2023) Amyloid Beta and EGCG Interactions with a Model Membrane. Colorado Proteinopathy Symposium at University of Denver.
11. Bhatia, A., Voss, B.J., **Vander Zanden, C.M.** (2023) Amyloid Beta and Curcumin Interactions with Anionic Cell Membranes. Colorado Proteinopathy Symposium at University of Denver.
12. **Vander Zanden, C.M.**, Estrada, F., Soto, J.D., Sallaberry, C., Voss, B.J., Browne, D.B., Weissbarth, Y., Talley, K., Morales, C., Majewski, J., Gabius, H.-J., Gilbert, N. (2022) Undergraduate-Driven Research in Protein/Membrane Interactions Using NSF's ChemMatCARS. Poster prepared for display at Sector 15 NSF's ChemMatCARS Advanced Photon Source.
13. Voss, B.J., **Vander Zanden, C.M**. (2022) Molecular dynamics simulations to investigate the role of curcumin in Alzheimer's disease. Chemical Biology and Physiology 21|22 National Meeting, Portland, OR.
14. **Vander Zanden, C.M.,** Gilbert, N., Majewski, J., Newcomer, M. (2021) Liquid surface X-ray scattering analysis of lipoxygenase (15-LOX-2) binding to DSPC/SAPC lipid monolayers. Spring American Chemical Society National Conference, Remote due to COVID-19 pandemic.
15. Sallaberry, C.A., **Vander Zanden, C.M.** (2021) XR and GIXD measurements to determine curcumin impacts on amyloid beta interactions with membranes. Spring American Chemical Society National Conference, Remote due to COVID-19 pandemic.

The posters above this red line represent presentations at **national or state-wide meetings** given by me or my students since my UCCS appointment began. Local and UCCS-level items are omitted.

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16. **Vander Zanden, C.M.,** Majewski, J., Watkins, E.B., Chi, E.Y. (2019) Fibrillar and non-fibrillar amyloid beta structures drive two distinct modes of membrane-mediated toxicity. IRADCA National Meeting, Ann Arbor, MI.
17. **Vander Zanden, C.M.,** Majewski, J., Watkins, E.B., Chi, E.Y. (2018) Impact of Toxic Amyloid-β Oligomers on Model Lipid Membranes. IRACDA National Conference, Atlanta, GA.
18. **Vander Zanden, C.M.,** Broad, A.J., Rowe, R.K., Robertson, A. B., Ho, P.S. (2018) Vertebrate Endonuclease G Preferentially Cleaves Holliday Junctions and Specifically Recognizes 5-Hydroxymethylcytosine. Biophysical Society National Meeting, San Francisco, CA.
19. **Vander Zanden, C.M.,** Broad, A.J., Rowe, R.K., Robertson, A. B., Ho, P.S. (2017) 5-Hydroxymethylcytosine Impacts Holliday Junction Structure to Promote Recombination via Recognition by Endonuclease G. Spring American Chemical Society Conference, San Francisco, CA.
20. **Vander Zanden, C.M.,** Broad, A.J., Rowe, R.K., Robertson, A. B., Ho, P.S. (2016) 5-Hydroxymethylcytosine Impacts Holliday Junction Structure to Promote Recombination via

Recognition by Endonuclease G. CMB/MCIN/BMB Poster Symposium, Fort Collins, CO. **(Highest honors)**

