

RAYMOND BERKELEY

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

RESEARCH EXPERIENCE

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

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

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

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

- 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

- 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

- 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

- 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