

# Dr. Eliot Morrison

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## Postdoc

**Prof. Dr. Christian Freund**

**Freie Universität, Berlin, Germany**

Jan. 2018 – present

*Structural investigation of DHHC PATs.* Investigated the enzymatic and structural properties of the multipass membrane DHHC PAT family.

## Previous Experience

### Doctoral Student

**Prof. Dr. Christian Freund**

**Freie Universität, Berlin, Germany**

Oct. 2012 – Jan. 2018

*Stimulation-dependent Palmitoylation in T Cells.* Used quantitative proteomics to establish stimulation-dependent palmitoylated proteins involved in TCR signaling.

### M.Sc. Candidate

**Dr. George Gassner**

**San Francisco State University, San Francisco, CA**

Jan. 2011 – Aug. 2012

Developed kinetic and thermodynamic experiments to establish flavin-transfer mechanism in styrene monooxygenase system.

## Publications

Alvaro-Benito, M.; **\*\*Morrison, E.**; Kuroпка, B.; Abualrous, E.; Freund, C. Quantification of HLA-DM-dependent MHCII-immunopeptidomes by the Peptide Landscape Antigenic Epitope Alignment Utility (PLAtEAU). *Front. Immunol.*, 9:872 (2018)

Niemz, J.; Kliche, S.; Pils, M.C.; **Morrison, E.**; Manns, A.; Freund, C.; Crittenden, J.; Graybiel, A.; Galla, M.; Jansch, L.; Huehn, J. The guanine-nucleotide exchange factor CalDAG GEF1 fine-tunes functional properties of regulatory T cells. *Eur. J. Microbiol. Immun.*, 7(2), 112-126 (2017)

**\*Morrison, E.**; Wiedemann, H.; Brügger, B.; Freund, C. Reversible Palmitoylierung von Proteinen. *BIOspektrum*, 23(1), 32-35 (2017)

Alvaro-Benito, M.; **Morrison, E.**; Wiczorek, M.; Sticht, J.; Freund, C. Human leukocyte Antigen-DM polymorphisms in autoimmune diseases. *Open Biol.*, 6(8), pii: 160165 (2016)

**\*Morrison, E.**; Kuroпка, B.; Kliche, S.; Brügger, B.; Krause, E.; Freund, C. Quantitative analysis of the human T cell palmitome. *Sci. Rep.*, 5, 11598 (2015)

Freund, C.; Kuroпка, B.; Albert, G.; **Morrison, E.**; Krause, E. Investigation of phosphorylation-dependent interactions in T cells. *J. Proteomics Bioinform.*, 7:8 (2014)

**\*Morrison, E.**; Kantz, A.; Gassner, G.; Sazinsky, M. Structure and Mechanism of Styrene Monooxygenase Reductase: New Insight into the FAD-Transfer Reaction. *Biochemistry*, 52, 6063-6075 (2013)

**\*Morrison, E.**; Kantz, A.; Chandrasekaran, P.; Liao, S.; Singh, B.; Tischler, D.; Sazinsky, M.; Gassner, G. Mechanism of FAD Reduction and Transport in the Two-Component Flavoenzyme, Styrene Monooxygenase from *Pseudomonas putida* S12. *Proceedings of the 17th International Symposium on Flavins and Flavoproteins* (2011)

\*First author. \*\*Co-first author.

## Education

Doctorate (2018)

*Doctor rerum naturalium*

**summa cum laude**

Freie Universität

Berlin, Germany

M.Sc. Biochemistry (2012)

**summa cum laude**

San Francisco State University

San Francisco, CA

B.S. Biochemistry (2010)

**magna cum laude**

Portland State University

Portland, OR

## Awards / Honors

**Berlin Science Hack Day: Best Hardware Hack (DIY PCR Thermocycler) (2015)**

**Proteomic Forum 2015: Best Poster (nom.) (2015)**

**DAAD Ph.D. Research Scholarship (2014–15), (2013–14), (2012–13)**

**SFSU Graduate Award for Distinguished Achievement (2013)**

**SFSU Summer Research Scholar (2012), (2011)**

**CSU Research Competition Finalist: Physical Sciences (2012)**

**Don Eden Graduate Student Research Award Finalist (2012)**

**ARCS Foundation Scholar (2011-12)**

## References

**Prof. Dr. Christian Freund**

*Doctoral Research Advisor*

Department of Biochemistry

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*Additional references available upon request.*