21. **Vander Zanden, C.M.,** Broad, A.J., Rowe, R.K., Robertson, A. B., Ho, P.S. (2015) Hydroxymethylcytosine Impacts Holliday Junction Structure and Stability. CSU Graduate Student Showcase, Fort Collins, CO. **(Outstanding Poster College Natural Sciences)**
22. **Vander Zanden, C.M.,** Broad, A.J., Rowe, R.K., Robertson, A. B., Ho, P.S. (2015) Hydroxymethylcytosine impacts Holliday junction structure to promote recombination via recognition by Endonuclease G. CMB/MCIN/BMB Poster Symposium, Fort Collins, CO. **(Honors)**
23. **Vander Zanden, C.M.**, Carter, M., Voth, A.R., Scholfield, M.R., Ho, P.S. (2013) The Structure-Energy Relationships of Halogen Bonds in Engineered DNA Junctions. Gordon Conference on Nucleic Acids, Biddeford, ME.
24. **Vander Zanden, C.M.**, Wilson, M. V., Wilson, E. (2011) Novel Circular Dichroism Spectroscopy Technique for the Study of Secondary Structure of Proteins Adsorbed to Solid Surfaces. Spring American Chemical Society Conference, Anaheim, CA
25. **Vander Zanden, C.M.**, Wilson, M. V., Kraye, H, Wilson, E. (2010) Study of Bone Mineralization through Analysis of Mineral-Binding Peptides. NISBRE Conference, Washington, DC.
26. **Vander Zanden, C.M.**, Wilson, M. V., Wilson, E. (2010) Infrared Spectroscopy and Novel Circular Dichroism Spectroscopy Techniques for the Study of Secondary Structure of Proteins Adsorbed to Solid Surfaces. Nebraska INBRE Conference, Grand Island, NE.

10. GRANTS

Under Review:

NSF Faculty Early Career Development Program (CAREER) (external) 6/1/26 – 5/31/31
Role: PI
Submitted budget: $ 991,619
Project title: CAREER: Elucidating Structure/Function Relationship of Galectin Protein Architectures

Current Awarded:

R15 - NIH/NIGMS Research Enhancement Award (external) 9/1/25 – 8/1/28
PI: Liliya Vugmeyster
Role: Co-principle investigator
Total Award: $ 466,972
Amount Awarded to UCCS: $ 22,103
Project title: Internal Water Dynamics in Hydration Shells of Amyloid-Beta Species

1R15GM150123-01- NIH/NIGMS Research Enhancement Award (external) 7/1/23 – 6/30/26
Role: PI
Total Award: $ 429,928
Project title: Galectin-3 and Engineered Variants for Controlling Clustering of Glycolipids and Glycoproteins on Membrane Surfaces

Previous Awarded:

1R15GM143724-01- NIH/NIGMS Research Enhancement Award (external) 9/30/21 – 8/31/24
PI: Nathan Gilbert
Role: Co-principle investigator
Total Award: $ 444,015
Amount Awarded to UCCS: $ 42,635
Project title: Conformational flexibility of lipoxygenases and its role in regulation and substrate acquisition

UCCS Dept. of Chemistry and Biochemistry Start-Up Funds (internal) 8/19/19 – 6/30/24
Role: PI
Total Award: $120,000
Project title: Structural biology of protein/membrane interactions

Undergraduate Research Award, UCCS (internal) 6/1/25 – 8/15/25
Role: PI
Student trainee: Kristina Hrbac
Total Award: $4,000
Project title: Formation of Toxic Amyloid Beta Species Found in Alzheimer's Disease

Undergraduate Research Award, UCCS (internal) 5/31/22 – 8/19/22
Role: PI
Student trainee: Advita Bhatia
Total Award: $3,500
Project title: Simulations to determine the neuroprotective mechanism of curcumin in Alzheimer's disease

Undergraduate Research Award, UCCS (internal) 8/24/20 – 12/19/20
Role: PI
Student trainee: Danielle Browne
Total Award: $3,500
Project title: Understanding mechanisms of cell communication

Undergraduate Research Award, UCCS (internal) 8/24/20 – 12/19/20
Role: PI
Student trainee: William Stone
Total Award: $3,500
Project title: Simulations to determine the neuroprotective mechanisms of curcumin

MBC180100 – NSF XSEDE Research Request (external) 10/01/18 – 3/30/20
Role: PI
Estimated Value: $1,284.73
Pittsburgh Super Computer "Bridges GPU" 3964 SUs, "Pylon Storage" 500GB
Project title: MD investigation of polyphenol and amyloid-beta interactions with lipid membranes

5K12GM088021-10 - NIH/NIGMS Research Career Development Award 9/1/18 – 8/31/19
(external/internal)
PI: Angela Wandinger-Ness
Role: Trainee
Total Award: $ 809,129
Project title: Academic Science Education and Research Training

MBC170121 – NSF XSEDE Startup Allocation (external) 9/24/17 – 9/24/18
Role: PI
Estimated Value: $2,147.13
Pittsburgh Super Computer "Bridges GPU" 6250 SUs, "Pylon Storage" 500GB
Project title: Alzheimer's Aβ peptide interaction with lipid membranes

