

# RAYMOND BERKELEY

Department of Chemistry, Scripps Research  
10550 N. Torrey Pines Rd., La Jolla, CA 92037

## RESEARCH EXPERIENCE

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**Scripps Research, La Jolla, CA** February 2025 - Present

*Advisor: Benjamin F. Cravatt III*

Structural bioinformatic approaches to characterizing the non-orthosteric ligandable proteome; structural and chemical proteomic characterization of covalent modulators of protein-protein interactions.

**University of California San Diego, La Jolla, CA** July 2023 - February 2025

*Advisor: Mark A. Herzik Jr.*

Development of machine learning applications for particle curation in cryoEM data.

**University of California San Diego, La Jolla, CA** September 2017 - July 2023

*Advisor: Galia T. Debelouchina*

Characterization of the physical and biochemical basis of protein phase transitions using chemical, structural, and computational biology methods.

**University of California Santa Cruz, Santa Cruz, CA** August 2012 - November 2015

*Advisor: R. Scott Lokey*

Investigation of the chemical basis for the passive permeability of cyclic peptide macrocycles; determination of the mechanism of action of a bioactive small molecule by whole genome sequencing of resistant mutants.

**University of Oxford, Oxfordshire, UK** January 2015 - March 2015

*Advisor: Stuart J. Conway*

Synthesis of analogs of a dimethylisoxazole-based bromodomain inhibitor.

## PROFESSIONAL EXPERIENCE

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**Bioinformatics Programmer II** July 2023 - February 2025

**University of California, San Diego, La Jolla, CA**

*Advisor: Mark A. Herzik Jr.*

Development of machine learning applications for particle curation in cryoEM data.

**Research Associate, Chemistry** November 2015 - August 2017

**Mendel Biological Solutions, Hayward, CA**

*Advisors: Peter P. Repetti & Joshua I. Armstrong*

Discovery and development of bioactive natural products for the enhancement of crop performance in agriculture.

## EDUCATION

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**University of California, San Diego**

Ph.D., Chemical Biology, 2023

## University of California, Santa Cruz

B.S., Molecular, Cell, & Developmental Biology with a minor in Bioinformatics, 2015

## PUBLICATIONS

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9. Hayward, R.E., Berkeley, R.F., Gao, Z., Garhammer, M., Morizono, M.A., Njomen, E., ... Melillo, B., Cravatt, B.F. (2025). Tryptoline stereoprobe elaboration identifies inhibitors of the grpE1-hspa9 chaperone complex. *bioRxiv*. ([link](#), [pdf](#))
8. Berkeley, R.F.\*, Cook, B.C.\*., Ji, D., Foroughi, A., Saladi, A., Bachochin, M., & Herzik Jr., M.A. (2025). Removal of false particle images from cryoEM data using ANTIDOTE: A Neural network Trained In Deleterious ObjecT Elimination. *bioRxiv*. ([link](#), [pdf](#))
7. Berkeley, R.F.\*, Plonski, A.P.\*., Phan, T.M.\*., Grohe, K., Becker, L., Wegner, S., ... Mittal, J., Debelouchina, G.T. (2025). Capturing the conformational heterogeneity of HSPB1 chaperone oligomers at atomic resolution. *J. Am. Chem. Soc.*, 147(18), 15181–15194. ([link](#), [pdf](#))
6. Berkeley, R.F.\*, Cook, B.C.\*., & Herzik Jr., M. (2024). Machine learning approaches to density modification improve map quality at the cost of ligand density quality. *Front. Mol. Biosci.*, 11, 1404885. ([link](#))
5. Berkeley, R.F., & Debelouchina, G.T. (2022). Chemical tools for study and modulation of biomolecular phase transitions. *Chem. Sci.*, 13(48), 14226–14245. ([link](#), [pdf](#))
4. Berkeley, R.F., Kashefi, M., & Debelouchina, G.T. (2021). Real-time observation of structure and dynamics during the liquid-to-solid transition of FUS LC. *Biophys. J.*, 120(7), 1276–1287. ([link](#), [pdf](#))
3. Lim, B. J., Berkeley, R.F., & Debelouchina, G.T. (2020). Fused split inteins: Tools for introducing multiple protein modifications. In *Methods mol. biol.* (Vol. 2133, pp. 163–181). New York, NY: Humana. ([link](#))
2. Schwochert, J., Turner, R., Thang, M., Berkeley, R.F., Ponkey, A. R., Rodriguez, K. M., ... Lokey, R.S (2015). Peptide to peptoid substitutions increase cell permeability in cyclic hexapeptides. *Org. Lett.*, 17(12), 2928–2931. ([link](#), [pdf](#))
1. Wride, D.A., Pourmand, N., Bray, W.M., Kosarchuk, J., Nisam, S., Quan, T., ... Lokey, R.S. (2014). Confirmation of the cellular targets of benomyl and rapamycin using next-generation sequencing of resistant mutants in *S. cerevisiae*. *Mol. BioSyst.*, 10(12), 3179–3187. ([link](#), [pdf](#))