## Recent Presentations and Workshops

**SFB/TRR186 Annual Ph.D./Postdoc Meeting** (Berlin, Germany, Apr 2018) *Using Mass Spectrometry to Quantify Stimulation-Dependent T-Cell Palmitoylation* (talk)

**SFB/TRR186 Annual Meeting** (Heidelberg, Germany, Oct 2017) *The palmitoylation switch of activated T cells* (talk/poster)

**FU Berlin Biochemistry Department Retreat** (Berlin, Germany, July 2017) *Dynamic Palmitoylation of VAMP7 during TCR Signaling: Proteomic and Enzymatic Approaches* (talk)

**de.NBI Summer School: From Big Data to Big Insights** (Schloss Dagstuhl, Germany, Sep 2016) (workshop)

**FEBS Young Scientists' Forum / 40th FEBS Congress** (Berlin, Germany, July 2015): *Quantitative analysis of dynamic palmitoylation in human T cells* (poster)

**Proteomic Forum 2015** (Berlin, Germany, March 2015): *Quantification of palmitoylated proteins in T cells using acyl-biotin exchange* (poster)

**Future Tensing** (Berlin, Germany, February 2015): *Who Owns Life? Unraveling Biological Patents* (talk)

**Pop Science Cafe** (Berlin, Germany, January 2015): *The Future Face of Infection: Antibiotic Resistance and Phage Therapy* (talk)

**Free University Department of Chemistry and Biochemistry** (Berlin, Germany, June 2014): *Tracking Inducible Palmitoylation in T Cells Using Quantitative Proteomics* (talk)

**56th Annual Biophysical Society Meeting** (San Diego, CA, Feb 2012): *Unlocking the Flavin Reduction and Transfer Mechanisms of the Two-Component Flavoenzyme Styrene Monooxygenase in Pseudomonas putida S12* (poster)

**24th Annual CSU Biotechnology Symposium** (Santa Clara, CA, Jan 2012): *Biodegradation of Styrene: Understanding Styrene Metabolism in Pseudomonas putida S12* (talk)

**CSU Research Competition** (Long Beach, CA, May 2012): *Biodegradation of Styrene: Understanding Styrene Metabolism in Pseudomonas putida S12* (talk)

**17th International Symposium of Flavins and Flavoproteins** (Berkeley, CA, Jul 2011): *Mechanism of FAD Reduction and Transport in the Two-Component Flavoenzyme, Styrene Monooxygenase from Pseudomonas putida S12* (poster)

## Research Experience / Skills

**Quantitative Mass Spectrometry** (2012–18): *Extensive LC-MS/MS training on Orbitrap Elite (Thermo Fisher) (AG Krause, FMP, Berlin) and LTQ Orbitrap Velos (BioSupraMol Core Facility). Quantitative mass spectrometry performed using SILAC-labeled Jurkat T cells and <sup>18</sup>O-labeled primary human T cells.*

**Relevant Skills:** Sample preparation, usage, troubleshooting and data analysis on Orbitrap Elite and LTQ Orbitrap Velos instruments. Data analysis using Python, MaxQuant, Mascot Distiller and Perseus.

**Improved Analysis of Quantitative Mass Spectrometric Data** (2014–18): *Used Python to develop software to improve experimental workflow and quality of data analysis. Projects include the extraction low-abundance peptides from background of <sup>18</sup>O-labeled primary T cell data, the global identification and prediction of N-glycosylated proteins, and a peptide alignment script with a custom label-free quantification algorithm.*

**Relevant Skills:** Python, R, Mascot Distiller, MaxQuant, Perseus

**Established Acyl-Biotin Exchange Protocol in AG Freund** (2013–14): *Adapted acyl-biotin exchange protocol (Wan et al., Nat. Prot. 2007) for use with Jurkat and primary T cells; improved efficiency of N-ethylmaleimide labeling; increased yield of precipitation steps.*

**Relevant Skills:** Palmitoylation enrichment via chemical labeling, Western blot

**Kinetic and Thermodynamic Properties of SMOA/B** (2011–12): *Headed a research project requiring the expression of styrene monooxygenase SMOA/B in E. coli, purification by HPLC, determination of binding constants by steady-state fluorescence and spectroscopic determination of redox potentials of the monooxygenase flavin system. (Morrison et al., Biochemistry, 2013)*

**Relevant Skills:** Protein expression, purification and refolding; Stopped-flow kinetics studies

## Additional Information

United States citizen.

Six years German language experience