F31GM113580 - NIH/NIGMS Pre-Doctoral Fellowship (external) 1/1/14 – 12/31/16
Role: PI
Total Award: $66,216

Project title: Hydroxymethylcytosine stabilizes Holliday junctions and promotes recombination

11. COURSES TAUGHT

University of Colorado, Colorado Springs (Colorado Springs, CO):
Instructor:
Introduction to Biochemical Principles (CHEM 2201)
Semesters taught: Spring 2023 (co-taught), Spring 2024, Spring 2025

- Adapted course to match my preferred teaching style
- Incorporated new lecture and homework on degree planning and career preparation

Biochemistry (CHEM 4211)
Semesters taught: Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025, Fall 2025

- Taught non-major students foundational principles in biochemistry
- Developed pre-recorded lectures and in-class practice problems

Research Methods (CHEM 6010)
Semesters taught: Fall 2021

- Taught graduate students research ethics topics, meeting NIH standards
- Guided students in writing a literature review chapter for their thesis

Advanced Techniques in Biochemistry (CHEM 4232/5232)
Semesters taught: Fall 2020, 2021

- Molecular biology cloning lab, emphasis on writing
- Developed online pre-lab content and recitation to accommodate COVID-19 pandemic

Biochemistry of Human Health and Development (CHEM 4751/5751)
Semesters taught: Fall 2019, 2020, 2021, 2022, 2023, 2024

- Taught course focused on the biochemistry of neurodegenerative diseases
- Emphasis on facilitating small-group discussion of primary literature and student writing
- Taught Hy-Flex (offered in-person, remote synchronous, AND remote asynchronous options) in 2020 to accommodate the COVID-19 pandemic

Advanced Biochemistry (CHEM 4261/5261)
Semesters taught: Spring 2020, 2021, 2022, 2023

- Instructed biochemistry of membranes portion of the course and developed recorded lecture videos and in-class practice problems
- Taught the entire course (including biochemistry of the gene) in Spring 2022

Biophysical Chemistry Applications Online (CHEM 4741/5741)
Semesters taught: Spring 2020, 2021

- Taught crystallography, NMR, electron microscopy, molecular dynamics
- Developed fully online curriculum – lectures, check-in questions, homework, discussions
- Developed "application projects" in crystallography and molecular dynamics
- The vast majority of my materials are still being used in current iterations of this course

Introduction to Organic and Biochemistry Lab (CHEM 1211)
Semesters taught: Spring 2020, 2021

- Delivered pre-lab lectures, graded lab reports, supervised students in lab
- Developed module on protein structure centered around SARS-CoV-2 spike protein

Central New Mexico Community College (Albuquerque, NM):
Co-Instructor:
General Chemistry I Lecture Online (CHEM 1710)
Semester taught: Spring 2019

- Designed and taught module for chemical bonding, molecular geometry, and phases
- Created online videos lectures
- Developed online "check-in" questions using CANVAS

Introductory Chemistry Lecture (CHEM 1410)
Semester taught: Fall 2018

- Designed and taught flipped learning module for stoichiometry, molar conversions, and naming compounds
- Created instructional videos for students to watch before class
- Developed in-class questions for student group work
- Wrote and graded weekly homework assignments

Southwest Indian Polytechnic Institute (Albuquerque, NM):
(100% Native American Student Population)
Co-Instructor:
General Biology Lecture (BIO 121)
Semester taught: Spring 2018

- Taught general biology topics including genetics, evolution, speciation, and diversity
- Designed in-class group learning activities, and wrote weekly quizzes and reading questions

General Biology Lab (BIO 121L)
Semester taught: Spring 2018

- Taught general biology labs including natural selection, protists and bacteria, DNA, genetics
- Designed lab experiments and prepped for labs

Biology for Health Sciences (BIO 123)
Semester taught: Spring 2018

- Taught health biology topics including inheritance, basic organ systems, cell types
- Designed in-class group learning activities, and wrote weekly quizzes and reading questions

Biology for Health Sciences Lab (BIO 123L)
Semester taught: Spring 2018

- Taught health biology labs including homeostasis, genetics, DNA extraction
- Designed lab experiments and prepped for labs