\* equal contribution

## AWARDS AND HONORS

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- 2022 ACS Graduate Student and Postdoctoral Scholar Recognition Program Award for Leadership in Mentoring
- 2021 Bruno Zimm Award
- 2019–2020 San Diego Fellowship\*
- 2018–2020 NIH Chemistry-Biology Interface Predoctoral Training Program\*

\* full support

## SERVICE

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- 2023 Global NMR Twitter Conference Judge
- 2022 ACSSA Undergraduate Research Symposium Judge
- 2021 Debelouchina Lab UCSD Mentor-Mentee Workshop
- 2021 Mira Mesa High School ScienceBridge Program Speaker
- 2021 ACSSA Undergraduate Research Symposium Moderator
- 2020 UCSD Grad Pals Mentorship Program
- 2018–2020 ChemPAL Mentorship Program
- 2012 Juvenile Diabetes Research Foundation Counsellor

## INVITED AND CONTRIBUTED TALKS

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- 2023 San Diego cryoEM Supergroup, La Jolla, CA
- 2023 Biophysical Society Annual Meeting (IDP subgroup early career speaker), San Diego, CA
- 2022 UT Southwestern Biophysics Seminar Series (lightning talk), Dallas, TX
- 2022 International Council on Magnetic Resonance in Biological Systems (lightning talk), Boston, MA
- 2021 UCSD Graduate Student Seminar Series, Virtual
- 2021 San Diego NMR Supergroup, Virtual
- 2021 San Diego Python Users Group, Virtual
- 2019 Chemistry Biology Interfaces Symposium, UC San Diego, La Jolla, CA
- 2019 CBI-CRIN Industry Interaction Day (Lightning Talk), UC San Diego, La Jolla, CA
- 2018 Chemistry Biology Interfaces Symposium, UC San Diego, La Jolla, CA

## OTHER CONFERENCES AND POSTERS

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- 2023 SoCal CryoEM Symposium (poster), UC Santa Barbara, Santa Barbara, CA
- 2023 Biophysical Society Annual Meeting (poster), San Diego, CA
- 2022 International Council on Magnetic Resonance in Biological Systems (poster), Boston, MA
- 2022 Southern California Users of Magnets (poster), UC Santa Barbara, Santa Barbara, CA
- 2021 Protein Society Annual Symposium (poster), Virtual
- 2021 Experimental Nuclear Magnetic Resonance Conference (poster), Virtual
- 2021 UCSD Graduate Student Seminar Series, Virtual
- 2021 Biophysical Society Annual Meeting (poster), Virtual
- 2020 Biomolecular Solid-State NMR Winter School, Stowe, VT

- 2016 PyData San Francisco, San Francisco, CA
- 2016 HPLC 2016, San Francisco, CA
- 2015 William S. Johnson Symposium (poster), Stanford University, Palo Alto, CA