

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. (Accepted). Tryptoline Stereoprobe Elaboration Identifies Inhibitors of the GRPEL1-HSPA9 Chaperone Complex. *Nat. Chem. Biol.* ([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.A.*. (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. Schwoichert, 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

2026	Drug Discovery Chemistry Best Poster Award
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

2026	Drug Discovery Chemistry (poster), San Diego, CA
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