Colorado State University (Fort Collins, CO):
Co-Instructor:
Advanced Structural Biology (BC711)
Semester taught: Spring 2014

- Taught practical crystallography skills (crystal growth, data collection, structure solving)

12. RECOGNITIONS

LAS Outstanding Teaching Award, Tenure Track Category 2023
UCCS, College of Letters, Arts, and Sciences

Biophysical Society Post-doctoral Travel Award: 2019
Award to travel to Biophysical Society National meeting 2019

Preecha Kownin Memorial Award: 2016
Outstanding senior PhD student in CSU biochemistry department

Highest Honors Poster Award: 2016
CMB/MCIN/BMB Poster Symposium

Professor Parviz Azari Graduate Fellowship: 2015
Fellowship to enhance student research opportunities in CSU biochemistry

College of Natural Sciences Outstanding Poster Award: 2015
CSU Graduate Student Showcase

Honors Poster Award: 2015
CMB/MCIN/BMB Poster Symposium

Graduate Student Excellence in Teaching: 2014
Outstanding graduate teaching for the College of Natural Sciences at CSU

Mauricio X. Zuber Memorial Award: 2013
Recognizes outstanding first or second year PhD student in CSU biochemistry

Makosky Prize 2010
Outstanding senior chemistry or biochemistry major at Doane College

David H. Smith Memorial Research Award: 2010
Outstanding research and oral presentation at Doane College

13. PROFESSIONAL ORGANIZATIONS

Biophysical Society
American Chemical Society

14. SERVICE

Department, College, and University Service

Faculty Advisor for Chemistry and Biochemistry Club	2025-Present
LAS Curriculum and Requirements Committee Co-Chair	2024-Present
UCCS CREST Belayers Mentoring Panel (panelist)	2024
Navigating Funding in STEM: A Faculty Panel on Grant Acquisition Journeys (panelist)	2024
Department of Chemistry and Biochemistry Hiring Committee Member (4 times)	2022-2024
Department of Chemistry and Biochemistry DEI Committee (Chair)	2021-Present
LAS Curriculum and Requirements Sub-Committee	2021-Present
Reviewer for UCCS Undergraduate Research Academy	2021, 2023
Orientation Table Staffing - Dept. of Chemistry & Biochemistry (1-2 times per year)	2020-Present
LAS Curriculum and Requirements Committee Member	2020-Present
Peer Observations of Teaching (6 times)	2020-Present

Professional Service

Reviewer for Nature Communications	2025
Reviewer for UKRI Funding Service	2024
Reviewer for ACS Chemical Neuroscience	2024
Reviewer for Natural Product Communications	2024
Reviewer for ACS Nano	2024
Reviewer for ACS Langmuir	2024
Reviewer for Neural Regeneration Research	2023
Reviewer for Journal of Alzheimer's Disease	2022
NSF Panel Reviewer	2022
NSF Ad Hoc Reviewer	2022
Reviewer for MDPI Life	2020, 2021
Reviewer for ACS Biomaterials	2019, 2020
Reviewer for *Biochimica et Biophysica Acta* Biomembranes	2019

Outreach and Volunteering

Village High School "Careers in Chemistry and Biochemistry" Speaker	2025
Doherty High School "Careers in Chemistry and Biochemistry" Speaker	2025
Guest Lecturing in Freshman Seminar Courses "Pathways in STEM" (11 times)	2022-2025
Peak Area Leadership in Science Meeting for Science Teachers – Speaker	2023
Cool Science Carnival – Designed hands-on enzyme activity (~200 participants/year)	2019-25
Inventa Academy STEAM Summer Camp – Organized 1 day of activities	2021
Big Brothers Big Sisters – Mentor 2.0, high school student mentoring	2018-19
Colorado State Science and Engineering Fair Judging	2015-16
Poudre School District Science Fair Volunteer	2015-16
Discovering DNA Structure – Middle and high school outreach events	2014-16
Biochemistry is Elementary – Multi-Week Elementary School Outreach Program	2014-15
Cell-Bikeology – Organized summer CSU biochemistry bike-to-work challenge	2013-14
Las Chicas de Mathematics – Invited speaker at high school girl's math summer camp	2013